New High School in Bungendore

Transport Assessment

Hindmarsh Construction Australia Pty Ltd

10 September 2021

The Power of Commitment

GHD Pty Ltd
Level 15, 133 Castlereagh Street
Sydney, NSW, 2000
T (02) 9239 7100 | **E** sydmail@ghd.com | **ghd.com**

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1. Strategic Context

This Transport Assessment (TA) accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) in support of an application for a State Significant Development (SSD No 14394209). The SSDA is for a new high school located at Bungendore.

In addition to this TA, a Draft School Transport Plan (TP) has been prepared by GHD for the new high school in Bungendore. The TP has been prepared to manage travel demand during the construction of the high school and to govern travel to and from school throughout post-occupancy. A copy of the TP is included in Appendix A.

Additionally, a Preliminary Construction and Pedestrian Traffic Management Plan (CTMP), has been prepared by GHD as a separate deliverable (with a summary provided in this TA) for the new high school in Bungendore.

This report addresses the Secretary's Environmental Assessment Requirements (SEARs), as detailed in Table 1-1.

Table 1-1 SEARs Comments

SEARs	GHD Response
Provide a transport and accessibility impact assessment, which includes, but is not limited to the following: Analysis of the existing transport network to at least the proposed enrolment boundary, including: – road hierarchy. – pedestrian, cycle and public transport infrastructure. – details of current daily and peak hour vehicle movements based on traffic surveys and / or existing traffic studies relevant to the locality. – existing transport operation for 1hr before and after proposed bell times such as span of service, frequency for public transport and school buses, pedestrian phasing for signals. – existing performance levels of nearby intersections utilising appropriate traffic modelling methods (such as SIDRA network modelling). – location and nature of adjoining rail infrastructure that may be impacted by the development.	A summary of the road hierarchy, including Kings Highway, Turallo Terrace, Gibraltar Street, Butmaroo Street and Majara Street is provided in Section 2.1.1 of the TA. A description of the active transport networks, including maps of the facilities adjacent to the school and the 1.2 km walking catchment, are included in Section 2.1.2.1 of the TA. The arrival and departure times of school buses at the adjoining Bungendore Primary School are summarised in Section 2.1.2.2.1 of the TA. Traffic survey were undertaken at intersections on Turallo Terrace, Majara Street, Gibraltar Street, Kings Highway and Majara Street on 05/11/2020 between 8:00 am – 9:30 am and 2:30 pm – 4:00 pm to capture activity during peak period of school operation, as detailed in Section 2.4 of the TA. SIDRA analysis and outputs for the key intersections in proximity to school site for the existing situation is included in Section 2.5 of the TIA. A description of the rail services and infrastructure in proximity to the school site is included in Section 2.1.2.2.3 of the TA.
Details of the proposed development, including: – a map of the proposed access which identifies public roads, bus routes, footpaths and cycleways. – pedestrian site access and vehicular access arrangements, including for service and emergency vehicles and loading/unloading, including swept path analysis demonstrating	An image showing the proposed walking and cycling network adjacent to the school, including the pedestrian and vehicular access points, bicycle parking locations, pick-up/drop-off locations for buses and cars and the car parking area is displayed in Section 3.2.1.1 and 3.2.2.1 of the TA. The routes of the current school bus services at the primary school within the Bungendore

SEARs	GHD Response
the largest design vehicle entering and leaving the site and moving in each direction through intersections along the proposed transport routes. – car and motorcycle parking, bicycle parking and end-of-trip facilities. – drop-off / pick-zone(s) and arrival/departure bus bay(s). – pedestrian, public transport or road infrastructure improvements or safety measures.	Township and its surrounds is displayed in Section 2.1.2.2.1 of the TA. A description of the active transport networks including maps of the facilities adjacent to the school and the 1.2 km walking catchment, are included in Section 2.1.2.1 of the TA. A description of the end of trip facilities is provided in Section 3.2.1.2 of the TA. The recommended upgrades to the active transport network will support active transport connectivity to the proposed high school and wider Bungendore Township is provided in Section 3.2.2.1 of the TA. A description of the car parking arrangements at the high school is provided in Section 3.2.2.2 of the TA. Details of the waste collection and delivery arrangements at the high school are included in Section 3.2.1.5 of the TA. Detail of the proposed pick-up/drop-off facilities are included in Section 3.2.1.4 of the TA.
Analysis of the impacts due to the operation of the proposed development, including: – proposed modal split for all users of the development including vehicle, pedestrian, bicycle riders, public transport, school buses and other sustainable travel modes. – estimated total daily and peak hour vehicular trip generation. – a clear explanation and justification of the: • assumed growth rate applied. • volume and distribution of proposed trips to be generated. • type and frequency of design vehicles accessing the site. – details of performance of nearby intersections and level crossings with the additional traffic generated by the development both at the commencement of operation and in a 10-year time period (using SIDRA network modelling). – cumulative traffic impacts from any surrounding approved development(s). – adequacy of pedestrian, bicycle and public transport infrastructure and operations to accommodate the development. – adequacy of car and motorcycle parking and bicycle parking provisions when assessed	The mode share targets for students and staff at the high school are detailed in Section 2.1.2 of the TP (Appendix A). The expected trip generation characteristics of the proposed high school are detailed in Section 4.2 of the TA. The trip generation was based on the 2016 census Journey to Work Data for Bungendore. The background traffic volumes were developed, accounting for the expected residential development at the North Elmslea Subdivision and the Bungendore East Subdivision. Additionally, to be conservative, an annual growth rate of two percent has been applied to the current traffic volumes, separate to the proposed subdivision peak hour traffic generation, to identify the horizon year baseline traffic volumes and account for the growth in Bungendore, as detailed in Section 4.1 of the TA. The trips generated by the school were distributed onto the road network in accordance with the locations of key residential areas within Bungendore and their geographical context to the school subject site, as detailed in Section 4.3 of the TA. As detailed in Section 4.4 of the TA, SIDRA analysis for key intersections was undertaken in

SEARs	GHD Response
against the relevant car / bicycle parking codes and standards. – adequacy of the drop-off / pick-up zone(s) and bus bay(s), including assessment of any related queuing during peak-hour access. – adequacy of the existing / proposed pedestrian infrastructure to enable convenient and safe access to and from the site for all users.	the 2023 (year of opening) and 2033 horizon year accounting for: – A two percent annual background traffic growth. – The trips associated with the North Elmslea and Bungendore East Subdivisions. – The trips associated with the new high school in Bungendore. The analysis of the parking supply at the high school is included in Section 3.2.2.2 of the TA. The changes in on street parking associated with the closure of Majara Street are detailed in Section 3.2.2.2 of the TA. A summary of the expected demand for buses and the expected capacity of the proposed bus zone on Gibraltar Street is provided in Section 3.2.1.3 of the TA. The recommended upgrades to the active transport network will support active transport connectivity to the proposed high school and wider Bungendore Township is provided in Section 3.2.2.1 of the TA.
Measures to ameliorate any adverse traffic and transport impacts due to the development based on the above analysis, including: – travel demand management programs to increase sustainable transport (such as a Green Travel Plan / School Transport Plan). – arrangements for the Travel Coordinator roles. – governance arrangements or relationships with state and local government transport providers to update roads safety. – infrastructure improvements or protection measures, including details of timing and method of delivery.	The recommended policies and procedures to increase sustainable mode shares and reduce the use of private vehicles are summarised in Section 2.2 of the TP (Appendix A). The roles and responsibilities of the Travel Coordinator at the new high school in Bungendore are detailed in Section 2.6.1 of the TP (Appendix A). The governance framework for the high school including the roles of the internal and external working groups are detailed in Section 2.6 of the TP (Appendix A). The recommended upgrades to the active transport network will support active transport connectivity to the proposed high school and wider Bungendore Township is provided in Section 3.2.2.1 of the TA.
A preliminary school transport plan detailing an operational traffic and access management plan for the site, pedestrian entries, the drop-off / pick-up zone(s) and bus bay(s).	The New High School in Bungendore Draft School Transport Plan (Appendix A) provides a summary of the school's access arrangements for pedestrians, cyclists, buses, waste collection vehicles and cars in Section 2.3.

SEARs	GHD Response
Analysis of the impacts of the traffic generated during construction of the proposed development, including: – construction vehicle routes, types and volumes. – construction program (duration and milestones). – on-site car parking and access arrangements for construction, emergency and construction worker vehicles. – cumulative impacts associated with other construction activities in the locality (if any). – road safety at identified intersections and level crossings near the site due to conflicts between construction vehicles and existing traffic in the locality. – measures to mitigate impacts, including to ensure the safety of pedestrian and cyclists during construction.	The primary construction routes to and from the subject site are detailed in 5.3.1 of the TA. The available construction program data is detailed in Section 5.1 of the TA. The onsite car parking arrangements are detailed in Section 5.3.3 of the TA. The emergency services vehicle arrangements are detailed in Section 5.3.7 of the TA. Potential impacts to public transport during construction are detailed in Section 5.3.6 of the TA. The measures to manage the potential impacts during construction on pedestrians and cyclists are detailed in 5.3.5 of the TA.
Measures to mitigate impacts, including to ensure the safety of pedestrian and cyclists during construction. – analysis of the impacts of construction works on the adjoining rail corridor prepared in consultation with TfNSW and John Holland Rail (rail manager of the Country Regional Network). – a preliminary Construction Traffic and Pedestrian Management Plan.	Potential impacts to public transport during construction are detailed in Section 5.3.5 of the TA. At the time of writing the TA and Preliminary CTMP there are ongoing discussions with TfNSW and John Holland about the expected operation of the level crossing in Bungendore in the context of the construction of the proposed high school.

1.1 Proposal

The proposed development is for the construction of a new high school in Bungendore. The proposal has been designed as a stream 3 high school to initially provide for approximately 450 students with core 4 facilities aimed to future proof demand forecasted to 2036.

The site is located adjacent to the existing Bungendore Public School to the south enabling the creation of an education style precinct that will enable a cohesive connection between the two schools as well as the wider Bungendore community.

The proposal will include the demolition of the Bungendore Swimming Pool (to be relocated to Queanbeyan-Palerang Regional Council's proposed new Bungendore Sports Hub) and the Bungendore Community Centre; repurposing of existing council buildings; and the construction of new school buildings. New facilities for the high school will comprise of 24 general learning spaces; dedicated science and technology spaces; a gymnasium; library; canteen; outdoor learning and play areas that include two games courts.

A new agricultural plot is also proposed to the north of the main school site including a new agricultural building and scout storage shed, adjacent to the existing scout hall.

The proposal will also provide for shared administration and staff facilities between the high school and existing primary school and construction of a warm shell for community facilities including a community library, council shopfront and community health hub.

Additionally, miscellaneous off-site works, including upgrades to nearby road intersections and infrastructure, crossings, footpaths and the like will be provided to encourage active transport opportunities and respond to changing traffic conditions.

The site plan for the new high school in Bungendore is displayed in Figure 1.1.

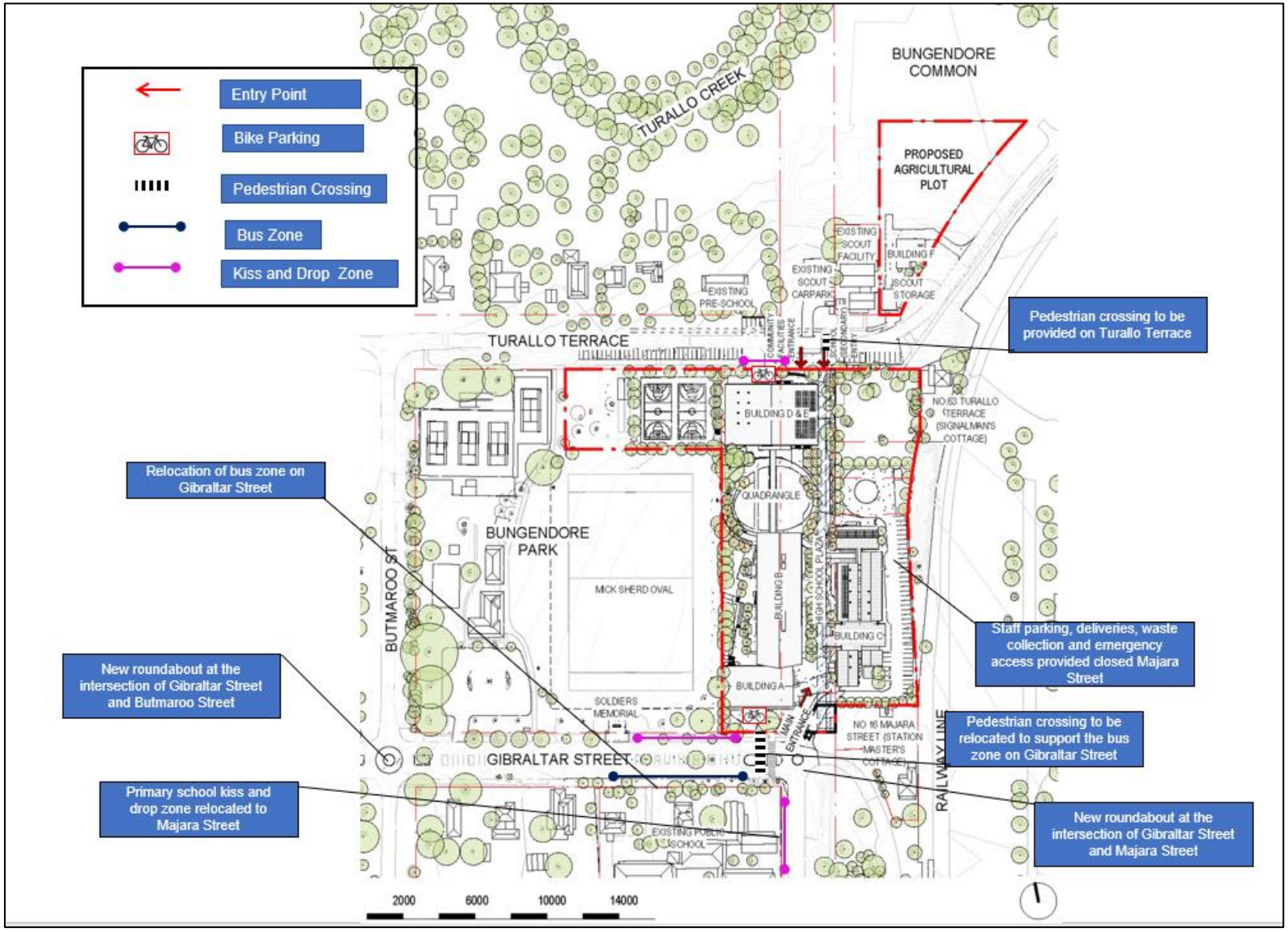

Figure 1.1 Proposed site plan

Source: TKD Architects

1.1.1 Subject Site

The proposed development is located within the Bungendore Town Centre within the local government area of Queanbeyan-Palerang Regional Council. The proposal involves the use of land which includes Bungendore Park bounded by Gibraltar Street, Majara Street, Turallo Terrace and Butmaroo Street, the existing former Palerang Council site at 10 Majara Street, the Majara Street road reserve bounded by Turallo Terrace and Gibraltar Streets and Nos. 2, 4 and 6 Majara Street (Refer to Table 1-2 below).

The site is approximately 29,205 m^2 in area and consists of a relatively flat topography. It contains part of Bungendore Park, existing Council buildings and maintained public open space areas. The land is mostly cleared of vegetation with some mature trees intersperse throughout subject lots.

The surrounding area generally includes low density residential developments to the north and west, an existing rail line to the east and Bungendore Public School and the Bungendore train station to the south and south west respectively.

Table 1-2 New high school in Bungendore legal description

Property Address	Lot Numbers
6-14 Butmaroo Street	Part Lot 701 DP1027107
2 Majara Street	Lot 12 DP1139067
4-6 Majara Street	Lot 13 DP1139067 Lot 14 DP1139067
10 Majara Street	Lot 3 DP830878
Butmaroo Street	Part Lot 701 DP96240
Portion of Majara Street (between Turallo Terrace and Gibraltar Street)	N/A

An aerial image of the school's subject site is displayed in Figure 1.2.

Figure 1.2 Site aerial depicting the land subject to the proposed High School

Source: TKD Architects

A key aspect of the school design is the closure of Majara Street (between Gibraltar Street and Turallo Terrace) to the east of the school subject site.

This change is required as currently Majara Street runs in a north/south direction through the high school subject site (as displayed in Figure 1.2). This would create an environment that would be unsafe for students and detract from the general amenity of the high school.

It is noted that at a meeting undertaken by QPRC on the 28th April 2021, councillors endorsed the closure of Majara Street to support the development of the school.

1.1.2 Student Catchment

The indicative catchment for the high school in Bungendore is displayed in Figure 1.3.

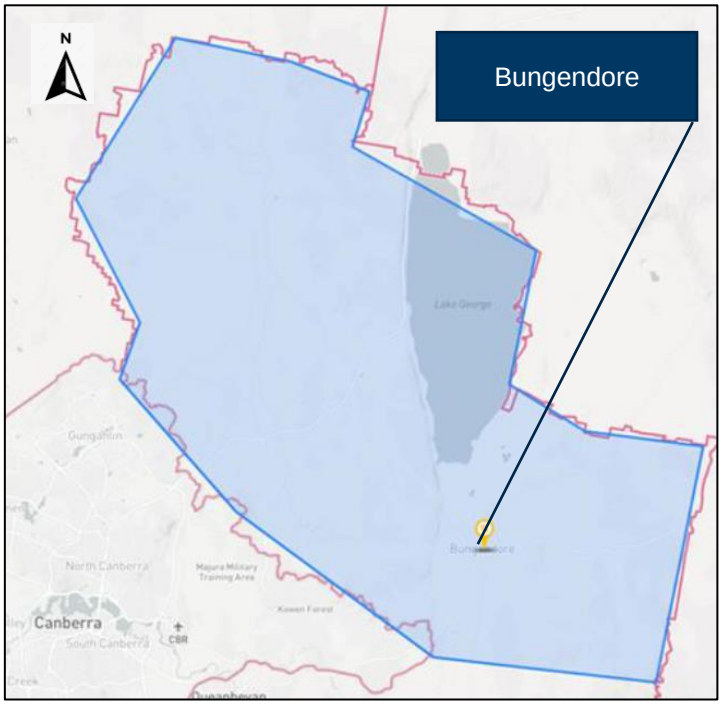

Figure 1.3 Indicative student catchment

Source: Final Business Case – A new high school in Bungendore

The student catchment for the new high school in Bungendore is large and extends to the NSW border with Australian Capital Territory (ACT), and includes townships of Sutton, Bywong, Gundaroo and Hoskintown.

1.1.3 Purpose of Transport Assessment

The TA has been prepared to:

– Respond to the SEARs (refer to Table 1-1)
– Assess multi-modal access to the school
– Identify potential travel impacts of the proposed school
– Propose solutions to mitigate identified impacts

1.2 School project context

1.2.1 Bungendore Structure Plan 2048 (2019)

The Bungendore Structure Plan 2048 was prepared by QPRC to guide the growth and development of Bungendore. The structure plan notes that 1,384 new dwellings are projected to be required within Bungendore over the next 30 years to accommodate the town's growth.

Some key supporting principles of the structure plan include:

– Pedestrian and cycling opportunities for all ages should be provided with links across all areas of the town.
– Pedestrian links throughout the central business district are encouraged.
– Development is to allow for public transport networks.

It is noted the principles above provide students in Bungendore with an opportunity to access/egress their schools using sustainable modes of transport.

With respect to the projected demand for additional dwellings, the structure plan indicates:

– To meet the growth scenario to 2048, greenfield housing (1,384 dwellings) is preferred over infill development to retain the character of Bungendore.
– The Bungendore Structure Plan identifies four key areas recommended for rezoning (Lots 1, 3, 4 and 6).
– The proposed residential growth is concentrated primarily north of the school and east of Tarago Road, within the vicinity of the school.

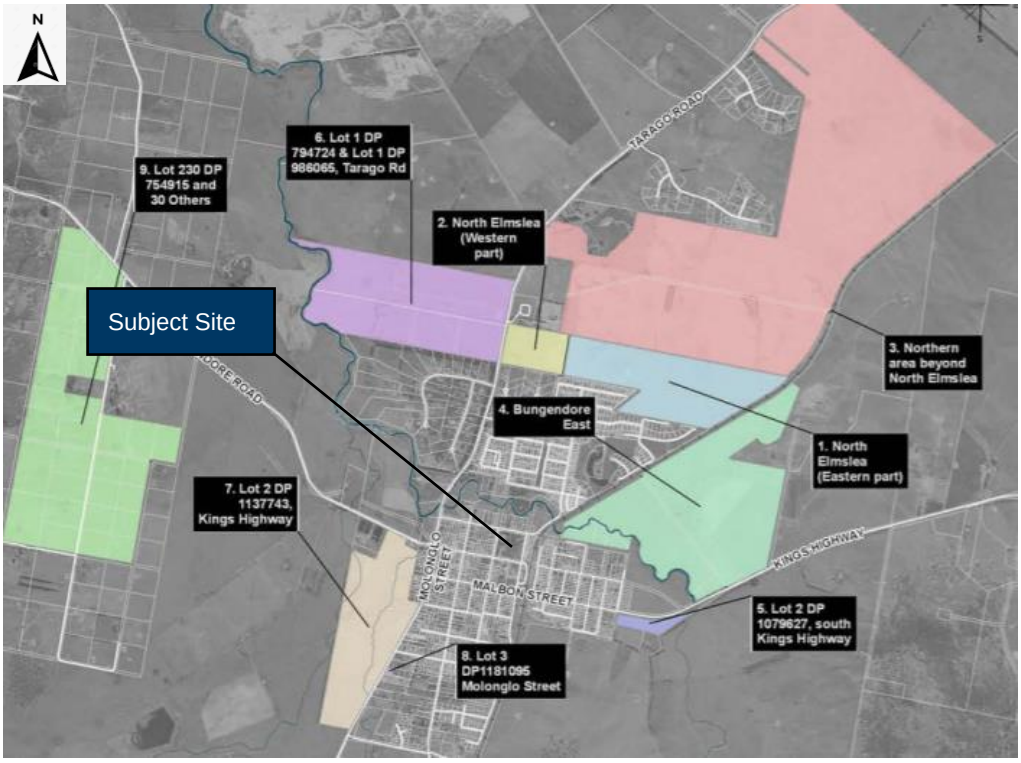

Figure 1.4 Key areas for residential growth in Bungendore

Source: Bungendore Structure Plan 2048

The projected dwelling yield for the residential areas are as follows:

– Lot 1 – 300 dwellings.
– Lot 3 – 300 dwellings.
– Lot 4 – 300 dwellings.
– Lot 6 – 250 dwellings.

Information provided by QPRC indicates that the North Elmslea Subdivision (Lot 1) and Bungendore East Subdivision (Lot 4) are expected to be fully developed in the next ten years, as follows:

– North Elmslea Subdivision (Lot 1) – A total of 300 lots with the construction of 75 lots per year from 2022.
– Bungendore East Subdivision (Lot 4) – A total of 500 lots with the construction of up to 100 lots per year from 2024.

1.2.2 Bungendore Bicycle and Pedestrian Facilities Plan (2019)

The Facilities Plan was prepared by QPRC and identifies a number of deficiencies in Bungendore's active transport network, including:

– The shared path network is disconnected and does not provide access to the town centre. Additionally, most of the designated shared paths have a width of 1.2 m, which does not support shared activity or width that complies with Austroads Guidelines.
– Footpaths are old with inconsistent treatments, particularly at road crossings. Additionally, many paths do not provide kerb ramps.

Proposed upgrades to the active transport network, in proximity to the subject site (see Figure 1.5), identified in the plan include the provision of:

– Footpaths on Butmaroo Street between Turallo Terrace and Kings Highway – designated as medium priority.
– A shared path on Majara Street between King Street and Gibraltar Street – designated as high priority.

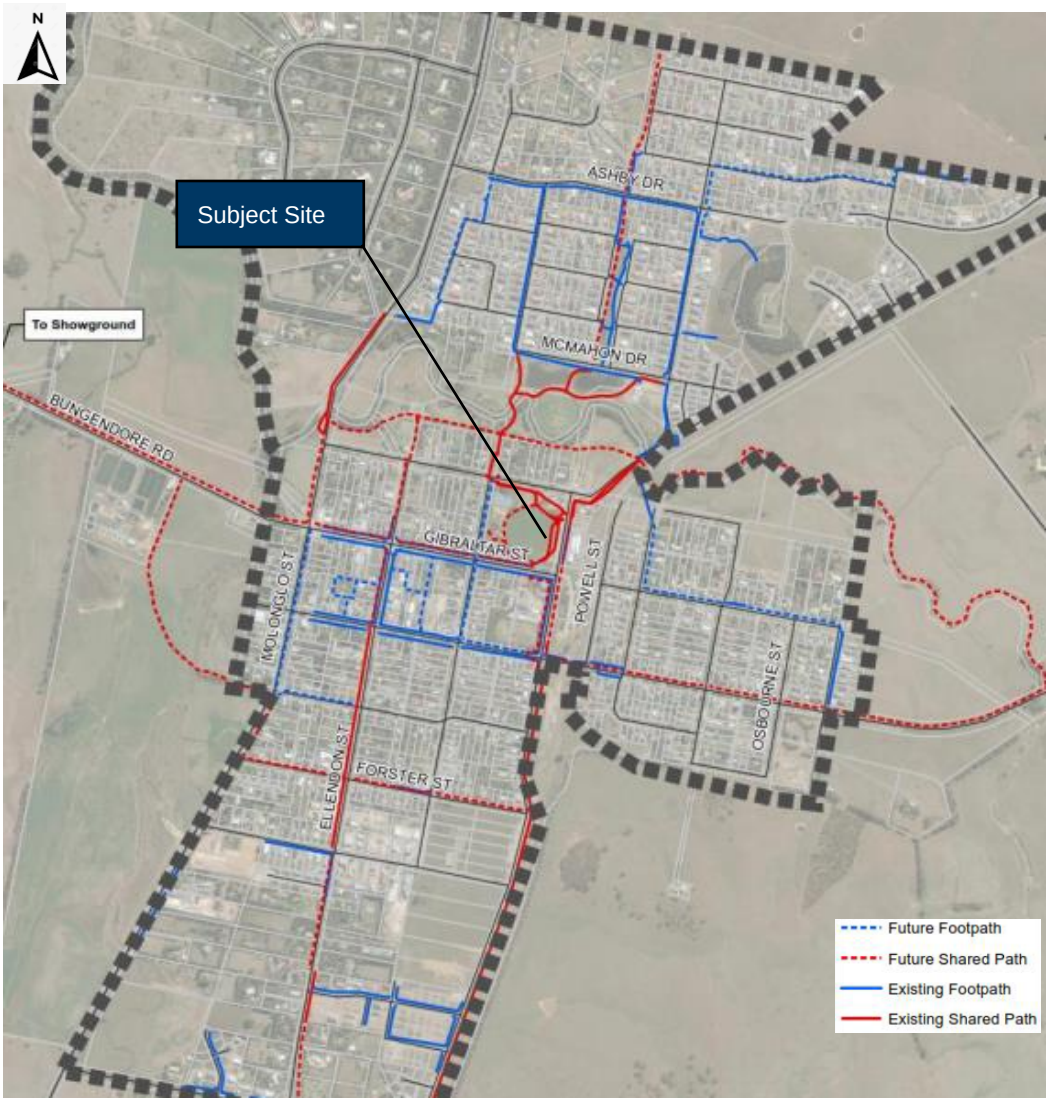

Figure 1.5 Bungendore's existing/proposed active transport network

Source: Bungendore Bicycle and Pedestrian Facilities Plan

The QPRC Facilities Plan does not account for a high school in Bungendore, and it assumes that high school students will continue to attend schools in Canberra and Queanbeyan. The Facilities Plan indicates that active transport routes should be prioritised in accordance with:

– Proximity to schools
– Route continuity

The new high school in Bungendore is consistent with both these criteria, and key upgrades in proximity to the school (such as the provision of footpaths on Butmaroo Street) should be prioritised.

The QPRC Facilities Plan upgrades in the context of the proposed high school are discussed further in Section 3.2.2.1.

1.2.3 New Bungendore High School Rapid Transport Assessment (2020)

In accordance with the Departments planning processes, GHD has completed a Rapid Transport Assessment (RTA) for the high school in Bungendore to document existing travel demand, site infrastructure and issues and opportunities on the adjoining transport network.

A summary of the key issues and opportunities identified in the RTA are presented in Table 1-3.

Table 1-3 New high school in Bungendore – Issues and Opportunities

Issues	Opportunities
– A general lack of active transport infrastructure. – Tarago Road and Kings Highway are barriers to pedestrian and cyclist permeability (vehicle volumes, speeds. Tarago Road also has no formal paths and limited natural surveillance due to dense foliage and frontage of the adjacent dwellings). – Lack of mid-block crossings within the western residential area. – Only one pedestrian crossing (pedestrian refuge) on Tarago Road. – There are no facilities near the school that provides priority to pedestrians over vehicles. – Potential parking conflicts between parents and visitors of the town centre. – Overflow parking along adjacent local roads along the verges (smaller cross-sections). – Lack of formal separation between the road and verge (Butmaroo Street, Turallo Terrace. Majara Street) – Lack of formal footpath network around and to the high school. – The open rail level crossing is a barrier to pedestrians, riders and scooterers (greater frequencies during the peaks). – In summary a major upgrade to active transport network in proximity to the school site is recommended.	– To enable students west of Tarago Road to walk or bicycle to school, crossing facilities is required on Tarago Road. – Provide zebra/wombat crossings on Turallo Terrace and Majara Street. – Provide additional pedestrian crossing points on Tarago Road and the Kings Highway. – Implement the high and medium priority active transport links detailed in the Bungendore Bicycle and Pedestrian Facilities Plan. Bring forward the future footpath/shared path on Butmaroo Street and Majara Street. These should have a formal verge and road separation on both sides of the road and consideration are street parking for kiss ‘n’ drop. – Provide formal verge separation and footpaths on Turallo Terrace. – Undertake a review of the bicycle and pedestrian plan to take into account a new high school and meeting the demand of students (primary and high school) who can walk and bicycle to school, including the new land release areas.s

As detailed in Section 1.2.1, the Structure Plan indicates that significant residential growth is planned for Bungendore.

The majority of students that may come from the new land release areas will live outside the walking catchment of 1.2 km. The options for travel to school will likely be by bus, bicycle (only if the environment is conducive to riding) or private vehicle. There will be a need to encourage travel to school by bicycle or bus to minimise traffic congestion around the school.

As well as the opportunities identified in Table 1-3, to increase the bicycle share from these areas, a connected, direct cycleway/shared path network to the school is required. This could potentially include:

– Extending the current shared path on Turallo Terrace to the northeast past Turallo Creek into Elmslea North (Lot 1 and Lot 3).
– Provision of a shared path linking East Bungendore to the school site and the town centre.

2. Existing conditions

2.1 Transport networks and operations

2.1.1 Road network

2.1.1.1 Kings Highway

The Kings Highway (B52) is a sub-arterial road that connects Canberra to Batemans Bay.

Within Bungendore, the Kings Highway has a speed limit of 50 km/h, with a 40 km/h School Zone (8:00 am – 9:30 am and 2:30 pm – 4:00 pm School Days) to support the safe movement of students and their parents/guardians at Bungendore Public School. Additionally, concrete footpaths are provided on both sides of the Kings Highway.

Within Bungendore, the Kings Highway has a single travel lane in either direction (refer Figure 2.1). Within the Bungendore, on-street parking is typically available on the Kings Highway, to the west of Butmaroo Street, with No Stopping east of Butmaroo Street to the rail line level crossing.

Figure 2.1 Kings Highway looking east towards Majara Street

Source: Google streetview

2.1.1.2 Turallo Terrace

Turallo Terrace is a local road with a single lane in either direction (refer to Figure 2.2). Parking lanes are not provided on Turallo Terrace. However, the unformed verge provides an opportunity for vehicles to park.

Kerbs, gutters and footpaths are not typically provided on Turallo Terrace.

Turallo Terrace has an urban default speed limit of 50 km/h.

Figure 2.2 Turallo Terrace looking west from Majara Street

Source: Google streetview

2.1.1.3 Gibraltar Street

Gibraltar Street is a local road that provides a single travel lane in either direction (refer to Figure 2.3). Concrete footpaths are typically provided on both sides of Gibraltar Street.

Figure 2.3 Gibraltar Street looking east from Butmaroo Street

Source: Google streetview

Ninety-degree centre-of-road parking is provided along Gibraltar Street. Typically, parallel on-street parking is provided on the northern and southern sides of Gibraltar Street.

A No Parking (8:00 am – 9:30 am and 2:30 pm – 4:00 pm School Days) zone is provided on the southern side of Gibraltar Street (west of Majara Street) to support pick-up/drop-off activity at Bungendore Primary School.

Gibraltar Street has a posted speed limit of 50 km/h, with a 40 km/h School Zone (8:00 am – 9:30 am and 2:30 pm – 4:00 pm School Days) located between Butmaroo Street and Majara Street.

2.1.1.4 Butmaroo Street

Butmaroo Street is a local road with a single lane in either direction (refer to Figure 2.4). Parking lanes are not provided on Butmaroo Street. However, the unformed verge provides an opportunity for vehicles to park.

Kerbs, gutters and footpaths are not provided on Butmaroo Street, and it has an urban default speed limit of 50 km/h.

Figure 2.4 Butmaroo Street looking south from Turallo Terrace

Source: Google streetview

2.1.1.5 Majara Street

Majara Street is a local road with a single travel lane in either direction (refer Figure 2.5).

A footpath is provided on the western side of Majara Street between Gibraltar Street and Kings Highway. A shared path is provided on the eastern side of Majara Street south of the Kings Highway.

Figure 2.5 Majara Street looking north from Gibraltar Street

Source: Google streetview

A Bus Zone (8:30 am – 9:30 am and 3:00 pm – 4:00 pm School Days), approximately 60 m in length, is located on the western side of Majara Street (south of Gibraltar Street) for the purpose of bus activity associated with Bungendore Primary School.

In proximity to the primary school, No Stopping (8:30 am – 9:30 am and 3:00 pm – 4:00 pm School Days) signage is provided on Majara Street, which prevents vehicles from parking during peak periods of school activity.

Majara Street has a posted speed limit of 50 km/h, with a 40 km/h School Zone (8:00 am – 9:30 am and 2:30 pm – 4:00 pm School Days) between Gibraltar Street and the Kings Highway.

The parking controls and school zones in proximity to the school site are displayed in Figure 2.6.

Figure 2.6 Parking controls and School Zones

Source: Sixmaps, modified by GHD

The state and regional roads in proximity to the school subject site is displayed in Figure 2.7.

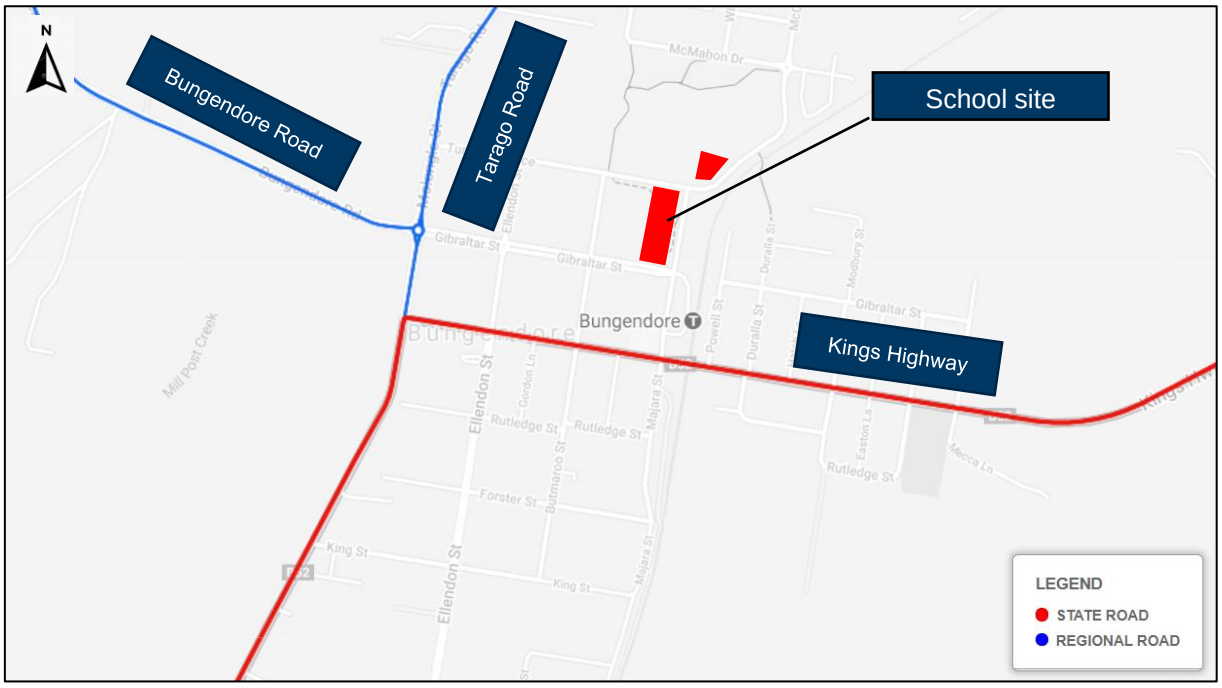

Figure 2.7 State and regional road network

Source: TfNSW modified by GHD

2.1.2 Active and public transport

2.1.2.1 Active transport

As described previously:

– Footpaths are provided on both sides of Gibraltar Street, both sides of the Kings Highway and on the western side of Majara Street between Gibraltar Street and Kings Highway.
– A shared path is provided on the eastern side of Majara Street, south of the Kings Highway.

In addition to the above, the following shared paths are provided in proximity to the school site (see Figure 2.8):

– Turallo Terrace to the south west of Turallo Creek linking into Majara Street.
– Turallo Terrace east of Butmaroo Street, linking into a north/south shared path adjacent to the east of Mick Sherd Oval and the school crossing on Gibraltar Street.
– In the park area to the north of the school, linking through to McMahon Drive.

Figure 2.8 Current shared paths and crossings

Source: Sixmaps modified by GHD

The active transport infrastructure within the school's walking catchment (refer to Section 2.2) is displayed in Figure 2.9.

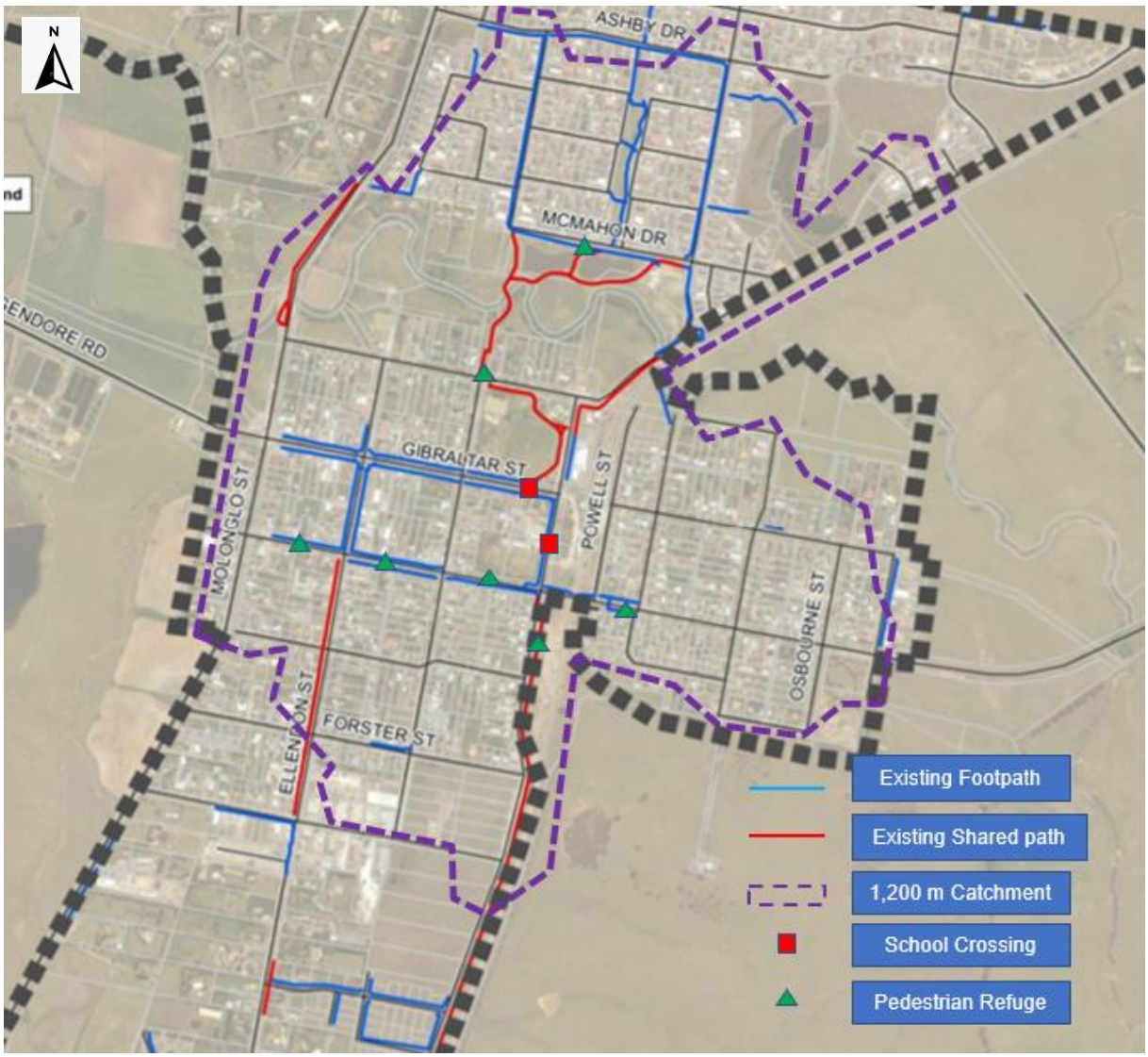

Figure 2.9 Bungendore active transport infrastructure

The following pedestrian crossing points are provided in proximity to the school site:

– A school crossing is provided on Majara Street at the frontage of the primary school.
– A pedestrian refuge/school crossing is provided on Gibraltar Street at the frontage of the primary school (refer to Figure 2.10).
– A pedestrian refuge is provided on the Kings Highway to the west of Majara Street (refer to Figure 2.11).
– A pedestrian refuge is provided on the Turallo Terrace east of Butmaroo Street.

Figure 2.10 Pedestrian refuge on Gibraltar Street

Source: Google Maps

Figure 2.11 Pedestrian refuge on Kings Highway

Source: Google Maps

Currently, there are no footpaths on Butmaroo Street or Turallo Terrace.

As detailed in Section 1.2.2, the Bungendore Bicycle and Pedestrian Facilities Plan (prepared by QPRC) propose new footpaths on Butmaroo Street and a new shared path on Majara Street.

2.1.2.2 Public transport

2.1.2.2.1 School bus services

As described previously, a school Bus Zone is located adjacent to Bungendore Primary School on the western side of Majara Street. As the Bus Zone is located next to the school, primary aged students are not required to cross any roads to access it.

At the primary school, classes commence at 9:10 am, and school concludes at 3:10 pm, with staff on duty from 8:45 am. The hours of operation at the proposed high school in Bungendore is not currently known. However, it is likely to be similar to that of the primary school.

Bungendore Bus and Coaches provide bus services operating for the primary school, with routes to nearby towns including Wamboin, Tarago, Hoskinstown and Butmaroo.

Details of the current school bus services at Bungendore Primary School are displayed in Table 2-1.

Table 2-1 Current school bus services – Bungendore Primary School

Route	Route Name	Arrival Time	Departure Time
S562	Wamboim	8:45 am	3:17 pm
S563	Targo	9:00 am	3:05 pm
S561	Hoskintown	9:00 am	3:30 pm
S560	Butmaroo	9:00 am	3:15 pm
S564	Kings Highway	9:00 am	3:15 pm

These bus routes within Bungendore and its surrounds are displayed in Figure 2.12.

A combination of minibuses and 12.5 m coaches are currently utilised for the Bungendore Primary School bus services.

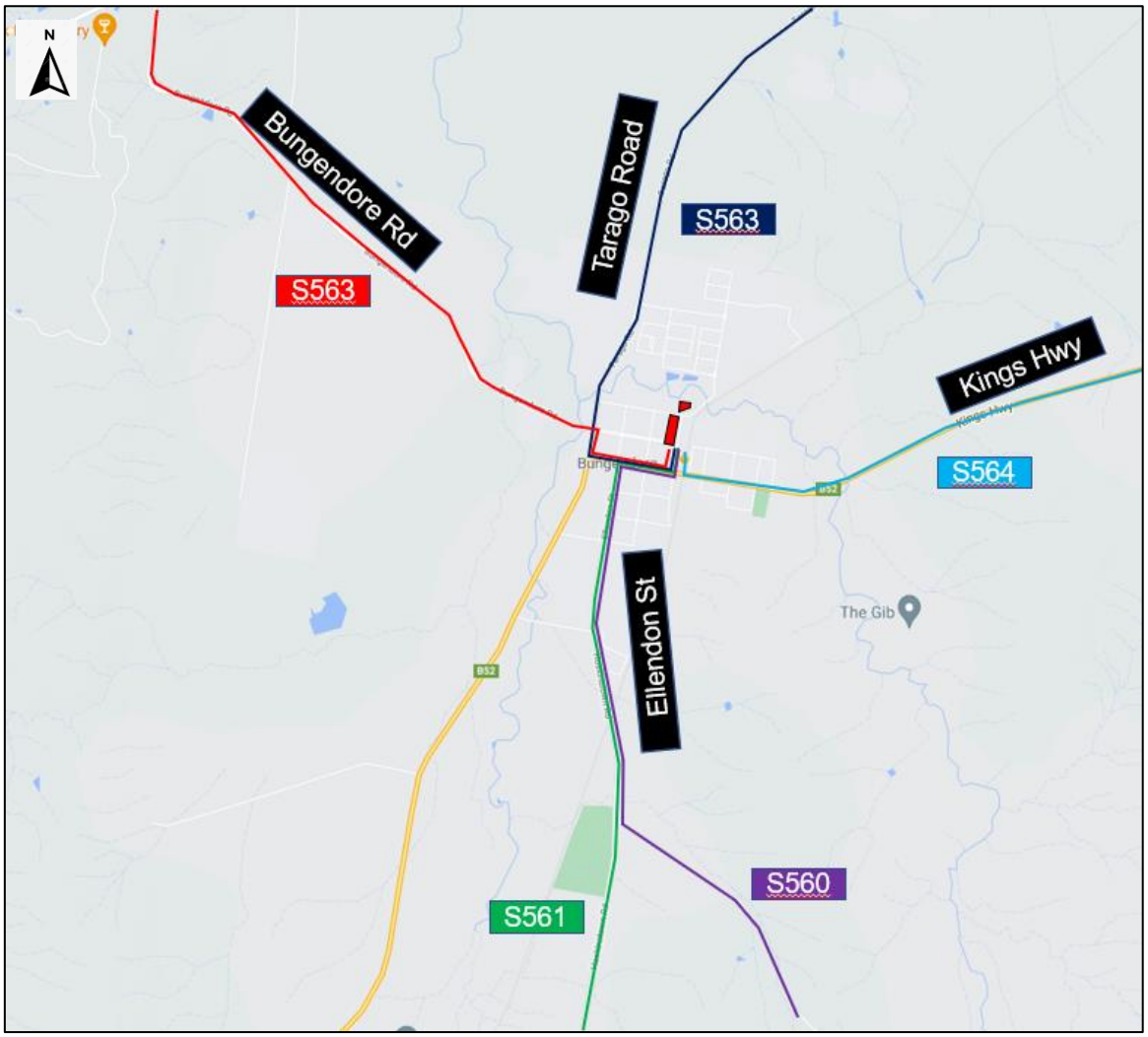

Figure 2.12 Bungendore school bus services

Source: Google Maps modified by GHD

A copy of the timetables for the buses serving Bungendore Primary School and images of the bus routes are included in Appendix B.

QCity Transit also provides school services in Bungendore, utilising the existing bus stop on Gibraltar Street at the frontage to the school site, as detailed in Table 2-2.

Table 2-2 Current School Bus Services – QCity Transit

Number	Servicing	Arrival Time (at Bungendore)	Departure Time (from Bungendore)
S277	Dickson, Bywong, Bungendore	4:30 pm	7:15 am
S151	Bungendore, Carwoola, The Ridgeway, Queanbeyan East, Queanbeyan		7:30 am
S263	Dickson, Bywong, Bungendore	5:21 pm	

Due to the timing of these services (outside the expected school hours of operation), they will be of limited utility to students of the new high school in Bungendore.

2.1.2.2.2 Public buses

QCity Transit also provides bus services in Bungendore. The 844/D841 bus services operate between Bungendore and Queanbeyan, with bus stops located on Gibraltar Street, between Mick Sherd Oval and the primary school. Currently, there are:

– Three weekday services from Bungendore to Queanbeyan (depart from Gibraltar Street at 7:27 am, 9:30 am and 5:06 pm).
– Two weekday services from Queanbeyan to Bungendore (arrive at Gibraltar Street at 4:39 pm and 6:12 pm).

Some high school aged students residing in Bungendore use the public bus services to access/egress schools in Queanbeyan.

Again, due to the timing of these services, they will be of limited utility to students of the new high school in Bungendore.

A shelter is provided on the northern side of Gibraltar Street, and a bench is provided on its southern side. As displayed in Figure 2.13, the QCity Transit public and bus services operate adjacent to the primary school subject site on Majara Street, Gibraltar Street, and Mick Sherd Oval (proposed high school site) on Turallo Terrace and Butmaroo Street.

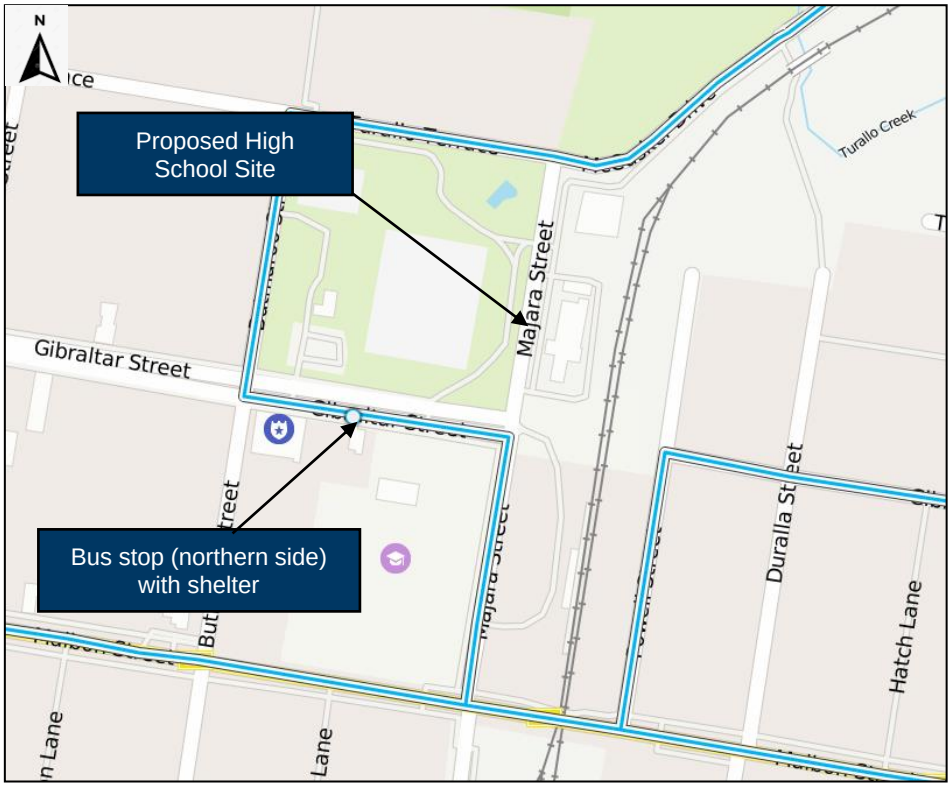

Figure 2.13 Public bus route

Source: TfNSW – modified by GHD

2.1.2.2.3 Trains

Bungendore Station is located on Majara Street opposite Bungendore Primary School. Train services operating between Sydney (Central Station) and Canberra. The time trains stop at Bungendore Station on weekdays is detailed in Table 2-3.

Table 2-3 Train services at Bungendore Station (weekdays)

Number	Servicing	Arrival Time
631	Central to Canberra	10:36 am*
632	Canberra to Central	7:32 am
633	Central to Canberra	3:24 pm*
634	Canberra to Central	12:32 pm
635	Central to Canberra	9:21 pm*
636	Canberra to Central	5:45 pm

* Stops to pick up and set down booked customers only when required

A railway crossing with boom gates is located on the Kings Highway, approximately 60 metres to the east of Majara Street.

Figure 2.14 Railway Crossing on Kings Highway

Source: Google Maps

As detailed in Table 2-3, over the course of a day, only six trains pass through Bungendore Station and typically do not do so during peak periods of school activity. However, the 633 service does stop at Bungendore Station at approximately 3:24 pm (if a passenger has booked a ticket to Bungendore).

The current hours of operation at the new high school in Bungendore are currently unknown, but the school is expected to conclude at approximately 3:20 pm. During afternoon school periods, vehicles travelling eastbound and westbound at the level crossing on the Kings Highway may be subject to minor delays should they coincide with the train service.

Potential mitigation to these delays is to engage with TfNSW and request they change the train service to arrive at Bungendore at approximately 4:00 pm, when peak school activity is expected to have ended. This has been discussed with representatives from TfNSW and QPRC.

Pedestrian controls at the railway crossing are displayed in Figure 2.15.

Figure 2.15 Pedestrian facilities at railway crossing

While fencing provides a “chicane” to prevent pedestrians from walking directly onto the rail line, there are no pedestrian gates that close automatically when a train is passing and no tactile paving at the crossing area.

The catchment analysis detailed in Section 2.2 indicates that a portion of high school students residing in east Bungendore are within the designated walking and cycling catchments and will be required to traverse the level crossing area to access the school.

2.1.3 Crash data

Crash data obtained from TfNSW’s Centre for Road Safety indicates that in the last five years (2015 – 2019) there have been no recorded crashes on Turallo Terrace, Butmaroo Street and Majara Street.

There have been two recorded crashes on Gibraltar Street, as follows:

– One crash involved a vehicle coming off the road and hitting an object, resulting in a minor injury.
– One crash involved a pedestrian being struck and resulted in a moderate injury.

The data also indicates that there have been two crashes on Kings Highway. In proximity to Majara Street, associated with vehicles coming off the footpath (RUM code 48). One crash resulted in minor injuries, and one resulted in moderate injuries.

Information provided by QPRC indicates both these crashes involved a vehicle impacting public school-aged students on bikes.

2.2 Travel patterns and travel demand

The following catchment analysis has been undertaken, using geographical information software (GIS), in the context of the residential locations of the school’s student population. This approach is in accordance with SINSW specifications, which requires the following catchment assumptions:

– Pedestrians = 400 metres, 800 metres and 1.2 kilometres (see).
– Bicycle riders = 1,200 metres, 2,400 metres, 3.6 kilometres and 4.8 kilometres (see).

The catchment analysis comprised the locations of 147 high school student residences, based upon information provided to GHD by SINSW. Noting the geographical extents of the student catchment, it should be noted that the depersonalised data that was provided only captured students who attended public schools and who live within the Bungendore Town Centre and its surrounds. This is a major limitation to the assessment of potential bus catchment.

The following is noted with respect to student eligibility to free public transport to/from schools as part of the School Student Transport Scheme (SSTS) for high school students:

– The straight-line distance from their home address to school is more than two kilometres, or
– Walking distance is more than 2.9 kilometres.

In each case, the analysis has been undertaken for:

– The notional catchments, i.e. a straight line radius from the school site.
– The actual catchment, based on the availability of the surrounding traffic and transport networks.

The outputs from the catchment analysis for the actual catchment are displayed in Table 2-4.

Table 2-4 Catchment data

Catchment	Number Students	Percentage
1 m – 400 m (5-min walk)	6	4%
401 m – 800 m (10-min walk)	24	16%
801 m – 1200 m (15-min walk or 5-min bike ride)	39	26%
Total walking catchment	**69**	**47%**
1 m – 1200 m (5-min bike ride)	69	47%
1,201 m – 2,400 m (10-min bike ride)	36	24%
2,401 m – 3,600 m (15-min bike ride)	30	20%
Total bike riding catchment	**135**	**92%**
1 m – 2,900 m (excluded from SSTS)	96	65%

The data in Table 2-4 indicates that:

– Approximately 47 percent of students reside within the 15-minute walking (actual) catchment from the new high school in Bungendore

– Approximately 92 percent of students live within the 15-minute bike riding (actual) catchment of the new high school in Bungendore. The bicycle network in proximity to the school is limited. While some shared paths are provided in proximity to the school site, they are disconnected, with some widths that do comply with Austroads Guidelines.

– Approximately 65 percent of students live within the SSTS bus catchment from the school. These students are not entitled to free public transport.

Additionally, it is noted that:

– Pedestrians
  - A large portion of students within the 1,200 m catchment reside south of the Kings Highway, and some reside to the west of Tarago Road, which are barriers to pedestrian permeability.
  - Many footpaths in Bungendore are old with inconsistent treatments, particularly at road crossings. Additionally, many paths do not provide kerb ramps.
  - Footpaths are typically discontinuous or absent. With the exception of school crossings in proximity to the primary school, there are no facilities that provide pedestrians with priority over vehicles.
  - These shortfalls are not conducive to a safe walking and cycling environment and will need to be addressed in order for a higher sustainable mode share to be achieved.

– Cyclists
  - The bicycle network in proximity to the school is limited. While some shared paths are provided in proximity to the school site, they are disconnected, with some widths that do not comply with Austroads Guidelines.
  - Given the high portion of students who reside within the school's cycling catchment, improvements to the bicycle infrastructure within this catchment is expected to increase the number of students accessing the school by cycling.

As detailed in Section 1.2.2, the QPRC Facilities Plan proposes upgrades to the walking (footpaths on Butmaroo Street) and cycling network (shared paths on Majara Street) that will improve active transport access to the new high school in Bungendore.

– Buses
  - It is noted that the depersonalised data provided to GHD did not cover the entire area of the school catchment displayed in Figure 1.3 (which was not available at the time). In accordance with the relatively large size of the school catchment (typically associated with rural schools), it is expected that the portion of students eligible for free transport is likely to exceed 35 percent.

- In accordance with the 2016 census data for Bungendore, which indicates that the township has a population of 225 students attending government secondary schools, approximately 50 percent of students may be eligible for free public transport.
- Students who live within the 2.9 kilometre catchment and are not eligible for free travel will be able to purchase a term pass and travel at a reduced concession rate.

2.3 Transport use

Bungendore journey-to-work (JTW) data from the 2016 census indicates:

– 70 percent of employed residents drove to work and five percent were car passengers.
– Five percent of employed residents worked from home.
– Two percent of employed residents walked to work.
– One percent of employed residents used public transport.

Given the relatively large distance to key commercial centres (Queanbeyan and Canberra) and the relatively poor public transport connections, the dependence on cars in Bungendore is unlikely to change in the foreseeable future.

The 2016 census data, indicates that Bungendore has a population of 225 students attending government secondary schools.

Accordingly, it is expected that approximately half the students will live within Bungendore and half will live in the wider school catchment.

2.4 Traffic surveys

To identify the existing traffic conditions in proximity to the proposed new high school in Bungendore subject site during weekday AM and PM peak periods, traffic counts were undertaken by Trans Traffic Survey at the following intersections on Thursday 5th November 2020, as displayed in Figure 2.16:

1. Turallo Terrace/Butmaroo Street
2. Turallo Terrace/Majara Street
3. Gibraltar Street/Butmaroo Street
4. Gibraltar Street/Majara Street
5. Kings Highway/Butmaroo Street
6. Kings Highway/Majara Street

Figure 2.16 Traffic survey locations

Source: Google Maps modified by GHD

The traffic counts were undertaken in 15-minute intervals for the following times, to coincide with peak periods of activity of the proposed school:

– 8:00 am – 9:30 am.
– 2:30 pm – 4:30 pm.

The observed traffic network peak hours were identified as the following:

– AM Peak: 8:15 am – 9:15 am
– PM: Peak 3:00 pm – 4:00 pm

It is noted that the traffic surveys captured the peak vehicle activity associated with the Bungendore Primary School.[1]

The intersection survey outputs are included in Appendix C. The peak hour volumes identified in the traffic surveys are displayed in Appendix D.

2.5 Current network operation

The operation of the intersections of interest has been assessed using SIDRA 9.

[1] The principal of Bungendore Primary School indicated that the surveys on 5th November 2020 would capture "typical" activity at the school.

SIDRA calculates the amount of delay to vehicles using an intersection and, amongst other performance measures, gives a Level of Service (LoS) rating, which indicates the relative performance of traffic movements within the intersection.

Table 2-5 presents the criteria generally applied to intersection performance. The LoS is determined from the calculated delay to traffic movements, which is a representation of driver frustration, fuel consumption and increased travel time. There are six LoS measures ranging from A (very low delay and very good operating conditions) to F (over saturation where arrival rates exceed intersection capacity). Typically a LoS D or better is considered to be acceptable, however, a LoS E may be acceptable if it also operates with a low degree of saturation.

Table 2-5 Intersection Level of Service criteria

LoS	Average Delay/ Vehicle (sec)	Traffic Signals & Roundabouts	Give-way & Stop signs
A	Less than 15	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28 to 42	Satisfactory	Satisfactory, but accident study required
D	42 to 56	Operating near capacity	Near capacity, accident study required
E	56 to 70	At capacity, excessive delays; roundabout requires other control mode	At capacity; requires other control mode
F	Exceeding 70	Unsatisfactory; requires additional capacity	Unsatisfactory, requires other control mode.

The layout of the intersections of interest (as modelled in SIDRA) are displayed below in Figure 2.17.

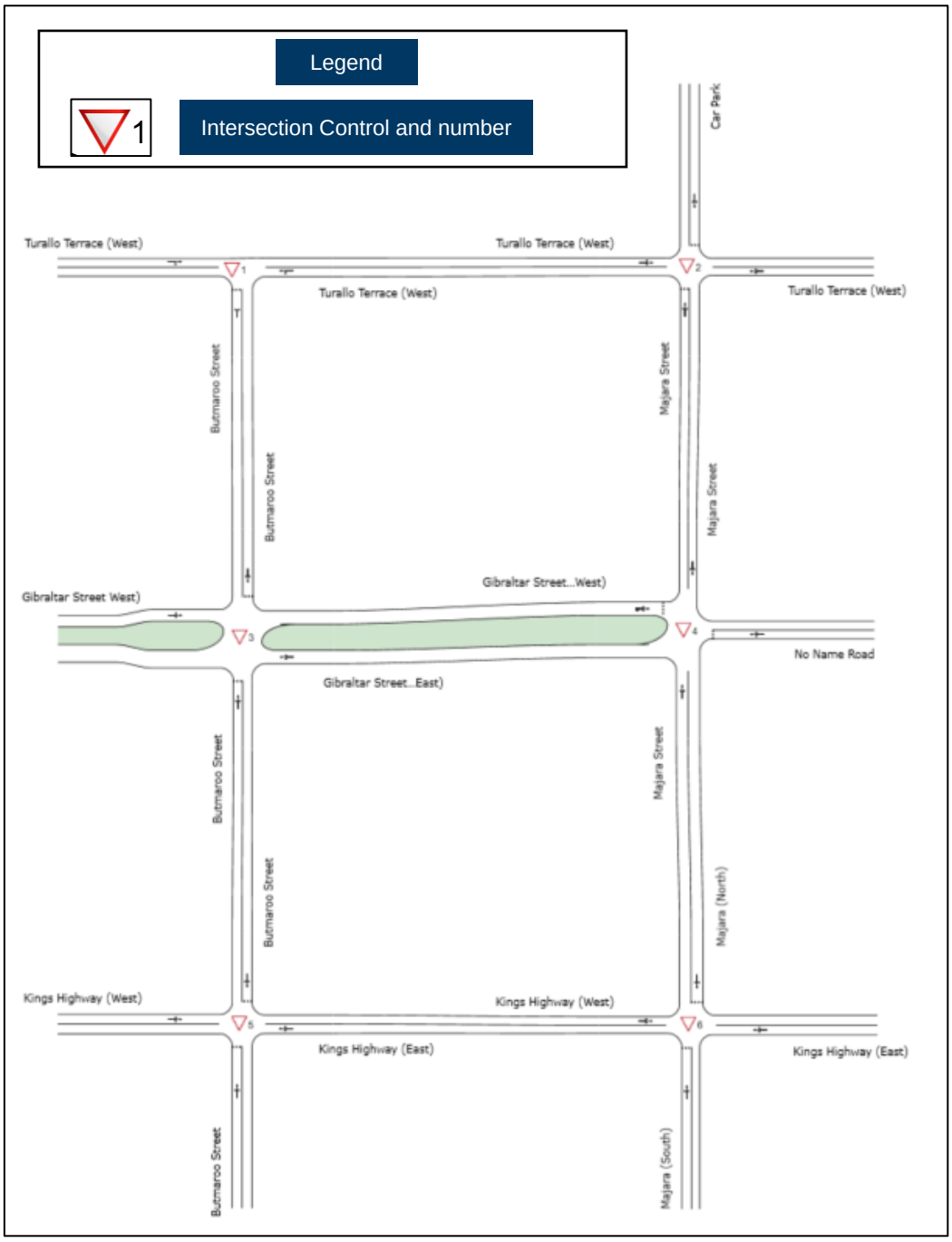

Figure 2.17 SIDRA network layout

The results of the SIDRA intersection modelling analysis, based on the existing traffic volumes and road geometry, are summarised in Table 2-6.

The data in Table 2-6 indicates that all the intersections of interest operate with a good LoS and minimal delays during peak periods of school activity.

Table 2-6 Current (2020) intersection performance

Intersection	AM Peak			PM Peak		
	Av Delay (sec)	LOS	95th % Queue (m)	Av Delay (sec)	LOS	95th % Queue (m)
Turallo Terrace/Butmaroo Street						
Butmaroo Street	5.0	A	1	4.8	A	1
Turallo Terrace - east	0.9	A	0	3.3	A	0
Turallo Terrace - west	1.2	A	0	0.3	A	0
All vehicles	1.9	A	-	2.8	A	-
Turallo Terrace/Majara Street						
Majara Street	5.0	A	1	5.1	A	1
Turallo Terrace – east	2.6	A	0	2.8	A	0
Car park entry	2.5	A	0	2.5	A	0
Turallo Terrace – west	2.7	A	1	2.0	A	0
All vehicles	3.0	A	-	3.3	A	-
Gibraltar Street/Butmaroo Street						
Butmaroo Street – south	5.5	A	2	5.1	A	1
Gibraltar Street – east	3.6	A	0	3.7	A	0
Butmaroo Street – north	5.3	A	1	5.3	A	0
Gibraltar Street – west	0.6	A	1	0.9	A	0
All vehicles	3.1	A	-	3.3	A	-
Gibraltar Street/Majara Street						
Majara Street – south	4.4	A	0	2.7	A	0
Station access road	5.5	A	0	5.4	A	0
Majara Street – north	4.4	A	0	3.3	A	0
Gibraltar Street – west	5.4	A	2	5.0	A	1
All vehicles	4.7	A	-	3.9	A	-
Kings Highway/Butmaroo Street						
Butmaroo Street –	5.8	A	1	7.9	A	1

Intersection	AM Peak			PM Peak		
	Av Delay (sec)	LOS	95th % Queue (m)	Av Delay (sec)	LOS	95th % Queue (m)
Kings Highway – east	3.3	A	0	3.4	A	0
Butmaroo Street – north	6.8	A	2	7.0	A	1
Kings Highway – west	0.7	A	1	1.3	A	0
All vehicles	2.6	A	-	2.9	A	
Kings Highway/Majara Street						
Majara Street – south	6.3	A	2	7.9	A	1
Station access road	3.6	A	0	3.4	A	0
Majara Street – north	6.3	A	2	7.0	A	1
Gibraltar Street – west	1.1	A	0	1.3	A	0
All vehicles	3.1	A	-	2.9	A	-

3. Strategic context, existing transport networks and travel demand

3.1 Testing school transport scenarios

3.1.1 Base case scenario

Mode share surveys for students at a school similar to the proposed new high school in Bungendore is not currently available.

TfNSW have prepared the *Trip Generation Surveys Schools Analysis Report* to determine contemporary trip generation data for schools within Greater Sydney and Regional NSW. Regional high schools included in the mode share surveys were located at Kiama, Cessnock, Springwood and Wyong.

The summary of the average mode split for regional high schools is presented in Table 3-1.

Table 3-1 Regional secondary school

Mode	Portion
Car	38%
Bus	35%
Walk	28%

It is noted the data does not include cycling or distinguish between students who were dropped off or drove themselves.

As described previously, the active transport network in Bungendore is relatively poor, accordingly for the purposes of analysis, it has been assumed that for the baseline scenario:

– Twenty percent of students will walk.
– Five percent of students will cycle.
– Thirty percent will catch the bus.
– Five percent of students will drive themselves.
– Forty percent of students will be picked-up/dropped -off.

3.1.2 Reach scenario

The reach mode share targets are based on the catchment analysis included in Section 2.2. In summary, the analysis indicates that:

– Forty seven percent of students reside within 1,200 m of the school.
– Forty four percent of students reside between 2,400 m and 3,600 m of the school site.
– Thirty five percent of students reside outside 2,900 m of the school and are eligible for the SSTS.

As stated previously, in accordance with the large size of the school catchment, up to 50 percent of students may be eligible for free transport.

To identify the reach targets for new high school in Bungendore:

– An average between the 35 percent of students identified in the catchment analysis that are eligible for the SSTS and the 50 percent identified on a first-principles basis, namely 43 percent, has been identified as bus mode share.
– The remaining 57 percent of students have been pro-rated for walking and cycling between the portion of students residing within 1,200 m of the school and the portion of students residing between 2,400 m – 3,600 m of the school.

In summary, for the reach scenario, it has been assumed that:

– Twenty nine percent of students will walk.
– Twenty eight percent of students will cycle.
– Forty three percent of students will catch the bus.

3.1.3 Target scenario

The target scenario mode share has been identified as being between the base and reach mode shares, as follows.

– The base scenario (20 percent) and the reach scenario (29 percent) for walking are similar. For the purposes of analysis, an average of the two, 25 percent has been assumed.
– There is a significant difference between the base and reach scenarios for cycling. The catchment analysis suggests that all of the Bungendore Township is located within a 15-minute bike ride from the school. Census data suggests that the new school, approximately half of the student population (225 students) will reside within the Bungendore Township. Applying a cycling target of a third of the students residing within Bungendore corresponds to 75 students (or approximately 15 percent) of the overall student population.
– For buses, the baseline scenario is 30 percent, and the reach scenario (based on the first-principles analysis) is 43 percent. For the target scenario, a bus mode share, an average of the two, 37 percent has been assumed.
– Of the remaining 23 percent of students, it is assumed that 18 percent will be picked-up/dropped-off and five percent of students will drive themselves.

The mode share scenarios have been applied to the expected student population of the new high school in Bungendore is detailed in Table 3-2.

Table 3-2 New high school in Bungendore mode share target (students)

Mode	Base case		Reach		Target	
	Students	Mode share	Students	Mode share	Students	Mode share
Walk, incl ped scooter	90	20%	112	25%	112	25%
Bicycle	23	5%	144	32%	68	15%
School bus	134	30%	194	43%	166	37%
Kiss-and-drop	180	40%			81	18%
Drive themselves	23	5%			23	5%
Total	**450**	**100%**	**450**	**100%**	**450**	**100%**

The residential locations of the staff at the high school are not currently available. However, it is expected that a significant portion of staff will reside in the nearby population centres of Canberra and Queanbeyan. Public transport connections between these centres and Bungendore are poor. The mode share targets for staff are also included in Table 3-3.

Table 3-3 New high school in Bungendore mode share targets

Mode	Target	
	Staff	Mode Share
Walk, incl ped scooter	4	10%
Bicycle	4	10%
Car as driver	29	70%
Car as passenger	4	10%
Total	**41**	**100%**

3.2 Supporting scenarios with infrastructure, operations, policies and programs

3.2.1 Site transport infrastructure

As stated previously, a key aspect of the school design is the closure to the public of Majara Street (between Gibraltar Street and Turallo Terrace) to the east of the school subject site.

This change is required as currently Majara Street runs in a north/south direction through the high school subject site and would create an environment that would be unsafe for students and detract from the general amenity of the high school.

3.2.1.1 Pedestrian, bike and scooter

The main pedestrian, bike and scooter access to the high school will be provided on Gibraltar Street, with an additional pedestrian access point provided on Turallo Terrace.

A pedestrian plaza will run in a north/south direction through the school between Gibraltar Street and Turallo Terrace.

3.2.1.2 End of trip facilities

The high school will have 41 staff, and three unisex shower/change cubicle will be provided near Building A (for use by staff only).

The full time staff at the nearby primary school will also be able to use these facilities.

Four bicycle parking spaces will be provided for staff in proximity to Building A, separate from the student parking.

Additionally, 76 bicycle parking spaces will be provided for students which will be located at the northern and southern pedestrian entries of the school.

The provision for parking for 76 bikes is consistent with the target mode share scenario for cycling, as detailed in Section 3.1.3.

All bike parking will be provided within the secured, fenced, boundary of the school. The indicative locations of the bike racks are displayed in Figure 1.1.

3.2.1.3 Public transport

High school students will share the primary school Bus Zone.

Currently, the primary school Bus Zone is located on the western side of Majara Street. In accordance with suggestions from QPRC, the bus zone will be relocated to the southern side of Gibraltar Street, adjacent to the primary school. Further, the primary school pick-up/drop-off zone will be relocated to the western side of Majara Street (refer to Figure 1.1).

Based on mode share targets in Table 3-2, approximately 167 students are expected to catch a bus to and from school. This is the equivalent of four to five buses, assuming approximately 40 students per bus.

Approximately 100 metres of kerb space is available for the Bus Zone on Gibraltar Street, which will service up to five large (14.5 m) buses/coaches simultaneously or up to 11 minibuses (i.e. 22-seater coasters), assuming dependent nose to tail operation with one-metre separation between vehicles).

It is noted that at the time of writing this report there are ongoing discussions with TfNSW and Bungendore Coaches regarding the provision of bus services for the high school.

Based on discussions with Bungendore Coaches:

– In order to accommodate the demand associated with the high school it will likely require the minibus vehicles to be increased to 12.5 m bus.
– Up to two existing bus routes will need to be changed to accommodate the additional residential locations of high school students.
– A kerb length of 100 metres will be sufficient to accommodate the buses required for primary school and high school students.

Based on the communications with TfNSW, there are ongoing internal discussions regarding the provision of bus services for the high school in Bungendore.

3.2.1.4 Vehicles

3.2.1.4.1 Pick-up/Drop-off

The high school student pick-up/drop-off zones will be on the northern side of Gibraltar Street and the southern side of Turallo Terrace, adjacent to the high school site.

The zone on Turallo Terrace will provide utility to parents (particularly in the AM peak) residing in northern Bungendore to drop their students off and travel westbound onto Molonglo Street/Kings Highway and onto the commercial centres of Canberra and Queanbeyan.

The pick-up/drop-off zones will be controlled by No Parking signage (8:00 am - 9:30 am and 2:30 pm – 4:00 pm school days) to encourage vehicle turnover.

Three kiss and drop parking spaces will be provided on Turallo Terrace and approximately 15 spaces will be provided on Gibraltar Street.

The agreed mode share target for students being dropped off is 18 percent of the student population, which is the equivalent of 85 students.

Assuming that the school peak will occur over a 15 minute period and a conservative allowance of approximately 60 seconds for a student to embark or disembark a vehicle, each space would turn over approximately 15 times. Therefore the proposed 18 spaces accommodate up to 270 vehicles in the peak 15 minutes of school activity.

Accordingly, 18 spaces is appropriate to accommodate the expected demand and minimise the risk of queuing vehicles on Turallo Terrace and Gibraltar Street and impacting through travel movements.

3.2.1.4.2 Parking

Vehicular access to the high school will be provided via the northern leg of a proposed roundabout at the intersection of Gibraltar Street and Majara Street.

Staff, delivery vehicles and waste collection vehicles will have access to the closed section of Majara Street, which will be controlled by a gate and a reader/intercom.

The current parking serving the staff at the QPRC building will be allocated to staff at the new high school. The parking supply of 44 spaces including two spaces for the mobility impaired will be sufficient to accommodate the parking demand associated with the proposed high school.

The QPRC Development Control Plan does not provide a parking rate for high schools. However, all staff will be able to park within the school grounds, and the provision of 44 parking spaces is considered acceptable.

Access to the car park will be controlled via a gate and a reader/intercom via the proposed roundabout at Gibraltar Street and Majara Street.

3.2.1.4.3 Special needs students

There will be opportunities for parents/guardians with special needs students attending the high school and minibuses associated with the NSW's Government Assisted School Travel Plan (ASTP), to pick-up/drop-off their students within the staff parking.

The available information on the ASTP team at the Department of Education indicates that:

– The volume of students who will require the ASTP services is not currently known.
– Transport will be provided in vehicles ranging from a car to a 12-seater minibus.
– Typically up to three ASTP vehicles will be queued up at the end of the school day.
– Students who require ASTP services should be picked up/dropped off separate from general parental traffic volumes.
– Students running onto the road is a major safety risk.
– The pick-up/drop-off point in the staff car park is generally a satisfactory arrangement.

The provision of ASTP vehicles within the staff car park, will provide separation from other parental pick-up/drop-off activity and occur behind gates, significantly reducing risks associated with students running onto the road.

The current council car park provides an indented bay with a length of approximately 18 metres, that provides direct pedestrian access to Building C. Minibuses with 12 seats have lengths of 5.4 metres. Accordingly, the indented area could accommodate up to three ASTP minibuses simultaneously.

3.2.1.5 Waste collection and deliveries

Waste collection and deliveries will occur within the closed section of Majara Street. Waste collection will be undertaken by a private contractor. The waste collection company will be issued with a number of key fobs, so drivers can access the waste collection area.

Information on how waste collection vehicles are expected to access/egress the high school and layover locations will be conveyed upon engagement of contract services.

The *Operation Waste Management Plan (OWMP) Bungendore High School* was prepared by EcCell Environmental Management in July 2021. The OWMP indicates that:

– Medium Rigid Vehicles (which are 10.5 metres in length) will collect waste from the nominated Waste Collection Point.
– Waste collection must only occur before 8:00 am and after 4:00 pm.
– Ideal waste collection times will be between 6:00 am – 7:30 am.

A swept path analysis (undertaken by M+G Consulting Engineers) of a waste collection vehicle accessing the school, maneuvering internally and exiting the school in a forward direction is displayed in Figure 3.1

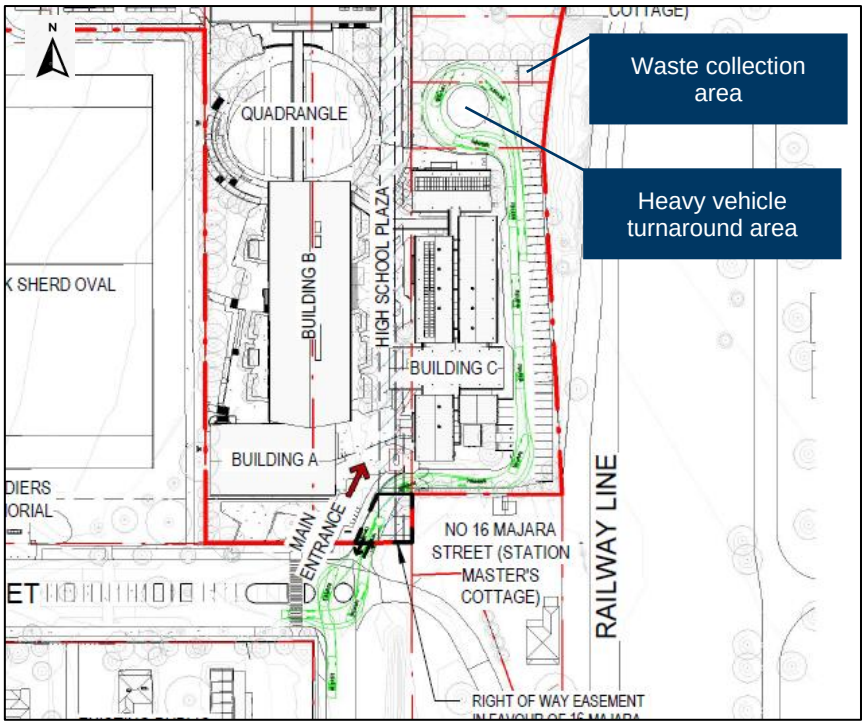

Figure 3.1 Waste collection vehicle – swept path analysis

Source: TKD Architects

3.2.2 Adjacent and to-site transport infrastructure

3.2.2.1 Active transport

A wombat/school pedestrian crossing will be provided on Gibraltar Street to replace the existing school crossing between the primary school and high school, to support the safe and efficient movement of students, staff and guardians accessing and egressing the schools.

The relocation of the Bus Zone to the southern side of Gibraltar Street (as described in Section 3.2.1.3) will require a minor relocation of the current school crossing location towards Majara Street to:

– Maximise the length of kerb space available to the Bus Zone.
– Balance pedestrian desire lines between the proposed high school, Mick Sherd Oval, the primary school and school Bus Zone.

Pedestrian crossings will also be provided:

– Across Turallo Terrace to support the safe movement of pedestrians between the school and the agricultural plot.

The development of the high school will require the realignment of the shared paths within and in proximity to Mick Sherd Oval and the high school subject site. Accordingly, it is proposed to:

– Link the existing shared path on Turallo Terrace (east of Butmaroo Street) to the existing shared path on Turallo Terrace to the south-west of Turallo Creek.
– Provide a new shared path between Mick Sherd Oval and the school site, connecting the shared path on Turallo Terrace to the pedestrian crossing on Gibraltar Street.

It is noted that for safety reasons, that as per the current arrangements, the shared path on Turallo Terrace will run behind the ninety-degree parking serving the community centre.

As detailed in the QPRC Bungendore Bicycle and Pedestrian Facilities Plan, the provision of a footpath on Butmaroo Street and between Turallo Terrace and the Kings Highway has been identified as a medium priority by QPRC. Based on discussions with QPRC, this shared path will be constructed prior to the opening of the high school.

Additionally, the Facility Plan indicates that most of the current shared paths in Bungendore have a width of 1.2 m, which does not support shared activity or width that complies with Austroads Guidelines. It would be of longer-term benefit for the community to uplift shared pathways to meet Austroads guidance, including widening, as it would improve user amenity and experience.

In summary, the recommended upgrades that will support active transport connectivity to the proposed high school and wider Bungendore Township (refer to Figure 3.2), include:

– The provision of a pedestrian crossing on Kings Highway at Majara Street and Ellendon Street.[2]
– Provision of a shared path on Majara Street between Turallo Terrace and Gibraltar Street, linking into the existing facilities.
– Provision of a shared path on Ellendon Street between Kings Highway and Turallo Terrace, linking into the existing facilities.
– Provision of a footpath on Butmaroo Street between Turallo Terrace and Kings Highway.
– Provision of a shared path on Tarago Road within a 3.6 kilometre cycling catchment of the high school.
– Provision of a shared on Turallo Terrace between Tarago Road and Butmaroo Street.

Figure 3.2 Recommended upgrades

Source: Sixmaps modified by GHD

Of the proposed upgrades identified above the highest importance should be applied to pedestrian crossings on Gibraltar Street, the shared path on Majara Street and the footpaths on Butmaroo Street.

3.2.2.2 Car parking

It is proposed to maintain the following parking areas for use by the general community:

– The current car park serving Mick Sherd Oval.

[2] The Supplement to Australian Standard AS 1742.10-2009 Manual Uniform Traffic Control Devices indicates that the reduced warrants for pedestrian crossing used by school students is pedestrian volumes of 30 or more and vehicle volumes of 200 or more, for a one hour direction immediately before or after school hours. The traffic surveys on Kings Highway indicate that the peak hour traffic volumes exceed 200, therefore the provision of a pedestrian crossing on Kings Highway may be appropriate subject to additional review of pedestrian activity subsequent to the opening of the high school.

– The ninety degree centre-of-road and parallel parking on Gibraltar Street. It is noted that a small amount of parking may be lost to account for the relocation of the pedestrian crossing on Gibraltar Street.
– The ninety-degree parking at the frontage to the Bungendore Community Centre.

It is noted that the construction of the school will result in the loss of the informal (approximately 40) and formal (twenty) ninety-degree parking bays currently provided on Majara Street between Gibraltar Street and Turallo Terrace.

These losses will be offset by the provision of the 30 bay car park located to the south of Bungendore Station, adjacent to the railway forecourt.

Additionally, parking on will be improved with 35 formal ninety degree parking bays provided the southern side of Turallo Terrace and five formal ninety degree parking bays on the northern side of Turallo Terrace .

Time restrictions will not be applied to the relocated parking bays.

3.2.2.3 Road upgrades

As displayed in Figure 1.1, the site plan for the new high school in Bungendore includes the provision of new roundabouts at the intersection of Gibraltar Street and Majara Street and Gibraltar Street and Butmaroo Street.

3.2.3 Adjacent and to-site transport operations

3.2.3.1 Active transport

With respect to the high school's active transport network:

– All individuals will be responsible for locking their bikes at the designated bike rack.
– A security fence will be provided around the perimeter of the school to restrict activity to the designated entry points for pedestrians, bicycle riders and vehicles.
– All bike parking will be provided within the secure, fenced, boundary of the school.
– Advanced cycling and bike maintenance classes will be provided to high school students.
– A Transport Access Guide (TAG) will be prepared to detail the ways students can get to school, emphasising active transport.
– The school will encourage and support sustainable modes of transport to the school through the provision of appropriate infrastructure, education, communication and support (like a Travel Coordinator).

3.2.3.2 Public transport

With respect to the high school's Bus Zone:

– Staff will be allocated to "bus duty" in afternoon periods, within the school gates, to support the safe movement of students using the Bus Zone on Gibraltar Street.
– Buses for excursions (or similar) will use the school's designated Bus Zone.
– A TAG will be prepared to detail the ways students can get to school, emphasising public transport.

At the time of writing this report, discussions have been initiated with QCity Transit and TfNSW about providing additional bus services to accommodate the additional demand associated with the proposed high school.

These communications are ongoing, and it is expected that a suitable provision of buses and appropriate bus routes will be operational on day one, term one of the commencement of the new high school in Bungendore.

3.2.3.3 Vehicles

With respect to vehicle access/egress to the high school:

– The school will promote car pooling, and a dedicated space will be provided at the high school.
– Staff will not manage/supervise the operation of the school's pick-up/drop-off facilities. Students will be responsible for egressing/accessing their parent's/guardian's vehicle.
– Access to the car park will be controlled by a gate and a reader/intercom. Only authorised vehicles (staff and waste collection vehicles) will be issued with a key fob to open the gate.
– All waste collection and deliveries will be scheduled to occur outside peak periods of school activity, in order to support the safety of students and their parents/guardians moving around the high school.
– There will be opportunities for parents/guardians with special needs students attending the high school and minibuses associated with the NSW's Government Assisted School Travel Plan (ASTP), to pick-up/drop-off their students within the staff parking.

There will be utility in offsetting or staggering the afternoon peak between the high school and the adjoining primary school.

Some parents are likely to have students in both the primary school and the high school and will potentially be penalised by an excessive stagger when picking-up their students in afternoon periods.

Additionally:

– It is proposed that primary school students and high school students share bus services, and a large stagger between schools would not support this arrangement.
– Primary school students require a higher level of support from staff compared to high school students when embarking buses.

Currently, at the primary school, classes conclude at 3:10 pm.

It is recommended that for high school that, classes conclude at up to 3:20 pm, as this will:

– Provide an offset between the peak afternoon activity between the primary school and the high school.
– Provide additional time for primary school students to embark buses in the afternoon.
– Not provide a major time penalty for parents with students in primary school and high school.

3.2.4 Transport operations, encouragement programs and staffing

3.2.4.1 Encouragement programs

The Travel Coordinator will make recommendations to the School Principal after consultation with the school community, including students, parents and staff, as to the type of programs that are best suited to the community and most likely to see the most impact to improving sustainable transport to the school.

These programs might include:

– Safe Routes to School.
– Independent Walking to School.
– Advanced cycling classes [3]
– Bike maintenance programs.
– Running to school – potentially as a form of training (if appropriate).

[3] Preliminary research in bike training providers indicates that rideTECHNICS in Canberra provides advanced training for groups of 10 people for a fee of $285 (incl GST). Assuming 100 students cycle to school and each student will be provided with two training sessions, a budget of $5,700 (incl GST) should be set aside for bike courses.

The programs need to be complemented by infrastructure investment like shared pathways and safe crossing locations to the school in order to be successful.

A summary of the proposed infrastructure and supporting management strategies are detailed in the TAG will provide:

– Active travel information, including:
  - Best active transport routes to school and how to access bicycle parking.
  - Messaging that a socially distant way of getting to school is walking and cycling.
  - Safety tips/rules for cycling (safety on wheels).
  - The health advantages of walking and cycling.
– Bus travel options, including:
  - School bus routes.
  - School bus timetables.
  - Information on the eligibility of the school bus pass (SSTS).
– Kiss-and-Drop (pick-up/drop-off) location.
– Bus Zone and No Parking restrictions.
– Demerits and fines associated with contravening these constrictions.

The TAG will include a map showing bus routes, walking routes, pedestrian crossing points, bus stop locations, bike parking locations and pick-up/drop-off locations.

An example of TAG templates prepared by the NSW Department of Education are included in Appendix E.

3.2.4.1.1 Staffing

In order to implement the transport initiatives at the new high school in Bungendore, a Travel Coordinator will need to be appointed, it is noted that:

– A Travel Coordinator will be required for the duration of construction and first year of post-occupancy occupancy to promote sustainable travel behaviours.
– During these periods, transport programs must be implemented to achieve travel behaviour change and support the active and public transport mode split targets.
– This role is initially funded by the project during delivery.
– After one year, ongoing discussion will be undertaken between the Department, SINSW and TfNSW regarding the funding of the Travel Coordinator.

The Travel Coordinator will be responsible for:

– Implementing the initiative/measures.
– Liaising with key stakeholders and executing the Communications Plan.
– Measuring the participation of the program and collecting data in the way staff and students travel to and from school.
– Managing enquiries for a crossing supervisor for the pedestrian crossing on Gibraltar Street. Applying to QPRC for a crossing supervisor if the key criteria are met.
– Organising annual surveys to determine changes in patterns of mode splits.
– Amending the Action Plan based on survey results, to support the mode share targets being met.
– Raising awareness of sustainable travel modes amongst students and their parents/guardians.
– The Travel Coordinator will be included in the internal and external working groups at the new high school in Bungendore.

The Travel Coordinator role is initially funded by the project during delivery. After one year, ongoing discussion will be undertaken between the Department, SINSW and TfNSW regarding the funding of the Travel Coordinator.

The following working groups will be established at the new high school in Bungendore:

– An internal group consisting of the school leadership team, parent/guardian and student representatives. The Road Safety Education Officer and representatives from the Asset Management Unit and Work Health and Safety Unit will also form part of this group.
– An external working group including representatives from the new high school in Bungendore, QPRC, TfNSW and public transport providers.

The internal working group will identify key issues (including safety issues) in the operation of the school's traffic and transport facilities and identify potential mitigation measures.

The external working group will assess the feasibility of the mitigation measures and allocate resources for their implementation (if required).

4. Traffic assessment

In accordance with SEARs specifications, SIDRA intersection analysis has been undertaken for:

– Commencement of operation (2023)
– A ten year time period from the commencement of operation (2033)

4.1 Background traffic growth

As detailed in section 1.2, in the Bungendore Structure Plan, 1,384 new dwellings are projected to be required within Bungendore over the next 30 years to accommodates the town's growth.

Information provided by QPRC, indicates that the North Elmslea Subdivision (Lot 1) and Bungendore East Subdivision (Lot 4) are expected to be fully developed in the next ten years, as follows:

– North Elmslea Subdivision – A total of 300 lots with the construction of 75 lots per year from 2022
– Bungendore East Subdivision - A total of 500 lots with the construction of up to 100 lots per year from 2024

It is noted that:

– Accounting for the year of commencement to 2023, it has been assumed that 75 lots of North Elmslea will be constructed and occupied.
– Accounting for a ten-year horizon to 2033, it has been assumed that North Elmslea and Bungendore East will be fully constructed and occupied.

The TfNSW Technical Direction TDT 2013/04a Guide to Traffic Generating Developments Updated Traffic Surveys indicates that on average, dwellings in regional areas generate:

– 0.78 trips per dwelling in the AM peak hour
– 0.71 trips per dwelling in the PM peak hour

It is assumed that these residential trips will be:

– 80 percent outbound and 20 percent inbound in the AM peak hour
– 20 percent outbound and 80 percent inbound in the PM peak hour

The peak hour trips associated with the proposed subdivisions are presented in Table 4-1.

Table 4-1 Subdivision peak hour traffic generation

Subdivison	Lots	AM Peak Hour		PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
North Elmslea	300	47	187	170	43
East Bungendore	500	78	312	284	71
Total	**800**	**125**	**499**	**454**	**114**

It is noted that:

– In the morning, peak activity for schools and residences (work trips) typically occurs at the same time.
– In the afternoon, peak activity for schools typically occurs prior to peak activity for residences (work trips).

To be very conservative, for the purposes of analysis, it has been assumed that the peak activity for the proposed high school and proposed residential subdivisions will occur at the same time in the morning and afternoon peak hours.

Additionally, to be conservative, an annual growth rate of two percent has been applied to the current traffic volumes (separate to the proposed to identify the horizon year baseline traffic volumes) and account for the expected growth in Bungendore in 2023 and 2033 scenarios.

4.2 Traffic generation

TfNSW has undertaken an extensive volume of surveys to determine trip generation for urban and regional school (primary and high schools).

Reference is made to TfNSW's Trip Generation Surveys Schools Analysis Report (2014) which indicates that for regional high schools:

– In the AM peak, there is an average rate of 0.35 trips per student and a maximum rate of 0.52 trips per student
– In the PM peak, there is an average rate of 0.24 trips per student and a maximum rate of 0.42 trips per student.

Schools typically generate fewer vehicles trips in the afternoon peak than in the morning peak.

It is noted that for the proposed new high school in Bungendore:

– In the AM peak it is expected that a significant amount of parents will drop their child/students off and drive to Queanbeyan or Canberra for work.
– Based on discussions with the bus operator, the existing bus services at the primary school can be easily expanded to serve the proposed high school.
– A small number of high school students (years 11 and 12) may drive to the proposed high school.

To be conservative, in accordance with the 2016 JTW data[4], it has been assumed that for the new high school in Bungendore:

– In the AM peak, the proposed high school will generate 0.7 trips per student.
– In the PM peak, the proposed high school will generate 0.6 trips per student.

Assuming a student population of up to 450 students (in order to provide a conservative assessment) and the above trip generation rates, the high school will generate:

– 315 trips in the AM peak (inbound and outbound).
– 270 trips in the PM peak (inbound and outbound).

Parents can typically have multiple children attending schools in different grades. For the purposes of analysis, it has been assumed that there will be an occupancy rate of 1.4 students per vehicle.

Applying this rate, the proposed high school is expected to generate:

– 450 trips in the AM peak (225 inbound and 225 outbound).
– 386 trips in the PM peak (193 inbound and 193 outbound).

Additionally, it has been assumed that teachers will access the school in the AM peak hour and exit the school in the PM peak hour.

4.3 Trip distribution

4.3.1 Residential subdivisions

It is assumed that during peak periods of road network activity, the majority of residents in the North Elmslea Subdivision (Lot 1, refer to Figure 1.4) would access/egress Tarago Road/Molonglo Street to the north of the school site, via Ashby Drive or other new roads that will be provided to support the residential growth in North Bungendore.

[4] It is noted that these trip rates are higher than the targets for private vehicles identified in Section 3.1, to support a conservative analysis

However, to be conservative, it is assumed that thirty percent of residents of the North Elmslea Subdivision will use Turallo Terrace to access/egress Tarago Road/Molonglo Street and the commercial centres of Canberra and Queanbeyan.

For the Bungendore East Subdivision (Lot 4, refer to Figure 1.4), it has been assumed that the Kings Highway will be the primary access/egress route. For the purposes of analysis, it has been assumed that during peak periods of road network activity:

– 75 percent of residents of the Bungendore East Subdivision will access/egress the subdivision to and from the west.
– 25 percent of residents of Bungendore East Subdivision will access/egress the subdivision to and from the east.

4.3.2 School trips

To support the trip distribution analysis, Bungendore has been divided into six spatially contiguous sectors as displayed in Figure 4.1.

It is noted that the key areas include the proposed Bungendore East (included in Sector 3) and North Elmslea Subdivisions (included in Sector 2).

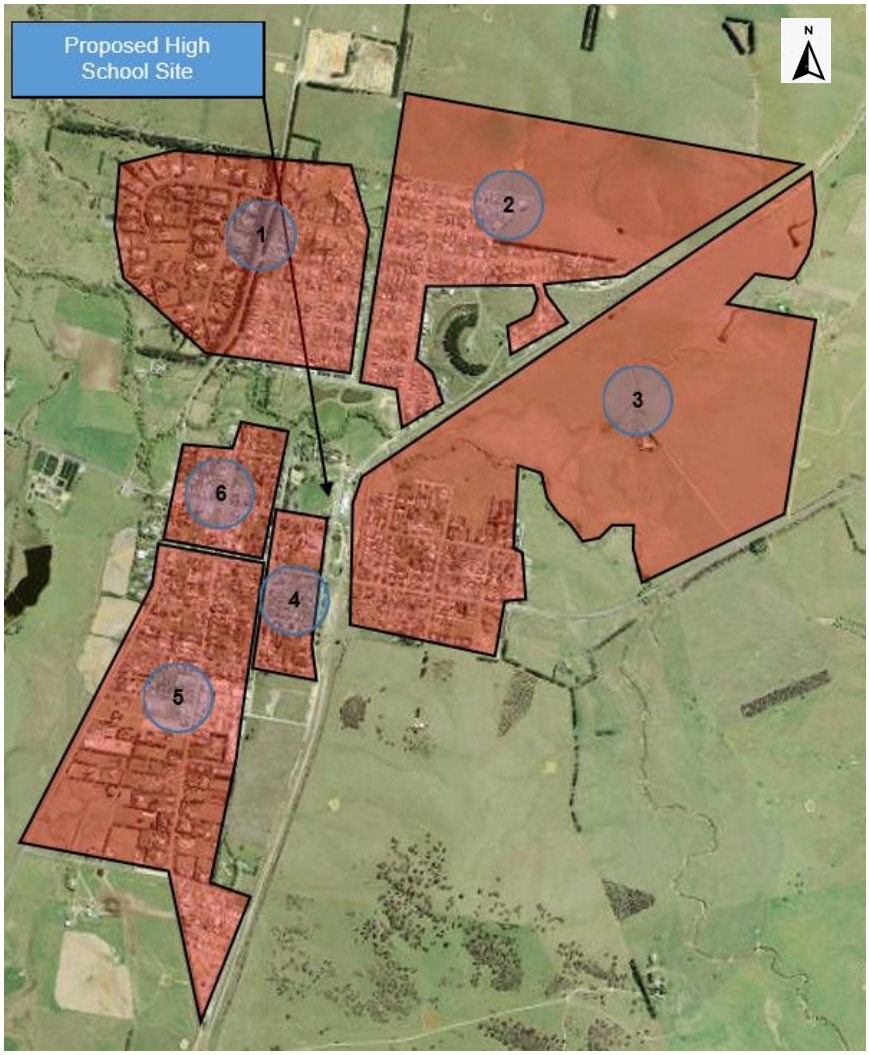

Figure 4.1 Trip distribution sectors

Each of the six sectors are expected to have a different trip distribution pattern to and from the proposed high school.

The trips generated by the school have been distributed onto the road network in the geographic context of the location of each sector to the proposed high school

It is noted that the high school pick-up/drop-off facility is proposed to be located on the northern side of Gibraltar Street and the southern side of Turallo Terrace.

The trip distribution analysis assumes that a roundabout will be constructed at the intersection of Gibraltar Street and Majara Street.

The assumed school access (purple lines) and egress arrangements (red lines) for each of the six sectors (at the intersection of interest), are displayed in Table 4-2.

Table 4-2 School access route by sector

Sector	Access Route
1	

Sector	Access Route
2	
3	

Sector	Access Route
4	
5	

Sector	Access Route
6	

In order to account for trips associated with each of the sectors, their approximate areas have been determined, as detailed in Table 4-3. For the purposes of analysis, it has been assumed that the housing densities are approximately similar for each of the six sectors.

Table 4-3 Sector information.

Sector	Area	Portion of Total
1	80 ha	16%
2	125 ha	25%
3	184 ha	36%
4	15 ha	3%
5	80 ha	16%
6	22 ha	4%
Total	**506**	**100%**

4.3.3 School AM peak hour

4.3.3.1 Inbound trips

The portions for each of the six sectors, detailed in Table 4-3, have been applied to the access routes detailed in Table 4-2 to determine the expected inbound AM peak hour traffic volumes, as displayed in Table 4-4.

Table 4-4 AM Inbound Trips

Sector	Portion of Total	Trips
1	16%	36
2	25%	56
3	36%	82
4	3%	7
5	16%	36
6	4%	10
Total	**100%**	**225**

4.3.3.2 Outbound trips

As stated previously, it is expected that a large portion of students accessing the school by car in the morning will be dropped off by their parents, who will then continue onto their places of employment, particularly in Canberra and Queanbeyan, as follows (see Figure 4.2):

– Gibraltar Street - these vehicles would be expected to turn right onto Majara Street, then right onto Kings Highway and continue onto Canberra and Queanbeyan.
– Turallo Terrace – these vehicles could be expected to continue east on Turallo Terrace, turn left onto Molonglo Street and continue onto Canberra and Queanbeyan.

A smaller amount of vehicles are expected to return to their places of residence.

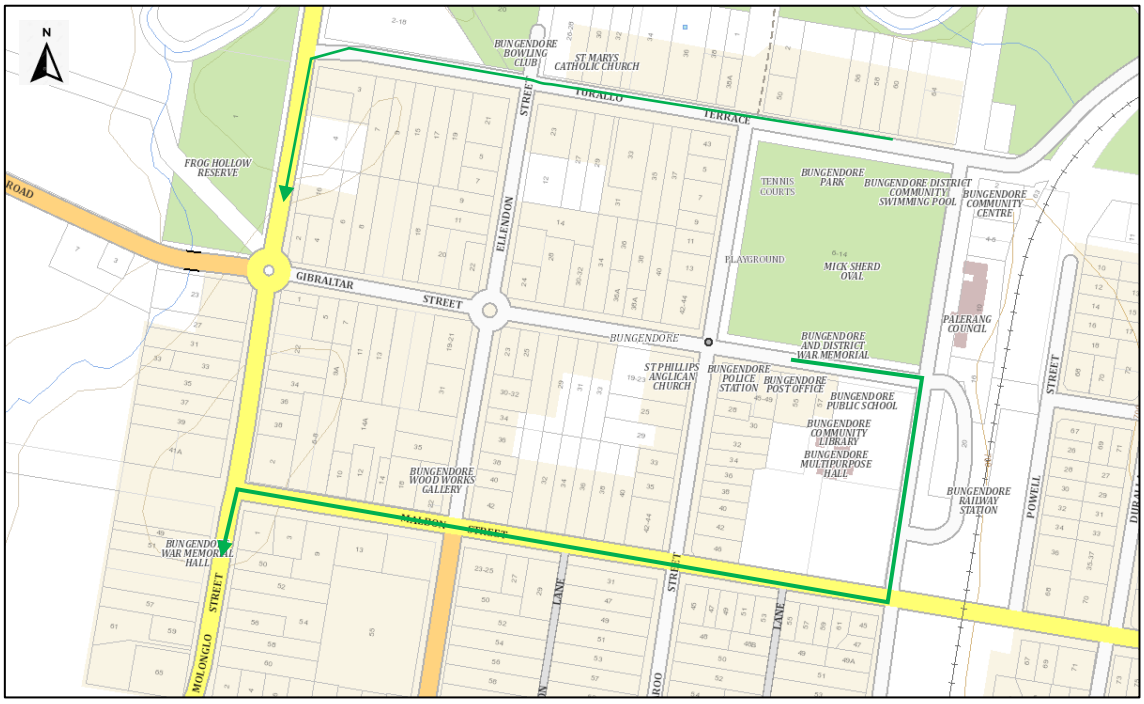

Figure 4.2 Route from school to Queanbeyan/Canberra employment centres

Source: Six Maps modified by GHD

For the purposes of analysis, it has been assumed that after dropping their students at school:

– 60 percent of outbound vehicles will travel to Queanbeyan/Canberra.
– The remaining 40 percent will return to their places of residence via the routes detailed in Table 4-2.

4.3.4 School PM peak hour

In the school PM peak, for analysis purposes, it is assumed that vehicles will access and egress the schools via the routes detailed in Table 4-2, as displayed in Table 4-5.

Table 4-5 PM inbound and outbound trips

Sector	Portion of Total	Trips
1	16%	31
2	25%	48
3	36%	70
4	3%	6
5	16%	31
6	4%	8
Total	**100%**	**193**

The trip generation volumes for the new high school in Bungendore are included in Appendix F.

4.3.5 School staff

It is expected that school staff, including teachers will typically access the high school, prior to students and exit the high school after students.

Accordingly, for the purposes of analysis, it has been assumed that staff will access the school in the morning peak hour and exit the school in the afternoon peak hour.

4.4 Intersection performance

Intersection analysis, using the SIDRA 9 modelling software, has been undertaken in the 2033 horizon year for a conservative post-development scenario accounting for:

– A two percent annual background traffic growth
– The trips associated with the North Elmslea and Bungendore East Subdivisions
– The trips associated with the new high school in Bungendore

As displayed in Figure 4.3, the SIDRA network has been updated to account for the provision of a roundabout at the intersection of Majara Street/Gibraltar Street, Butmaroo/Gibraltar Street and the closure of Majara Street, between Gibraltar Street and Turallo Terrace (staff access only).

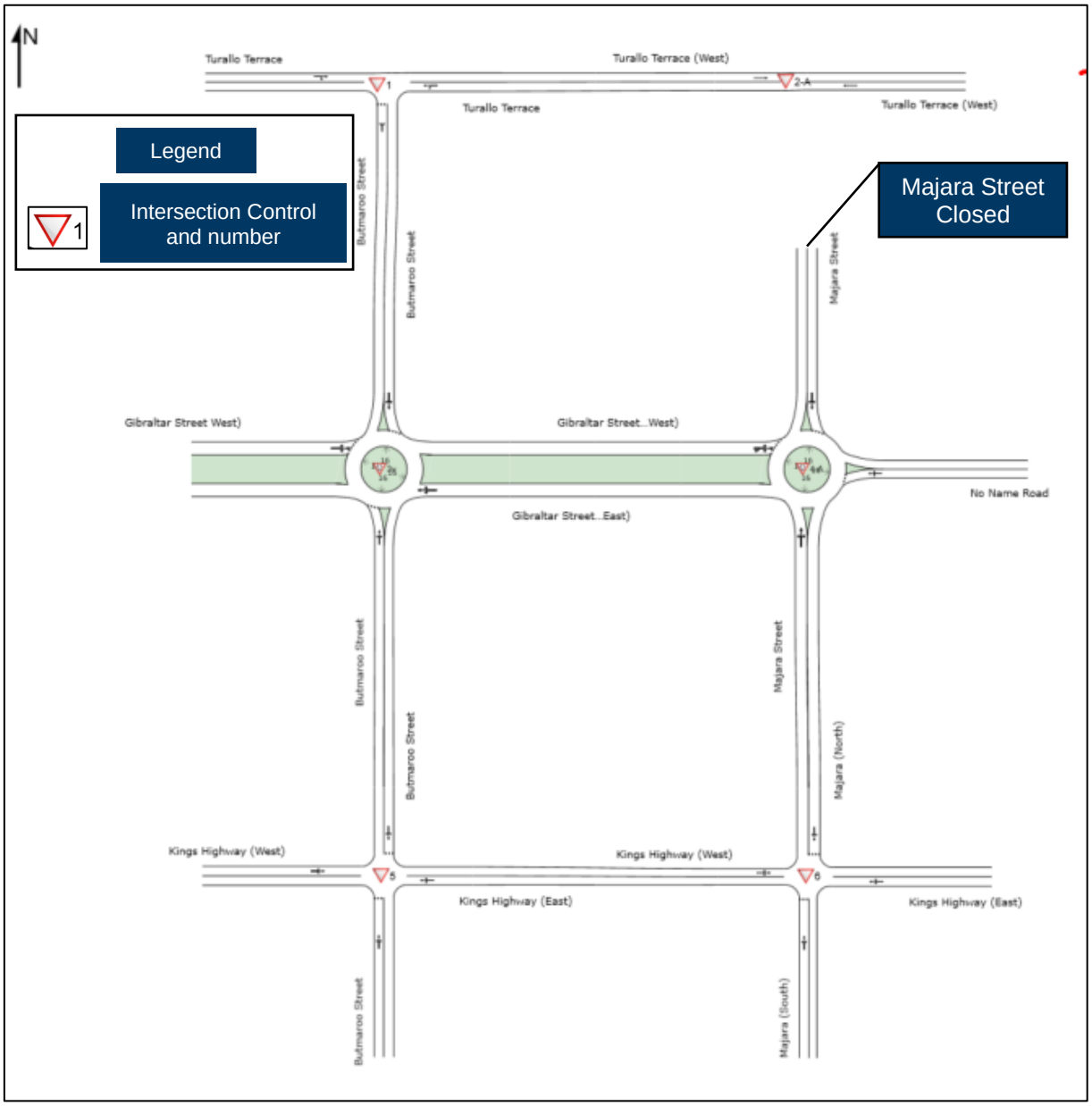

Figure 4.3 2033 SIDRA network (proposed post development scenario)

The results of the SIDRA analysis for the 2023 horizon year (year of opening) are displayed in Table 4-7, with the results of the SIDRA analysis for the 2033 horizon year are displayed in Table 4-7.

The 2023 and 2033 traffic volumes are displayed in Appendix G.

Table 4-6 Intersection performance 2023 post development (year of opening)

Intersection	AM Peak			PM Peak		
	Av Delay (sec)	LOS	95th % Queue (m)	Av Delay (sec)	LOS	95th % Queue (m)
Turallo Terrace/Butmaroo Street						
Butmaroo Street	6.2	A	1	6.1	A	1
Turallo Terrace – east	2.2	A	0	2.5	A	0
Turallo Terrace – west	2.6	A	0	0.9	A	0
All vehicles	3.3	A	-	3.5	A	-
Turallo Terrace/Majara Street						
Turallo Terrace – east	0.0	A	0	0.0	A	0
Turallo Terrace – west	0.0	A	0	0.0	A	0
All vehicles	0.0	A	-	0.0	A	-
Gibraltar Street/Butmaroo Street						
Butmaroo Street – south	8.0	A	3	7.5	A	3
Gibraltar Street – east	3.8	A	0	4.2	A	0
Butmaroo Street – north	7.1	A	1	6.3	A	1
Gibraltar Street – west	5.4	A	2	5.6	A	2
All vehicles	5.8	A	-	5.7	A	-
Gibraltar Street/Majara Street						
Majara Street – south	3.2	A	1	3.9	A	1
Station access road	6.0	A	1	5.9	A	1
Majara Street –	6.0	A	1	7.0	A	1
Gibraltar Street – west	7.6	A	2	7.5	A	2
All vehicles	5.8	A	-	6.5	A	-
Kings Highway/Butmaroo Street						
Butmaroo Street – south	8.9	A	1	9.6	A	1
Kings Highway – east	3.6	A	0	3.7	A	0

Intersection	AM Peak			PM Peak		
	Av Delay (sec)	LOS	95th % Queue (m)	Av Delay (sec)	LOS	95th % Queue (m)
Butmaroo Street – north	9.6	A	2	8.2	A	2
Kings Highway – west	0.7	A	0	1.3	A	1
All vehicles	3.5	A	-	3.9	A	-
Kings Highway/Majara Street						
Majara Street – south	7.7	A	1	8.2	A	1
Kings Highway - east	3.6	A	0	3.5	A	0
Majara Street – north	9.2	A	5	8.9	A	5
Kings Highway – west	1.7	A	0	0.9	A	0
All vehicles	4.6	A	-	4.3	A	-

The results in Table 4-6 indicate that the six intersections of interest are expected to operate with spare capacity during the AM and PM peak periods in the 2023 horizon year (post-development) with the trips generated by the new high school in Bungendore, assumed background traffic growth and the trips associated with the proposed subdivision.

Table 4-7 Intersection performance 2033 post development

Intersection	AM Peak			PM Peak		
	Av Delay (sec)	LOS	95th % Queue (m)	Av Delay (sec)	LOS	95th % Queue (m)
Turallo Terrace/Butmaroo Street						
Butmaroo Street	6.6	A	1	6.3	A	1
Turallo Terrace – east	1.9	A	0	2.5	A	0
Turallo Terrace – west	2.5	A	1	0.6	A	0
All vehicles	3.0	A	-	3.3	A	-
Turallo Terrace/Majara Street						
Turallo Terrace – east	0.0	A	0	0.0	A	0
Turallo Terrace – west	0.0	A	0	0.0	A	0
All vehicles	0.0	A	-	0.0	A	-
Gibraltar Street/Butmaroo Street						
Butmaroo Street – south	8.1	A	3	7.6	A	4
Gibraltar Street – east	3.9	A	0	4.2	A	0
Butmaroo Street – north	5.9	A	2	6.5	A	2
Gibraltar Street – west	5.5	A	3	5.7	A	3
All vehicles	5.6	A	-	5.8	A	-
Gibraltar Street/Majara Street						
Majara Street – south	3.2	A	0	4.0	A	1
Station access road	6.0	A	0	6.0	A	1
Majara Street –	6.0	A	0	7.0	A	1
Gibraltar Street – west	7.6	A	2	7.4	A	2
All vehicles	5.7	A	-	6.4	A	-
Kings Highway/Butmaroo Street						
Butmaroo Street – south	18.4	B	3	18.8	B	3
Kings Highway – east	3.5	A	0	3.6	A	0

Intersection	AM Peak			PM Peak		
	Av Delay (sec)	LOS	95th % Queue (m)	Av Delay (sec)	LOS	95th % Queue (m)
Butmaroo Street – north	19.7	B	4	16.3	B	5
Kings Highway – west	0.9	A	1	0.9	A	1
All vehicles	4.6	A	-	4.6	A	-
Kings Highway/Majara Street						
Majara Street – south	14.0	A	2	11.3	A	1
Kings Highway - east	3.5	A	0	3.5	A	0
Majara Street – north	19.7	B	10	15.9	B	8
Kings Highway – west	1.5	A	0	0.6	A	0
All vehicles	6.2	A	-	5.1	A	-

The results in Table 4-7 indicate that the six intersections of interest are expected to operate with spare capacity during the AM and PM peak periods in the 2033 horizon year (post-development) with the trips generated by the new high school in Bungendore, assumed background traffic growth and the trips associated with the proposed subdivision.

It is noted that at the intersections with Kings Highway, Butmaroo Street and Majara Street are expected to operate with a LoS B. As per the criteria included in Table 2-5, LoS B is good with acceptable delays and spare capacity. Additionally, in accordance with the 2023 SIDRA outputs (which show a LoS A at Butmaroo Street and Majara Street), the LoS B can be attributed to the wider growth of the Bungendore Township.

In summary, accounting for a conservative assumptions with respect to future land uses and growth within Bungendore and the trips associated with the proposed high school, the intersections of interest are expected to operate at an acceptable LoS in the 2033 horizon year.

The SIDRA outputs incorporating the new high school in Bungendore are included in Appendix H.

5. Construction assessment

As detailed in Section 1, a Preliminary Construction and Pedestrian Traffic Management Plan (CTMP), has been prepared by GHD as a separate deliverable for the new high school in Bungendore. A summary of key aspects of the CTMP is provided below.

5.1 Construction outline

The new high school in Bungendore is expected to commence operation on day one, term one in 2023.

Traffic generated by construction activities for the project would include heavy vehicles associated with the construction plant, deliveries and removal of materials along with light vehicles from construction workers.

5.1.1 Heavy vehicles

Preliminary estimates of the heavy vehicle activity associated with the construction of the new High School in Bungendore is as follows:

– Cranes - likely to be required during the construction of the superstructure, approximately three cranes per week for a period of two months.
– Truck and dog trailer – likely to be required for the duration of the civil works, approximately four to six movements per day (inbound and outbound) for a period of two months.
– Material deliveries – likely to be multiple deliveries per day, in vehicles ranging from utes to pantecs.
– Waste – likely to be one movement every second day.

5.1.2 Light vehicles

It is expected that there will be a maximum workforce of approximately 110 workers.

The majority of workers are expected to reside in the nearby population centres of Queanbeyan and Canberra, offering opportunities for carpooling. For the purpose of analysis, it is assumed that there will be an occupancy rate of 1.5 workers per vehicle.

Application of this car driver rate to the assumed workforce yields a typical traffic generation in the order of 75 light vehicles per day, which are anticipated to access the subject site in the morning and depart the subject site in the afternoon/evening.

5.1.3 Oversize vehicles

Section 5.1.1 outlines the proposed access routes for heavy vehicles, typically up to truck and dog trailer.

A review of the suitability of the use of the local road network for larger vehicles should be undertaken independently by the Contractor and may require specific traffic control (i.e. vehicle escort) if such larger vehicles are required.

At this stage of the project, details of the oversized vehicles required to transport equipment or plant to the site are not available. However, should oversize vehicles be required (i.e. lifts and pre-cast structures, crane erection), the Contractor will be required to apply for permits from Transport for NSW and Council, with the submission of suitable traffic management and transportation routes to be agreed, subject to the required size of the vehicle.

Oversize vehicle routes are to be carried out where possible on designated heavy vehicle routes or routes approved by Transport for NSW. Additionally, oversized traffic movements should be carried out, where possible, outside peak road network periods, thereby minimising the impacts on the road network.

5.1.4 Construction traffic impacts

The number of construction vehicles to access the site will need to be confirmed by the Contractor during the detailed construction planning stage. However, it is assumed that construction traffic volumes will be within typical daily traffic fluctuations and will not adversely alter the operation of the existing road network condition. Furthermore, it is estimated construction active will be less than the future operational activity of the developed site. Traffic assessment of road network in the future development scenario (as outlined in this TA) indicates the road network will continue to operate within an acceptable level of service.

Notwithstanding the above, the Contractor should encourage carpooling for workers and maintain deliveries at staggered intervals and outside road network periods and incorporated them in the Construction Traffic Management Plan.

5.2 Construction compound

Information provided by Hindmarsh for the construction compound indicates that:

– A chain mesh fence will be constructed around the compound with shade clothes providing a visual, physical and dust control barrier.
– The site gates at the construction compound will be provided:
  - Gale 1 on Turallo Terrace will be allocated for large deliveries and pedestrian access for workers and visitors.
  - Gate 2 on Gibraltar Street will be for the egress of construction vehicles.
  - Gate 3 on Turallo Terrace will provide an additional access and egress for construction vehicle.
– Site gates will be managed by authorised traffic controllers to assist in the safe access and egress of vehicles associated with the construction activity and other vehicles, pedestrians and cyclist on the adjoining public road network.
– Site signage installed adjacent to all site gates providing site information to the general public.
– The current on-site car park, adjacent to the Queanbeyan-Palerang Regional Council (QPRC) Building (which provides 44 parking spaces and two spaces for the mobility impaired), will be maintained for the parking of workers associated with the construction.

5.3 Preliminary Construction Management Plan

5.3.1 Construction vehicle access route

It is expected that the majority of heavy vehicles and workers will access/egress the subject site to and from the nearby population/commercial centres of Queanbeyan and Canberra.

Access to the construction compound, including delivery and worker vehicles, will be provided via the site access points on Turallo Terrace.

Egress from the construction compound will be provided via Gibraltar Street / Majara Street) and Turallo Terrace.

In determining haulage routes:

– Vehicles will utilise the Kings Highway and Molonglo Street as the primary access/egress route aligning with the road state/regional road hierarchy amend authorised B-double route
– Vehicle activity on the township's collector and local road network will be minimised, with site vehicles travelling on Gibraltar Street and Turallo Terrace local road network to directly access/egress the site.
– During school peak pick up and drop off periods, heavy vehicle movements will be restricted to Turallo Terrace only, to provide improved safety to Bungendore Primary School students on Gibraltar Street and Majara Street.

The primary designated haulage routes to and from the construction compound are detailed in Figure 5.1.

As part of an induction truck drivers will be informed of the designated haulage routes to and from the construction compound.

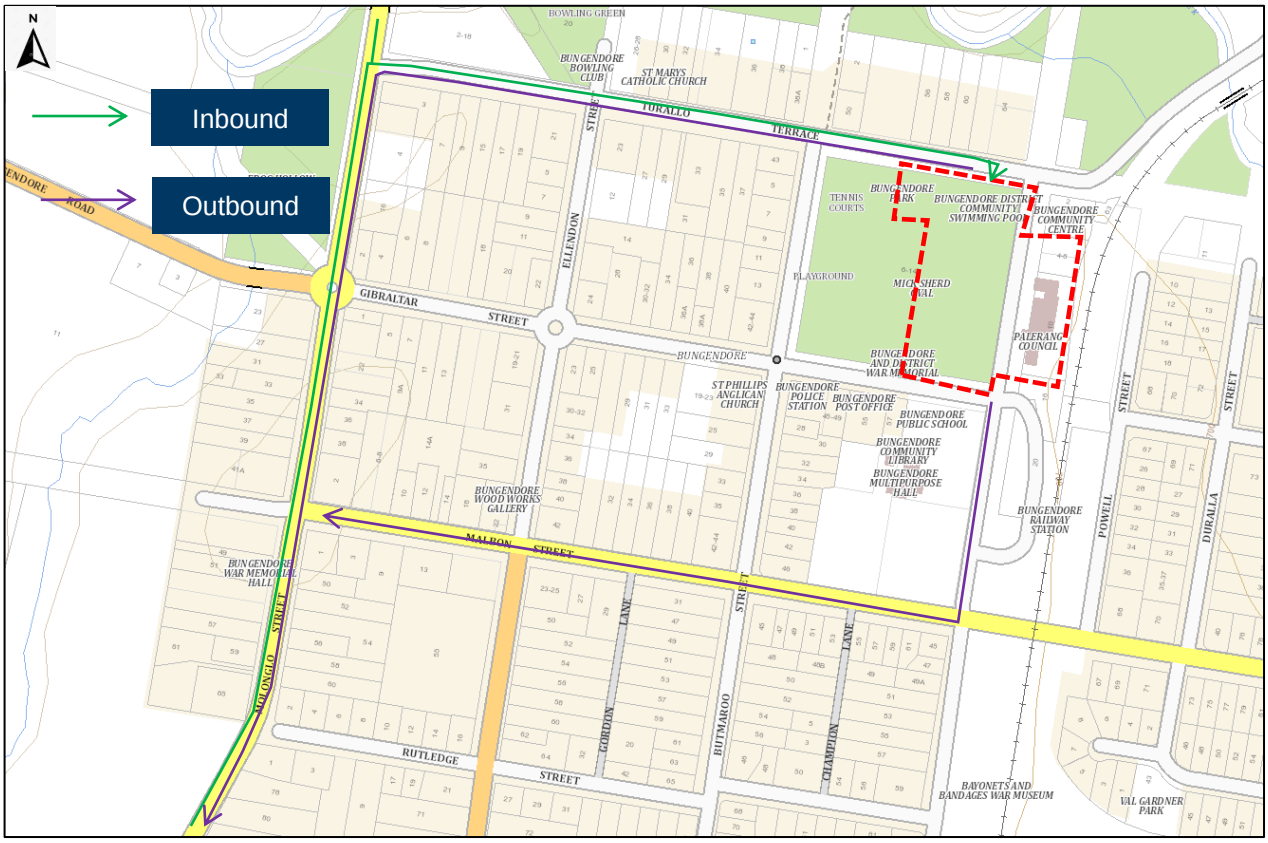

Figure 5.1 Primary designated haulage routes

5.3.2 Construction works timing

The NSW Environmental Protection Authority, Draft Construction Noise Guidelines, details the recommended standard hours for construction works:

– Weekdays 7:00 am – 6:00 pm.
– Saturdays 8:00 am – 1:00 pm.
– Sundays and public holidays, no work.

The construction works at the new high school in Bungendore will be scheduled to occur during these standard hours.

Additionally, where possible, deliveries will be scheduled to occur outside of the periods of 8:00 am – 9:30 am and 2:30 pm – 4:00 pm to minimise potential impacts with vehicle activity at the adjoining Bungendore Primary School.

5.3.3 Construction parking

5.3.3.1 Heavy vehicles

Heavy vehicle activity, i.e. deliveries and waste collection, will occur within the construction compound.

Heavy vehicle arrivals will be coordinated to avoid queuing of vehicles outside the site as queuing of vehicles is not permitted on the public road network or in a position that will cause obstruction or safety issues to vehicles (or occupants), pedestrians or cyclists.

Vehicles are not to double park or queue to impact traffic and pedestrian thoroughfare and property access.

During school peak pick up and drop off periods, heavy vehicle movements will be restricted to Turallo Terrace only, to provide improved safety to Bungendore Primary School students on Gibraltar Street and Majara Street.

5.3.4 Light vehicles

As stated previously, up to 75 light vehicles are expected to access the construction compound.

The existing QPRC building parking will be available to workers. It is recommended that the majority of these parking spaces be allocated to individuals who car pool, in order to reduce single occupancy vehicle trips.

Up to approximately 25 vehicles may be required to find alternative parking arrangements.

Informal parking (i.e. on grass verges and gravel hardstands, without kerb and guttering) is provided on Turallo Terrace and Butmaroo Street, adjacent to the site. It is expected that some workers will park in these locations in proximity to the construction compound.

5.3.5 Pedestrian and bicycle management

Site access will be restricted to authorised personnel only.

It is anticipated that the pedestrian, and to a lesser extent, cyclist activity, within the public areas surrounding the site will be moderate due to the site's vicinity to sports grounds and local primary school.

Potential interactions between construction traffic and pedestrians and bicycle riders include:

– Impact to pedestrian and bicycle rider movements due to the movement of material, traffic diversions and the location of crane/s during construction.
– Pedestrian and bicycle desire lines may be obstructed between the sports oval and the school due to the location of the site and the currently shared path.
– Increased vehicle movements may reduce safety.
– Site access and egress location crossing pedestrian footpath areas.

Traffic controllers will monitor the site during construction deliveries entering and exiting from the site at each of the access/egress gates to ensure that people in the vicinity of the site are protected from heavy vehicles movements into and out of the construction compound.

The detailed CTMP incorporating the Traffic Guidance Scheme (TGS) will need to be developed by the construction contractor will need to consider the safe access for pedestrians and cyclists, which may include minor local diversion to alternate pedestrian and cycle facilities to avoid the construction works areas. Pedestrian and cyclists path of travel is to be free of trip hazards and debris to minimise the risk of injuries and will be monitored throughout the works

5.3.6 Impacts on public transport

No changes to existing bus operations are required to facilitate construction works. The bus stop located on Gibraltar Street will remain operational at all times. Pedestrian access to this bus stop will also be maintained.

The bus zone adjacent to the primary school on Gibraltar Street will also remain operational at all times.

As detailed in Section 2.1.2.2.3, a railway crossing with boom gates is located on the Kings Highway, approximately 60 metres to the east of Majara Street.

Within the construction hours detailed in Section 5.3.2, up to five trains will access Bungendore Station, requiring the closure of the boom gates for short periods of time.

As stated previously, the majority of light and heavy construction vehicles are expected to access/egress the construction compound via Queanbeyan and Canberra and therefore will not be required to traverse the level crossing.

Additionally, as detailed in Section 5.3.2, workers are expected to access the construction compound prior to 7:00 am and depart it subsequent to 6:00 pm. Trains are not expected to travel through Bungendore at these times.

Accordingly, the construction of the high school is expected to have a negligible impact on the operation of the level crossing in Bungendore, which will principally continue to operate at its current level of service.

At the time of writing this Preliminary CTMP there are ongoing discussions with TfNSW and John Holland about the expected operation of the level crossing in Bungendore in the context of the construction of the proposed high school.

5.3.7 Contact of emergency services

In the event of an emergency related construction traffic incident on the public road network, it will be the responsibility of the Site Manager to ensure that emergency services are notified. The emergency services include but are not limited to:

– Fire
– Ambulance
– Police.

Phone “000” in cases of emergency.

If required, emergency services vehicles will access the car park or park on the roads adjacent to the subject site.

Furthermore, it is the responsibility of the Site Manager to advise the emergency services of any restriction of vehicular access to the public and private areas (1) one week prior to its implementation.

6. Summary and conclusions

6.1 Summary

This Transport Assessment (TA) accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) in support of an application for a State Significant Development (SSD No 14394209). The SSDA is for a new high school located at Bungendore.

The proposed development is for the construction of a new high school in Bungendore. The proposal has been designed as a stream 3 high school to initially provide for approximately 450 students with core 4 facilities aimed to future proof demand forecasted to 2036.

The site is located adjacent to the existing Bungendore Public School to the south enabling the creation of an education style precinct that will enable a cohesive connection between the two schools as well as the wider Bungendore community.

6.2 Key findings

Following a detailed assessment of the proposed development of the new high school in Bungendore we provide the following conclusions:

– The student catchment for the new high school in Bungendore is large and extends to the NSW border with Australian Capital Territory (ACT), and includes townships of Sutton, Bywong, Gundaroo and Hoskintown.
– SIDRA intersection analysis indicates that the key intersections in proximity to the school site operate with a good Level of Service and minimal delays.
– The current Journey to Work data for Bungendore indicates 75 percent of residents used private vehicles to access their workplace and eight percent used sustainable modes of transport (walking, cycling and public transport).
– Information provided by QPRC, indicates that the North Elmslea Subdivision (300 lots) and Bungendore East Subdivision (500 lots) are expected to be fully developed in the next ten years.
– The trips rates for the high school was undertaken on a first principals basis in accordance with the current Journey to Work Data. Accounting for an occupancy rate of 1.4 students per vehicle, the proposed high school is expected to generate:
    - 450 trips in the AM peak (225 inbound and 225 outbound).
    - 386 trips in the PM peak (193 inbound and 193 outbound).
– SIDRA intersection analysis accounting for the high school trips, the proposed subdivision and a two percent annual background traffic growth indicates that the intersection will continue to perform with a good Level of Service in 2023 and 2033.

Accordingly, the proposed high school in Bungendore can be supported from a traffic and transport perspective.

Appendices

Appendix A

New High School in Bungendore – Draft School Transport Plan

New High School in Bungendore

Preliminary School Transport Plan

Hindmarsh Construction Australia Pty Ltd

6 September 2021

The Power of Commitment

Level 15, 133 Castlereagh Street
Sydney, NSW, 2000
T (02) 9239 7100 | **E** sydmail@ghd.com | **ghd.com**

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S03	1	M Lucas	S Clarke	On file	S Clarke	On file	25/06/21
S03	2	M Lucas	S Clarke	On file	S Clarke	On file	12/07/201
S03	3	M Lucas	S Clarke	On file	S Clarke	On file	21/07/2021
S03	4	M Lucas	S Clarke	On file	S Clarke	On file	04/08/2021
S04	5	M Lucas	S Clarke	On file	S Clarke	On file	06/09/2021

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This plan: has been prepared by GHD for Hindmarsh Construction Australia Pty Ltd and may only be used and relied on by Hindmarsh Construction Australia Pty Ltd for the purpose agreed between GHD and Hindmarsh Construction Australia Pty Ltd as set out in this report.

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The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this plan. GHD disclaims liability arising from any of the assumptions being incorrect.

1. Introduction

This School Transport Plan accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) in support of an application for a State Significant Development (SSD No 14394209). The SSDA is for a new high school located at Bungendore.

School Infrastructure is seeking to implement a transport plan to increase sustainable mode share to the school. The basis of this plan is to set targets for sustainable mode share for staff and students and then to identify policies, procedures and strategies to improve sustainable travel.

1.1 Proposal

The proposed development is for the construction of a new high school in Bungendore. The proposal has been designed as a stream 3 high school to initially provide for approximately 450 students with core 4 facilities aimed to future proof demand forecasted to 2036.

The site is located adjacent to the existing Bungendore Public School to the south enabling the creation of an education style precinct that will enable a cohesive connection between the two schools as well as the wider Bungendore community.

The proposal will include the demolition of the Bungendore Swimming Pool (to be relocated to Queanbeyan-Palerang Regional Council's proposed new Bungendore Sports Hub) and the Bungendore Community Centre; repurposing of existing council buildings; and the construction of new school buildings. New facilities for the high school will comprise of 24 general learning spaces; dedicated science and technology spaces; a gymnasium; library; canteen; outdoor learning and play areas that include two games courts.

A new agricultural plot is also proposed to the north of the main school site including a new agricultural building and scout storage shed, adjacent to the existing scout hall.

The proposal will also provide for shared administration and staff facilities between the high school and existing primary school and construction of a warm shell for community facilities including a community library, council shopfront and community health hub.

Additionally, miscellaneous off-site works, including upgrades to nearby road intersections and infrastructure, crossings, footpaths and the like will be provided to encourage active transport opportunities and respond to changing traffic conditions. The site plan for the new high school in Bungendore is displayed in Figure 1.1. Details of the high school's access arrangements and traffic and transport facilities are included in Section 2.3.

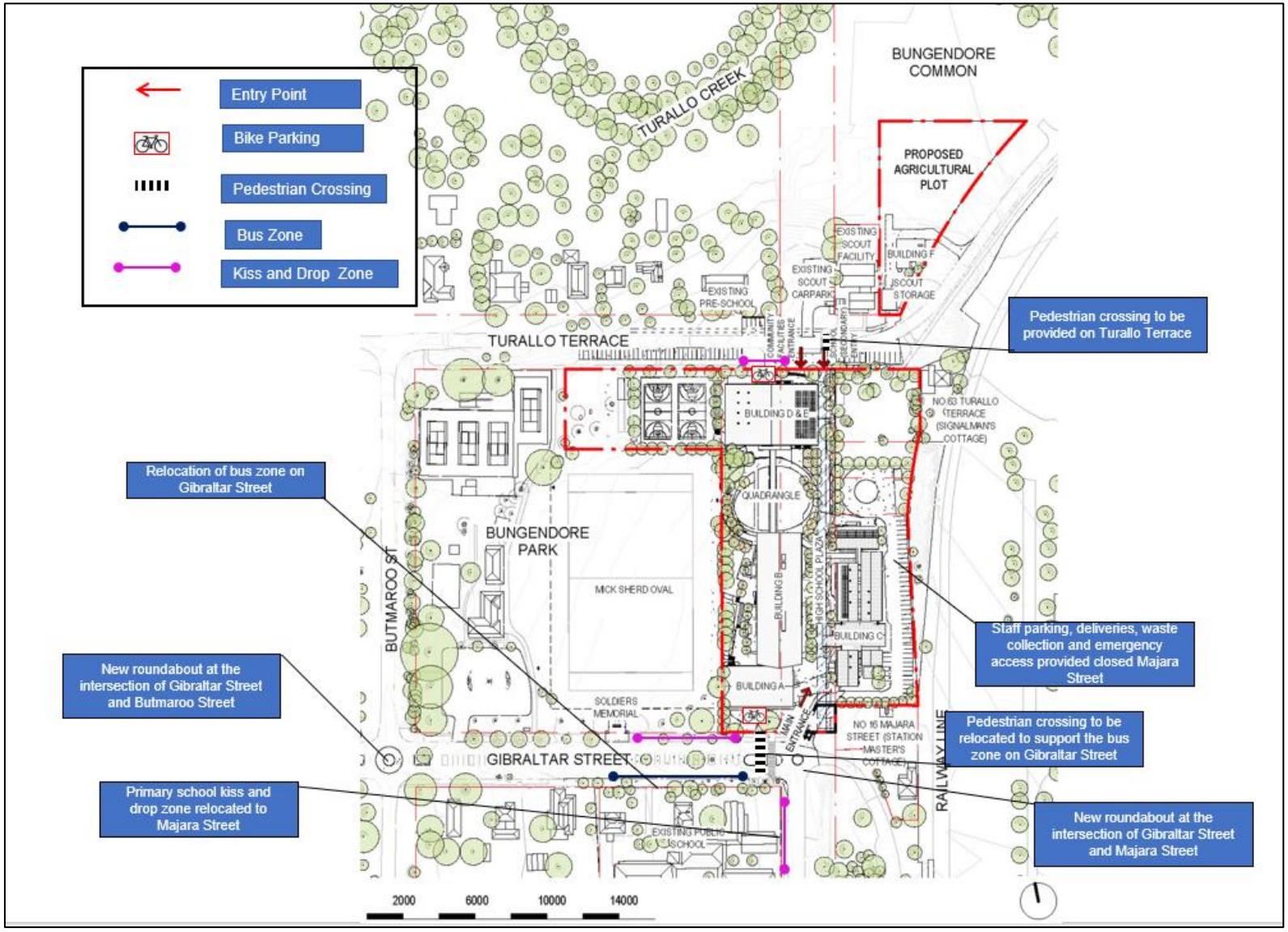

Figure 1.1 Site Plan

Source: TKD Architects – modified by GHD

1.2 Site Description

The proposed development is located within the Bungendore Town Centre within the local government area of Queanbeyan-Palerang Regional Council. The proposal involves the use of land which includes Bungendore Park bounded by Gibraltar Street, Majara Street, Turallo Terrace and Butmaroo Street, the existing former Palerang Council site at 10 Majara Street, the Majara Street road reserve bounded by Turallo Terrace and Gibraltar Streets and Nos. 2, 4 and 6 Majara Street

The surrounding area generally includes low-density residential developments to the north and west, an existing rail line to the east and Bungendore Public School and the Bungendore Train Station to the south and south-west, respectively.

An aerial image of the school site is displayed in Figure 1.2.

Figure 1.2 Site aerial image depicting the land subject to the proposed High School

Source: TKD Architects

A key aspect of the school design is the closure of Majara Street (between Gibraltar Street and Turallo Terrace) to the east of the school site.

This change is required currently Majara Street runs in a north/south direction through the high school site (as displayed in Figure 1.2). This would create an environment that would be unsafe for students and detract from the general amenity of the high school.

It is noted that at a meeting undertaken by QPRC on the 28th April 2021, councillors endorsed the closure of Majara Street to support the development of the school.

2. Transport Plan

2.1 Transport Goals

2.1.1 School Transport Plan vision and objectives

This STP has been prepared to manage travel demand during construction of the high school and to govern travel to and from school throughout post-occupancy.

The key objectives of a STP are to:

– Achieve the transport mode shares identified in Table 2.1 of this report.
– Proactively identify and meet school travel demand safely, efficiently and sustainably.
– Deliver transport infrastructure to meet school travel demand.
– Maximise the use of active and public transport modes to reduce car traffic before and after school day start and end times.
– Decongest the road networks around schools.
– Increase active travel to and from school in a safe transport environment.
– Enhance connectedness to neighbourhood and community through safe travel to and from school.
– Empower students and young people to be safe road users now and into the future.

2.1.2 Mode share targets

The mode share targets for the new high school in Bungendore have been developed as part of scenario testing undertaken in the Transport Assessment and are displayed in Table 2.1.

The residential locations of the staff at the high school are not currently available. However, it is expected that a significant portion of staff will reside in the nearby population centres of Canberra and Queanbeyan. Public transport connections between these centres and Bungendore are poor. The mode share targets for staff are also included in Table 2.1.

Table 2.1 New High School in Bungendore mode share targets

Mode	Target		Target	
	Students	Mode share	Staff	Mode Share
Walk, incl ped scooter	113	25%	4	10%
Bicycle	68	15%	4	10%
School bus	167	37%		
Kiss-and-drop	81	18%		-
Drive themselves	23	5%		-
Car as driver	-	-	29	70%
Car as passenger	-	-	4	10%
Total	450	100%	41	100%

Achieving the target mode shares will be supported by the development of a communication plan, as detailed in Section 0 and implementing the policies and programs identified in this STP.

2.1.3 Links to other application documents

The Monaro Cluster – Bungendore High School Ecological Sustainable Development Statement (April 2020) identifies the following initiatives to improve sustainable transport options:

– A traffic engineer has been engaged to carry out a transport assessment in line with the SINSW requirements.
– To encourage active and public transport, bicycle parking for staff and students as well as change facilities for staff are provided at the high school.

2.2 Policies and Procedures

These policies and procedures listed below will be used to:

– Increase sustainable modes of transport.
– Reduce the use of private vehicles.
– Manage risks.

A summary of policies and procedures for the new school in Bungendore, which will be co-designed by the School Principal and Travel Coordinator will include:

Increase sustainable modes of transport

– Prioritisation of multi-modal transport access for example walking and bus to school.
– The school will encourage and support sustainable modes of transport to the school through the provision of appropriate infrastructure, education, communication and support (like a Travel Coordinator).
– The school will advocate with local council to improve walking and cycling infrastructure to the school
– A Transport Access Guide (TAG) will be prepared to detail the ways students can get to school, emphasising active and public transport.

Reduce Use of Private Vehicles

– The school will promote car pooling and a dedicated space will be provided at the high school.
– The school will provide education, communication and encouragement of sustainable travel.
– The school will support Council rangers inspection of poor behaviours of kiss n drop to encourage safe behaviours and make private vehicle use unattractive.

School Management Procedures

– Safe access to the school will be guided by entry points for pedestrians, bikes and a separate entry for vehicles.
– All bike parking will be provided within the secure, fenced, boundary of the school.
– A security fence will be provided around the perimeter of the school to restrict activity to the designated entry points for pedestrians, bicycle riders and vehicles.
– Zones for each mode of transport to be communicated through wayfinding for example bus drop off and pick up to use Bus Zone (per Section 2.3.1.3).
– There will be opportunities for parents/guardians with special needs students attending the high school and minibuses associated with the NSW's Government Assisted School Travel Plan (ASTP), to pick-up/drop-off these students within the staff parking.
– All individuals will be responsible for locking their bikes at the designated bike rack.
– Access to the car park will be controlled by a gate and a reader/intercom. Only authorised vehicles (staff and waste collection vehicles) will be issued with a key fob to open the gate.
– Gates providing access to the car park will be kept closed at all times, unless being used by the school.
– All waste collection will be scheduled, where possible, to occur outside peak periods of school activity (prior to 7:30 am), in order to support the safety of students and their parents/guardians moving around the high school.
– Staff will be allocated to "bus duty" in afternoon periods, within the school gates, to support the safe movement of students using the Bus Zone on Gibraltar Street.

2.3 School Transport Operation

2.3.1 Site Transport Access

2.3.1.1 Pedestrians, bikes and scooters

The main pedestrian, bike and scooter access to the high school will be provided on Gibraltar Street, with an additional pedestrian access point provided on Turallo Terrace.

A pedestrian plaza will be oriented in a north/south direction through the school between Gibraltar Street and Turallo Terrace.

Catchment analysis suggests that all of the Bungendore Township is located within a 15-minute bike ride from the school. Accordingly, an upgrade to the active infrastructure within Bungendore will provide utility to the students residing in the township.

2.3.1.2 End of trip facilities

The high school will have 41 staff, and three unisex shower/change cubicle will be provided near Building A (for use by staff only).

The teaching staff at the nearby primary school will also be able to use these facilities.

Four bicycle parking spaces will be provided for staff in proximity to Building A, separate from the student parking.

Additionally, 76 bicycle parking spaces will be provided for students which will be located at the northern and southern pedestrian entries of the school. All bike parking will be provided within the secured, fenced, boundary of the school.

2.3.1.3 Public Transport

High school students will share the primary school Bus Zone.

Currently, the primary school Bus Zone is located on the western side of Majara Street. In accordance with suggestions from QPRC, the bus zone will be relocated to the southern side of Gibraltar Street, adjacent to the primary school. Further, the primary school pick-up/drop-off zone will be relocated to the western side of Majara Street (refer to Figure 1.1).

Based on mode share targets in Table 2.1, approximately 167 students are expected to catch a bus to and from school. This is the equivalent of four to five buses, assuming approximately 40 students per bus.

Approximately 100 metres of kerb space is available for the Bus Zone, which will service a minimum of four large buses simultaneously.

2.3.1.4 Pick-up/Drop-off

The high school student pick-up/drop-off zones will be on the northern side of Gibraltar Street and the southern side of Turallo Terrace, adjacent to the high school site.

The zone on Turallo Terrace will provide utility to parents (particularly in the AM peak) residing in northern Bungendore to drop their students off and travel westbound onto Molonglo Street/Kings Highway and onto the commercial centres of Canberra and Queanbeyan.

The pick-up/drop-off zones will be controlled by No Parking signage (8:00 am - 9:30 am and 2:30 pm – 4:00 pm school days) to encourage vehicle turnover. Outside of these periods, the pick-up/drop-off zone can be used for parking by the general public.

2.3.1.5 Waste collection and deliveries

Waste collection and deliveries will occur within the closed section of Majara Street. Waste collection will be undertaken by a private contractor. The waste collection company will be issued with a number of key fobs, so drivers can access the waste collection area.

Information on how waste collection vehicles are expected to access/egress the high school will be conveyed upon engagement of contract services.

All waste collection and deliveries will be scheduled to occur outside peak periods of school activity, prior to 7:30 am.

Deliveries will also occur with the closed section of Majara Street and be scheduled to occur outside peak periods of school activity, i.e., no deliveries will be scheduled between 8:00 am – 9:30 am and 2:30 pm – 4:00 pm. Delivery vehicles will not be issued with a key fob or be able to access the school when it is unattended.

Information on layover locations and access arrangements will be conveyed upon engagement of contracted services.

2.3.1.6 Car Parking

Vehicular access to the high school will be provided via the northern leg of the roundabout at the intersection of Gibraltar Street and Majara Street.

Only staff and waste collection vehicles will have access to the closed section of Majara Street, which will be controlled by a gate and a reader/intercom, via the northern leg of the roundabout at Gibraltar Street and Majara Street.

The current parking serving the staff at the QPRC building will be allocated to staff at the new high school. The current supply (44 parking bays including two bays for the mobility impaired) will be sufficient to accommodate the parking demand associated with the high school.

There will be opportunities for parents/guardians with special needs students attending the high school and minibuses associated with the NSW's Government Assisted School Travel Plan (ASTP), to pick-up/drop-off their students within the staff parking.

Visitors will park on the road network adjacent to the school.

2.3.2 Day to day school operations

A summary of the new high school in Bungendore management strategies is provided in Table 2.2.

Table 2.2 Management Strategy Summary

Facility	Location	Management Strategy
Site entries, pedestrian and vehicle	The main pedestrian access to the high school will be provided on Gibraltar Street, with an additional pedestrian access point provided on Turallo Terrace. Vehicle access (including service and emergency vehicles) will be provided via the northern leg of a roundabout at the intersection of Gibraltar Street and Majara Street.	All pedestrian entry/exit into the school will be controlled using gates, which will close outside of school periods to prevent unauthorised entry. Access to the car park will be controlled by a gate and a reader/intercom. Only authorised vehicles (staff and waste collection vehicles) will be issued with a key fob to open the gate. A security fence will be provided around the perimeter of the school to: • Restrict activity to the designated entry points for pedestrian, bicycle riders and vehicles. • Direct students to the designated pedestrian points on Gibraltar Street and Turallo Terrace. All waste collection will be scheduled to occur outside peak periods of school activity, prior to 7:30 am in order to support the safety of students and their parents/guardians moving around the high school. Deliveries will be scheduled to occur outside peak periods of school activity, i.e., no deliveries will be scheduled between 8:00 am – 9:30 am and 2:30 pm – 4:00 pm. Delivery vehicles will not be issued with a key fob or be able to access the school when it is unattended.
Active Transport	The committed upgrade in active transport infrastructure at the high school includes pedestrian crossings on Turallo Terrace and Gibraltar Street. The high school will: - Link the shared path on Turallo Terrace (east of Butmaroo Street) to the shared path on Turallo Terrace to the south-west of Turallo Creek. - Provide a new shared path between Mick Sherd Oval and the school site, connecting the shared path on Turallo Terrace to the pedestrian crossing on Gibraltar Street. A footpath will be constructed on Butmaroo Street between Kings Highway and Turallo Terrace. End of trip facilities, including 80 bike parking spaces for staff and students and three showers/lockers for staff.	Communicate the ways students can get to school, emphasising active and public transport, through a TAG. All individuals will be responsible for locking their bikes at the designated bike rack. Advanced cycling and bike maintenance classes will be provided to high school students.
Kiss-and-drop including Assisted School Transport Program	The high school student pick-up/drop-off zones will be on the northern side of Gibraltar Street and the southern side of Turallo Terrace, adjacent to the high school site.	Staff will not manage/supervise the operation of the school's pick-up/drop-off facilities. There will be opportunities for parents/guardians with special needs students attending the high school and minibuses associated with the NSW's Government Assisted School Travel Plan (ASTP), to pick-up/drop-off their students within the staff parking.

Facility	Location	Management Strategy
	There will be opportunities for parents/guardians with special needs students attending the high school and minibuses associated with the NSW's Government Assisted School Travel Plan (ASTP), to pick-up/drop-off their students within the staff parking.	The pick-up/drop-off zone will be controlled by No Parking signage (8:00 am - 9:30 am and 2:30 pm – 4:00 pm school days) to encourage vehicle turnover. Outside of these periods, the pick-up/drop-off zones could potentially be used for parking by the general public. Preparation of a TAG detailing expected student and parent behaviours at the pick-up/drop-off facility.
Buses	High school students will share the primary school Bus Zone. Currently, the primary school Bus Zone is located on the western side of Majara Street. In accordance with suggestions from QPRC, the bus zone will be relocated to the southern side of Gibraltar Street, adjacent to the primary school.	Staff will be allocated to "bus duty" in afternoon periods, within the school gates, to support the safe movement of students using the Bus Zone on Gibraltar Street. Communicate bus routes serving the school, timetables and School Student Transport Scheme (SSTS) criteria through a TAG. Buses for excursions (or similar) will use the school's designated Bus Zone. Review bus patronage on an annual basis to ensure that there is sufficient capacity for primary and high school students. Review the school bus routes in the context of student addresses (using the depersonalised household data) and coordinate / advocate for better bus service design to pick up kids closer to where they live.
Car parking	The current parking serving the staff at the QPRC building on Majara Street will be allocated to staff at the new high school. The construction of the school will result in the loss of the informal (approximately 40) and formal (twenty) ninety-degree parking bays currently provided on Majara Street between Gibraltar Street and Turallo Terrace. These losses will be offset by the provision of the 30 bay car park located to the south of Bungendore Station, adjacent to the railway forecourt. Additionally, the southern side of Turallo Terrace will be improved and approximately 30 ninety degree parking bays will be provided.	Gates providing access to the car park be kept closed at all times, unless being used by the school Time restrictions will not be applied to the 60 (approximately) relocated parking bays on the station forecourt and Turallo Terrace.

2.3.3 Event transport operations

During excursions or events, the facilities/strategies will be similar to the management strategy summary is outlined in Table 2.2, noting:

– Buses for excursions (or similar) will use the school's designated Bus Zone on Gibraltar Street.
– The Bungendore Community will not be able to use the school's car park outside of school times.

2.3.4 Sample transport encouragement programs

The Travel Coordinator will make recommendations to the School Principal after consultation with the school community, including students, parents and staff, as to the type of programs that are best suited to the community and most likely to see the most impact to improving sustainable transport to the school.

These programs include:

– Safe Routes to School.
– Independent Walking to School.
– Advanced cycling classes [1](per Section 2.2).
– Bike maintenance programs.
– Running to school – potentially as a form of training (if appropriate).

2.4 Communication Plan

2.4.1 Channels of communication

The key channels of communication between the school and the school community to keep them informed about travel and transport initiatives will include:

– Starter kits, with key information including the TAG, will be provided to all new students/parents.
– The high school's website.
– Social media accounts such as Facebook and twitter.

The Principal's Message, available online for schools, is another forum to communicate with students and their parents/guardians. These messages typically cover a range of subjects, including the school's ethos, extracurricular activities and academic and sporting results. However, it can also include feedback with respect to the operation of parking and pick-up/drop-off facilities.

The school leadership will coordinate with the NSW Police to:

– Monitor the operations of the vehicles utilising the school's pick-up/drop-off facilities.
– Assist in education students on safe travel.

2.4.2 Messages

The channels of communication detailed in Section 2.4.1, will provide an opportunity for the leadership of the new high school in Bungendore and parents/guardian to communicate to each other directly about:

– Encouraging students to use sustainable modes of transport.
– The layout and location of the traffic and transport infrastructure in proximity to the school.
– Reporting of transport issues as concerns arise.
– Educational and learning opportunities for students, parents/guardians and the community.

[1] Preliminary research in bike training providers indicates that rideTECHNICS in Canberra provides advanced training for groups of 10 people for a fee of $285 (incl GST). Assuming 70 students cycle to school and each student will be provided with two training sessions, a budget of $3,990 (incl GST) should be set aside for bike courses.

– Car pooling initiatives and encouragement.
– Bike training, maintenance programs.
– Reporting of statistics on sustainable travel uptake by the school community.
– Championing of sustainable travel behaviour.

2.4.3 Transport Access Guide

Prior to the school opening, a TAG will be created for the school to encourage the use of sustainable modes of travel. The TAG will be used as a critical piece of information included in “welcome packs” provided to parents/guardians and carers as part of the Year 7 induction and for new enrolments throughout the school year.

A summary of the infrastructure and supporting management strategies are detailed in summary the TAG will provide:

– Active travel information, including:
  - Best active transport routes to school and how to access bicycle parking.
  - Messaging that a socially distant way of getting to school is walking and cycling.
  - Safety tips/rules for cycling (safety on wheels).
  - The health advantages of walking and cycling.
– Bus travel options, including:
  - School bus routes.
  - School bus timetables.
  - Information on the eligibility of the school bus pass (SSTS).
– Kiss-and-Drop (pick-up/drop-off) location.
– Bus Zone and No Parking restrictions.
– Demerits and fines associated with contravening these constrictions.

The TAG will include a map showing bus routes, walking routes, pedestrian crossing points, bus stop locations, bike parking locations and pick-up/drop-off locations.

The nearest bike shop to the school is Bspoke Bicycles, located on Gibraltar Street in Bungendore, which will be identified in the TAG.

A summary of key aspects of the Communication Strategy for the new high school in Bungendore is provided in Table 2.3.

Table 2.3 Communications Plan

What	When	Frequency	How	To Whom	By Whom
Aspirations to have students travel to school by walking, bike, scooter or bus. Share the vision and meet the mode share targets for the number of students to walk and ride to school.	Before the school opens – in promotional and marketing material.	Annually	Welcome packs (new starter kits) to new students. School website and Facebook page.	Students and parents.	School Principal and Travel Coordinator to draft contents.
Share the walk, ride and bus transport options for the high school.	Information will be available at all times.	Marketed at the start of every term.	Welcome packs (new starter kits) to new students. School website, school app and Facebook page. Principals message.	Students, parents and staff.	Travel Coordinator to draft content based on a TAG.
Communicate expected standards for behaviour at the pick-up and drop-off facilities.	Upon commencement of each school year.	Marketed at the start of every term.	Welcome packs to new students. Newsletters. Principals message.	Students and parents.	Travel Coordinator to draft content based on a TAG and Council's Road Safety Officer.
"Never to Old to be Safe" materials.	Information will be available at all times.	Marketed at the start of every term.	School website.	Students.	Travel Coordinator.
Road safety behaviours	Information will be available at all times.	Marketed at the start of every term.	Welcome packs (new starter kits) to new students. School website, school app and Facebook page. Principals message.	Student, parents and staff.	Travel Coordinator to draft content based on a TAG.

A copy of the TAG will be provided to all staff. A copy of the TAG will also be displayed prominently in staff areas, such as lunch rooms and foyer areas and information boards throughout the school for parents and students.

The TAG will be presented in a form that is reflective of the commitment to achieving positive transport objectives.

The TAG will be prepared upon completion of school bus route planning with TfNSW and local bus operators.

2.5 Data collection and monitoring

2.5.1 Data collection

With the appointment of the Travel Coordinator, before school opening, travel surveys will be established to form a baseline of mode share among students and staff. SINSW have prepared a questionnaire template, which identifies:

– The school year of the student.
– Mode of travel used to access/egress the school (for students and staff).

– Arrival and departure times.
– A selection of measures that would encourage students and staff to walk or cycle to school, use public transport or carpool.

The surveys will be undertaken on an annual basis at the start of the academic year (to be managed by the Travel Coordinator, as detailed in Section 2.6.1) to capture potential changes in travel mode as a result of interventions, i.e. the upgrades to the active transport network within Bungendore.

A review of the school bus routes in the context of student addresses (in GIS using the depersonalised household data) will be undertaken every two years, and the Travel Coordinator will coordinate / advocate for better bus service design to pick up students closer to where they live.

Bus patronage monitoring will occur on an annual basis to determine if sufficient capacity is being provided for high school students.

Targeted interviews with staff, students and their parents/guardians will be undertaken by the Travel Coordinator on an annual basis, in terms two and three. The interviews will identify which aspects of the travel plan are supporting improved transport options and any impediments to transport they are facing.

2.5.2 Program evaluation

The program evaluation will determine if the initiatives implemented at the new high school in Bungendore have been successful in terms of meeting the objectives and targets.

The School Travel Plan will be evaluated periodically and as a minimum every two years to increase the success of increasing active travel modes to school. It is recommended that data is collected annually in term 3 to enable refinements to be made to the program in time to influence behaviour changes

Recommendations on how the School Travel Plan, with a focus on the Communications Plan will be improved to assist with reaching the targets and aspirational targets will be recommended as a result of the data analysis.

The mode share targets for the new high school in Bungendore (refer to Section 2.1.2) will be updated as required to reflect the identified travel patterns of student activity.

The school leadership will advocate for additional funding from the Department of Education if additional bike racks are required.

Feedback will be provided to parents and students via newsletters (as part of the Communication Plan) so they can see the benefits associated with sustainable travel.

The Travel Coordinator will be responsible for implementing the evaluation programs.

2.5.3 Report findings

The findings of the data collection, program evaluation and the required responses/mitigations will be included in an updated Communications Plan, which will be undertaken on an annual basis.

2.6 Governance framework

In order to implement the STP, the following groups will be required:

– An internal group consisting of the school leadership team (the school Principal or their delegated representative), parent/guardian and student representatives, the QPRC Road Safety Education Officer and representatives from the Asset Management Unit and Work Health and Safety Unit will also form part of this group.
– An external working group including representatives from the new high school in Bungendore, QPRC, TfNSW and public transport providers.

2.6.1 Travel Coordinator

In order to implement the STP at the new high school in Bungendore, a Travel Coordinator will be appointed, it is noted that:

– A Travel Coordinator will be required for the duration of construction and first year of post-occupancy occupancy to promote sustainable travel behaviours.
– During these periods, transport programs must be implemented to achieve travel behaviour change and support the active and public transport mode split targets.
– This role is initially funded by the project during delivery.
– After one year, ongoing discussion will be undertaken between the Department, SINSW and TfNSW regarding the funding of the Travel Coordinator.

The Travel Coordinator will be responsible for:

– Finalising the detail of this STP and implementing the measures with school leadership and stakeholders.
– Liaising with key stakeholders and executing the Communications Plan.
– Measuring the participation of the program and collecting data in the way staff and students travel to and from school.
– Managing enquiries for a crossing supervisor for the pedestrian crossing on Gibraltar Street. Applying to QPRC for a crossing supervisor if the key criteria are met.[2]
– Organising annual travel surveys at least annually or more frequently if possible to determine changes in patterns of mode splits.
– Reviewing the adequacy of the supply of bike racks, and the requirement for additional bike racks.
– Amending the STP Action Plan based on survey results, to support the mode share targets being met.
– Managing travel demand (walking, cycling, public transport and vehicles) amongst staff. students and their parents/guardians.
– The Travel Coordinator will be included in the internal and external working groups at the new high school in Bungendore.

2.6.2 Internal working group

The internal working group for the new high school in Bungendore will be established as close as possible to school opening.

Upon the opening of the school, representatives for the student leadership will be invited to join the internal working group.

The internal working group will identify key issues (including safety issues) in the operation of the school's traffic and transport facilities and identify potential mitigation measures.

2.6.3 External working group

The external working group for the new high school in Bungendore (consisting of representatives of QPRC and TfNSW) has commenced meeting to discuss the planning for the school.

The external working group will:

– Meet on a (minimum) quarterly basis.
– Review the issues and recommendations of the internal working group.
– Assess the feasibility of the mitigation measures and allocate resources for their implementation (if required).
– Review the annual survey data and any proposed changes to the STP.

[2] TfNSW criteria for a school crossing supervisor is that the crossing must be used be infant/primary school children and be located with a 40 km/h school zone. Additionally, the crossing must register counts of 50 or more unaccompanied primary school or 300 or more passenger car units. Surveys will be required to determine if these requirements are met subsequent to the school openning.

– Respond to issues in a collaborative manner to support the safe and efficient movement of students to and from the school.
– The Travel Coordinator will be responsible for ensuring these meetings are minuted, and key actions/recommendation are included in the school's Communication Plan.

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The Power of Commitment

Appendix B

Bungendore School Bus Data

BAROMU PTY LTD
TRADING AS

BUNGENDORE
BUS & COACHES

79 Butmaroo Street, Bungendore NSW 2621
www.bungendorebusandcoach.com.au / email: stevenscharter@bigpond.com.au
TRANSPORT FOR NSW ACCREDITATION # RRP 9226
ACT URBAN SERVICES ACCREDITATION #ACTBS005TC

Tuesday, April 21, 2015

WAMBOIN

Am

Bungendore Depot	7:40
Wyoming Rd	7:58
Millyn Rd	8:01
Bungendore Rd & Norton Rd intersection	8:07
1300 Norton Rd	8:08
Corner Norton Rd & Clare Valley Place	8:10
Norton Rd & Ryans Rd intersection	8:13
944 Norton Rd	8:15
294 Weeroona Drive	8:18
Weeroona Drive & Denley Drive intersection	8:24
Denley Drive & Macks Reef Rd intersection	8:27
Macks Reef Rd and Bungendore Rd intersection	8:29
Bungendore Rd & Forrest Rd intersection	8:35
Bungendore Rd & Lake Rd intersection	8:39
Bungendore Primary School	8:45
Carlton Estate	8:55
Bungendore Primary School	9:05

Pm

Bungendore Primary School	3:05
Depart Bungendore Public School	3:17
Bungendore Rd & Matthews Rd intersection	3:20
Bungendore Rd & Joe Rocks Rd intersection	3:23
Bungendore Rd & Norton Rd intersection	3:28
1300 Norton Rd	3:30
Norton Rd & Ryans Rd intersection	3:33
944 Norton Rd	3:35
Norton Rd & Weeroona Drive intersection	3:40
Weeroona Drive & Denley Drive intersection	3:46
Denley Drive & Macks Reef Rd intersection	3:48
Macks Reef Rd and Bungendore Rd intersection	3:50
Milynn Rd	3:53
Wyoming Rd	4:55

BAROMU PTY LTD
TRADING AS

BUNGENDORE
BUS & COACHES

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ACT URBAN SERVICES ACCREDITATION #ACTBS005TC

Tuesday, April 21, 2015

TARAGO

AM ROUTE:

High School Feeder Service for Q-City Transit	
Depart Depot	6:20
Depart Mount Fairy Rail way crossing	6:45
Substation driveway entrance	6:52
Werriwa.	6:55
Hope Drive culdisack	7:00
McDonald Drive Culdisack	7:05
Elmslea Drive	7:10
Bungendore Police Station	7:12
Primary School Service:	
Bungendore round about	7:55
Taylors Creek Rd	8:16
corner Tarago Rd & Mount Fairy Rd	8:21
railway crossing turn around	8:25
corner Tarago Rd & Mount Fairy Rd	8:30
corner Hope Dr & Tarago Rd	8:38
Hope Dr culdisack	8:40
corner Hope Dr & Tarago Rd	8:41
corner McDonald St & Tarago Rd	8:42
corner Elmslea Dr & Tarago / Molonglo St	8:44
Elmslea Dr roundabout	8:45
corner Elmslea Dr and Tarago / Molonglo St	8:53
corner Ashby Dr & Tarago / Molonglo St	8:54
corner Molonglo & Malbon St	8:58
Bungendore Primary School	9:00

PM ROUTE:

Primary School Service	
Bungendore Primary School	3:05
corner Molonglo St & Ashby Dr	3:21
Elmslea Drive roundabout	3:28
corner McDonald Drive and Tarago Rd	3:31
corner Hope Drive and Tarago Rd	3:32
Hope Drive roundabout	3:33
corner Tarago Rd and mount Fairy Rd	3:43
Mount Fairy Rd Railway crossing	3:47
corner Tarago Rd and mount Fairy Rd	3:52
Corner Tarago Rd and Taylors Creek Rd	3:55
corner Tarago Rd and mount Fairy Rd	3:58
High School Feeder Service for Q-City Transit	
Depart Bungendore Park	4:35
McDonald Culdisack	4:45
Hope Drive Culdisack	4:50
Werriwa	4:55

Substation entrance	4:57
Mount Fairy Rd Railway crossing	5:03

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7th May 2018

HOSKINSTOWN

AM SERVICE:		
leave depot		7:00
595 Hoskinstown Rd		7:05
199 Forbes creek Rd		7:25
Corner Sheehan Rd		7:28
Hoskinstown hall		7:30
495 Plains Rd		7:31
drop off at widgewa shelter	Interchange with Q-City Transit service 42	7:38
leave widgewa rd bus shelter		8:26
Hoskinstown hall		8:36
474 Plains Rd		8:38
corner Plains Rd & Briars Sharrow		8:41
250 Briars Sharrow Rd		8:43
557 Briars Sharrow Rd		8:45
595 Hoskinstown Rd		8:49
Hereford Street bus shelter		8:55
bungendore primary school		9:00
Return to Depot		9:10

PM SERVICE:		
Depart Depot		15:05
Depart Bungendore Primary		15:13
Carlton Estate		15:21
Depart Bungendore Primary School		15:30
Hereford Street bus shelter		15:36
595 Hoskinstown Road		15:43
corner Briars Sharrow Rd		15:46
557 Briars Sharrow Rd		15:47
250 Briard Sharrow Rd		15:49
corner Plains Rd & Briars Sharrow		15:51
474 Plains Rd		15:57
Hoskinstown hall		15:59
widgewa shelter	Interchange with Q-City Transit service 43	16:35
hoskinstown		16:47
Sheehan Rd		16:49
return to depot		17:00

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Tuesday, April 21, 2015

BUTMAROO

AM SERVICE:

leave depot	8:05
gidleigh station	8:17
intersection Butmaroo Rd and Ingeldow Rd	8:20
Butmaroo Station	8:30
intersection Butmaroo Rd and Ingeldow Rd	8:40
gidleigh station	8:43
corner Gidleigh Lane and Ellendon St	8:50
Trucking Yard Lane	8:53
Bungendore Bungendore Primary School	9:00
Depot	9:05

PM SERVICE:

leave depot	3:05
Bungendore Primary School	3:15
Trucking Yard Lane	3:23
corner Gidleigh Lane and Ellendon St	3:26
gidleigh station	3:32
intersection Butmaroo Rd and Ingeldow Rd	3:35
Butmaroo Station	3:45
depot	4:07

BAROMU PTY LTD
TRADING AS

BUNGENDORE
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Tuesday, April 21, 2015

KINGS HIGHWAY

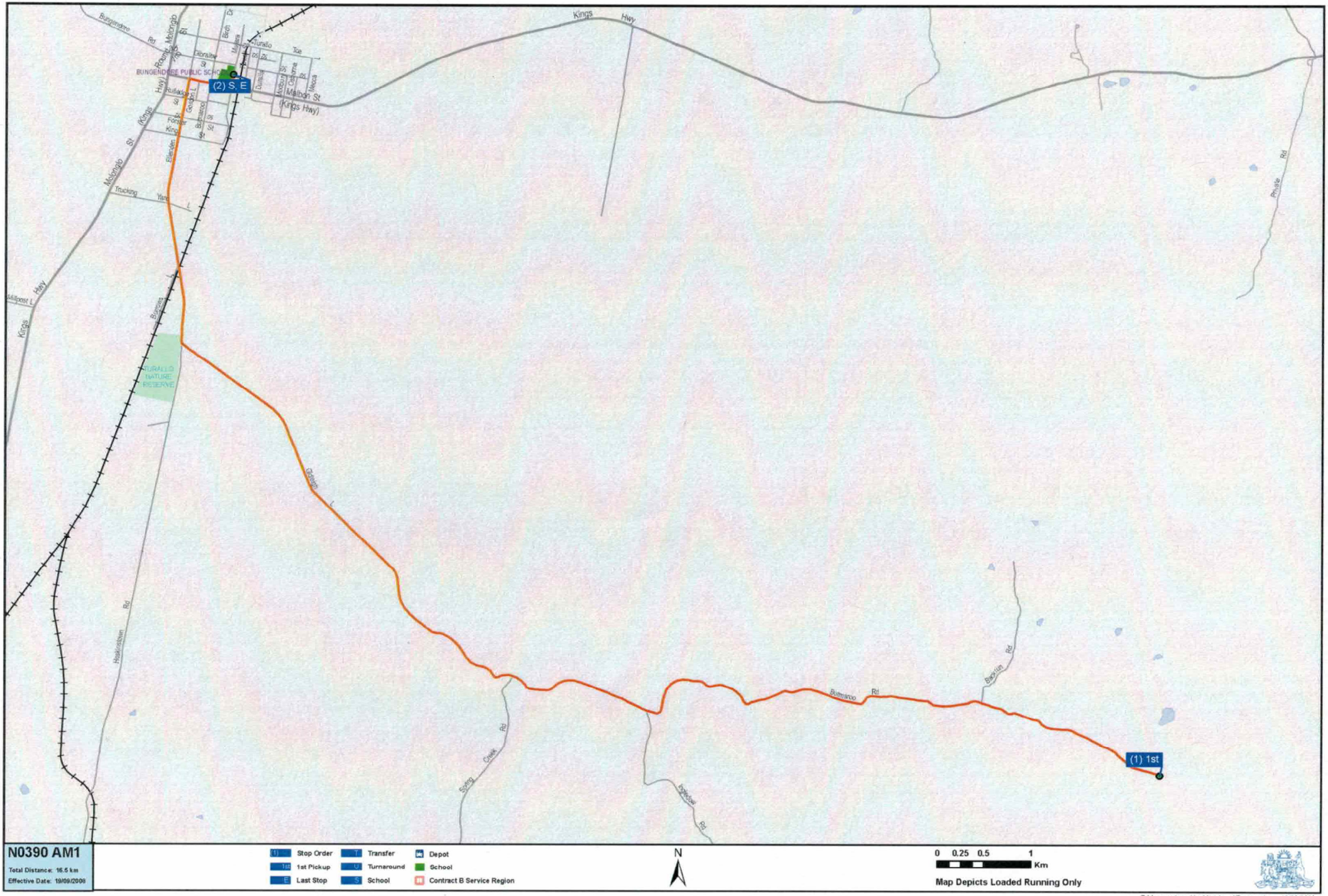
AM Service

Depart Depot	8:05
Depart first pickup "Myimbarr" Duckfield Rd	8:35
Corner Kings Hwy & Goulburn Rd	8:39
Maloon Road	8:44
Bobbaduck Estate	8:46
Longfield farm (stopping at entrance of Petallo)	8:50
Deep Creek	8:52
Harrowford Road	8:56
Mecca lane	8:58
Bungendore Primary School	9:00

PM Service

Depart Depot	3:05
Depart Bungendore Primary School	3:15
Mecca Lane	3:17
Harrowford Road	3:19
Deep Creek	3:23
Longfield Farm. (Stopping at gate of 3830 Kings Hwy)	3:25
Bobbaduck Estate	3:32
Hazeldall Road	3:34
Corner Kings Hwy & Goulburn Road	3:39
"Myimbarr" Duckfield Rd	3:45
Arrive Depot	4:10

Schedule 5A Service Map - N0390 AM1 - Bungendore-Butmaroo



N0390 AM1

Total Distance: 16.5 km
Effective Date: 19/09/2008

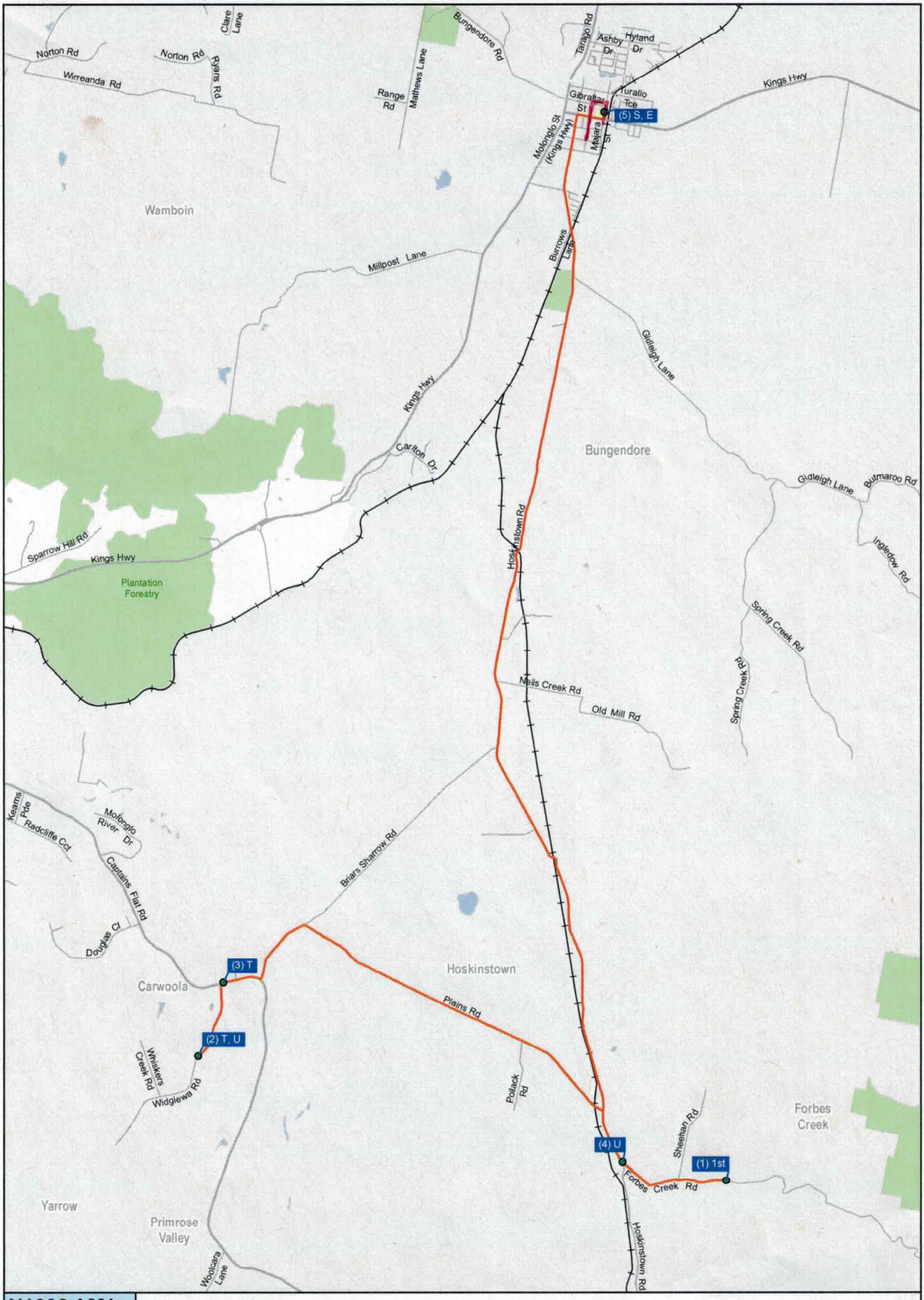
SO Stop Order	T Transfer	Depot	
1st 1st Pickup	TA Turnaround	School	
E Last Stop	S School	Contract B Service Region	

N

0 0.25 0.5 1 Km

Map Depicts Loaded Running Only

Schedule 5 Service Map - N1002 AM1 - Bungendore-Hoskinstown



N1002 AM1

Total Distance: 42.9 km
Effective Date: 06/08/2015

(1)	Stop Order	T	Transfer		Depot
1st	1st Pickup	U	Turnaround		School
E	Last Stop	S	School		Contract B Service Region

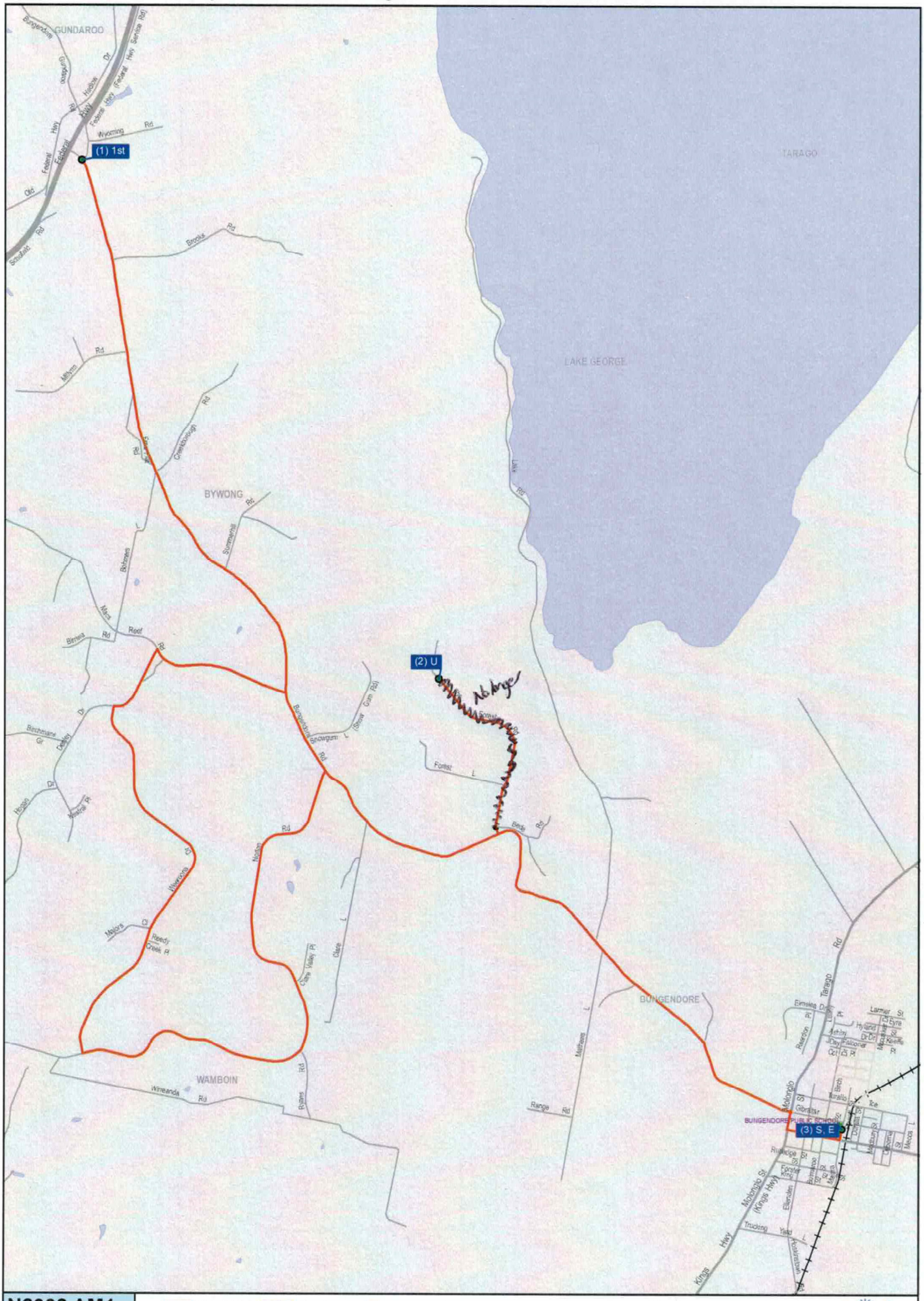
N

0 0.75 1.5 3 Km

Map Depicts Loaded Running Only

NSW Transport for NSW

Schedule 5A Service Map - N2332 AM1 - Bungendore - Macs Reef Road



N2332 AM1

Total Distance: 40.0 km
Effective Date: 18/09/2008

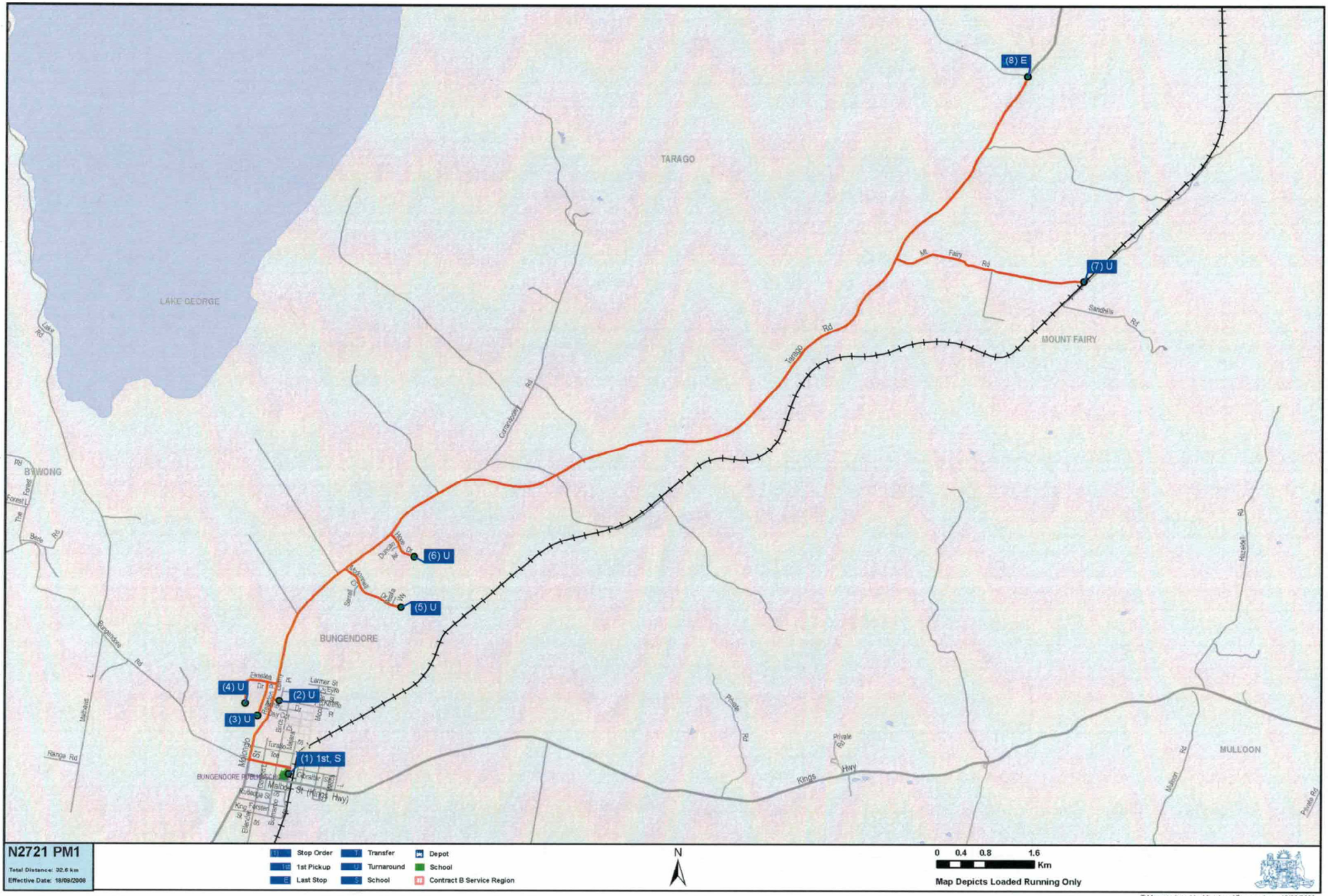
(1)	Stop Order	T	Transfer		Depot
1st	1st Pickup	U	Turnaround		School
E	Last Stop	S	School		Contract B Service Region

N

0 0.5 1 2 Km

Map Depicts Loaded Running Only

Schedule 5A Service Map - N2721 PM1 - Bungendore-Mount Fairy



N2721 PM1

Total Distance: 32.6 km
Effective Date: 18/09/2008

Stop Order	Transfer	Depot	
1st Pickup	Turnaround	School	
Last Stop	School	Contract B Service Region	

N

0 0.4 0.8 1.6 Km

Map Depicts Loaded Running Only

Schedule 5A Service Map - N2816 AM1 - Bungendore - Mulloon

N2816 AM1

Total Distance: 25.2 km

Effective Date: 18/09/2008

T Stop Order	T Transfer	Depot	
1st 1st Pickup	T Turnaround	School	
L Last Stop	S School	Contract B Service Region	

N

0 0.45 0.9 1.8 Km

Map Depicts Loaded Running Only

Appendix C

Traffic Survey Outputs

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Turallo Tce and Butmaroo St, Bungendor

GPS *-35.252483, 149.443761*

Date:	Wed 04/11/20
Weather:	Fine
Suburban:	Bungendore
Customer:	GHD

North:	N/A
East:	Turallo Tce
South:	Butmaroo St
West:	Turallo Tce

Survey Period	AM:	8:00 AM-9:30 AM
	PM:	2:30 PM-4:00 PM
Traffic Peak	AM:	8:15 AM-9:15 AM
	PM:	2:45 PM-3:45 PM

All Vehicles

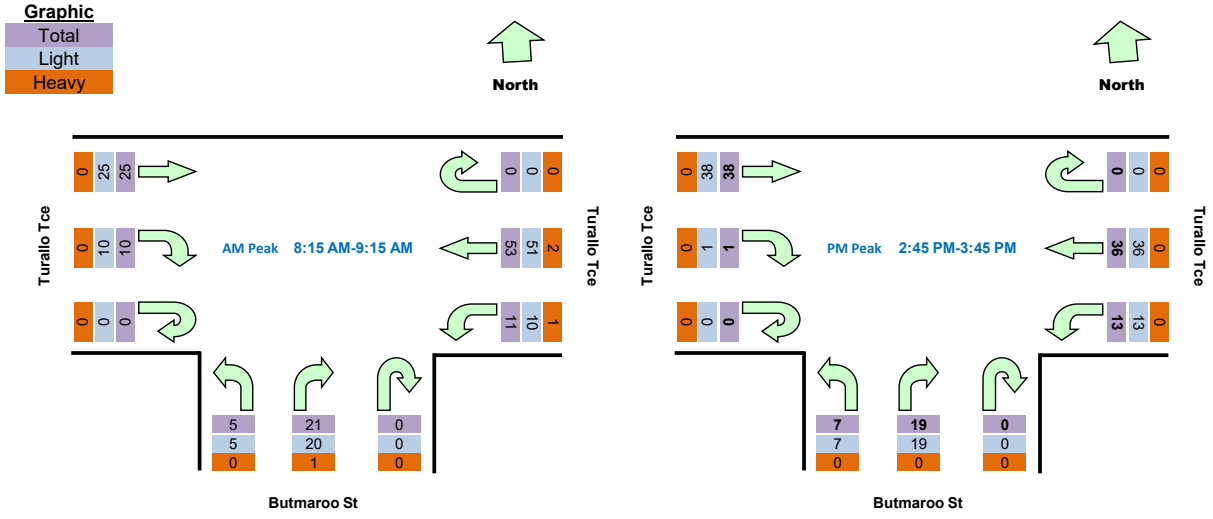
Time		East Approach Turallo Tce			South Approach Butmaroo S			West Approach Turallo Tce			Hourly Total		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak	
8:00	8:15	0	14	4	0	3	2	0	1	3	99		27
8:15	8:30	0	13	2	0	3	2	0	2	3	125	Peak	25
8:30	8:45	0	7	1	0	0	0	0	1	3	122		12
8:45	9:00	0	17	1	0	7	1	0	3	6			35
9:00	9:15	0	16	7	0	11	2	0	4	13			53
9:15	9:30	0	7	2	0	6	1	0	1	5			22
14:30	14:45	0	4	5	0	3	2	0	1	6	105		21
14:45	15:00	0	9	3	0	3	1	0	0	16	114	Peak	32
15:00	15:15	0	8	3	0	2	1	0	1	10	108		25
15:15	15:30	0	10	2	0	9	2	0	0	4			27
15:30	15:45	0	9	5	0	5	3	0	0	8			30
15:45	16:00	0	5	2	0	5	4	0	1	9			26

Peak Time		East Approach Turallo Tce			South Approach Butmaroo S			West Approach Turallo Tce			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
8:15	9:15	0	53	11	0	21	5	0	10	25	125
14:45	15:45	0	36	13	0	19	7	0	1	38	114

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Turallo Tce and Carpark, Bungendore

GPS	*-35.252808, 149.446219*
Date:	Wed 04/11/20
Weather:	Fine
Suburban:	Bungendore
Customer:	GHD

North:	Carpark
East:	Turallo Tce
South:	Majara St
West:	Turallo Tce

Survey Period	AM:	8:00 AM-9:30 AM
	PM:	2:30 PM-4:00 PM
Traffic Peak	AM:	8:30 AM-9:30 AM
	PM:	2:45 PM-3:45 PM

All Vehicles

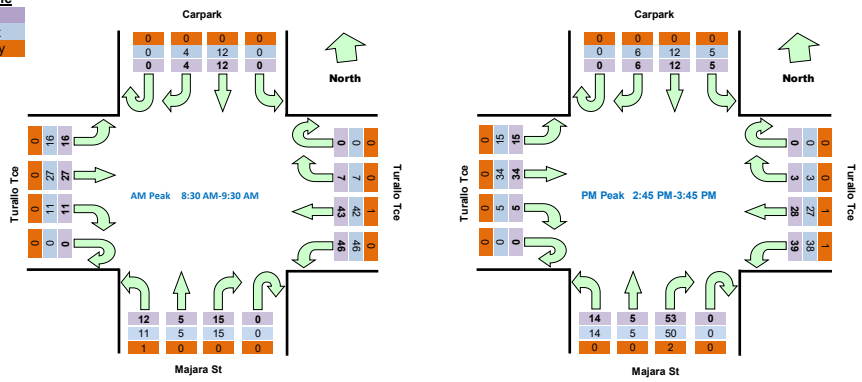
Time		North Approach Carpark				East Approach Turallo Tce				South Approach Majara St				West Approach Turallo Tce				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
8:00	8:15	0	0	0	0	0	0	18	9	0	5	0	1	0	0	5	0	128	38
8:15	8:30	0	0	0	0	0	0	13	8	0	4	0	1	0	0	7	0	189	33
8:30	8:45	0	0	0	0	0	2	8	3	0	0	0	1	0	1	3	0	198	18
8:45	9:00	0	0	0	0	0	2	16	9	0	2	1	1	0	3	3	2		39
9:00	9:15	0	2	9	0	0	3	16	27	0	7	3	5	0	5	11	11		99
9:15	9:30	0	2	3	0	0	0	3	7	0	6	1	5	0	2	10	3		42
14:30	14:45	0	2	1	0	0	0	7	1	0	4	0	2	0	0	9	2	205	28
14:45	15:00	0	3	2	2	0	1	7	10	0	3	4	3	0	1	4	10	219	50
15:00	15:15	0	2	9	2	0	2	7	21	0	4	0	2	0	3	10	4	206	66
15:15	15:30	0	0	0	0	0	0	4	3	0	35	1	6	0	1	10	1		61
15:30	15:45	0	1	1	1	0	0	10	5	0	11	0	3	0	0	10	0		42
15:45	16:00	0	0	0	0	0	0	8	6	0	8	0	0	0	2	12	1		37

Peak Time		North Approach Carpark				East Approach Turallo Tce				South Approach Majara St				West Approach Turallo Tce				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:30	9:30	0	4	12	0	0	7	43	46	0	15	5	12	0	11	27	16	198
14:45	15:45	0	6	12	5	0	3	28	39	0	53	5	14	0	5	34	15	219

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Gibraltar St and Butmaroo St, Bungendore

GPS	*-35.254561, 149.443334*
Date:	Wed 04/11/20
Weather:	Fine
Suburban:	Bungendore
Customer:	GHD

North:	Butmaroo St
East:	Gibraltar St
South:	Butmaroo St
West:	Gibraltar St

Survey Period	AM:	8:00 AM-9:30 AM
	PM:	2:30 PM-4:00 PM
Traffic Peak	AM:	8:30 AM-9:30 AM
	PM:	3:00 PM-4:00 PM

All Vehicles

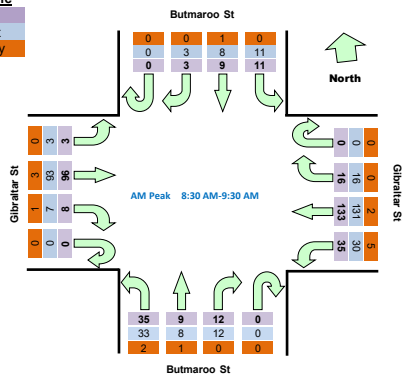
Time		North Approach Butmaroo St				East Approach Gibraltar St				South Approach Butmaroo St				West Approach Gibraltar St				Hourly Total	
Period Start	**Period End**	**U**	**R**	**SB**	**L**	**U**	**R**	**WB**	**L**	**U**	**R**	**NB**	**L**	**U**	**R**	**EB**	**L**	**Hour**	**Peak**
8:00	8:15	0	0	4	0	0	2	7	2	0	1	2	6	0	2	11	0	232	
8:15	8:30	0	2	3	1	0	0	9	6	0	2	3	7	0	1	17	0	340	
8:30	8:45	0	1	0	3	0	0	17	3	0	2	0	7	0	3	20	0	370	Peak
8:45	9:00	0	0	3	2	0	6	33	4	0	5	3	8	0	2	22	0		
9:00	9:15	0	1	4	5	0	10	55	20	0	3	4	10	0	2	29	2		
9:15	9:30	0	1	2	1	0	0	28	8	0	2	2	10	0	1	25	1		
14:30	14:45	0	0	3	2	0	1	10	2	0	7	2	9	0	4	16	0	306	
14:45	15:00	0	2	3	0	0	2	15	1	0	4	3	14	0	3	20	0	334	
15:00	15:15	0	1	2	0	0	0	11	3	0	6	2	7	0	5	31	1	336	Peak
15:15	15:30	0	3	0	1	0	5	40	22	0	5	5	10	0	2	19	2		
15:30	15:45	0	1	3	1	0	1	21	7	0	7	7	16	0	3	17	0		
15:45	16:00	0	1	2	0	0	1	14	5	0	9	9	8	0	2	18	0		

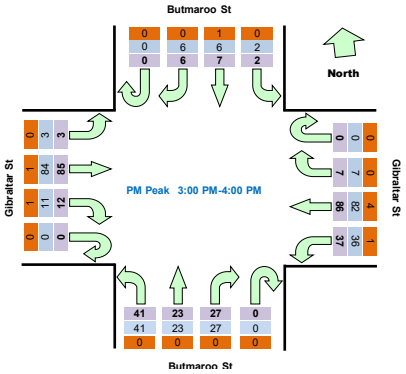
Peak Time		North Approach Butmaroo St				East Approach Gibraltar St				South Approach Butmaroo St				West Approach Gibraltar St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:30	9:30	0	3	9	11	0	16	133	35	0	12	9	35	0	8	96	3	370
15:00	16:00	0	6	7	2	0	7	86	37	0	27	23	41	0	12	85	3	336

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of No Name Rd and Majara St , Bungendore

GPS	*-35.254852, 149.445813*
Date:	Wed 04/11/20
Weather:	Fine
Suburban:	Bungendore
Customer:	GHD

North:	Majara St
East:	No Name Rd
South:	Majara St
West:	Gibraltar St

Survey Period	AM:	8:00 AM-9:30 AM
	PM:	2:30 PM-4:00 PM
Traffic Peak	AM:	8:30 AM-9:30 AM
	PM:	2:45 PM-3:45 PM

All Vehicles

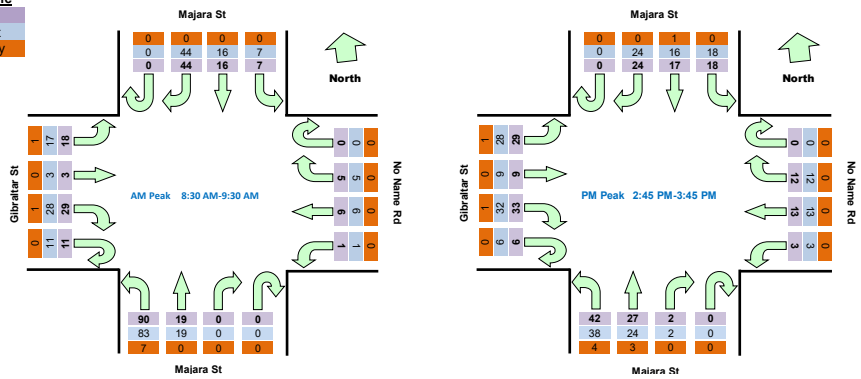
Time		North Approach Majara St				East Approach No Name Rd				South Approach Majara St				West Approach Gibraltar St				Hourly Total	
Period Start	**Period End**	**U**	**R**	**SB**	**L**	**U**	**R**	**WB**	**L**	**U**	**R**	**NB**	**L**	**U**	**R**	**EB**	**L**	**Hour**	**Peak**
8:00	8:15	0	1	6	0	0	0	0	0	0	0	9	7	0	4	0	2	156	
8:15	8:30	0	5	4	0	0	0	0	0	0	0	5	6	0	2	1	7	232	
8:30	8:45	0	2	4	0	0	0	0	0	0	0	4	16	1	12	1	3	249	Peak
8:45	9:00	0	8	0	1	0	0	1	1	0	0	7	26	2	4	0	4		
9:00	9:15	0	23	9	6	0	2	3	0	0	0	6	34	6	6	2	8		
9:15	9:30	0	11	3	0	0	3	2	0	0	0	2	14	2	7	0	3		
14:30	14:45	0	0	4	0	0	0	0	0	0	0	8	4	0	7	0	3	224	
14:45	15:00	0	10	2	4	0	0	0	0	0	0	6	8	2	9	3	7	235	Peak
15:00	15:15	0	8	4	14	0	0	0	0	0	2	7	13	2	8	5	3	227	
15:15	15:30	0	3	5	0	0	12	11	2	0	0	10	13	2	9	1	13		
15:30	15:45	0	3	6	0	0	0	2	1	0	0	4	8	0	7	0	6		
15:45	16:00	0	5	5	0	0	0	0	0	0	0	11	8	0	11	0	3		

Peak Time		North Approach Majara St				East Approach No Name Rd				South Approach Majara St				West Approach Gibraltar St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:30	9:30	0	44	16	7	0	5	6	1	0	0	19	90	11	29	3	18	249
14:45	15:45	0	24	17	18	0	12	13	3	0	2	27	42	6	33	9	29	235

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Kings Hwy and Butmaroo St, Bungendore

GPS *-35.256588, 149.442980*

Date:	Wed 04/11/20
Weather:	Fine
Suburban:	Bungendore
Customer:	GHD

North:	Butmaroo St
East:	Kings Hwy
South:	Butmaroo St
West:	Kings Hwy

Survey Period	AM:	8:00 AM-9:30 AM
	PM:	2:30 PM-4:00 PM
Traffic Peak	AM:	8:15 AM-9:15 AM
	PM:	3:00 PM-4:00 PM

All Vehicles

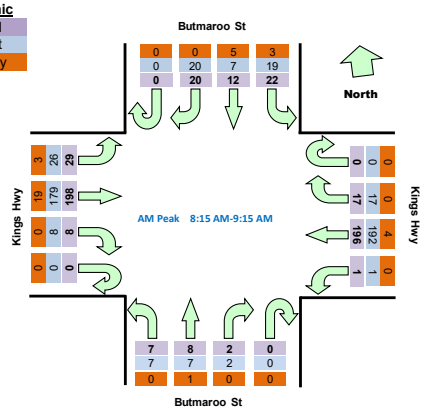
Time		North Approach Butmaroo St				East Approach Kings Hwy				South Approach Butmaroo St				West Approach Kings Hwy				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
8:00	8:15	0	1	2	4	0	4	63	0	0	6	3	3	0	0	20	2	481	
8:15	8:30	0	8	1	2	0	4	58	0	0	0	0	0	0	0	41	11	520	Peak
8:30	8:45	0	3	2	3	0	3	40	1	0	0	2	2	0	4	45	3	513	
8:45	9:00	0	4	1	7	0	5	47	0	0	2	5	2	0	2	59	6		
9:00	9:15	0	5	8	10	0	5	51	0	0	0	1	3	0	2	53	9		
9:15	9:30	0	6	2	3	0	2	42	1	0	0	4	2	0	2	49	5		
14:30	14:45	0	0	2	1	0	0	29	0	0	0	0	3	0	1	36	13	507	
14:45	15:00	0	8	1	4	0	6	40	1	0	0	5	5	0	6	42	9	562	
15:00	15:15	0	3	0	5	0	4	46	1	0	5	3	3	0	3	72	8	595	Peak
15:15	15:30	0	11	6	10	0	5	59	0	0	1	5	0	0	4	31	10		
15:30	15:45	0	4	4	5	0	6	52	0	0	2	2	0	0	1	42	22		
15:45	16:00	0	5	2	2	0	4	46	0	0	0	1	5	0	4	71	20		

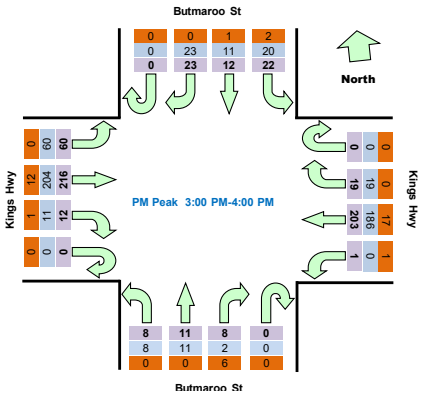
Peak Time		North Approach Butmaroo St				East Approach Kings Hwy				South Approach Butmaroo St				West Approach Kings Hwy				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:15	9:15	0	20	12	22	0	17	196	1	0	2	8	7	0	8	198	29	520
15:00	16:00	0	23	12	22	0	19	203	1	0	8	11	8	0	12	216	60	595

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Kings Hwy and Majara St, Bungendore

GPS	*-35.256901, 149.445428*
Date:	Wed 04/11/20
Weather:	Fine
Suburban:	Bungendore
Customer:	GHD

North:	Majara St
East:	Kings Hwy
South:	Majara St
West:	Kings Hwy

Survey Period	AM:	8:00 AM-9:30 AM
	PM:	2:30 PM-4:00 PM
Traffic Peak	AM:	8:15 AM-9:15 AM
	PM:	3:00 PM-4:00 PM

All Vehicles

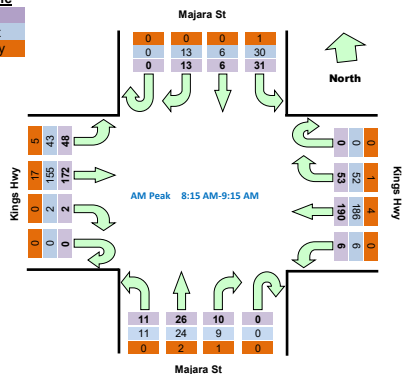
Time		North Approach Majara St				East Approach Kings Hwy				South Approach Majara St				West Approach Kings Hwy				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
8:00	8:15	0	0	4	5	0	10	65	2	0	2	2	2	1	1	27	2	523	
8:15	8:30	0	2	1	7	0	6	58	0	0	2	5	2	0	0	41	2	568	Peak
8:30	8:45	0	2	2	11	0	10	41	1	0	3	5	1	0	0	41	7	567	
8:45	9:00	0	3	0	3	0	18	45	2	0	4	3	4	0	0	47	21		
9:00	9:15	0	6	3	10	0	19	46	3	0	1	13	4	0	2	43	18		
9:15	9:30	0	8	3	9	0	11	37	0	0	2	3	0	0	3	46	3		
14:30	14:45	0	2	3	8	0	2	27	0	0	0	2	0	0	1	29	7	528	
14:45	15:00	0	0	0	10	0	8	46	2	0	0	5	1	0	2	36	8	576	
15:00	15:15	0	1	1	8	0	18	45	1	0	2	11	5	0	1	52	29	611	Peak
15:15	15:30	0	20	18	18	0	6	42	1	0	0	6	2	0	0	40	2		
15:30	15:45	0	1	5	8	0	5	51	1	0	1	2	6	0	1	44	4		
15:45	16:00	0	2	2	12	0	8	46	2	0	2	4	2	0	1	66	6		

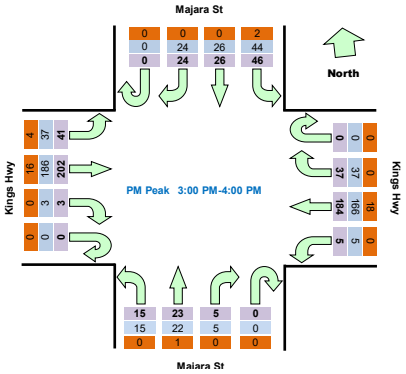
Peak Time		North Approach Majara St				East Approach Kings Hwy				South Approach Majara St				West Approach Kings Hwy				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:15	9:15	0	13	6	31	0	53	190	6	0	10	26	11	0	2	172	48	568
15:00	16:00	0	24	26	46	0	37	184	5	0	5	23	15	0	3	202	41	611

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

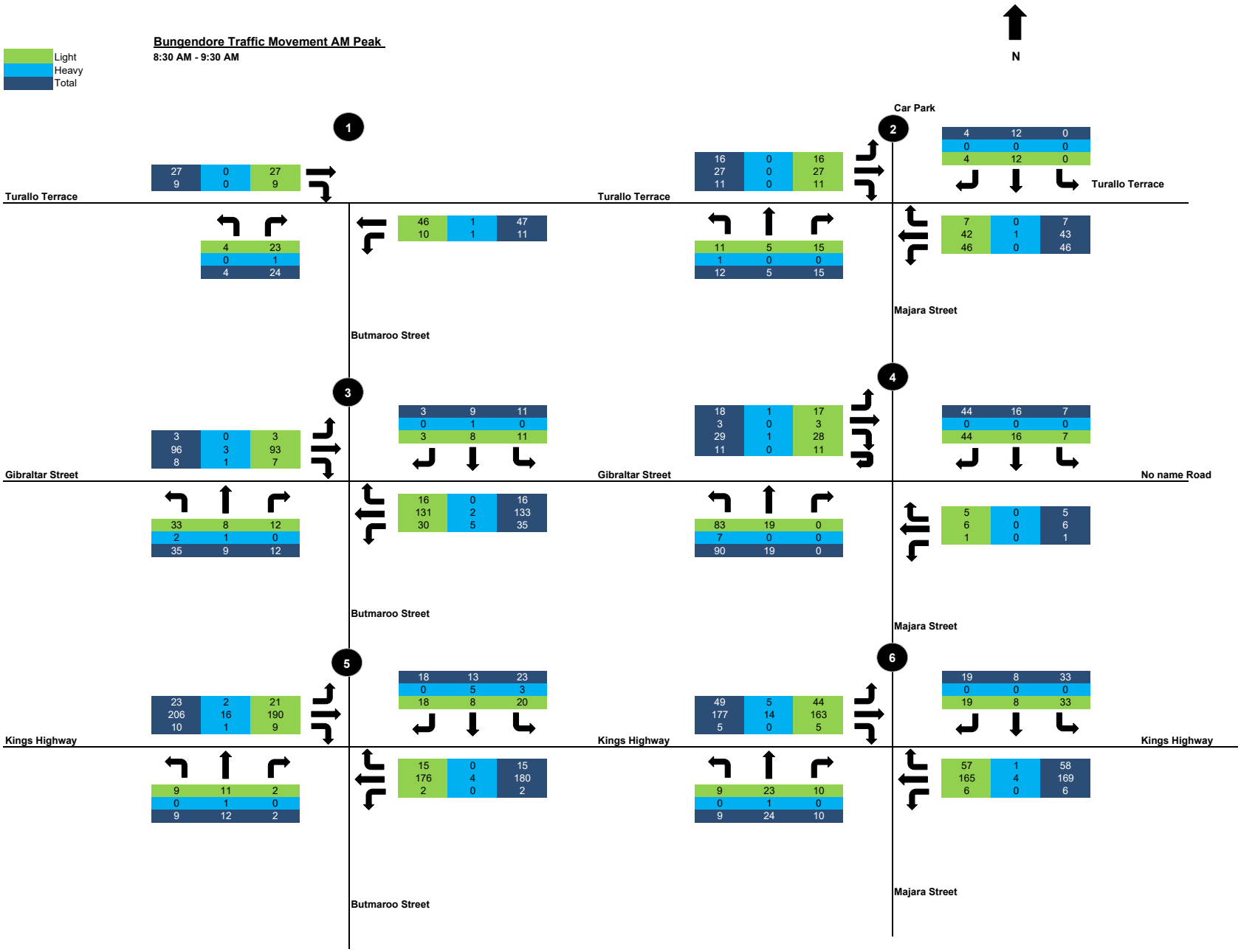
Total
Light
Heavy

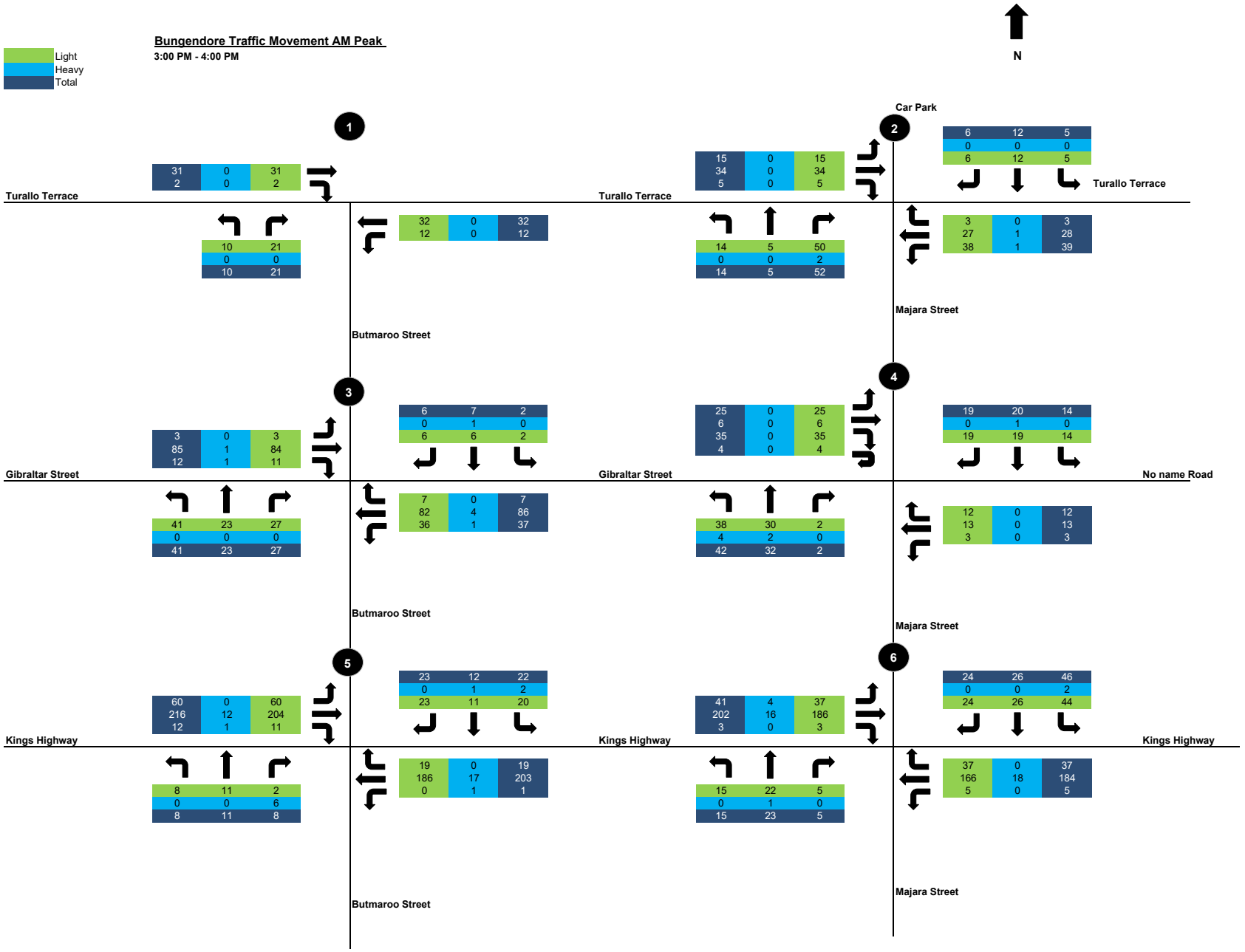




Appendix D

Peak Hour Traffic Volumes


Bungendore Traffic Movement AM Peak
8:30 AM - 9:30 AM
Light
Heavy
Total
N
Car Park
1
2
3
4
5
6
Turallo Terrace
Turallo Terrace
Turallo Terrace
Gibraltar Street
Gibraltar Street
No name Road
Kings Highway
Kings Highway
Kings Highway
Butmaroo Street
Butmaroo Street
Butmaroo Street
Majara Street
Majara Street
Majara Street
27 0 27
9 0 9
4 23
0 1
4 24
46 1 47
10 1 11
16 0 16
27 0 27
11 0 11
11 5 15
1 0 0
12 5 15
4 12 0
0 0 0
4 12 0
7 0 7
42 1 43
46 0 46
3 0 3
96 3 93
8 1 7
33 8 12
2 1 0
35 9 12
3 9 11
0 1 0
3 8 11
16 0 16
131 2 133
30 5 35
18 1 17
3 0 3
29 1 28
11 0 11
83 19 0
7 0 0
90 19 0
44 16 7
0 0 0
44 16 7
5 0 5
6 0 6
1 0 1
23 2 21
206 16 190
10 1 9
9 11 2
0 1 0
9 12 2
18 13 23
0 5 3
18 8 20
15 0 15
176 4 180
2 0 2
49 5 44
177 14 163
5 0 5
9 23 10
0 1 0
9 24 10
19 8 33
0 0 0
19 8 33
57 1 58
165 4 169
6 0 6


Bungendore Traffic Movement AM Peak
3:00 PM - 4:00 PM
Light
Heavy
Total
N
1
2
3
4
5
6
Car Park
Turallo Terrace
Turallo Terrace
Turallo Terrace
Butmaroo Street
Majara Street
Gibraltar Street
Gibraltar Street
No name Road
Butmaroo Street
Majara Street
Kings Highway
Kings Highway
Kings Highway
Butmaroo Street
Majara Street
31 0 31
2 0 2
32 0 32
12 0 12
10 21
0 0
10 21
15 0 15
34 0 34
5 0 5
14 5 50
0 0 2
14 5 52
6 12 5
0 0 0
6 12 5
3 0 3
27 1 28
38 1 39
3 0 3
85 1 84
12 1 11
6 7 2
0 1 0
6 6 2
25 0 25
6 0 6
35 0 35
4 0 4
19 20 14
0 1 0
19 19 14
41 23 27
0 0 0
41 23 27
7 0 7
82 4 86
36 1 37
38 30 2
4 2 0
42 32 2
12 0 12
13 0 13
3 0 3
60 0 60
216 12 204
12 1 11
23 12 22
0 1 2
23 11 20
41 4 37
202 16 186
3 0 3
24 26 46
0 0 2
24 26 44
8 11 2
0 0 6
8 11 8
19 0 19
186 17 203
0 1 1
15 22 5
0 1 0
15 23 5
37 0 37
166 18 184
5 0 5

Appendix E

Travel Access Guide Templates

[Insert school name]

Travel Access Guide

[Insert date/month/year]

Project overview

Insert project description from project page on SINSW website.

Active ways to get to school

Walking is an active and healthy way to get to school

- Include safety tips for local students.

Ride your bike

- Include safety tips for local students.

Ride your scooter

- Include safety tips for local students.

Kiss and drop expectations

- Reflect anything agreed in the School Transport Plan.
- Ensure consistency with NSW Education's road safety messaging: https://education.nsw.gov.au/teaching-and-learning/curriculum/learning-across-the-curriculum/road-safety-education/safe-travel

Message from your Principal

- Insert text from Principal that lets the school community know they are becoming an active travel school.
- Principal message to include relevant safety information.
- Principal message may include their own commitment to active travel.
- Include Principal photo and signature block.

Message from your P&C President

- Insert text from P&C President that outlines their support for becoming an active travel school.
- P&C message may include information about how changing the way you get to school even one day per week can make a 20% difference to local traffic congestion.
- Include P&C President photo and signature block.

For more information contact:
School Infrastructure NSW
Email: schoolinfrastructure@det.nsw.edu.au
Phone: 1300 482 651
www.schoolinfrastructure.nsw.gov.au

NSW GOVERNMENT

Local map: Active Travel

Must be included

- Graphic map of the school, showing all school entry points.
- Emphasise accessible entry points.
- Use icons to show which entry points are most suitable for walking, riding bikes and riding scooters.
- Show the 5, 10, 15, 20+ minute walk to school with single line rings of different colours (not shading).
- Include footpaths near the school, on both sides of all roads and near pedestrian crossings.
- Include pedestrian crossings and crossings with signals or Lollipop staff.
- Include nearby bus stops and bus routes, if relevant.

Map details

- North is up.
- Include a scale, in metres.
- Show bike and scooter parking within the school grounds.
- Show steps and stairs that may make entrances harder to access.

For more information contact:
School Infrastructure NSW
Email: schoolinfrastructure@det.nsw.edu.au
Phone: 1300 482 651
www.schoolinfrastructure.nsw.gov.au

NSW GOVERNMENT

Breakout boxes to fill empty spaces

Something broken on the way to school?

Use the Snap Send Solve app or website to report issues to the people who can fix them.

Things like abandoned trolleys, broken footpaths or water leaks can all be reported in the app.

Download it today from the App Store or Google Play. Or visit **www.snapsendsolve.com**

Discounts, offers or initiatives for students and parents

- Include information about bike insurance, discounts, courses or car share pods, as relevant.

For more information contact:
School Infrastructure NSW
Email: schoolinfrastructure@det.nsw.edu.au
Phone: 1300 482 651
www.schoolinfrastructure.nsw.gov.au

[Insert school name]

Travel Access Guide

[Insert date/month/year]

Project overview

Insert project description from project page on SINSW website.

Using public transport to get to school

School buses and public buses

- Include route numbers and nearest bus stop locations.
- Include safety tips for local students.

Trains | Ferries | Light Rail

- Include nearest station or wharf locations.
- Include safety tips for local students.

Apply for a School Opal Card | School Term Bus Pass

- Include information about how to apply for any subsidised public transport programs available for students at this school.
- Student code of conduct
- Include information about expectations for students on public transport, for example offering seats to adults, no swearing or fighting, etc.

Message from your Principal

- Insert text from Principal that lets the school community know they are becoming a public transport school.
- Principal message to include relevant safety information.
- Principal message may include their own commitment to public transport.
- Include Principal photo and signature block.

Message from your P&C President

- Insert text from P&C President that outlines their support for becoming a public transport school.
- P&C message may include information about how changing the way you get to school even one day per week can make a 20% difference to local traffic congestion.
- Include P&C President photo and signature block.

Kiss and drop code of conduct

- Reflect anything agreed in the School Transport Plan.
- Ensure consistency with NSW Education's road safety messaging.

For more information contact:

School Infrastructure NSW
Email: schoolinfrastructure@det.nsw.edu.au
Phone: 1300 482 651
www.schoolinfrastructure.nsw.gov.au

NSW GOVERNMENT

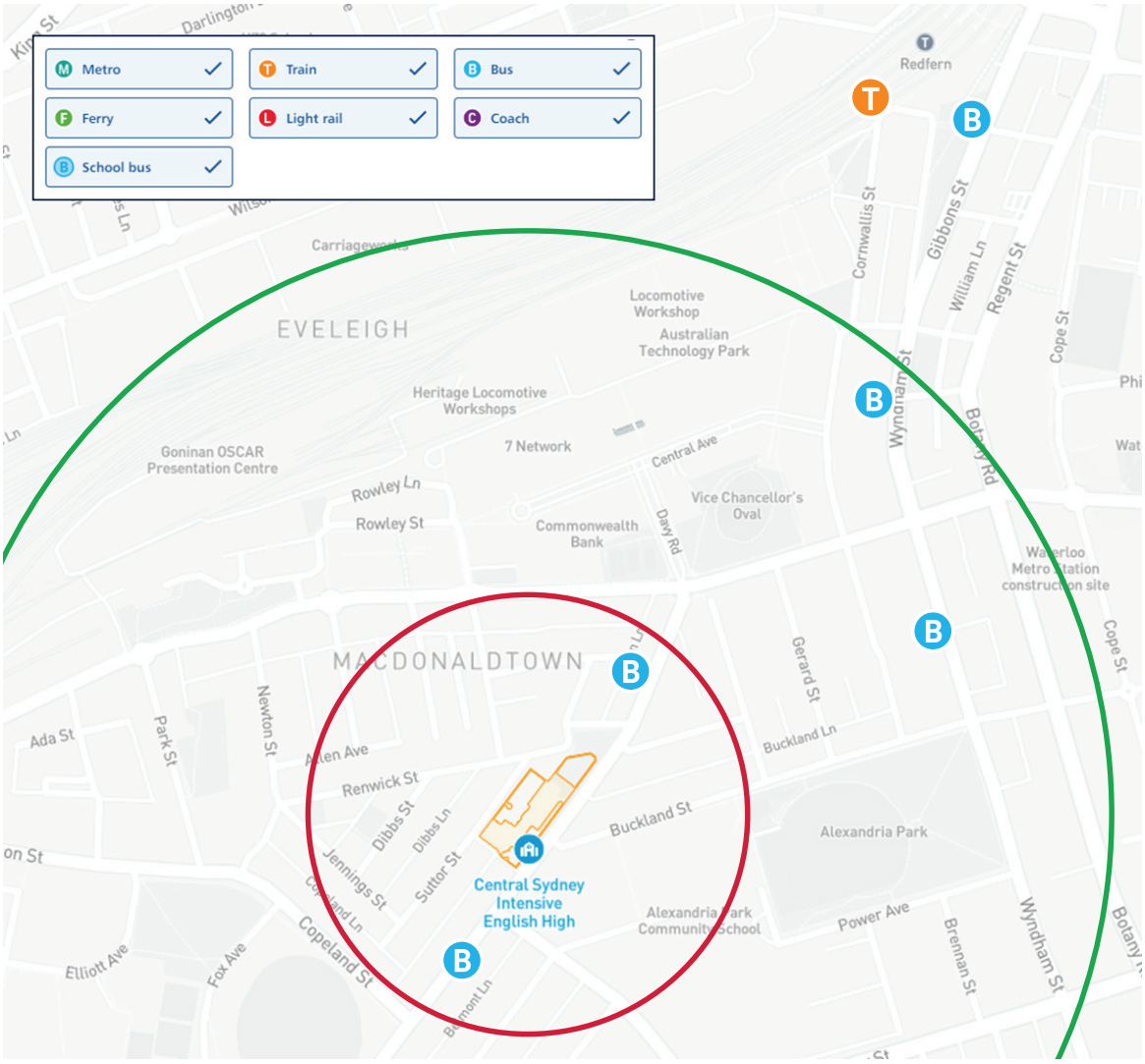
Local map: Public transport

Must be included

- Graphic map of the school, showing all school entry points.
- Use icons to show the nearest bus, train, ferry and light rail stops to the school. Only use Transport for NSW icons for each type of transport.
- Show routes using colours to match the Transport for NSW icon colours, for example, orange for trains, blue for buses.
- Differentiate morning and afternoon stop locations.
- Show the 5, 10, 15, 20+ minute walk to school with single line rings of different colours (not shading).
- Show the walk to school from public transport stops.

Map details

- North is up.
- Include a scale, in metres.
- Emphasise accessible entry points.
- Show steps and stairs that may make entrances harder to access.
- Show bike and scooter parking within the school grounds.
- Include footpaths near the school, on both sides of all roads and near pedestrian crossings.
- Include pedestrian crossings and crossings with signals or Lollipop staff.



For more information contact:
School Infrastructure NSW
Email: schoolinfrastructure@det.nsw.edu.au
Phone: 1300 482 651
www.schoolinfrastructure.nsw.gov.au

NSW GOVERNMENT

Breakout boxes to fill empty spaces

Something broken on the way to school?

Use the Snap Send Solve app or website to report issues to the people who can fix them.

Things like abandoned trolleys, broken footpaths or water leaks can all be reported in the app.

Download it today from the App Store or Google Play. Or visit **www.snapsendsolve.com**

Discounts, offers or initiatives for students and parents

- Include information about bike insurance, discounts, courses or car share pods, as relevant.

Tap on and tap off every time

Use your School Opal card every time you catch public transport to school.

It tells us how many people are using public transport to help us plan buses, trains and ferries to suit you.

Plan your trip to school

You can plan ahead to make sure you get to school on time!

Visit transport.info or download an app to help:

- Trip View
- Next There

For more information contact:
School Infrastructure NSW
Email: schoolinfrastructure@det.nsw.edu.au
Phone: 1300 482 651
www.schoolinfrastructure.nsw.gov.au

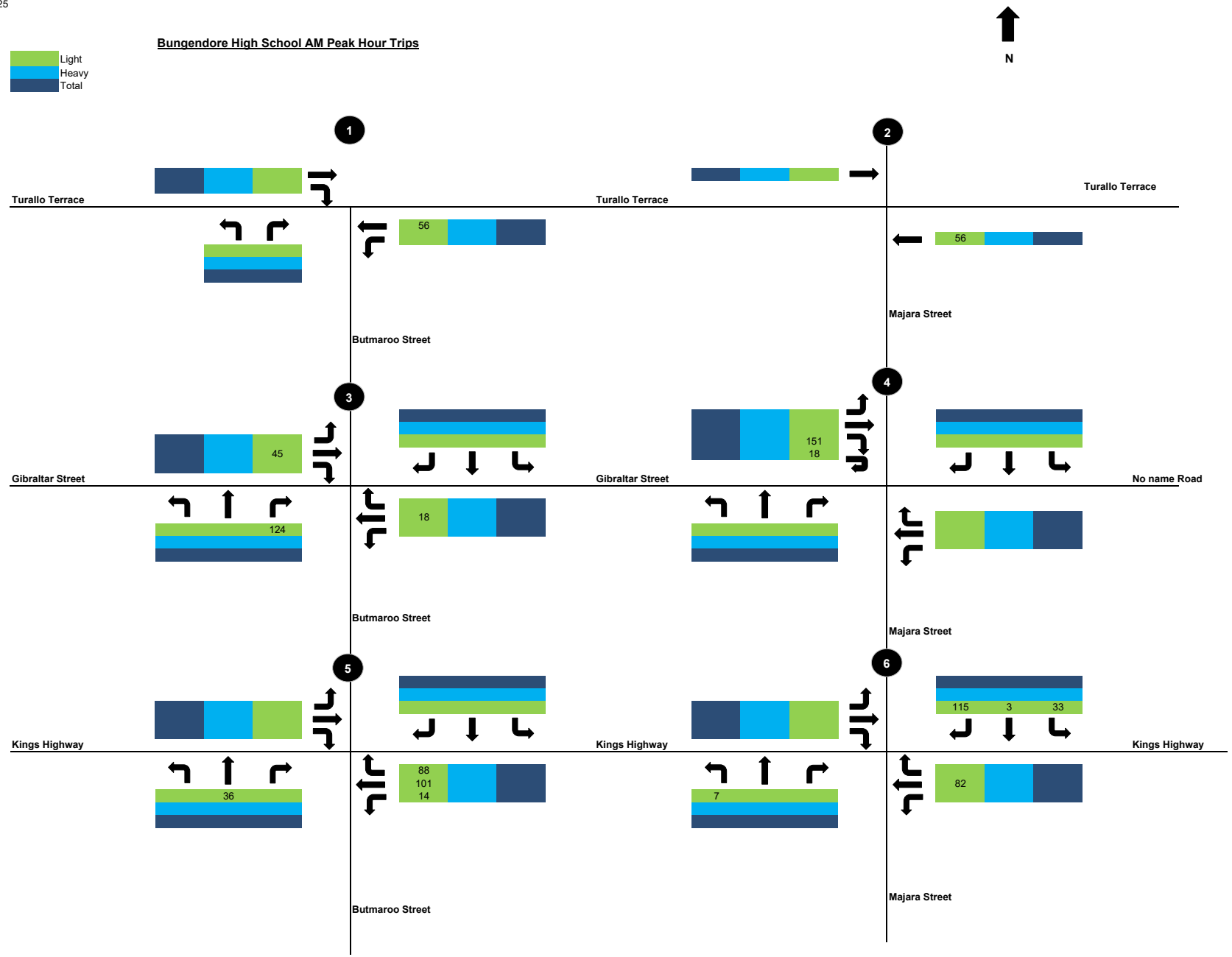
NSW GOVERNMENT

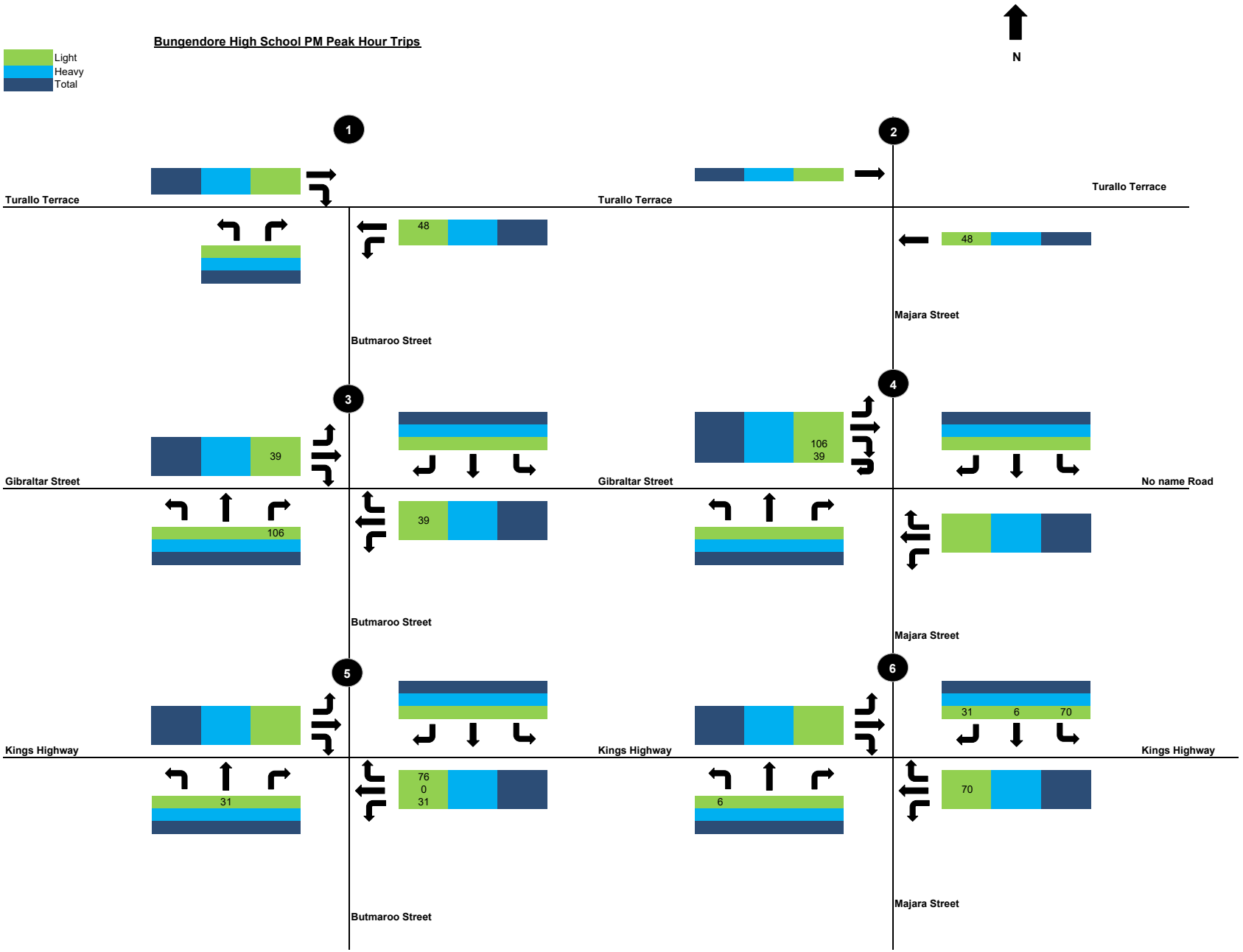
Appendix F

Trip Generation Volumes

AM Trips 225

Bungendore High School AM Peak Hour Trips

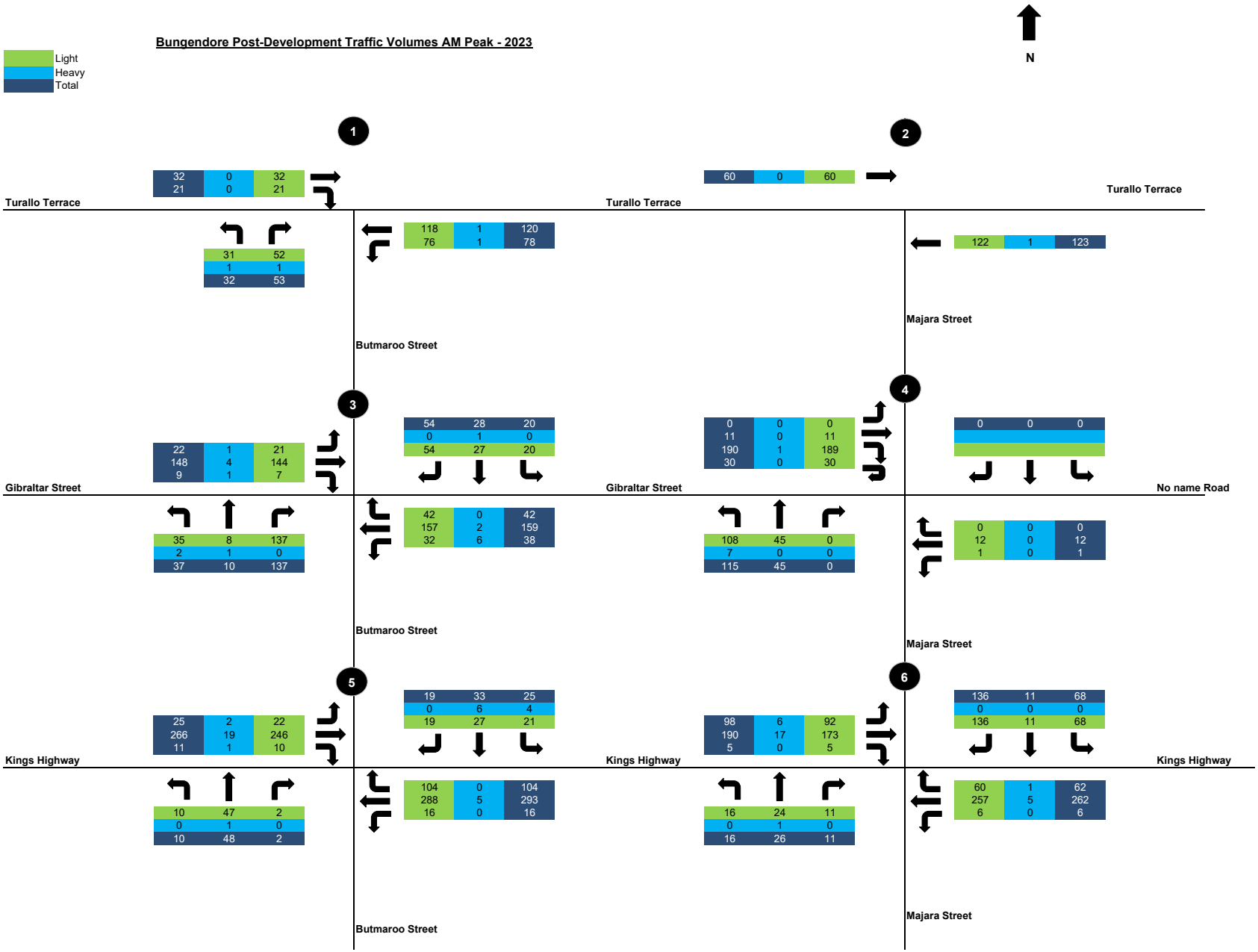



Bungendore High School PM Peak Hour Trips
Light
Heavy
Total
N
1
2
3
4
5
6
Turallo Terrace
Turallo Terrace
Turallo Terrace
48
48
Butmaroo Street
Majara Street
Gibraltar Street
Gibraltar Street
No name Road
39
106
39
106
39
Butmaroo Street
Majara Street
Kings Highway
Kings Highway
Kings Highway
31
6
70
31
76
0
31
6
70
Butmaroo Street
Majara Street

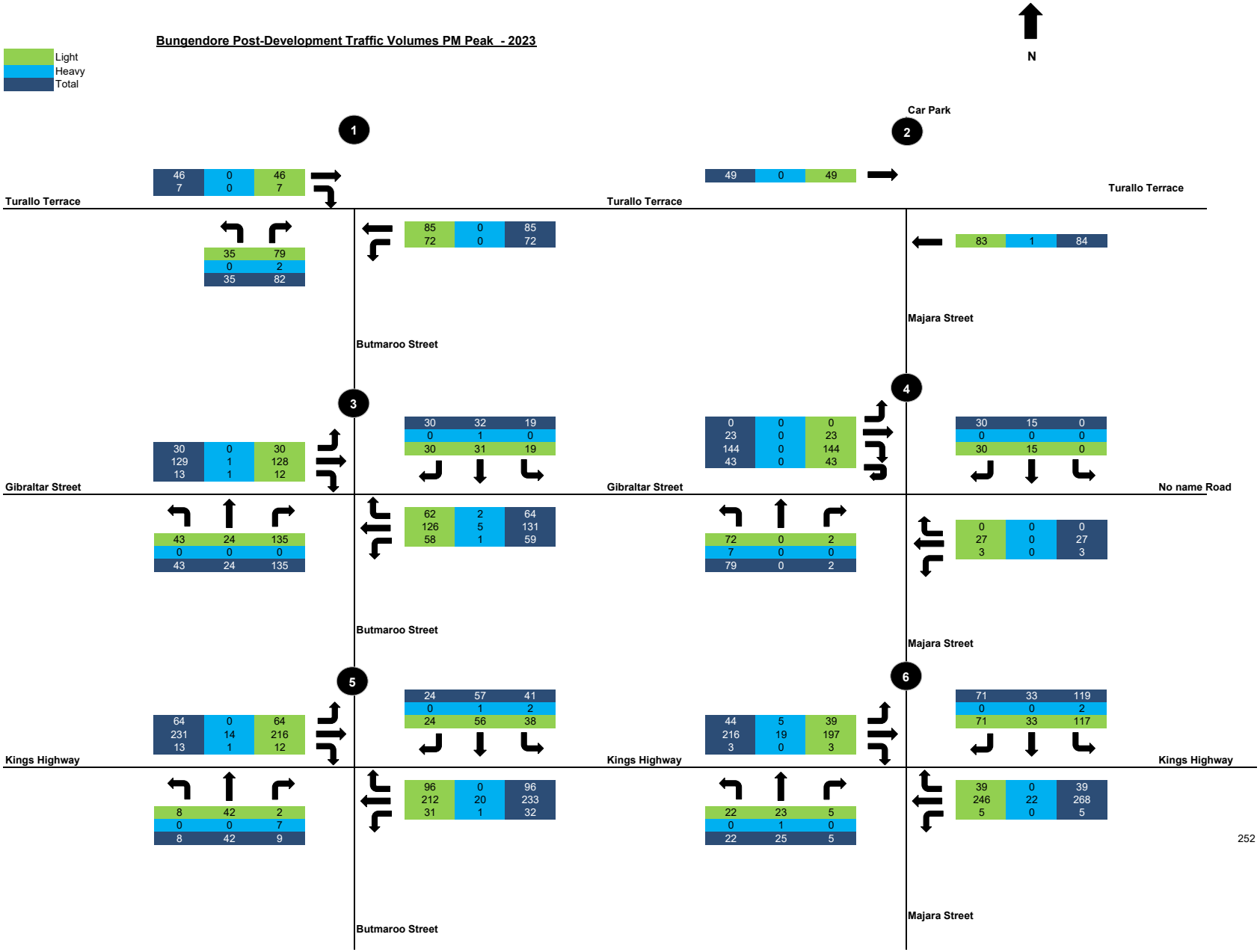
Appendix G

2023 and 2033 Traffic Volumes

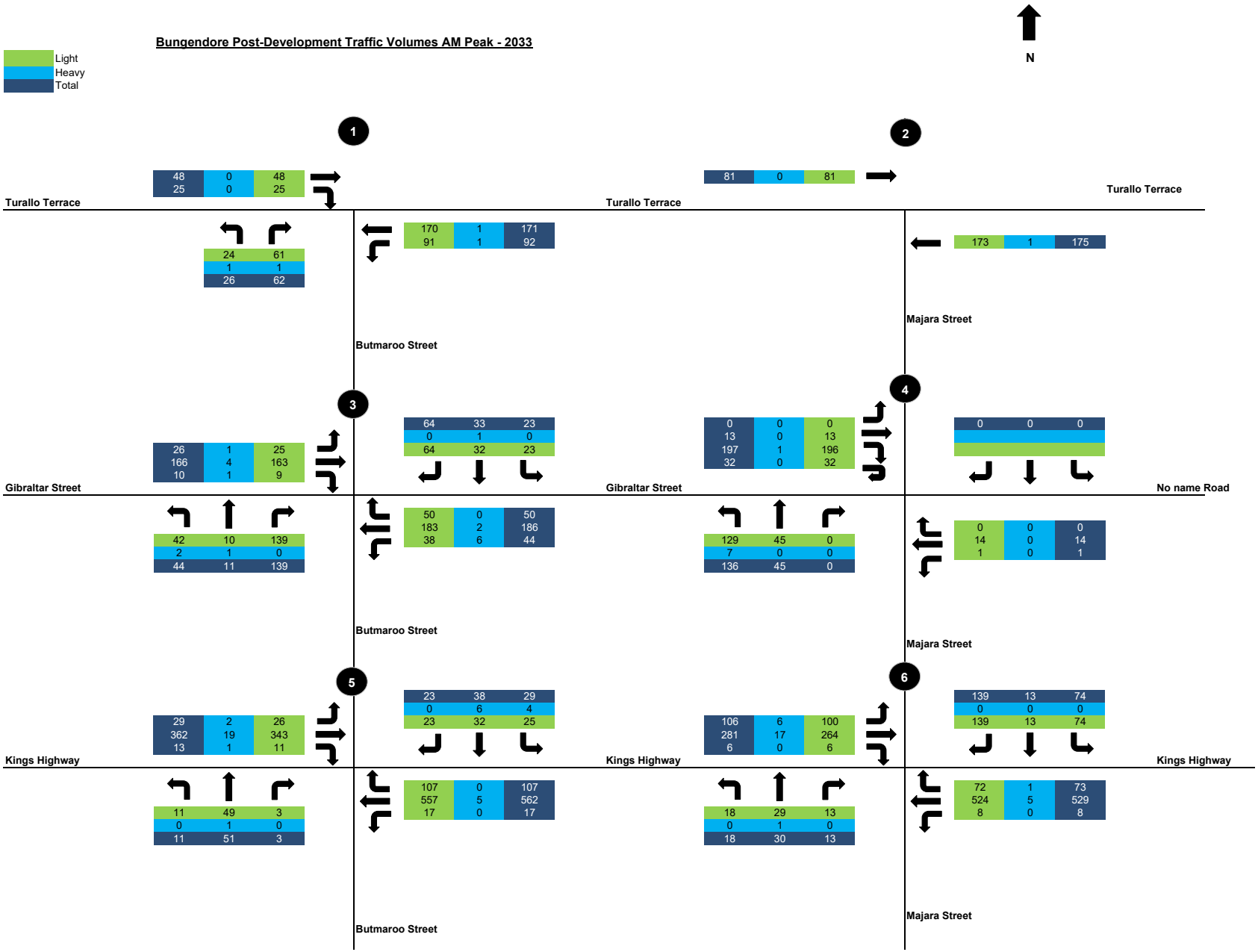
Bungendore Post-Development Traffic Volumes AM Peak - 2023



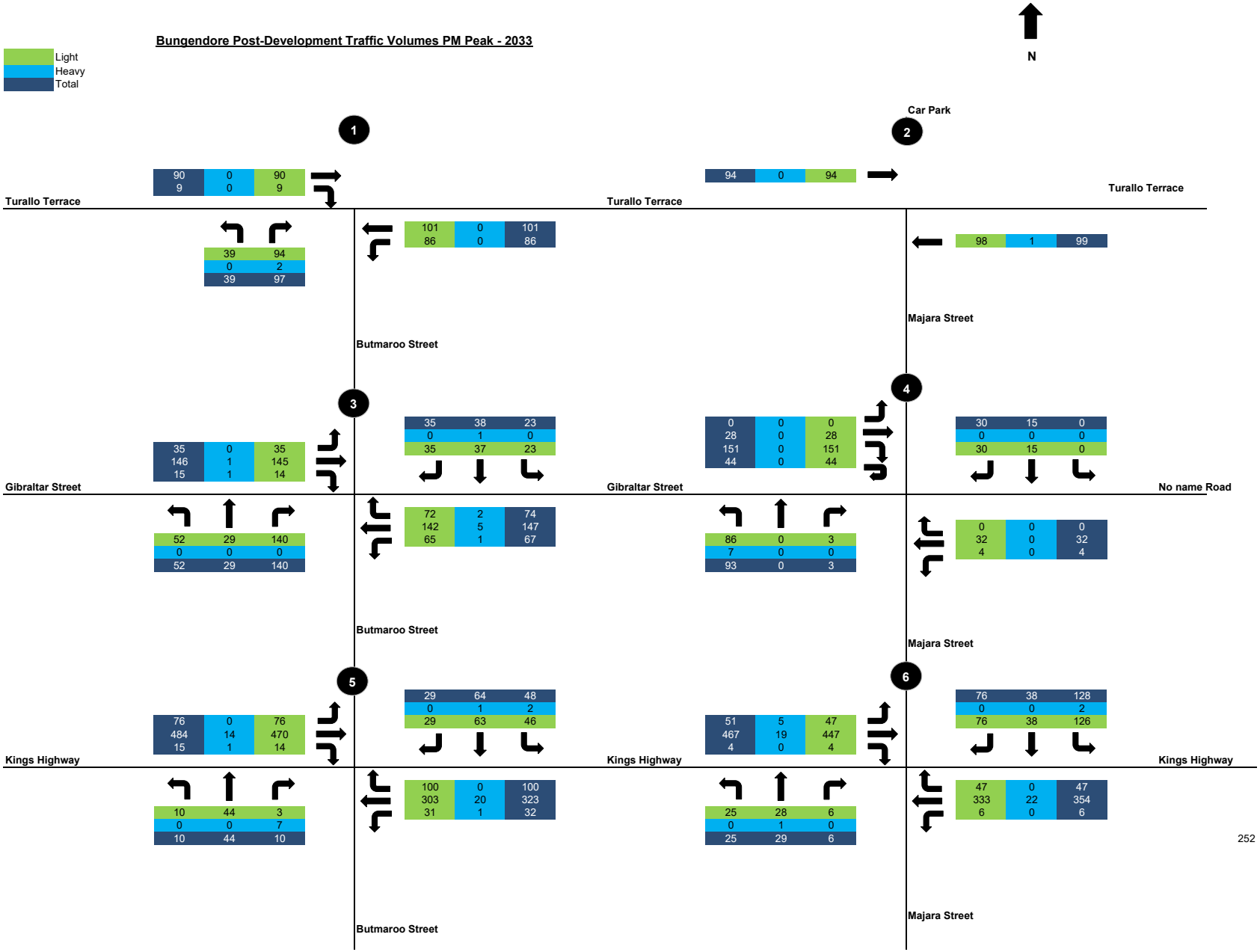
Bungendore Post-Development Traffic Volumes PM Peak - 2023



Bungendore Post-Development Traffic Volumes AM Peak - 2033



Bungendore Post-Development Traffic Volumes PM Peak - 2033



Appendix H

SIDRA Outputs

MOVEMENT SUMMARY

Site: 1 [2020_Base_AM Peak_ Butmaroo Street and Turallo Terrace]

Network: N101 [2020_Base_AM Network]

2020_Base_AM Peak_ Butmaroo Street and Turallo Terrace
Site Category: Base_2020_AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Butmaroo Street														
1	L2	4	0.0	4	0.0	0.027	4.8	LOS A	0.1	0.7	0.18	0.53	0.18	42.3
3	R2	25	4.2	25	4.2	0.027	5.0	LOS A	0.1	0.7	0.18	0.53	0.18	37.9
Approach		29	3.6	29	3.6	0.027	5.0	LOS A	0.1	0.7	0.18	0.53	0.18	38.9
East: Turallo Terrace (West)														
4	L2	12	9.1	12	9.1	0.033	4.6	LOS A	0.0	0.0	0.00	0.10	0.00	47.7
5	T1	49	2.1	49	2.1	0.033	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	48.8
Approach		61	3.4	61	3.4	0.033	0.9	NA	0.0	0.0	0.00	0.10	0.00	48.7
West: Turallo Terrace (West)														
11	T1	28	0.0	28	0.0	0.021	0.1	LOS A	0.1	0.4	0.08	0.14	0.08	46.0
12	R2	9	0.0	9	0.0	0.021	4.7	LOS A	0.1	0.4	0.08	0.14	0.08	46.0
Approach		38	0.0	38	0.0	0.021	1.2	NA	0.1	0.4	0.08	0.14	0.08	46.0
All Vehicles		128	2.5	128	2.5	0.033	1.9	NA	0.1	0.7	0.06	0.21	0.06	46.0

MOVEMENT SUMMARY

Site: 2 [2020_Base_AM Peak_Majara Street and Turallo Terrace]

Network: N101 [2020_Base_AM Network]

2020_Base_AM Peak_Majara Street and Turallo Terrace
Site Category: Base_2020_AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Majara Street														
1	L2	13	8.3	13	8.3	0.032	4.8	LOS A	0.1	0.8	0.16	0.53	0.16	38.9
2	T1	5	0.0	5	0.0	0.032	4.7	LOS A	0.1	0.8	0.16	0.53	0.16	17.3
3	R2	16	0.0	16	0.0	0.032	5.2	LOS A	0.1	0.8	0.16	0.53	0.16	44.5
Approach		34	3.1	34	3.1	0.032	5.0	LOS A	0.1	0.8	0.16	0.53	0.16	38.2
East: Turallo Terrace (West)														
4	L2	48	0.0	48	0.0	0.055	4.6	LOS A	0.1	0.4	0.03	0.30	0.03	46.9
5	T1	45	2.3	45	2.3	0.055	0.0	LOS A	0.1	0.4	0.03	0.30	0.03	46.9
6	R2	7	0.0	7	0.0	0.055	5.6	LOS A	0.1	0.4	0.03	0.30	0.03	36.1
Approach		101	1.0	101	1.0	0.055	2.6	NA	0.1	0.4	0.03	0.30	0.03	45.8
North: Car Park														
7	L2	1	0.0	1	0.0	0.017	2.9	LOS A	0.1	0.4	0.20	0.48	0.20	52.7
8	T1	13	0.0	13	0.0	0.017	2.3	LOS A	0.1	0.4	0.20	0.48	0.20	26.2
9	R2	4	0.0	4	0.0	0.017	3.0	LOS A	0.1	0.4	0.20	0.48	0.20	26.2
Approach		18	0.0	18	0.0	0.017	2.5	LOS A	0.1	0.4	0.20	0.48	0.20	34.8
West: Turallo Terrace (West)														
10	L2	17	0.0	17	0.0	0.031	5.7	LOS A	0.1	0.6	0.10	0.27	0.10	16.7
11	T1	28	0.0	28	0.0	0.031	0.1	LOS A	0.1	0.6	0.10	0.27	0.10	48.0
12	R2	12	0.0	12	0.0	0.031	4.9	LOS A	0.1	0.6	0.10	0.27	0.10	44.4
Approach		57	0.0	57	0.0	0.031	2.7	NA	0.1	0.6	0.10	0.27	0.10	36.6
All Vehicles		209	1.0	209	1.0	0.055	3.0	NA	0.1	0.8	0.09	0.34	0.09	41.3

MOVEMENT SUMMARY

Site: 3 [2020_Base_AM Peak Gibraltar Street and Butmaroo Street]

Network: N101 [2020_Base_AM Network]

2020_Base_AM Peak Gibraltar Street and Turallo Terrace
Site Category: Base_2020_AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Butmaroo Street														
1	L2	37	5.7	37	5.7	0.063	5.3	LOS A	0.2	1.7	0.28	0.54	0.28	41.9
2	T1	9	11.1	9	11.1	0.063	5.2	LOS A	0.2	1.7	0.28	0.54	0.28	37.6
3	R2	13	0.0	13	0.0	0.063	6.2	LOS A	0.2	1.7	0.28	0.54	0.28	37.6
Approach		59	5.4	59	5.4	0.063	5.5	LOS A	0.2	1.7	0.28	0.54	0.28	40.8
East: Gibraltar Street (East)														
4	L2	37	14.3	37	14.3	0.097	4.7	LOS A	0.0	0.0	0.00	0.48	0.00	41.4
5	T1	140	1.5	140	1.5	0.097	3.2	LOS A	0.0	0.0	0.00	0.48	0.00	44.4
6	R2	17	0.0	17	0.0	0.097	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	41.4
Approach		194	3.8	194	3.8	0.097	3.6	NA	0.0	0.0	0.00	0.48	0.00	43.9
North: Butmaroo Street														
7	L2	12	0.0	12	0.0	0.026	5.0	LOS A	0.1	0.7	0.25	0.51	0.25	38.0
8	T1	9	11.1	9	11.1	0.026	5.3	LOS A	0.1	0.7	0.25	0.51	0.25	38.0
9	R2	3	0.0	3	0.0	0.026	6.2	LOS A	0.1	0.7	0.25	0.51	0.25	42.0
Approach		24	4.3	24	4.3	0.026	5.3	LOS A	0.1	0.7	0.25	0.51	0.25	38.9
West: Gibraltar Street West)														
10	L2	3	0.0	3	0.0	0.059	6.1	LOS A	0.1	0.5	0.06	0.06	0.06	56.3
11	T1	101	3.1	101	3.1	0.059	0.1	LOS A	0.1	0.5	0.06	0.06	0.06	56.3
12	R2	8	12.5	8	12.5	0.059	5.3	LOS A	0.1	0.5	0.06	0.06	0.06	56.3
Approach		113	3.7	113	3.7	0.059	0.6	NA	0.1	0.5	0.06	0.06	0.06	56.3
All Vehicles		389	4.1	389	4.1	0.097	3.1	NA	0.2	1.7	0.08	0.37	0.08	45.0

MOVEMENT SUMMARY

Site: 4 [2020_Base_AM Peak Gibraltar Street and Majara Street]

Network: N101 [2020_Base_AM Network]

2020_Base_AM Peak Gibraltar Street and Majara Street
Site Category: Base_2020_AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Majara Street														
1	L2	95	7.8	95	7.8	0.062	4.6	LOS A	0.0	0.0	0.00	0.52	0.00	39.7
2	T1	20	0.0	20	0.0	0.062	3.4	LOS A	0.0	0.0	0.00	0.52	0.00	39.7
3	R2	1	0.0	1	0.0	0.062	4.6	LOS A	0.0	0.0	0.00	0.52	0.00	42.7
Approach		116	6.4	116	6.4	0.062	4.4	NA	0.0	0.0	0.00	0.52	0.00	39.8
East: No Name Road														
4	L2	1	0.0	1	0.0	0.012	5.6	LOS A	0.0	0.3	0.16	0.55	0.16	43.2
5	T1	6	0.0	6	0.0	0.012	5.1	LOS A	0.0	0.3	0.16	0.55	0.16	43.2
6	R2	5	0.0	5	0.0	0.012	6.0	LOS A	0.0	0.3	0.16	0.55	0.16	43.2
Approach		13	0.0	13	0.0	0.012	5.5	LOS A	0.0	0.3	0.16	0.55	0.16	43.2
North: Majara Street														
7	L2	7	0.0	7	0.0	0.038	4.7	LOS A	0.0	0.0	0.00	0.53	0.00	43.9
8	T1	17	0.0	17	0.0	0.038	3.5	LOS A	0.0	0.0	0.00	0.53	0.00	40.2
9	R2	46	0.0	46	0.0	0.038	4.7	LOS A	0.0	0.0	0.00	0.53	0.00	40.2
Approach		71	0.0	71	0.0	0.038	4.4	NA	0.0	0.0	0.00	0.53	0.00	40.8
West: Gibraltar Street (West)														
10	L2	19	5.6	19	5.6	0.059	4.7	LOS A	0.2	1.6	0.11	0.55	0.11	39.2
11	T1	3	0.0	3	0.0	0.059	4.9	LOS A	0.2	1.6	0.11	0.55	0.11	45.3
12	R2	31	3.4	31	3.4	0.059	5.3	LOS A	0.2	1.6	0.11	0.55	0.11	39.2
12u	U	12	0.0	12	0.0	0.059	7.2	LOS A	0.2	1.6	0.11	0.55	0.11	39.2
Approach		64	3.3	64	3.3	0.059	5.4	LOS A	0.2	1.6	0.11	0.55	0.11	39.7
All Vehicles		263	3.6	263	3.6	0.062	4.7	NA	0.2	1.6	0.03	0.53	0.03	40.2

MOVEMENT SUMMARY

Site: 5 [2020_Base_AM Peak Butmaroo Street and Kings Highway]

Network: N101 [2020_Base_AM Network]

2020_Base_AM Peak Butmaroo Street and Kings Highway
Site Category: Base_2020_AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Butmaroo Street														
1	L2	9	0.0	9	0.0	0.029	5.5	LOS A	0.1	0.7	0.37	0.57	0.37	41.7
2	T1	12	0.0	12	0.0	0.029	5.9	LOS A	0.1	0.7	0.37	0.57	0.37	37.0
3	R2	2	0.0	2	0.0	0.029	7.3	LOS A	0.1	0.7	0.37	0.57	0.37	37.0
Approach		23	0.0	23	0.0	0.029	5.8	LOS A	0.1	0.7	0.37	0.57	0.37	39.5
East: Kings Highway (East)														
4	L2	2	0.0	2	0.0	0.109	4.6	LOS A	0.0	0.0	0.00	0.47	0.00	44.5
5	T1	189	2.2	189	2.2	0.109	3.2	LOS A	0.0	0.0	0.00	0.47	0.00	44.7
6	R2	16	0.0	16	0.0	0.109	4.6	LOS A	0.0	0.0	0.00	0.47	0.00	41.8
Approach		207	2.0	207	2.0	0.109	3.3	NA	0.0	0.0	0.00	0.47	0.00	44.5
North: Butmaroo Street														
7	L2	24	13.0	24	13.0	0.080	6.0	LOS A	0.3	2.2	0.42	0.63	0.42	35.4
8	T1	14	38.5	14	38.5	0.080	7.6	LOS A	0.3	2.2	0.42	0.63	0.42	39.9
9	R2	19	0.0	19	0.0	0.080	7.4	LOS A	0.3	2.2	0.42	0.63	0.42	39.9
Approach		57	14.8	57	14.8	0.080	6.8	LOS A	0.3	2.2	0.42	0.63	0.42	38.6
West: Kings Highway (West)														
10	L2	24	8.7	24	8.7	0.138	4.9	LOS A	0.1	0.8	0.04	0.07	0.04	47.7
11	T1	217	7.8	217	7.8	0.138	0.0	LOS A	0.1	0.8	0.04	0.07	0.04	47.7
12	R2	11	10.0	11	10.0	0.138	5.4	LOS A	0.1	0.8	0.04	0.07	0.04	46.4
Approach		252	7.9	252	7.9	0.138	0.7	NA	0.1	0.8	0.04	0.07	0.04	47.6
All Vehicles		539	6.1	539	6.1	0.138	2.6	NA	0.3	2.2	0.08	0.31	0.08	44.5

MOVEMENT SUMMARY

Site: 6 [2020_Base_AM Peak_Kings Highway and Majara Street]

Network: N101 [2020_Base_AM Network]

2020_Base_AM Peak_Kings Highway and Majara Street
Site Category: Base_2020_AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Majara (South)														
1	L2	9	0.0	9	0.0	0.060	5.4	LOS A	0.2	1.5	0.42	0.62	0.42	36.1
2	T1	24	0.0	24	0.0	0.060	6.2	LOS A	0.2	1.5	0.42	0.62	0.42	36.1
3	R2	11	0.0	11	0.0	0.060	7.5	LOS A	0.2	1.5	0.42	0.62	0.42	40.3
Approach		44	0.0	44	0.0	0.060	6.3	LOS A	0.2	1.5	0.42	0.62	0.42	37.6
East: Kings Highway (East)														
4	L2	6	0.0	6	0.0	0.129	4.6	LOS A	0.0	0.0	0.00	0.49	0.00	44.1
5	T1	178	2.4	178	2.4	0.129	3.3	LOS A	0.0	0.0	0.00	0.49	0.00	41.2
6	R2	61	1.7	61	1.7	0.129	4.6	LOS A	0.0	0.0	0.00	0.49	0.00	41.2
Approach		245	2.1	245	2.1	0.129	3.6	NA	0.0	0.0	0.00	0.49	0.00	41.3
North: Majara (North)														
7	L2	35	0.0	35	0.0	0.076	5.5	LOS A	0.3	1.9	0.36	0.60	0.36	41.2
8	T1	8	0.0	8	0.0	0.076	6.0	LOS A	0.3	1.9	0.36	0.60	0.36	41.2
9	R2	20	0.0	20	0.0	0.076	7.6	LOS A	0.3	1.9	0.36	0.60	0.36	36.3
Approach		63	0.0	63	0.0	0.076	6.3	LOS A	0.3	1.9	0.36	0.60	0.36	40.2
West: Kings Highway (West)														
10	L2	52	10.2	52	10.2	0.137	4.7	LOS A	0.1	0.4	0.02	0.12	0.02	46.9
11	T1	186	7.9	186	7.9	0.137	0.0	LOS A	0.1	0.4	0.02	0.12	0.02	48.3
12	R2	5	0.0	5	0.0	0.137	5.3	LOS A	0.1	0.4	0.02	0.12	0.02	46.2
Approach		243	8.2	243	8.2	0.137	1.1	NA	0.1	0.4	0.02	0.12	0.02	48.1
All Vehicles		596	4.2	596	4.2	0.137	3.1	NA	0.3	1.9	0.08	0.36	0.08	44.1

MOVEMENT SUMMARY

Site: 1 [2020_Base_PM Peak_ Butmaroo Street and Turallo Terrace]

Network: N101 [2020_Base_PM Network]

2020_Base_PM Peak_ Butmaroo Street and Turallo Terrace
Site Category: Base_2020_PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Butmaroo Street														
1	L2	11	0.0	11	0.0	0.029	4.7	LOS A	0.0	0.3	0.13	0.52	0.13	42.5
3	R2	22	0.0	22	0.0	0.029	4.9	LOS A	0.0	0.3	0.13	0.52	0.13	38.3
Approach		33	0.0	33	0.0	0.029	4.8	LOS A	0.0	0.3	0.13	0.52	0.13	40.2
East: Turallo Terrace (West)														
4	L2	13	0.0	13	0.0	0.024	4.6	LOS A	0.0	0.0	0.00	0.15	0.00	46.6
5	T1	34	0.0	34	0.0	0.024	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	48.2
Approach		46	0.0	46	0.0	0.024	1.2	NA	0.0	0.0	0.00	0.15	0.00	47.9
West: Turallo Terrace (West)														
11	T1	33	0.0	33	0.0	0.018	0.0	LOS A	0.0	0.0	0.02	0.03	0.02	49.0
12	R2	2	0.0	2	0.0	0.018	4.7	LOS A	0.0	0.0	0.02	0.03	0.02	49.0
Approach		35	0.0	35	0.0	0.018	0.3	NA	0.0	0.0	0.02	0.03	0.02	49.0
All Vehicles		114	0.0	114	0.0	0.029	2.0	NA	0.0	0.3	0.04	0.22	0.04	45.8

MOVEMENT SUMMARY

Site: 2 [2020_Base_PM Peak_Majara Street and Turallo Terrace]

Network: N101 [2020_Base_PM Network]

2020_Base_PM Peak_Majara Street and Turallo Terrace
Site Category: Base_2020_PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Majara Street														
1	L2	16	6.7	16	6.7	0.071	4.8	LOS A	0.1	0.8	0.16	0.54	0.16	38.4
2	T1	5	0.0	5	0.0	0.071	4.7	LOS A	0.1	0.8	0.16	0.54	0.16	19.4
3	R2	55	3.8	55	3.8	0.071	5.2	LOS A	0.1	0.8	0.16	0.54	0.16	44.2
Approach		76	4.2	76	4.2	0.071	5.1	LOS A	0.1	0.8	0.16	0.54	0.16	42.0
East: Turallo Terrace (West)														
4	L2	41	2.6	41	2.6	0.041	4.6	LOS A	0.0	0.1	0.02	0.32	0.02	46.5
5	T1	29	3.6	29	3.6	0.041	0.0	LOS A	0.0	0.1	0.02	0.32	0.02	46.5
6	R2	3	0.0	3	0.0	0.041	5.6	LOS A	0.0	0.1	0.02	0.32	0.02	40.5
Approach		74	2.9	74	2.9	0.041	2.8	NA	0.0	0.1	0.02	0.32	0.02	46.2
North: Car Park														
7	L2	5	0.0	5	0.0	0.022	2.9	LOS A	0.0	0.2	0.16	0.48	0.16	52.6
8	T1	13	0.0	13	0.0	0.022	2.2	LOS A	0.0	0.2	0.16	0.48	0.16	26.4
9	R2	6	0.0	6	0.0	0.022	3.0	LOS A	0.0	0.2	0.16	0.48	0.16	26.4
Approach		24	0.0	24	0.0	0.022	2.5	LOS A	0.0	0.2	0.16	0.48	0.16	44.2
West: Turallo Terrace (West)														
10	L2	16	0.0	16	0.0	0.030	5.6	LOS A	0.0	0.1	0.04	0.21	0.04	16.9
11	T1	36	0.0	36	0.0	0.030	0.0	LOS A	0.0	0.1	0.04	0.21	0.04	48.7
12	R2	5	0.0	5	0.0	0.030	4.8	LOS A	0.0	0.1	0.04	0.21	0.04	46.3
Approach		57	0.0	57	0.0	0.030	2.0	NA	0.0	0.1	0.04	0.21	0.04	38.9
All Vehicles		231	2.3	231	2.3	0.071	3.3	NA	0.1	0.8	0.09	0.38	0.09	42.4

MOVEMENT SUMMARY

Site: 3 [2020_Base_PM Peak Gibraltar Street and Butmaroo Street]

Network: N101 [2020_Base_PM Network]

2020_Base_PM Peak Gibraltar Street and Turallo Terrace
Site Category: Base_2020_PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Butmaroo Street														
1	L2	43	0.0	43	0.0	0.095	5.0	LOS A	0.1	1.0	0.24	0.53	0.24	42.3
2	T1	24	0.0	24	0.0	0.095	4.6	LOS A	0.1	1.0	0.24	0.53	0.24	38.0
3	R2	28	0.0	28	0.0	0.095	5.8	LOS A	0.1	1.0	0.24	0.53	0.24	38.0
Approach		96	0.0	96	0.0	0.095	5.1	LOS A	0.1	1.0	0.24	0.53	0.24	40.6
East: Gibraltar Street (East)														
4	L2	39	2.7	39	2.7	0.068	4.6	LOS A	0.0	0.0	0.00	0.49	0.00	41.2
5	T1	91	4.7	91	4.7	0.068	3.2	LOS A	0.0	0.0	0.00	0.49	0.00	44.2
6	R2	7	0.0	7	0.0	0.068	4.6	LOS A	0.0	0.0	0.00	0.49	0.00	41.2
Approach		137	3.8	137	3.8	0.068	3.7	NA	0.0	0.0	0.00	0.49	0.00	43.5
North: Butmaroo Street														
7	L2	2	0.0	2	0.0	0.018	4.9	LOS A	0.0	0.2	0.30	0.52	0.30	37.9
8	T1	7	14.3	7	14.3	0.018	4.9	LOS A	0.0	0.2	0.30	0.52	0.30	37.9
9	R2	6	0.0	6	0.0	0.018	5.8	LOS A	0.0	0.2	0.30	0.52	0.30	42.0
Approach		16	6.7	16	6.7	0.018	5.3	LOS A	0.0	0.2	0.30	0.52	0.30	40.1
West: Gibraltar Street (West)														
10	L2	3	0.0	3	0.0	0.055	5.9	LOS A	0.0	0.3	0.08	0.08	0.08	54.8
11	T1	89	1.2	89	1.2	0.055	0.1	LOS A	0.0	0.3	0.08	0.08	0.08	54.8
12	R2	13	8.3	13	8.3	0.055	5.1	LOS A	0.0	0.3	0.08	0.08	0.08	54.8
Approach		105	2.0	105	2.0	0.055	0.9	NA	0.0	0.3	0.08	0.08	0.08	54.8
All Vehicles		354	2.4	354	2.4	0.095	3.3	NA	0.1	1.0	0.10	0.38	0.10	44.5

MOVEMENT SUMMARY

Site: 4 [2020_Base_PM Peak Gibraltar Street and Majara Street]

Network: N101 [2020_Base_PM Network]

2020_Base_PM Peak Gibraltar Street and Majara Street
Site Category: Base_2020_PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Majara Street														
1	L2	44	9.5	44	9.5	0.043	4.7	LOS A	0.0	0.1	0.01	0.31	0.01	43.3
2	T1	34	6.3	34	6.3	0.043	0.0	LOS A	0.0	0.1	0.01	0.31	0.01	43.3
3	R2	2	0.0	2	0.0	0.043	5.6	LOS A	0.0	0.1	0.01	0.31	0.01	46.9
Approach		80	7.9	80	7.9	0.043	2.7	NA	0.0	0.1	0.01	0.31	0.01	43.4
East: No Name Road														
4	L2	3	0.0	3	0.0	0.028	5.6	LOS A	0.0	0.3	0.16	0.55	0.16	43.2
5	T1	14	0.0	14	0.0	0.028	4.8	LOS A	0.0	0.3	0.16	0.55	0.16	43.2
6	R2	13	0.0	13	0.0	0.028	6.0	LOS A	0.0	0.3	0.16	0.55	0.16	43.2
Approach		29	0.0	29	0.0	0.028	5.4	LOS A	0.0	0.3	0.16	0.55	0.16	43.2
North: Majara Street														
7	L2	15	0.0	15	0.0	0.031	5.7	LOS A	0.0	0.3	0.14	0.32	0.14	47.2
8	T1	21	5.0	21	5.0	0.031	0.1	LOS A	0.0	0.3	0.14	0.32	0.14	42.4
9	R2	20	0.0	20	0.0	0.031	4.8	LOS A	0.0	0.3	0.14	0.32	0.14	42.4
Approach		56	1.9	56	1.9	0.031	3.3	NA	0.0	0.3	0.14	0.32	0.14	44.3
West: Gibraltar Street (West)														
10	L2	26	0.0	26	0.0	0.066	4.7	LOS A	0.1	0.7	0.14	0.53	0.14	39.1
11	T1	6	0.0	6	0.0	0.066	4.8	LOS A	0.1	0.7	0.14	0.53	0.14	45.3
12	R2	37	0.0	37	0.0	0.066	5.1	LOS A	0.1	0.7	0.14	0.53	0.14	39.1
12u	U	4	0.0	4	0.0	0.066	6.8	LOS A	0.1	0.7	0.14	0.53	0.14	39.1
Approach		74	0.0	74	0.0	0.066	5.0	LOS A	0.1	0.7	0.14	0.53	0.14	40.0
All Vehicles		239	3.1	239	3.1	0.066	3.9	NA	0.1	0.7	0.10	0.41	0.10	42.5

MOVEMENT SUMMARY

Site: 5 [2020_Base_PM Peak Butmaroo Street and Kings Highway]

Network: N101 [2020_Base_PM Network]

2020_Base_PM Peak Butmaroo Street and Kings Highway
Site Category: Base_2020_PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Butmaroo Street														
1	L2	8	0.0	8	0.0	0.049	5.7	LOS A	0.1	0.6	0.46	0.63	0.46	39.9
2	T1	12	0.0	12	0.0	0.049	6.6	LOS A	0.1	0.6	0.46	0.63	0.46	34.4
3	R2	8	75.0	8	75.0	0.049	11.9	LOS A	0.1	0.6	0.46	0.63	0.46	34.4
Approach		28	22.2	28	22.2	0.049	7.9	LOS A	0.1	0.6	0.46	0.63	0.46	36.7
East: Kings Highway (East)														
4	L2	1	100.0	1	100.0	0.128	5.0	LOS A	0.0	0.0	0.00	0.47	0.00	43.0
5	T1	214	8.4	214	8.4	0.128	3.2	LOS A	0.0	0.0	0.00	0.47	0.00	44.5
6	R2	20	0.0	20	0.0	0.128	4.6	LOS A	0.0	0.0	0.00	0.47	0.00	41.8
Approach		235	8.1	235	8.1	0.128	3.4	NA	0.0	0.0	0.00	0.47	0.00	44.4
North: Butmaroo Street														
7	L2	23	9.1	23	9.1	0.083	6.0	LOS A	0.1	0.9	0.43	0.65	0.43	35.2
8	T1	13	8.3	13	8.3	0.083	6.9	LOS A	0.1	0.9	0.43	0.65	0.43	40.3
9	R2	24	0.0	24	0.0	0.083	7.9	LOS A	0.1	0.9	0.43	0.65	0.43	39.8
Approach		60	5.3	60	5.3	0.083	7.0	LOS A	0.1	0.9	0.43	0.65	0.43	38.7
West: Kings Highway (West)														
10	L2	63	0.0	63	0.0	0.164	4.7	LOS A	0.1	0.4	0.05	0.13	0.05	46.2
11	T1	227	5.6	227	5.6	0.164	0.1	LOS A	0.1	0.4	0.05	0.13	0.05	46.2
12	R2	13	8.3	13	8.3	0.164	5.6	LOS A	0.1	0.4	0.05	0.13	0.05	45.7
Approach		303	4.5	303	4.5	0.164	1.3	NA	0.1	0.4	0.05	0.13	0.05	46.2
All Vehicles		626	6.7	626	6.7	0.164	2.9	NA	0.1	0.9	0.09	0.33	0.09	43.9

MOVEMENT SUMMARY

Site: 6 [2020_Base_PM Peak_Kings Highway and Majara Street]

Network: N101 [2020_Base_PM Network]

2020_Base_PM Peak_Kings Highway and Majara Street
Site Category: Base_2020_PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Majara (South)														
1	L2	16	0.0	16	0.0	0.062	5.6	LOS A	0.1	0.6	0.41	0.61	0.41	36.1
2	T1	24	4.3	24	4.3	0.062	6.5	LOS A	0.1	0.6	0.41	0.61	0.41	36.1
3	R2	5	0.0	5	0.0	0.062	7.9	LOS A	0.1	0.6	0.41	0.61	0.41	40.3
Approach		45	2.3	45	2.3	0.062	6.3	LOS A	0.1	0.6	0.41	0.61	0.41	36.9
East: Kings Highway (East)														
4	L2	5	0.0	5	0.0	0.129	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	44.2
5	T1	194	9.8	194	9.8	0.129	3.3	LOS A	0.0	0.0	0.00	0.48	0.00	41.4
6	R2	39	0.0	39	0.0	0.129	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	41.4
Approach		238	8.0	238	8.0	0.129	3.6	NA	0.0	0.0	0.00	0.48	0.00	41.5
North: Majara (North)														
7	L2	48	4.3	48	4.3	0.130	5.8	LOS A	0.2	1.4	0.41	0.64	0.41	40.9
8	T1	27	0.0	27	0.0	0.130	6.4	LOS A	0.2	1.4	0.41	0.64	0.41	40.9
9	R2	25	0.0	25	0.0	0.130	8.0	LOS A	0.2	1.4	0.41	0.64	0.41	35.9
Approach		101	2.1	101	2.1	0.130	6.5	LOS A	0.2	1.4	0.41	0.64	0.41	40.1
West: Kings Highway (West)														
10	L2	43	9.8	43	9.8	0.145	4.7	LOS A	0.0	0.1	0.01	0.10	0.01	47.6
11	T1	213	7.9	213	7.9	0.145	0.0	LOS A	0.0	0.1	0.01	0.10	0.01	48.7
12	R2	3	0.0	3	0.0	0.145	5.4	LOS A	0.0	0.1	0.01	0.10	0.01	46.5
Approach		259	8.1	259	8.1	0.145	0.9	NA	0.0	0.1	0.01	0.10	0.01	48.6
All Vehicles		643	6.7	643	6.7	0.145	3.1	NA	0.2	1.4	0.10	0.36	0.10	44.2

MOVEMENT SUMMARY

Site: 1 [2023_Future Build_AM Peak_ Butmaroo Street and Turallo Terrace (Site Folder: General)]

Network: N101 [2023 AM Peak (Network Folder: General)]

2023_Future_AM Peak_ Butmaroo Street and Turallo Terrace
Site Category: 2023_Future_AM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	34	3.1	34	3.1	0.077	6.0	LOS A	0.1	0.8	0.25	0.58	0.25	45.7
3	R2	56	1.9	56	1.9	0.077	6.3	LOS A	0.1	0.8	0.25	0.58	0.25	40.9
Approach		89	2.4	89	2.4	0.077	6.2	LOS A	0.1	0.8	0.25	0.58	0.25	43.4
East: Turallo Terrace														
4	L2	81	1.3	81	1.3	0.109	4.9	LOS A	0.0	0.0	0.00	0.27	0.00	47.1
5	T1	125	0.8	125	0.8	0.109	0.4	LOS A	0.0	0.0	0.00	0.27	0.00	51.0
Approach		206	1.0	206	1.0	0.109	2.2	NA	0.0	0.0	0.00	0.27	0.00	50.0
West: Turallo Terrace														
11	T1	34	0.0	34	0.0	0.033	0.4	LOS A	0.1	0.4	0.24	0.23	0.24	44.8
12	R2	22	0.0	22	0.0	0.033	6.1	LOS A	0.1	0.4	0.24	0.23	0.24	44.8
Approach		56	0.0	56	0.0	0.033	2.6	NA	0.1	0.4	0.24	0.23	0.24	44.8
All Vehicles		352	1.2	352	1.2	0.109	3.3	NA	0.1	0.8	0.10	0.34	0.10	47.6

MOVEMENT SUMMARY

Site: 2-A [2023_Future Build_AM Peak_Majara Street and Turallo Terrace - Conversion (One Way) (Site Folder: General)]

Network: N101 [2023 AM Peak (Network Folder: General)]

2023_Future_AM Peak_Majara Street and Turallo Terrace (One Way)
Site Category: 2023_Future_AM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Turallo Terrace (West)														
5	T1	129	0.8	129	0.8	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		129	0.8	129	0.8	0.069	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West: Turallo Terrace (West)														
11	T1	63	0.0	63	0.0	0.033	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		63	0.0	63	0.0	0.033	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
All Vehicles		193	0.5	193	0.5	0.069	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0

MOVEMENT SUMMARY

Site: 3v [2023_Future Build_AM Peak Gibraltar Street and Butmaroo Street - Conversion (Roundabout) (Site Folder: General)]

Network: N101 [2023 AM Peak (Network Folder: General)]

2023_Future_AM Peak Gibraltar Street and Turallo Terrace
Site Category: 2023_Future_AM Peak
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	39	5.4	39	5.4	0.188	5.1	LOS A	0.5	3.3	0.51	0.64	0.51	40.0
2	T1	9	11.1	9	11.1	0.188	5.2	LOS A	0.5	3.3	0.51	0.64	0.51	34.6
3	R2	144	0.0	144	0.0	0.188	9.0	LOS A	0.5	3.3	0.51	0.64	0.51	34.6
Approach		193	1.6	193	1.6	0.188	8.0	LOS A	0.5	3.3	0.51	0.64	0.51	36.2
East: Gibraltar Street (East)														
4	L2	40	15.8	40	15.8	0.126	3.3	LOS A	0.0	0.0	0.00	0.43	0.00	41.3
5	T1	167	1.3	167	1.3	0.126	3.1	LOS A	0.0	0.0	0.00	0.43	0.00	46.4
6	R2	44	0.0	44	0.0	0.126	7.1	LOS A	0.0	0.0	0.00	0.43	0.00	41.3
Approach		252	3.3	252	3.3	0.126	3.8	LOS A	0.0	0.0	0.00	0.43	0.00	45.2
North: Butmaroo Street														
7	L2	21	0.0	21	0.0	0.107	4.9	LOS A	0.2	1.7	0.50	0.61	0.50	35.4
8	T1	29	3.6	29	3.6	0.107	5.0	LOS A	0.2	1.7	0.50	0.61	0.50	35.4
9	R2	57	0.0	57	0.0	0.107	9.0	LOS A	0.2	1.7	0.50	0.61	0.50	42.4
Approach		107	1.0	107	1.0	0.107	7.1	LOS A	0.2	1.7	0.50	0.61	0.50	39.9
West: Gibraltar Street West)														
10	L2	23	4.5	23	4.5	0.166	5.1	LOS A	0.3	2.4	0.37	0.52	0.37	41.9
11	T1	156	2.7	156	2.7	0.166	5.3	LOS A	0.3	2.4	0.37	0.52	0.37	41.9
12	R2	8	12.5	8	12.5	0.166	8.2	LOS A	0.3	2.4	0.37	0.52	0.37	41.9
Approach		187	3.4	187	3.4	0.166	5.4	LOS A	0.3	2.4	0.37	0.52	0.37	41.9
All Vehicles		739	2.6	739	2.6	0.188	5.8	LOS A	0.5	3.3	0.30	0.53	0.30	41.3

MOVEMENT SUMMARY

Site: 4-A [2023_Future Build_AM Peak Gibraltar Street and Majara Street - Conversion (Roundabout) (Site Folder: General)]

Network: N101 [2023 AM Peak (Network Folder: General)]

2023_Future_AM Peak Gibraltar Street and Majara Street (Roundabout)
Site Category: 2023_Future_AM Peak
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Majara Street														
1	L2	121	6.1	121	6.1	0.090	3.1	LOS A	0.0	0.0	0.00	0.42	0.00	42.2
2	T1	47	0.0	47	0.0	0.090	3.1	LOS A	0.0	0.0	0.00	0.42	0.00	47.2
3	R2	1	0.0	1	0.0	0.090	7.2	LOS A	0.0	0.0	0.00	0.42	0.00	47.4
Approach		169	4.3	169	4.3	0.090	3.2	LOS A	0.0	0.0	0.00	0.42	0.00	44.3
East: No Name Road														
4	L2	1	0.0	1	0.0	0.014	5.4	LOS A	0.0	0.2	0.44	0.48	0.44	41.2
5	T1	13	0.0	13	0.0	0.014	5.7	LOS A	0.0	0.2	0.44	0.48	0.44	41.2
6	R2	1	0.0	1	0.0	0.014	9.8	LOS A	0.0	0.2	0.44	0.48	0.44	48.1
Approach		15	0.0	15	0.0	0.014	6.0	LOS A	0.0	0.2	0.44	0.48	0.44	42.0
North: Majara Street														
7	L2	1	0.0	1	0.0	0.003	5.3	LOS A	0.0	0.0	0.41	0.49	0.41	44.6
8	T1	1	0.0	1	0.0	0.003	4.3	LOS A	0.0	0.0	0.41	0.49	0.41	38.0
9	R2	1	0.0	1	0.0	0.003	8.4	LOS A	0.0	0.0	0.41	0.49	0.41	38.0
Approach		3	0.0	3	0.0	0.003	6.0	LOS A	0.0	0.0	0.41	0.49	0.41	41.0
West: Gibraltar Street (West)														
10	L2	1	0.0	1	0.0	0.173	3.3	LOS A	0.3	2.2	0.15	0.60	0.15	40.8
11	T1	12	0.0	12	0.0	0.173	4.5	LOS A	0.3	2.2	0.15	0.60	0.15	44.3
12	R2	200	0.5	200	0.5	0.173	7.3	LOS A	0.3	2.2	0.15	0.60	0.15	36.1
12u	U	32	0.0	32	0.0	0.173	10.6	LOS A	0.3	2.2	0.15	0.60	0.15	36.1
Approach		244	0.4	244	0.4	0.173	7.6	LOS A	0.3	2.2	0.15	0.60	0.15	36.7
All Vehicles		432	2.0	432	2.0	0.173	5.8	LOS A	0.3	2.2	0.10	0.52	0.10	39.6

MOVEMENT SUMMARY

Site: 5 [2023_Future Build_AM Peak Butmaroo Street and Kings Highway (Site Folder: General)]

Network: N101 [2023 AM Peak (Network Folder: General)]

2023_Future_AM Peak Butmaroo Street and Kings Highway
Site Category: 2023_Future_AM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	11	0.0	11	0.0	0.125	6.3	LOS A	0.2	1.2	0.58	0.76	0.58	38.6
2	T1	51	2.1	51	2.1	0.125	9.3	LOS A	0.2	1.2	0.58	0.76	0.58	32.5
3	R2	2	0.0	2	0.0	0.125	10.8	LOS A	0.2	1.2	0.58	0.76	0.58	32.5
Approach		63	1.7	63	1.7	0.125	8.9	LOS A	0.2	1.2	0.58	0.76	0.58	34.0
East: Kings Highway (East)														
4	L2	17	0.0	17	0.0	0.229	4.6	LOS A	0.0	0.0	0.00	0.49	0.00	44.1
5	T1	308	1.7	308	1.7	0.229	3.2	LOS A	0.0	0.0	0.00	0.49	0.00	44.3
6	R2	109	0.0	109	0.0	0.229	4.6	LOS A	0.0	0.0	0.00	0.49	0.00	41.2
Approach		435	1.2	435	1.2	0.229	3.6	NA	0.0	0.0	0.00	0.49	0.00	43.8
North: Butmaroo Street														
7	L2	26	16.0	26	16.0	0.163	6.6	LOS A	0.2	1.8	0.55	0.74	0.55	31.7
8	T1	35	18.2	35	18.2	0.163	11.0	LOS A	0.2	1.8	0.55	0.74	0.55	37.7
9	R2	20	0.0	20	0.0	0.163	11.0	LOS A	0.2	1.8	0.55	0.74	0.55	37.5
Approach		81	13.0	81	13.0	0.163	9.6	LOS A	0.2	1.8	0.55	0.74	0.55	36.3
West: Kings Highway (West)														
10	L2	25	8.3	25	8.3	0.174	5.2	LOS A	0.1	0.4	0.06	0.06	0.06	47.9
11	T1	279	7.2	279	7.2	0.174	0.1	LOS A	0.1	0.4	0.06	0.06	0.06	47.9
12	R2	12	9.1	12	9.1	0.174	6.1	LOS A	0.1	0.4	0.06	0.06	0.06	46.5
Approach		316	7.3	316	7.3	0.174	0.7	NA	0.1	0.4	0.06	0.06	0.06	47.8
All Vehicles		895	4.5	895	4.5	0.229	3.5	NA	0.2	1.8	0.11	0.38	0.11	43.1

MOVEMENT SUMMARY

Site: 6 [2023_Future Build_AM Peak_Kings Highway and Majara Street (Site Folder: General)]

Network: N101 [2023 AM Peak (Network Folder: General)]

2023_Future_AM Peak_Kings Highway and Majara Street
Site Category: 2023_Future_AM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Majara (South)														
1	L2	17	0.0	17	0.0	0.089	6.0	LOS A	0.1	0.9	0.49	0.70	0.49	34.1
2	T1	26	4.0	26	4.0	0.089	8.2	LOS A	0.1	0.9	0.49	0.70	0.49	34.1
3	R2	12	0.0	12	0.0	0.089	9.0	LOS A	0.1	0.9	0.49	0.70	0.49	39.0
Approach		55	1.9	55	1.9	0.089	7.7	LOS A	0.1	0.9	0.49	0.70	0.49	35.7
East: Kings Highway (East)														
4	L2	6	0.0	6	0.0	0.182	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	44.2
5	T1	276	1.9	276	1.9	0.182	3.3	LOS A	0.0	0.0	0.00	0.48	0.00	41.4
6	R2	64	1.6	64	1.6	0.182	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	41.4
Approach		346	1.8	346	1.8	0.182	3.6	NA	0.0	0.0	0.00	0.48	0.00	41.5
North: Majara (North)														
7	L2	72	0.0	72	0.0	0.347	6.4	LOS A	0.7	4.7	0.52	0.78	0.63	38.4
8	T1	12	0.0	12	0.0	0.347	8.9	LOS A	0.7	4.7	0.52	0.78	0.63	38.3
9	R2	143	0.0	143	0.0	0.347	10.6	LOS A	0.7	4.7	0.52	0.78	0.63	32.1
Approach		226	0.0	226	0.0	0.347	9.2	LOS A	0.7	4.7	0.52	0.78	0.63	35.2
West: Kings Highway (West)														
10	L2	103	6.1	103	6.1	0.175	4.7	LOS A	0.0	0.2	0.02	0.19	0.02	45.4
11	T1	200	8.9	200	8.9	0.175	0.0	LOS A	0.0	0.2	0.02	0.19	0.02	47.5
12	R2	5	0.0	5	0.0	0.175	5.8	LOS A	0.0	0.2	0.02	0.19	0.02	45.4
Approach		308	7.8	308	7.8	0.175	1.7	NA	0.0	0.2	0.02	0.19	0.02	47.0
All Vehicles		936	3.4	936	3.4	0.347	4.6	NA	0.7	4.7	0.16	0.47	0.19	41.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

MOVEMENT SUMMARY

Site: 1 [2023_Future Build_PM Peak_ Butmaroo Street and Turallo Terrace (Site Folder: General)]

Network: N101 [2023 PM Peak (Network Folder: General)]

2023_Future_PM Peak_ Butmaroo Street and Turallo Terrace
Site Category: 2023_Future_PM Peak
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	37	0.0	37	0.0	0.103	5.8	LOS A	0.1	1.1	0.22	0.58	0.22	46.4
3	R2	85	2.5	85	2.5	0.103	6.2	LOS A	0.1	1.1	0.22	0.58	0.22	41.1
Approach		122	1.7	122	1.7	0.103	6.1	LOS A	0.1	1.1	0.22	0.58	0.22	43.4
East: Turallo Terrace (West)														
4	L2	76	0.0	76	0.0	0.087	5.0	LOS A	0.0	0.0	0.00	0.31	0.00	46.7
5	T1	89	0.0	89	0.0	0.087	0.4	LOS A	0.0	0.0	0.00	0.31	0.00	51.0
Approach		165	0.0	165	0.0	0.087	2.5	NA	0.0	0.0	0.00	0.31	0.00	49.6
West: Turallo Terrace (West)														
11	T1	48	0.0	48	0.0	0.030	0.1	LOS A	0.0	0.1	0.08	0.08	0.08	48.1
12	R2	7	0.0	7	0.0	0.030	5.9	LOS A	0.0	0.1	0.08	0.08	0.08	48.1
Approach		56	0.0	56	0.0	0.030	0.9	NA	0.0	0.1	0.08	0.08	0.08	48.1
All Vehicles		343	0.6	343	0.6	0.103	3.5	NA	0.1	1.1	0.09	0.37	0.09	47.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

MOVEMENT SUMMARY

Site: 2-A [2023_Future Build_PM Peak_Majara Street and Turallo Terrace - Conversion (One Way) (Site Folder: General)]

Network: N101 [2023 PM Peak (Network Folder: General)]

2023_Future_PM Peak_Majara Street and Turallo Terrace (One Way)
Site Category: 2023_Future_PM Peak
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Turallo Terrace (West)														
5	T1	88	1.2	88	1.2	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		88	1.2	88	1.2	0.047	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West: Turallo Terrace (West)														
11	T1	52	0.0	52	0.0	0.027	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		52	0.0	52	0.0	0.027	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
All Vehicles		140	0.8	140	0.8	0.047	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

MOVEMENT SUMMARY

Site: 3v [2023_Future Build_PM Peak Gibraltar Street and Butmaroo Street - Conversion (Roundabout) (Site Folder: General)]

Network: N101 [2023 PM Peak (Network Folder: General)]

2023_Future_PM Peak Gibraltar Street and Turallo Terrace
Site Category: 2023_Future_PM Peak
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	45	0.0	45	0.0	0.200	4.7	LOS A	0.5	3.4	0.48	0.62	0.48	40.5
2	T1	25	0.0	25	0.0	0.200	4.8	LOS A	0.5	3.4	0.48	0.62	0.48	35.1
3	R2	142	0.0	142	0.0	0.200	8.8	LOS A	0.5	3.4	0.48	0.62	0.48	35.1
Approach		213	0.0	213	0.0	0.200	7.5	LOS A	0.5	3.4	0.48	0.62	0.48	36.8
East: Gibraltar Street (East)														
4	L2	62	1.7	62	1.7	0.135	3.2	LOS A	0.0	0.0	0.00	0.46	0.00	40.7
5	T1	138	3.8	138	3.8	0.135	3.1	LOS A	0.0	0.0	0.00	0.46	0.00	46.0
6	R2	67	3.1	67	3.1	0.135	7.2	LOS A	0.0	0.0	0.00	0.46	0.00	40.7
Approach		267	3.1	267	3.1	0.135	4.2	LOS A	0.0	0.0	0.00	0.46	0.00	44.1
North: Butmaroo Street														
7	L2	20	0.0	20	0.0	0.084	4.7	LOS A	0.2	1.3	0.48	0.57	0.48	36.3
8	T1	34	3.1	34	3.1	0.084	4.8	LOS A	0.2	1.3	0.48	0.57	0.48	36.3
9	R2	32	0.0	32	0.0	0.084	8.8	LOS A	0.2	1.3	0.48	0.57	0.48	43.1
Approach		85	1.2	85	1.2	0.084	6.3	LOS A	0.2	1.3	0.48	0.57	0.48	39.6
West: Gibraltar Street (West)														
10	L2	32	0.0	32	0.0	0.162	5.2	LOS A	0.3	2.3	0.40	0.54	0.40	41.5
11	T1	136	0.8	136	0.8	0.162	5.4	LOS A	0.3	2.3	0.40	0.54	0.40	41.5
12	R2	14	7.7	14	7.7	0.162	8.3	LOS A	0.3	2.3	0.40	0.54	0.40	41.5
Approach		181	1.2	181	1.2	0.162	5.6	LOS A	0.3	2.3	0.40	0.54	0.40	41.5
All Vehicles		746	1.6	746	1.6	0.200	5.7	LOS A	0.5	3.4	0.29	0.54	0.29	40.9

MOVEMENT SUMMARY

Site: 4-A [2023_Future Build_PM Peak Gibraltar Street and Majara Street - Conversion (Roundabout) (Site Folder: General)]

Network: N101 [2023 PM Peak (Network Folder: General)]

2023_Future_PM Peak Gibraltar Street and Majara Street (Roundabout)
Site Category: 2023_Future_PM Peak
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Majara Street														
1	L2	83	8.9	83	8.9	0.074	3.8	LOS A	0.2	1.2	0.29	0.45	0.29	39.8
2	T1	1	0.0	1	0.0	0.074	3.7	LOS A	0.2	1.2	0.29	0.45	0.29	45.7
3	R2	2	0.0	2	0.0	0.074	9.0	LOS A	0.2	1.2	0.29	0.45	0.29	47.7
Approach		86	8.5	86	8.5	0.074	3.9	LOS A	0.2	1.2	0.29	0.45	0.29	40.2
East: No Name Road														
4	L2	3	0.0	3	0.0	0.031	5.5	LOS A	0.1	0.5	0.44	0.50	0.44	41.4
5	T1	28	0.0	28	0.0	0.031	5.8	LOS A	0.1	0.5	0.44	0.50	0.44	41.4
6	R2	1	0.0	1	0.0	0.031	10.0	LOS A	0.1	0.5	0.44	0.50	0.44	48.3
Approach		33	0.0	33	0.0	0.031	5.9	LOS A	0.1	0.5	0.44	0.50	0.44	41.7
North: Majara Street														
7	L2	1	0.0	1	0.0	0.044	5.3	LOS A	0.1	0.6	0.39	0.56	0.39	42.7
8	T1	16	0.0	16	0.0	0.044	4.3	LOS A	0.1	0.6	0.39	0.56	0.39	35.7
9	R2	32	0.0	32	0.0	0.044	8.3	LOS A	0.1	0.6	0.39	0.56	0.39	35.7
Approach		48	0.0	48	0.0	0.044	7.0	LOS A	0.1	0.6	0.39	0.56	0.39	35.9
West: Gibraltar Street (West)														
10	L2	1	0.0	1	0.0	0.134	3.1	LOS A	0.3	1.8	0.03	0.62	0.03	41.7
11	T1	24	0.0	24	0.0	0.134	4.3	LOS A	0.3	1.8	0.03	0.62	0.03	45.3
12	R2	152	0.0	152	0.0	0.134	7.1	LOS A	0.3	1.8	0.03	0.62	0.03	37.3
12u	U	45	0.0	45	0.0	0.134	10.4	LOS A	0.3	1.8	0.03	0.62	0.03	37.3
Approach		222	0.0	222	0.0	0.134	7.5	LOS A	0.3	1.8	0.03	0.62	0.03	38.6
All Vehicles		389	1.9	389	1.9	0.134	6.5	LOS A	0.3	1.8	0.17	0.57	0.17	38.8

MOVEMENT SUMMARY

Site: 5 [2023_Future Build_PM Peak Butmaroo Street and Kings Highway (Site Folder: General)]

Network: N101 [2023 PM Peak (Network Folder: General)]

2023_Future_PM Peak Butmaroo Street and Kings Highway
Site Category: 2023_Future_PM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	8	0.0	8	0.0	0.132	5.9	LOS A	0.2	1.4	0.57	0.76	0.57	38.2
2	T1	44	0.0	44	0.0	0.132	8.4	LOS A	0.2	1.4	0.57	0.76	0.57	31.9
3	R2	9	77.8	9	77.8	0.132	18.1	LOS B	0.2	1.4	0.57	0.76	0.57	31.9
Approach		62	11.9	62	11.9	0.132	9.6	LOS A	0.2	1.4	0.57	0.76	0.57	33.2
East: Kings Highway (East)														
4	L2	34	3.1	34	3.1	0.206	4.6	LOS A	0.0	0.0	0.00	0.50	0.00	43.9
5	T1	244	8.6	244	8.6	0.206	3.3	LOS A	0.0	0.0	0.00	0.50	0.00	44.0
6	R2	101	0.0	101	0.0	0.206	4.6	LOS A	0.0	0.0	0.00	0.50	0.00	41.0
Approach		379	5.8	379	5.8	0.206	3.7	NA	0.0	0.0	0.00	0.50	0.00	43.5
North: Butmaroo Street														
7	L2	42	5.0	42	5.0	0.211	6.1	LOS A	0.3	2.2	0.51	0.72	0.51	33.5
8	T1	60	1.8	60	1.8	0.211	8.8	LOS A	0.3	2.2	0.51	0.72	0.51	39.2
9	R2	25	0.0	25	0.0	0.211	10.1	LOS A	0.3	2.2	0.51	0.72	0.51	38.7
Approach		127	2.5	127	2.5	0.211	8.2	LOS A	0.3	2.2	0.51	0.72	0.51	37.8
West: Kings Highway (West)														
10	L2	67	0.0	67	0.0	0.176	4.8	LOS A	0.1	0.5	0.06	0.13	0.06	46.1
11	T1	242	6.1	242	6.1	0.176	0.1	LOS A	0.1	0.5	0.06	0.13	0.06	46.1
12	R2	14	7.7	14	7.7	0.176	5.9	LOS A	0.1	0.5	0.06	0.13	0.06	45.7
Approach		323	4.9	323	4.9	0.176	1.3	NA	0.1	0.5	0.06	0.13	0.06	46.1
All Vehicles		892	5.4	892	5.4	0.211	3.9	NA	0.3	2.2	0.14	0.41	0.14	42.4

MOVEMENT SUMMARY

Site: 6 [2023_Future Build_PM Peak_Kings Highway and Majara Street (Site Folder: General)]

Network: N101 [2023 PM Peak (Network Folder: General)]

2023_Future_PM Peak_Kings Highway and Majara Street
Site Category: 2023_Future_PM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Majara (South)														
1	L2	23	0.0	23	0.0	0.093	6.8	LOS A	0.1	0.9	0.53	0.72	0.53	33.4
2	T1	25	4.2	25	4.2	0.093	8.9	LOS A	0.1	0.9	0.53	0.72	0.53	33.4
3	R2	5	0.0	5	0.0	0.093	11.1	LOS A	0.1	0.9	0.53	0.72	0.53	38.6
Approach		54	2.0	54	2.0	0.093	8.2	LOS A	0.1	0.9	0.53	0.72	0.53	34.2
East: Kings Highway (East)														
4	L2	6	0.0	6	0.0	0.222	4.6	LOS A	0.0	0.0	0.00	0.47	0.00	44.3
5	T1	363	6.4	363	6.4	0.222	3.3	LOS A	0.0	0.0	0.00	0.47	0.00	41.5
6	R2	46	0.0	46	0.0	0.222	4.6	LOS A	0.0	0.0	0.00	0.47	0.00	41.5
Approach		416	5.6	416	5.6	0.222	3.5	NA	0.0	0.0	0.00	0.47	0.00	41.6
North: Majara (North)														
7	L2	125	1.7	125	1.7	0.352	6.7	LOS A	0.7	4.8	0.50	0.75	0.60	38.7
8	T1	35	0.0	35	0.0	0.352	10.1	LOS A	0.7	4.8	0.50	0.75	0.60	38.6
9	R2	75	0.0	75	0.0	0.352	11.9	LOS A	0.7	4.8	0.50	0.75	0.60	32.6
Approach		235	0.9	235	0.9	0.352	8.9	LOS A	0.7	4.8	0.50	0.75	0.60	37.3
West: Kings Highway (West)														
10	L2	46	11.4	46	11.4	0.157	4.8	LOS A	0.0	0.1	0.02	0.10	0.02	47.5
11	T1	227	8.8	227	8.8	0.157	0.0	LOS A	0.0	0.1	0.02	0.10	0.02	48.7
12	R2	3	0.0	3	0.0	0.157	6.3	LOS A	0.0	0.1	0.02	0.10	0.02	46.5
Approach		277	9.1	277	9.1	0.157	0.9	NA	0.0	0.1	0.02	0.10	0.02	48.6
All Vehicles		981	5.3	981	5.3	0.352	4.3	NA	0.7	4.8	0.15	0.44	0.18	42.1

MOVEMENT SUMMARY

Site: 1 [2033_Future Build_AM Peak_ Butmaroo Street and Turallo Terrace (Site Folder: General)] — **Network: N101 [2033 AM Peak (Network Folder: General)]**

2033_Future Build_AM Peak_ Butmaroo Street and Turallo Terrace
Site Category: 2033_Future Build_AM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	26	4.0	26	4.0	0.087	6.2	LOS A	0.1	0.9	0.31	0.62	0.31	45.2
3	R2	65	1.6	65	1.6	0.087	6.7	LOS A	0.1	0.9	0.31	0.62	0.31	40.4
Approach		92	2.3	92	2.3	0.087	6.6	LOS A	0.1	0.9	0.31	0.62	0.31	42.4
East: Turallo Terrace														
4	L2	97	1.1	97	1.1	0.146	4.9	LOS A	0.0	0.0	0.00	0.24	0.00	47.4
5	T1	180	0.6	180	0.6	0.146	0.3	LOS A	0.0	0.0	0.00	0.24	0.00	51.0
Approach		277	0.8	277	0.8	0.146	1.9	NA	0.0	0.0	0.00	0.24	0.00	50.2
West: Turallo Terrace														
11	T1	51	0.0	51	0.0	0.046	0.5	LOS A	0.1	0.5	0.26	0.21	0.26	44.9
12	R2	26	0.0	26	0.0	0.046	6.3	LOS A	0.1	0.5	0.26	0.21	0.26	44.9
Approach		77	0.0	77	0.0	0.046	2.5	NA	0.1	0.5	0.26	0.21	0.26	44.9
All Vehicles		445	0.9	445	0.9	0.146	3.0	NA	0.1	0.9	0.11	0.31	0.11	48.0

MOVEMENT SUMMARY

Site: 2-A [2033_Future Build_AM Peak_Majara Street and Turallo Terrace - Conversion (One Way) (Site Folder: General)] — **Network: N101 [2033 AM Peak (Network Folder: General)]**

2033_Future Build_AM Peak_Majara Street and Turallo Terrace (One Way)
Site Category: 2033_Future Build_AM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Turallo Terrace (West)														
5	T1	183	0.6	183	0.6	0.097	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		183	0.6	183	0.6	0.097	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West: Turallo Terrace (West)														
11	T1	85	0.0	85	0.0	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		85	0.0	85	0.0	0.044	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
All Vehicles		268	0.4	268	0.4	0.097	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0

MOVEMENT SUMMARY

Site: 3v [2033_Future Build_AM Peak Gibraltar Street and Butmaroo Street - Conversion (Roundabout) (Site Folder: General)] — **Network: N101 [2033 AM Peak (Network Folder: General)]**

2033_Future Build_AM Peak Gibraltar Street and Turallo Terrace
Site Category: 2033_Future Build_AM Peak
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	28	7.4	28	7.4	0.180	5.0	LOS A	0.4	3.1	0.49	0.64	0.49	39.9
2	T1	12	9.1	12	9.1	0.180	5.1	LOS A	0.4	3.1	0.49	0.64	0.49	34.5
3	R2	146	0.0	146	0.0	0.180	9.0	LOS A	0.4	3.1	0.49	0.64	0.49	34.5
Approach		186	1.7	186	1.7	0.180	8.1	LOS A	0.4	3.1	0.49	0.64	0.49	35.7
East: Gibraltar Street (East)														
4	L2	44	14.3	44	14.3	0.141	3.2	LOS A	0.0	0.0	0.00	0.43	0.00	41.3
5	T1	186	1.1	186	1.1	0.141	3.1	LOS A	0.0	0.0	0.00	0.43	0.00	46.4
6	R2	51	0.0	51	0.0	0.141	7.1	LOS A	0.0	0.0	0.00	0.43	0.00	41.3
Approach		281	3.0	281	3.0	0.141	3.9	LOS A	0.0	0.0	0.00	0.43	0.00	45.2
North: Butmaroo Street														
7	L2	67	0.0	67	0.0	0.128	5.1	LOS A	0.3	2.1	0.52	0.59	0.52	36.8
8	T1	35	3.0	35	3.0	0.128	5.2	LOS A	0.3	2.1	0.52	0.59	0.52	36.8
9	R2	24	0.0	24	0.0	0.128	9.2	LOS A	0.3	2.1	0.52	0.59	0.52	43.6
Approach		126	0.8	126	0.8	0.128	5.9	LOS A	0.3	2.1	0.52	0.59	0.52	38.7
West: Gibraltar Street West)														
10	L2	27	3.8	27	3.8	0.190	5.2	LOS A	0.4	2.8	0.39	0.53	0.39	41.8
11	T1	176	2.4	176	2.4	0.190	5.3	LOS A	0.4	2.8	0.39	0.53	0.39	41.8
12	R2	11	10.0	11	10.0	0.190	8.3	LOS A	0.4	2.8	0.39	0.53	0.39	41.8
Approach		214	3.0	214	3.0	0.190	5.5	LOS A	0.4	2.8	0.39	0.53	0.39	41.8
All Vehicles		807	2.3	807	2.3	0.190	5.6	LOS A	0.4	3.1	0.30	0.53	0.30	41.2

MOVEMENT SUMMARY

Site: 4-A [2033_Future Build_AM Peak Gibraltar Street and Majara Street - Conversion (Roundabout) (Site Folder: General)] **Network: N101 [2033 AM Peak (Network Folder: General)]**

2033_Future Build_AM Peak Gibraltar Street and Majara Street (Roundabout)
Site Category: 2033_Future Build_AM Peak
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Majara Street														
1	L2	143	5.1	143	5.1	0.101	3.1	LOS A	0.0	0.0	0.00	0.42	0.00	42.2
2	T1	47	0.0	47	0.0	0.101	3.1	LOS A	0.0	0.0	0.00	0.42	0.00	47.2
3	R2	1	0.0	1	0.0	0.101	7.2	LOS A	0.0	0.0	0.00	0.42	0.00	47.4
Approach		192	3.8	192	3.8	0.101	3.2	LOS A	0.0	0.0	0.00	0.42	0.00	44.0
East: No Name Road														
4	L2	1	0.0	1	0.0	0.016	5.5	LOS A	0.0	0.3	0.45	0.49	0.45	41.2
5	T1	15	0.0	15	0.0	0.016	5.8	LOS A	0.0	0.3	0.45	0.49	0.45	41.2
6	R2	1	0.0	1	0.0	0.016	9.9	LOS A	0.0	0.3	0.45	0.49	0.45	48.1
Approach		17	0.0	17	0.0	0.016	6.0	LOS A	0.0	0.3	0.45	0.49	0.45	41.8
North: Majara Street														
7	L2	1	0.0	1	0.0	0.003	5.3	LOS A	0.0	0.0	0.42	0.49	0.42	44.5
8	T1	1	0.0	1	0.0	0.003	4.4	LOS A	0.0	0.0	0.42	0.49	0.42	37.9
9	R2	1	0.0	1	0.0	0.003	8.4	LOS A	0.0	0.0	0.42	0.49	0.42	37.9
Approach		3	0.0	3	0.0	0.003	6.0	LOS A	0.0	0.0	0.42	0.49	0.42	40.9
West: Gibraltar Street (West)														
10	L2	1	0.0	1	0.0	0.181	3.3	LOS A	0.3	2.4	0.15	0.60	0.15	40.9
11	T1	14	0.0	14	0.0	0.181	4.5	LOS A	0.3	2.4	0.15	0.60	0.15	44.4
12	R2	207	0.5	207	0.5	0.181	7.3	LOS A	0.3	2.4	0.15	0.60	0.15	36.2
12u	U	34	0.0	34	0.0	0.181	10.6	LOS A	0.3	2.4	0.15	0.60	0.15	36.2
Approach		256	0.4	256	0.4	0.181	7.6	LOS A	0.3	2.4	0.15	0.60	0.15	36.8
All Vehicles		467	1.8	467	1.8	0.181	5.7	LOS A	0.3	2.4	0.10	0.52	0.10	39.7

MOVEMENT SUMMARY

Site: 5 [2033_Future Build_AM Peak Butmaroo Street and Kings Highway (Site Folder: General)] **Network: N101 [2033 AM Peak (Network Folder: General)]**

2033_Future Build_AM Peak Butmaroo Street and Kings Highway
Site Category: 2033_Future Build_AM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	12	0.0	12	0.0	0.266	10.3	LOS A	0.4	2.6	0.82	0.94	0.93	31.5
2	T1	53	2.0	53	2.0	0.266	20.1	LOS B	0.4	2.6	0.82	0.94	0.93	23.6
3	R2	3	0.0	3	0.0	0.266	20.9	LOS B	0.4	2.6	0.82	0.94	0.93	23.6
Approach		67	1.6	67	1.6	0.266	18.4	LOS B	0.4	2.6	0.82	0.94	0.93	25.4
East: Kings Highway (East)														
4	L2	18	0.0	18	0.0	0.377	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	44.2
5	T1	592	0.9	592	0.9	0.377	3.2	LOS A	0.0	0.0	0.00	0.48	0.00	44.4
6	R2	113	0.0	113	0.0	0.377	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	41.5
Approach		722	0.7	722	0.7	0.377	3.5	NA	0.0	0.0	0.00	0.48	0.00	44.1
North: Butmaroo Street														
7	L2	31	13.8	31	13.8	0.358	9.9	LOS A	0.5	4.2	0.78	0.95	0.98	22.8
8	T1	40	15.8	40	15.8	0.358	25.6	LOS B	0.5	4.2	0.78	0.95	0.98	30.5
9	R2	24	0.0	24	0.0	0.358	22.5	LOS B	0.5	4.2	0.78	0.95	0.98	30.4
Approach		95	11.1	95	11.1	0.358	19.7	LOS B	0.5	4.2	0.78	0.95	0.98	28.6
West: Kings Highway (West)														
10	L2	29	7.1	29	7.1	0.234	6.2	LOS A	0.1	0.8	0.08	0.05	0.08	47.5
11	T1	381	5.2	381	5.2	0.234	0.2	LOS A	0.1	0.8	0.08	0.05	0.08	47.5
12	R2	13	8.3	13	8.3	0.234	8.5	LOS A	0.1	0.8	0.08	0.05	0.08	46.4
Approach		423	5.5	423	5.5	0.234	0.9	NA	0.1	0.8	0.08	0.05	0.08	47.5
All Vehicles		1307	3.1	1307	3.1	0.377	4.6	NA	0.5	4.2	0.12	0.40	0.14	41.8

MOVEMENT SUMMARY

Site: 6 [2033_Future Build_AM Peak_Kings Highway and Majara Street (Site Folder: General)]

Network: N101 [2033 AM Peak (Network Folder: General)]

2033_Future Build_AM Peak_Kings Highway and Majara Street
Site Category: 2033_Future Build_AM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Majara (South)														
1	L2	19	0.0	19	0.0	0.195	8.8	LOS A	0.3	1.9	0.74	0.88	0.77	27.0
2	T1	32	3.3	32	3.3	0.195	16.3	LOS B	0.3	1.9	0.74	0.88	0.77	27.0
3	R2	14	0.0	14	0.0	0.195	15.7	LOS B	0.3	1.9	0.74	0.88	0.77	33.9
Approach		64	1.6	64	1.6	0.195	14.0	LOS A	0.3	1.9	0.74	0.88	0.77	29.1
East: Kings Highway (East)														
4	L2	8	0.0	8	0.0	0.334	4.6	LOS A	0.0	0.0	0.00	0.47	0.00	44.3
5	T1	557	0.9	557	0.9	0.334	3.3	LOS A	0.0	0.0	0.00	0.47	0.00	41.5
6	R2	77	1.4	77	1.4	0.334	4.6	LOS A	0.0	0.0	0.00	0.47	0.00	41.5
Approach		642	1.0	642	1.0	0.334	3.5	NA	0.0	0.0	0.00	0.47	0.00	41.6
North: Majara (North)														
7	L2	78	0.0	78	0.0	0.622	11.9	LOS A	1.4	10.1	0.75	1.08	1.38	30.8
8	T1	14	0.0	14	0.0	0.622	22.1	LOS B	1.4	10.1	0.75	1.08	1.38	30.6
9	R2	146	0.0	146	0.0	0.622	23.6	LOS B	1.4	10.1	0.75	1.08	1.38	22.8
Approach		238	0.0	238	0.0	0.622	19.7	LOS B	1.4	10.1	0.75	1.08	1.38	26.6
West: Kings Highway (West)														
10	L2	112	5.7	112	5.7	0.232	4.8	LOS A	0.0	0.4	0.04	0.15	0.04	46.0
11	T1	296	6.0	296	6.0	0.232	0.1	LOS A	0.0	0.4	0.04	0.15	0.04	47.9
12	R2	6	0.0	6	0.0	0.232	7.8	LOS A	0.0	0.4	0.04	0.15	0.04	45.7
Approach		414	5.9	414	5.9	0.232	1.5	NA	0.0	0.4	0.04	0.15	0.04	47.5
All Vehicles		1358	2.3	1358	2.3	0.622	6.2	NA	1.4	10.1	0.18	0.50	0.29	38.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

MOVEMENT SUMMARY

▽ Site: 1 [2033_Future Build_PM Peak_ Butmaroo Street and Turallo Terrace (Site Folder: General)]

Network: N101 [2033 PM Peak (Network Folder: General)]

2033_Future Build_PM Peak_ Butmaroo Street and Turallo Terrace
Site Category: 2033_Future Build_2020_PM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	41	0.0	41	0.0	0.127	5.9	LOS A	0.2	1.3	0.26	0.60	0.26	46.2
3	R2	101	2.1	101	2.1	0.127	6.5	LOS A	0.2	1.3	0.26	0.60	0.26	40.8
Approach		142	1.5	142	1.5	0.127	6.3	LOS A	0.2	1.3	0.26	0.60	0.26	43.1
East: Turallo Terrace (West)														
4	L2	91	0.0	91	0.0	0.104	5.0	LOS A	0.0	0.0	0.00	0.31	0.00	46.6
5	T1	106	0.0	106	0.0	0.104	0.5	LOS A	0.0	0.0	0.00	0.31	0.00	51.0
Approach		197	0.0	197	0.0	0.104	2.5	NA	0.0	0.0	0.00	0.31	0.00	49.6
West: Turallo Terrace (West)														
11	T1	95	0.0	95	0.0	0.056	0.1	LOS A	0.0	0.2	0.06	0.06	0.06	48.5
12	R2	9	0.0	9	0.0	0.056	6.1	LOS A	0.0	0.2	0.06	0.06	0.06	48.5
Approach		104	0.0	104	0.0	0.056	0.6	NA	0.0	0.2	0.06	0.06	0.06	48.5
All Vehicles		443	0.5	443	0.5	0.127	3.3	NA	0.2	1.3	0.10	0.34	0.10	47.2

MOVEMENT SUMMARY

▽ Site: 2-A [2033_Future Build_PM Peak_Majara Street and Turallo Terrace - Conversion (One Way) (Site Folder: General)]

Network: N101 [2033 PM Peak (Network Folder: General)]

2033_Future Build_PM Peak_Majara Street and Turallo Terrace (One Way)
Site Category: 2033_Future Build_PM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Turallo Terrace (West)														
5	T1	104	1.0	104	1.0	0.055	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		104	1.0	104	1.0	0.055	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West: Turallo Terrace (West)														
11	T1	99	0.0	99	0.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		99	0.0	99	0.0	0.052	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
All Vehicles		203	0.5	203	0.5	0.055	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0

MOVEMENT SUMMARY

▽ Site: 3v [2033_Future Build_PM Peak Gibraltar Street and Butmaroo Street - Conversion (Roundabout) (Site Folder: General)]

Network: N101 [2033 PM Peak (Network Folder: General)]

2033_Future Build_PM Peak Gibraltar Street and Turallo Terrace
Site Category: 2033_Future Build_PM Peak
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	55	0.0	55	0.0	0.225	5.0	LOS A	0.6	3.9	0.52	0.64	0.52	40.4
2	T1	31	0.0	31	0.0	0.225	5.1	LOS A	0.6	3.9	0.52	0.64	0.52	35.0
3	R2	147	0.0	147	0.0	0.225	9.1	LOS A	0.6	3.9	0.52	0.64	0.52	35.0
Approach		233	0.0	233	0.0	0.225	7.6	LOS A	0.6	3.9	0.52	0.64	0.52	36.8
East: Gibraltar Street (East)														
4	L2	69	1.5	69	1.5	0.152	3.2	LOS A	0.0	0.0	0.00	0.47	0.00	40.7
5	T1	155	3.4	155	3.4	0.152	3.1	LOS A	0.0	0.0	0.00	0.47	0.00	46.0
6	R2	78	2.7	78	2.7	0.152	7.2	LOS A	0.0	0.0	0.00	0.47	0.00	40.7
Approach		302	2.8	302	2.8	0.152	4.2	LOS A	0.0	0.0	0.00	0.47	0.00	44.1
North: Butmaroo Street														
7	L2	24	0.0	24	0.0	0.102	4.9	LOS A	0.2	1.6	0.50	0.59	0.50	36.1
8	T1	40	2.6	40	2.6	0.102	5.0	LOS A	0.2	1.6	0.50	0.59	0.50	36.1
9	R2	37	0.0	37	0.0	0.102	9.0	LOS A	0.2	1.6	0.50	0.59	0.50	42.9
Approach		101	1.0	101	1.0	0.102	6.5	LOS A	0.2	1.6	0.50	0.59	0.50	39.4
West: Gibraltar Street (West)														
10	L2	37	0.0	37	0.0	0.188	5.3	LOS A	0.4	2.8	0.42	0.56	0.42	41.2
11	T1	154	0.7	154	0.7	0.188	5.5	LOS A	0.4	2.8	0.42	0.56	0.42	41.2
12	R2	16	6.7	16	6.7	0.188	8.5	LOS A	0.4	2.8	0.42	0.56	0.42	41.2
Approach		206	1.0	206	1.0	0.188	5.7	LOS A	0.4	2.8	0.42	0.56	0.42	41.2
All Vehicles		842	1.4	842	1.4	0.225	5.8	LOS A	0.6	3.9	0.31	0.55	0.31	40.8

MOVEMENT SUMMARY

Site: 4-A [2033_Future Build_PM Peak Gibraltar Street and Majara Street - Conversion (Roundabout) (Site Folder: General)]

Network: N101 [2033 PM Peak (Network Folder: General)]

2033_Future Build_PM Peak Gibraltar Street and Majara Street (Roundabout)
Site Category: 2033_Future Build_PM Peak
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Majara Street														
1	L2	98	7.5	98	7.5	0.088	3.8	LOS A	0.2	1.4	0.30	0.46	0.30	39.7
2	T1	1	0.0	1	0.0	0.088	3.7	LOS A	0.2	1.4	0.30	0.46	0.30	45.6
3	R2	3	0.0	3	0.0	0.088	9.1	LOS A	0.2	1.4	0.30	0.46	0.30	47.6
Approach		102	7.2	102	7.2	0.088	4.0	LOS A	0.2	1.4	0.30	0.46	0.30	40.2
East: No Name Road														
4	L2	4	0.0	4	0.0	0.037	5.6	LOS A	0.1	0.6	0.45	0.50	0.45	41.3
5	T1	34	0.0	34	0.0	0.037	5.9	LOS A	0.1	0.6	0.45	0.50	0.45	41.3
6	R2	1	0.0	1	0.0	0.037	10.0	LOS A	0.1	0.6	0.45	0.50	0.45	48.2
Approach		39	0.0	39	0.0	0.037	6.0	LOS A	0.1	0.6	0.45	0.50	0.45	41.6
North: Majara Street														
7	L2	1	0.0	1	0.0	0.045	5.3	LOS A	0.1	0.6	0.41	0.57	0.41	42.7
8	T1	16	0.0	16	0.0	0.045	4.4	LOS A	0.1	0.6	0.41	0.57	0.41	35.6
9	R2	32	0.0	32	0.0	0.045	8.4	LOS A	0.1	0.6	0.41	0.57	0.41	35.6
Approach		48	0.0	48	0.0	0.045	7.0	LOS A	0.1	0.6	0.41	0.57	0.41	35.9
West: Gibraltar Street (West)														
10	L2	1	0.0	1	0.0	0.143	3.1	LOS A	0.3	2.0	0.04	0.62	0.04	41.7
11	T1	29	0.0	29	0.0	0.143	4.3	LOS A	0.3	2.0	0.04	0.62	0.04	45.4
12	R2	159	0.0	159	0.0	0.143	7.2	LOS A	0.3	2.0	0.04	0.62	0.04	37.4
12u	U	46	0.0	46	0.0	0.143	10.4	LOS A	0.3	2.0	0.04	0.62	0.04	37.4
Approach		236	0.0	236	0.0	0.143	7.4	LOS A	0.3	2.0	0.04	0.62	0.04	38.9
All Vehicles		425	1.7	425	1.7	0.143	6.4	LOS A	0.3	2.0	0.18	0.56	0.18	39.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

MOVEMENT SUMMARY

Site: 5 [2033_Future Build_PM Peak Butmaroo Street and Kings Highway (Site Folder: General)]

Network: N101 [2033 PM Peak (Network Folder: General)]

2033_Future Build_PM Peak Butmaroo Street and Kings Highway
Site Category: 2033_Future Build_PM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Butmaroo Street														
1	L2	11	0.0	11	0.0	0.268	7.9	LOS A	0.4	2.9	0.79	0.91	0.90	31.4
2	T1	46	0.0	46	0.0	0.268	17.1	LOS B	0.4	2.9	0.79	0.91	0.90	23.5
3	R2	11	70.0	11	70.0	0.268	37.0	LOS C	0.4	2.9	0.79	0.91	0.90	23.5
Approach		67	10.9	67	10.9	0.268	18.8	LOS B	0.4	2.9	0.79	0.91	0.90	25.2
East: Kings Highway (East)														
4	L2	34	3.1	34	3.1	0.258	4.6	LOS A	0.0	0.0	0.00	0.49	0.00	44.0
5	T1	340	6.2	340	6.2	0.258	3.3	LOS A	0.0	0.0	0.00	0.49	0.00	44.2
6	R2	105	0.0	105	0.0	0.258	4.6	LOS A	0.0	0.0	0.00	0.49	0.00	41.2
Approach		479	4.6	479	4.6	0.258	3.6	NA	0.0	0.0	0.00	0.49	0.00	43.8
North: Butmaroo Street														
7	L2	51	4.2	51	4.2	0.423	11.1	LOS A	0.7	5.2	0.78	0.99	1.07	25.1
8	T1	67	1.6	67	1.6	0.423	18.8	LOS B	0.7	5.2	0.78	0.99	1.07	32.7
9	R2	31	0.0	31	0.0	0.423	19.6	LOS B	0.7	5.2	0.78	0.99	1.07	32.4
Approach		148	2.1	148	2.1	0.423	16.3	LOS B	0.7	5.2	0.78	0.99	1.07	30.7
West: Kings Highway (West)														
10	L2	80	0.0	80	0.0	0.323	5.0	LOS A	0.1	0.8	0.05	0.08	0.05	47.3
11	T1	509	2.9	509	2.9	0.323	0.1	LOS A	0.1	0.8	0.05	0.08	0.05	47.3
12	R2	16	6.7	16	6.7	0.323	6.8	LOS A	0.1	0.8	0.05	0.08	0.05	46.3
Approach		605	2.6	605	2.6	0.323	0.9	NA	0.1	0.8	0.05	0.08	0.05	47.3
All Vehicles		1300	3.7	1300	3.7	0.423	4.6	NA	0.7	5.2	0.15	0.38	0.19	41.2

MOVEMENT SUMMARY

Site: 6 [2033_Future Build_PM Peak_Kings Highway and Majara Street (Site Folder: General)]

Network: N101 [2033 PM Peak (Network Folder: General)]

2033_Future Build_PM Peak_Kings Highway and Majara Street
Site Category: 2033_Future Build_PM Peak
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Majara (South)														
1	L2	26	0.0	26	0.0	0.155	6.9	LOS A	0.2	1.5	0.63	0.78	0.63	29.7
2	T1	31	3.4	31	3.4	0.155	14.1	LOS A	0.2	1.5	0.63	0.78	0.63	29.7
3	R2	6	0.0	6	0.0	0.155	16.3	LOS B	0.2	1.5	0.63	0.78	0.63	35.9
Approach		63	1.7	63	1.7	0.155	11.3	LOS A	0.2	1.5	0.63	0.78	0.63	30.6
East: Kings Highway (East)														
4	L2	6	0.0	6	0.0	0.229	4.6	LOS A	0.0	0.0	0.00	0.47	0.00	44.3
5	T1	374	6.2	374	6.2	0.229	3.3	LOS A	0.0	0.0	0.00	0.47	0.00	41.5
6	R2	49	0.0	49	0.0	0.229	4.6	LOS A	0.0	0.0	0.00	0.47	0.00	41.5
Approach		429	5.4	429	5.4	0.229	3.5	NA	0.0	0.0	0.00	0.47	0.00	41.6
North: Majara (North)														
7	L2	135	1.6	135	1.6	0.573	12.3	LOS A	1.3	9.2	0.76	1.07	1.29	33.1
8	T1	40	0.0	40	0.0	0.573	18.8	LOS B	1.3	9.2	0.76	1.07	1.29	33.0
9	R2	80	0.0	80	0.0	0.573	20.7	LOS B	1.3	9.2	0.76	1.07	1.29	25.5
Approach		255	0.8	255	0.8	0.573	15.9	LOS B	1.3	9.2	0.76	1.07	1.29	31.3
West: Kings Highway (West)														
10	L2	55	9.6	55	9.6	0.301	4.8	LOS A	0.0	0.2	0.01	0.06	0.01	48.5
11	T1	491	4.1	491	4.1	0.301	0.0	LOS A	0.0	0.2	0.01	0.06	0.01	49.2
12	R2	4	0.0	4	0.0	0.301	6.7	LOS A	0.0	0.2	0.01	0.06	0.01	47.0
Approach		549	4.6	549	4.6	0.301	0.6	NA	0.0	0.2	0.01	0.06	0.01	49.2
All Vehicles		1297	4.0	1297	4.0	0.573	5.1	NA	1.3	9.2	0.19	0.43	0.29	41.5

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