Transport Assessment

New High School in Bungendore

PREPARED FOR:
Hindmarsh Construction Australia Pty Ltd

REFERENCE:
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DATE:
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ABN: 47 153 795 567

Reference: 0593r05v02

Date: 22/11/2022

Revision History

VERSION	DATE	PREPARED	REVIEWED	APPROVED	SIGNED
01	21/11/2022	Julius Boncato	Paul Corbett	Paul Corbett	Original Signed
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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 a State Significant Development Application (SSDA), SSD 14394209. The SSDA is for a new high school located at Bungendore (herein referred to as the 'Proposal').

In addition to this TA, a draft School Transport Plan (TP) has been prepared by PDC Consultants 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 draft TP has been prepared separately.

Additionally, a Preliminary Construction and Pedestrian Traffic Management Plan (PCTMP), has been prepared by PDC Consultants as a separate document (with a summary provided in this TA) for the new high school in Bungendore. A copy of the draft PCTMP has been prepared separately.

This TA addresses the Secretary's Environmental Assessment Requirements (SEARs), as detailed in **Table 1**. This report has been prepared as an updated transport assessment of the Proposal and follows subsequent reports including:

- Transport Assessment prepared by GHD (ref: 12548316, Rev 5) dated 9/10/2021.
- Transport Assessment Addendum prepared by PDC Consultants (ref: 0593r02v03) dated 20/07/2022.

Table 1: SEARs Comments & Response

SEARs	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 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 of the TA. Traffic surveys 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 2.5of the TIA. A description of the rail services and infrastructure in proximity to the school site is included in Section 2.1.2.4 of the TA.
Details of the proposed development, including:	An image showing the proposed walking and cycling network adjacent to the school, including the pedestrian and vehicular access

• 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 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.	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 and 3.2.2 of the TA. The routes of the current school bus services at the primary school within the Bungendore Township and its surrounds is displayed in Section 2.1.2.2 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 3.2.1.4.2 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 3.2.1.4.1 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 against the relevant car/bicycle 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.	The mode share targets for students and staff at the high school are detailed in Section 3.1.3 of the TA The expected trip generation characteristics of the proposed high school are detailed in Section 5.2 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 5.1 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 5.3 of the TA. As detailed in Section 5.4 of the TA, SIDRA analysis for key intersections was undertaken in the 2023 (year of opening) and 2033 horizon year accounting for: • A 2% 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 on-street 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 new high school 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

• adequacy of the existing / proposed pedestrian infrastructure to enable convenient and safe access to and from the site for all users.	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 3.2.4 of the TA and the draft TP (prepared separately). The roles and responsibilities of the Travel Coordinator at the new high school in Bungendore are detailed in Section 3.2.4 of the TA and the draft TP (prepared separately). The governance framework for the high school including the roles of the internal and external working groups are detailed in the of draft TP (prepared separately). 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 / pickup zone(s) and bus bay(s).	The New High School in Bungendore Draft School Transport Plan (prepared separately) provides a summary of the school's access arrangements for pedestrians, cyclists, buses, waste collection vehicles and cars.
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 Section 6.4 and of the TA. The available construction program data is detailed in Section 6.1 of the TA. The onsite car parking arrangements are detailed in Section 6.2.3 of the TA. The emergency services vehicle arrangements are detailed in Section 6.2.5 of the TA. Potential impacts to public transport during construction are detailed in Section 6.5 of the TA. The measures to manage the potential impacts during construction on pedestrians and cyclists are detailed in 6.2.4 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 6.5.3 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 Proposal 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 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 (2) 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.

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**.

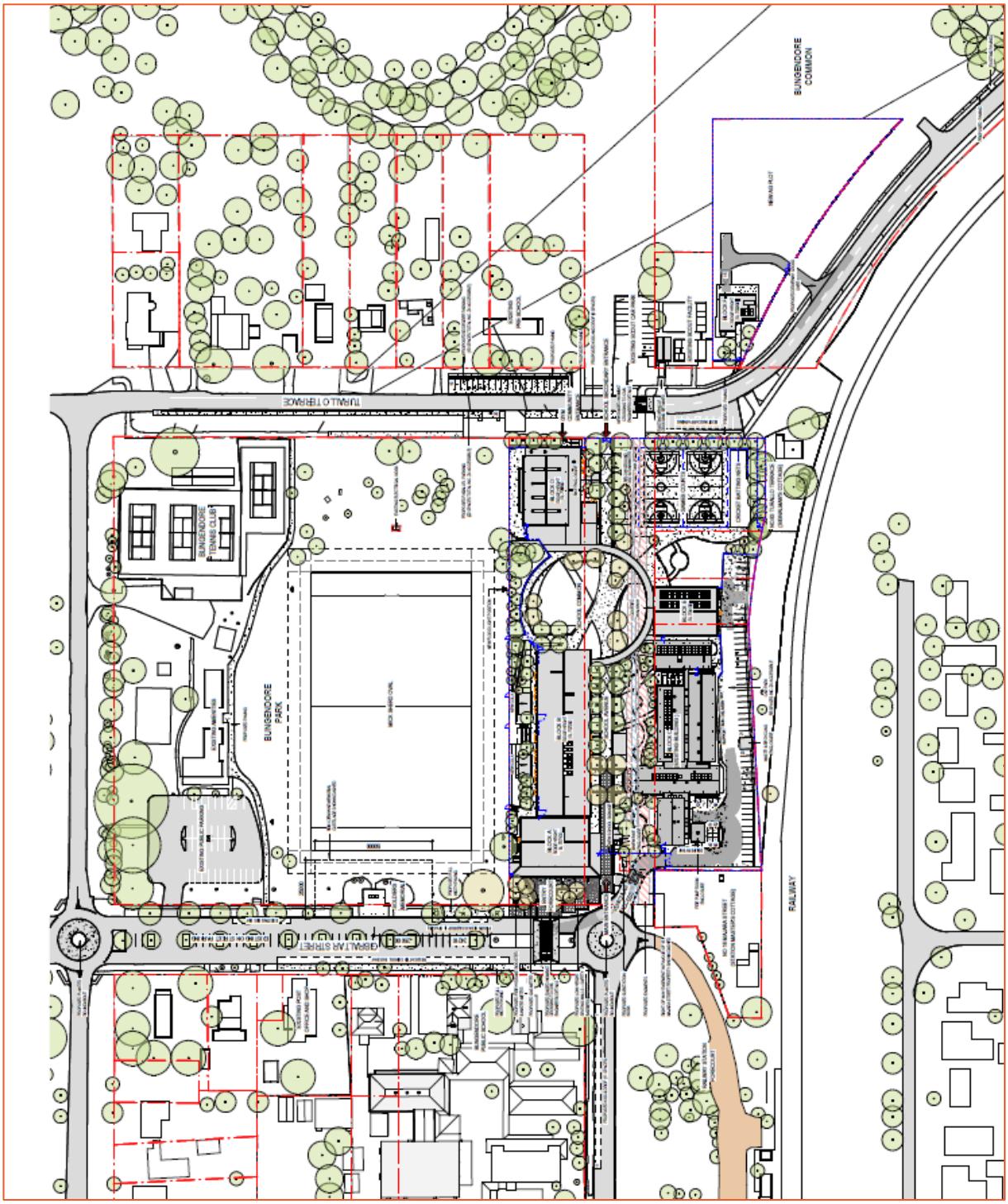


Figure 1: Proposed Site Plan (source: TKD Architects)

1.1.1. Subject Site

The Proposal is located within the Bungendore Town Centre, within the local government area (LGA) of Queanbeyan-Palerang Regional Council (QPRC). The Proposal involves the use of land which includes Bungendore Park bounded by Gibraltar Street, Majara Street, Turallo Terrace and Butmaroo Street, the existing Council Chambers site at 10 Majara Street, the Majara Street road reserve bounded by Turallo Terrace in the north and Gibraltar Street in the south and Nos. 2, 4 and 6 Majara Street. **Figure 2** provides an appreciation of the aforementioned lands subject to use by the Proposal.

The site has an area of approximately 25,400m^2 and consists of a relatively flat topography. The site will contain the existing Council buildings, the community centre, a portion of the swimming pool location, and a small portion of Mick Sherd Oval[1].

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 Railway Station to the south and south-west respectively.

Table 2: Land Subject to the Location for the New High School in Bungendore - Legal Description

PROPERTY ADDRESS	LOT NUMBERS
6-14 Butmaroo Street (Mick Sherd Oval)	Part Lot 701, DP 1027107
2 Majara Street	Lot 12, DP 1139067
4-6 Majara Street	Lot 13, DP 1139067 Lot 14, DP 1139067
10 Majara Street	Lot 3, DP 830878
Butmaroo Street (Turallo Terrace Reserve)	Part Lot 701, DP 96240
Portion of Majara Street (between Turallo Terrace and Gibraltar Street)	N/A

An aerial image of the Proposal is shown in **Figure 2**.

[1] *https://www.schoolinfrastructure.nsw.gov.au/content/dam/infrastructure/projects/n/new-high-school-in-bungendore-/may-2022/Bungendore_HS_PU_April22.pdf*

Figure 2: Site Aerial Depicting the Land Subject to the Proposed High School *(source: TKD Architects)*

A key aspect of the Proposal's design is the closure of Majara Street (between Turallo Terrace in the north and Gibraltar Street in the south) in the centre of the proposed high school site.

This change is required as currently Majara Street runs in a north-south direction through the proposed high school subject site, as shown in **Figure 2**. This would create an environment that would be unsafe for students and detract from the general amenity of the proposed high school.

At the time of writing this report, the lands/properties, as described in Section 1.1.1 and **Table 2**, have been transferred to the Department of Education.

1.1.2. Student Catchment

The indicative catchment for the high school in Bungendore is displayed in **Figure 3**.

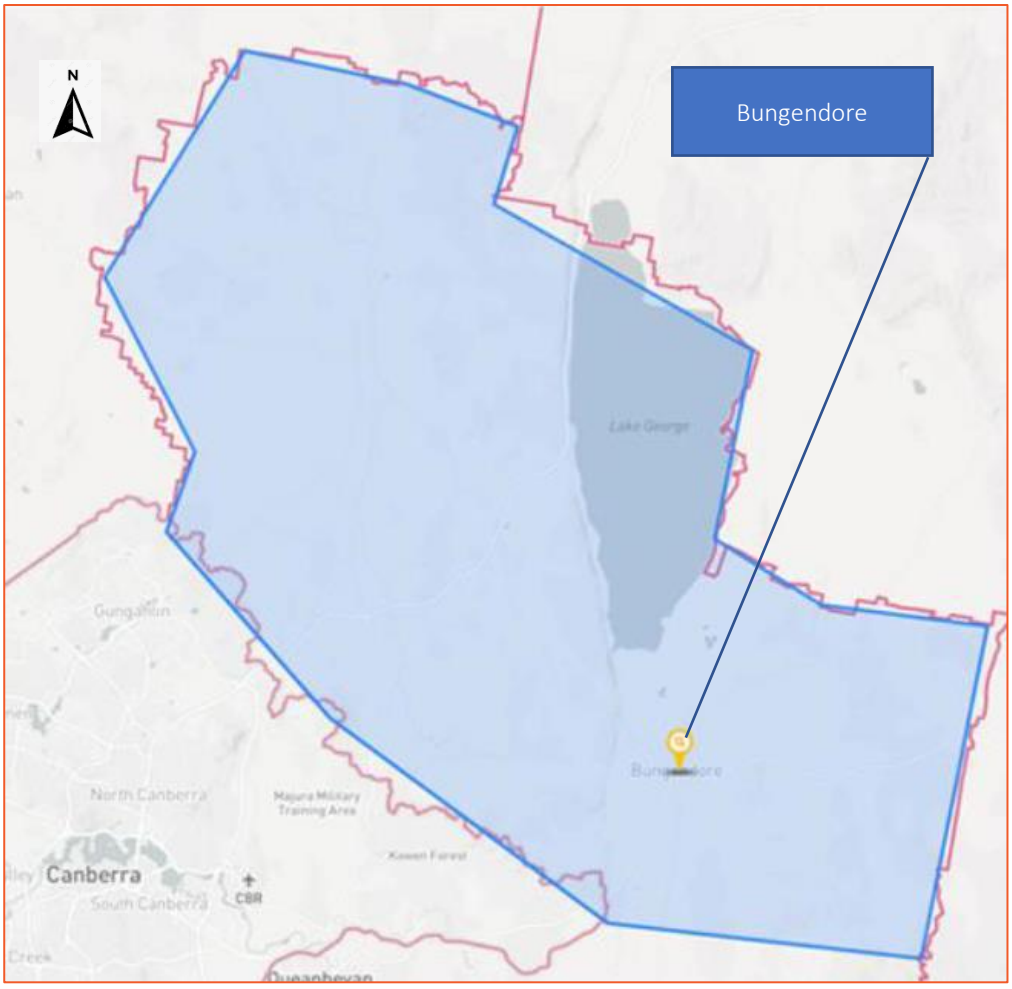


Figure 3: Indicative Student Catchment *(source: Final Business Case - A New High School in Bungendore)*

The indicative 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**).
- Assess multi-modal access to the school.
- Identify potential travel impacts of the proposed high school.
- Propose solutions to mitigate identified impacts.

1.2. School Project Context

1.2.1. Bungendore Structure Plan 2048

The Bungendore Structure Plan 2048 (BSP 2048) was prepared by QPRC to guide the growth and development of Bungendore. The BSP 2048 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 BSP 2048 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 BSP 2048 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 BSP 2048 identifies four (4) key areas recommended for rezoning (Lots 1, 3, 4 and 6).
- The proposed residential growth is concentrated primarily north of the proposed high school and east of Tarago Road, within the vicinity of the proposed high school.

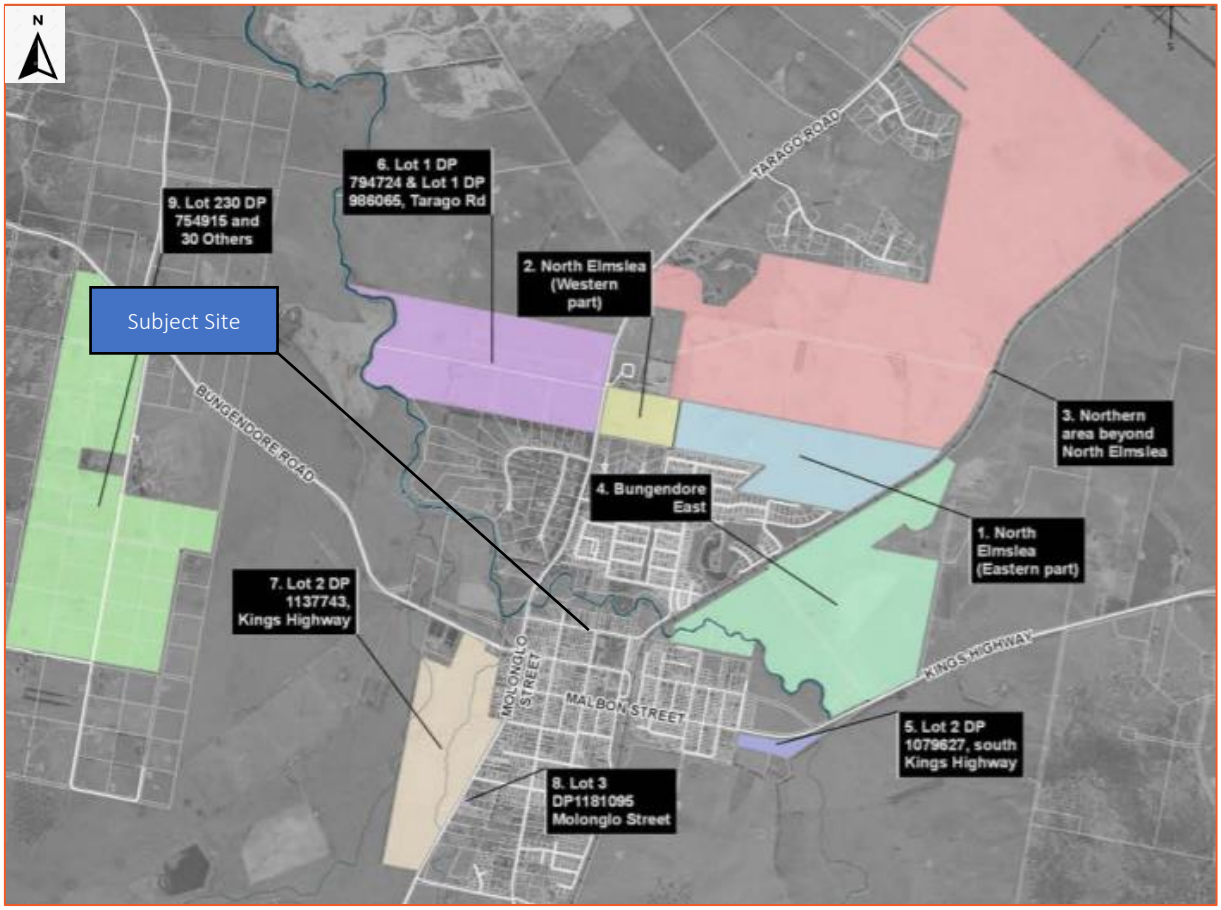


Figure 4: Key Areas for Residential Growth in Bungendore *(source: Bungendore Structure Plan 2048)*

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 (10) 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 Bungendore Bicycle and Pedestrian Facilities Plan 2019 (BPFP 2019) 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 metres, 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 as illustrated in **Figure 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.

The BPFP 2019 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 BPFP 2019 indicates that active transport routes should be prioritised in accordance with:

- Proximity to schools.
- Route continuity.

The Proposal is consistent with both these criteria, and key upgrades in proximity to the proposed high school (such as the provision of footpaths on Butmaroo Street) should be prioritised. The BPFP 2019 upgrades in the context of the proposed high school are discussed further in Section 3.2.2.1.

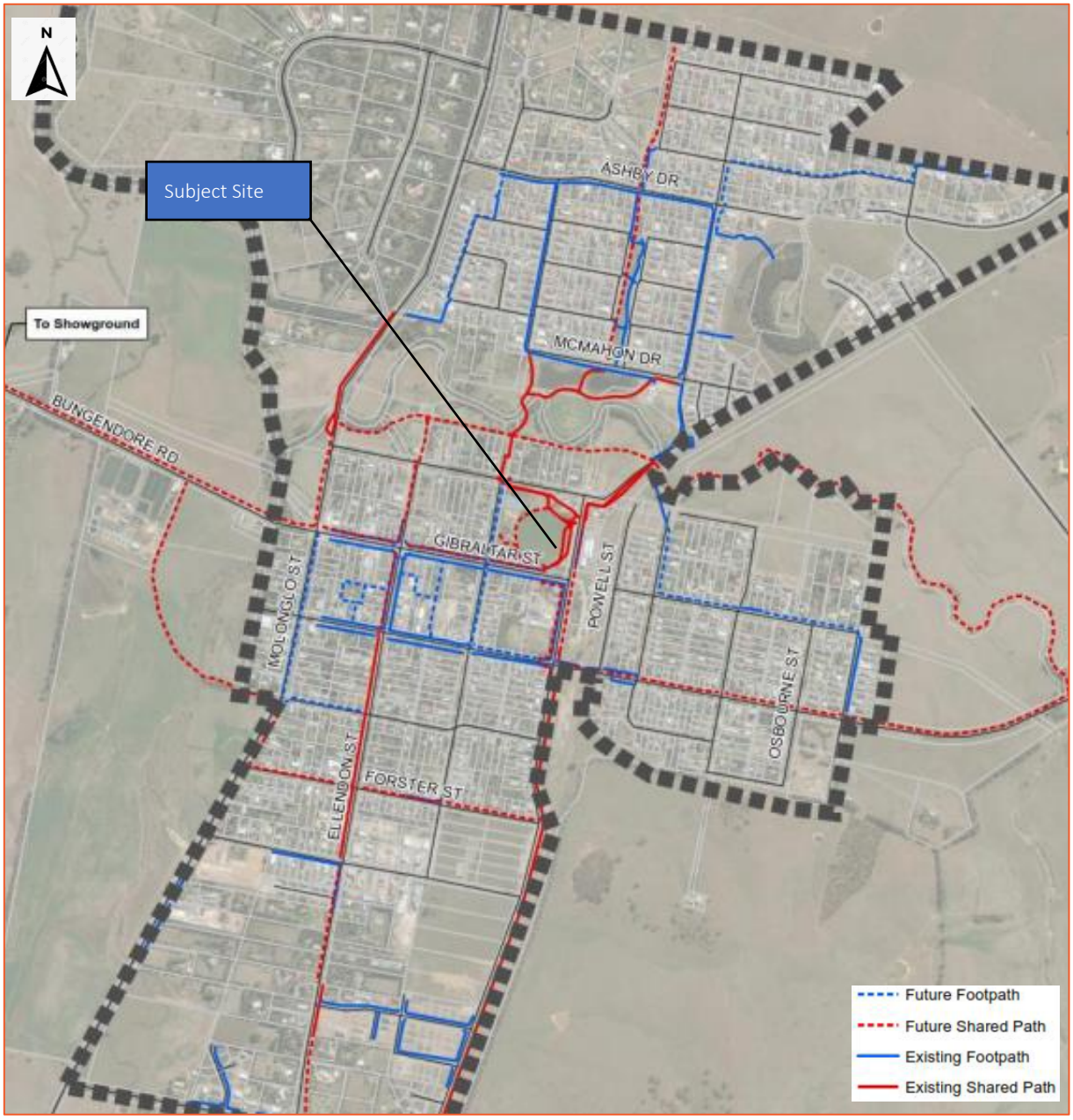


Figure 5: Bungendore's Existing / Proposed Active Transport Network
(source: Bungendore Bicycle and Pedestrian Facilities Plan 2019)

1.2.3. New Bungendore High School Rapid Transport Assessment (2020)

In accordance with the Department's planning processes, PDC Consultants has undertaken 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 3**.

Table 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 (i.e. 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 (1) 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 and Majara Street). • Lack of formal footpath network around and to the proposed high school. • The open rail level crossing is a barrier to pedestrians, bicycles and scooters (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 are 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 BPFP 2019. 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.

As detailed in Section 1.2.1, the BSP 2048 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 kilometres. 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 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 north-east past Turallo Creek into Elmslea North (Lot 1 and Lot 3).
- Provision of a shared path linking East Bungendore to the proposed high 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

Kings Highway forms part of a TfNSW State Road, MR 51 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 (8:00am – 9:30am and 2:30pm – 4:00pm 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 Kings Highway.

Within Bungendore, Kings Highway has a single travel lane in either direction as shown in **Figure 6**. Within Bungendore, on-street parking is typically available on Kings Highway, to the west of Butmaroo Street, with 'No Stopping' restriction provided east of Butmaroo Street to the rail line level crossing.

Figure 6: 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 as shown in **Figure 7**.

Parking lanes are not provided on Turallo Terrace however, the unformed verges provide an opportunity for vehicles to park. Kerbs, gutters and footpaths are not typically provided on Turallo Terrace. Turallo Terrace is subject to 50km/h speed zoning restrictions.

Figure 7: 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 as shown in **Figure 8**. Concrete footpaths are typically provided on both sides of Gibraltar Street.

Angled (90-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. 'No Parking' restrictions (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 50km/h, with a section between Butmaroo Street and Majara Street subject to 40km/h School Zone restrictions (8:00 am – 9:30 am and 2:30 pm – 4:00 pm School Days).

Figure 8: Gibraltar Street Looking East from Butmaroo Street *(source: Google Streetview)*

2.1.1.4 Butmaroo Street

Butmaroo Street is a local road with a single lane in either direction as shown in **Figure 9**. 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 is subject to 50km/h speed zoning restrictions.

2.1.1.5 Majara Street

Majara Street is a local road with a single travel lane in either direction as shown in **Figure 10**.

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.

A Bus Zone (8:30am – 9:30am and 3:00pm – 4:00pm School Days), approximately 60 metres 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' (8:30am – 9:30am and 3:00pm – 4:00pm 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 50km/h, with a section between Gibraltar Street and King's Highway subject to 40km/h School Zone restrictions (8:00 am – 9:30 am and 2:30 pm – 4:00 pm School Days).

With regard to the above, the parking controls and school zones in proximity to the proposed high school site are displayed in **Figure 11**.

Figure 9: Butmaroo Street Looking South from Turallo Terrace *(source: Google Streetview)*

Figure 10: Majara Street Looking North from Gibraltar Street *(source: Google Streetview)*

Figure 11: Existing Parking controls and School Zones *(source- Sixmaps)*

The existing road hierarchy within proximity to the proposed high school site is shown **Figure 12**.

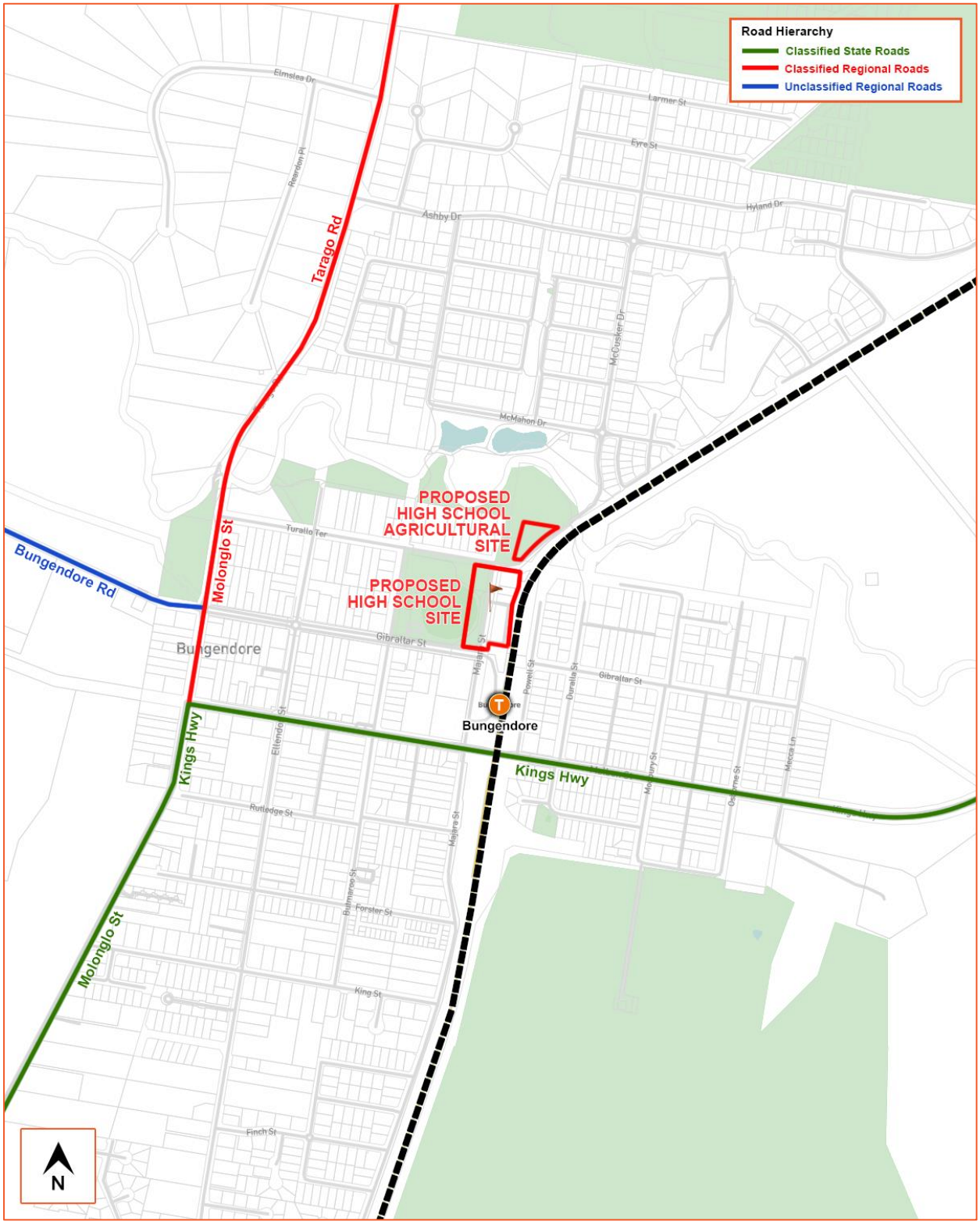


Figure 12: Location & Road Hierarchy

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 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, as shown in **Figure 13**:

- 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.

The existing active transport infrastructure within the proposed high school's walking catchment (refer to Section 2.2) is displayed in **Figure 14**.

Figure 13: Current Shared Paths and Crossings *(source: Sixmaps)*

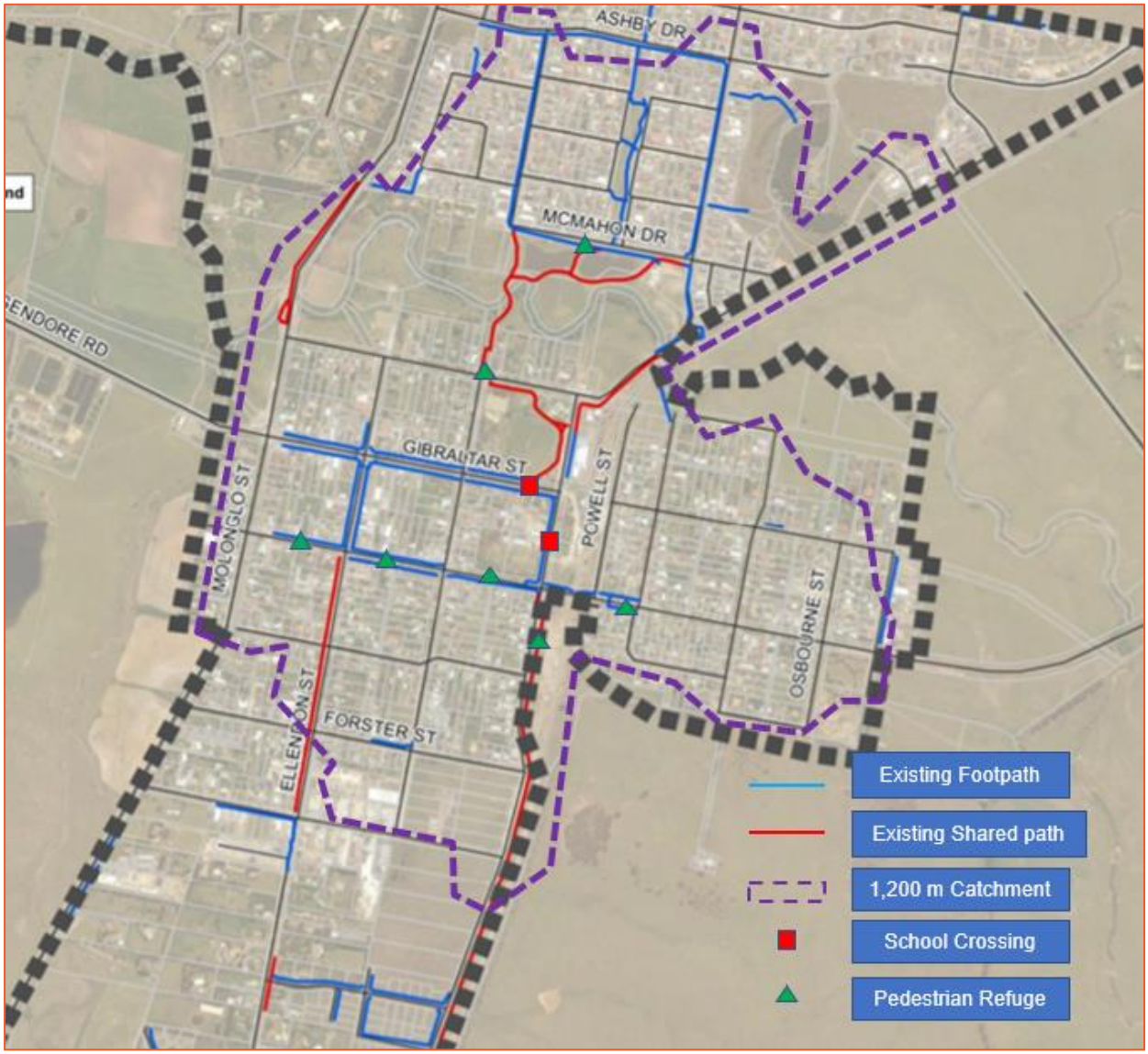


Figure 14: Bungendore Active Transport Infrastructure

The following pedestrian crossing points are provided in proximity to the proposed high 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 as shown in **Figure 15**.
- A pedestrian refuge is provided on the Kings Highway to the west of Majara Street as shown in **Figure 16**.
- A pedestrian refuge is provided on the Turallo Terrace east of Butmaroo Street.

Figure 15: Pedestrian Refuge on Gibraltar Street *(source- Google maps)*

Figure 16: 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 BPFP 2019 propose new footpaths on Butmaroo Street and a new shared path on Majara Street.

Public Transport

2.1.2.2 School Bus Services

As previously descibed, 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 serving Bungendore Primary School are displayed in **Table 4**.

Table 4: Bungendore Primary School – Bus Services Operated by Bungendore Bus and Coaches

ROUTE NO.	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 17**.

A combination of mini-buses and 12.5-metre-long coaches are currently utilised for bus services serving Bungendore Primary School bus services.

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

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 5**.

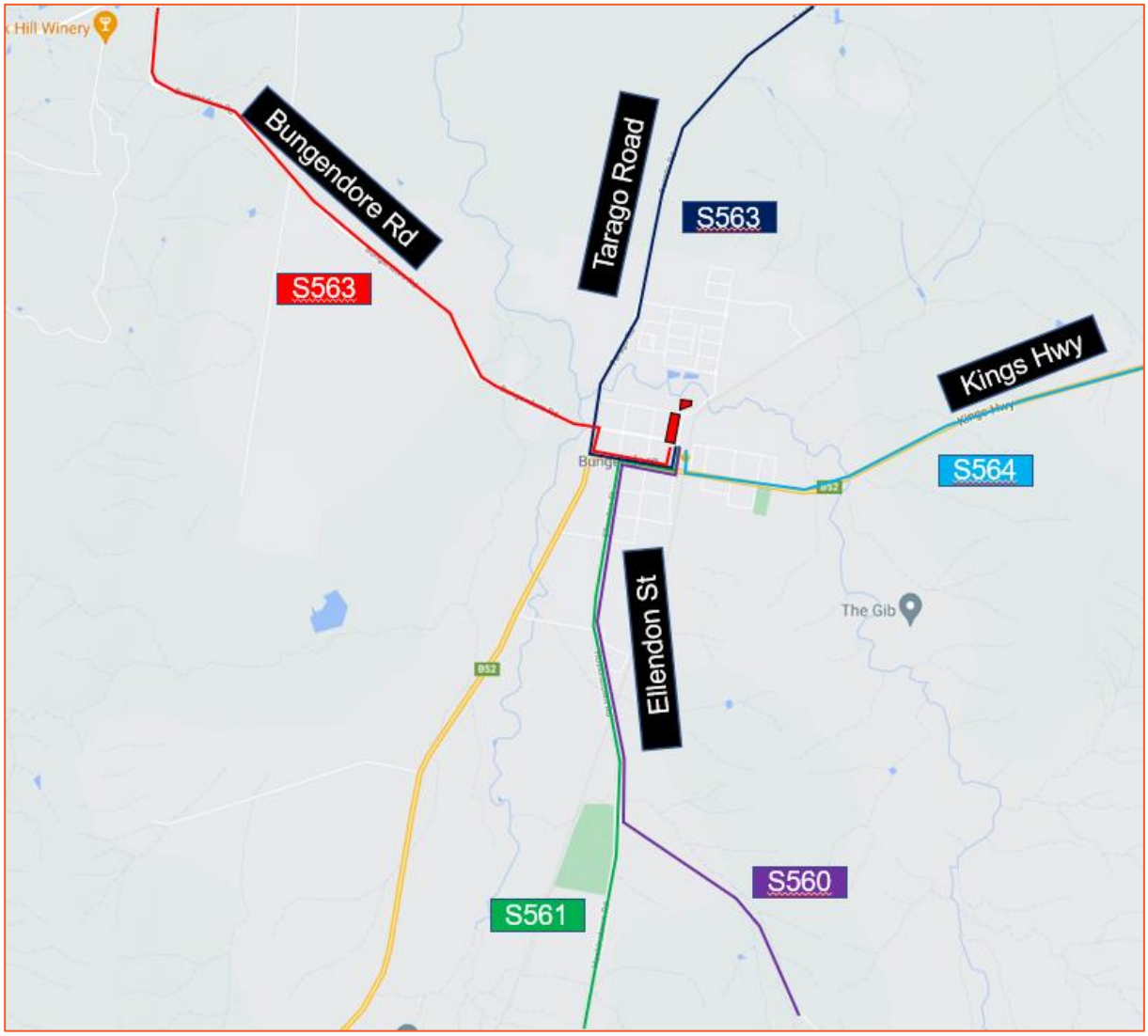


Figure 17: Bungendore School Bus Services *(source: Google Maps)*

Table 5: Bungendore Primary School – Bus Services Operated by QCity Transit

ROUTE NO.	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.

2.1.2.3 Public Bus Services

QCity Transit also provides bus services in Bungendore. The 844 bus service operate between Bungendore and Queanbeyan, with bus stops located on Gibraltar Street, between Mick Sherd Oval and Bungendore Primary School. Currently, there are:

- Three (3) weekday services from Bungendore to Queanbeyan (depart from Gibraltar Street at 7:27am, 9:30am and 5:06pm).
- Two (2) weekday services from Queanbeyan to Bungendore (arrive at Gibraltar Street at 4:39pm and 6:12pm).

A proportion of high school-aged students residing in Bungendore use the public bus services to travel to / from schools in Queanbeyan.

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

A bus shelter is provided on the northern side of Gibraltar Street, and a bench is provided on its southern side. As displayed in **Figure 17**, QCity Transit 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.

2.1.2.4 Rail Services

Bungendore Railway Station is located on Majara Street, opposite Bungendore Primary School, and operates rail services between Sydney (Central Station) and Canberra. The typical headway between services at Bungendore Station on weekdays is detailed in **Table 6**.

Table 6: 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 (pre-paid) customers only when required.*

A railway crossing with boom gates is located on Kings Highway, approximately 60 metres to the east of Majara Street as shown in **Figure 19**.

Figure 18: Active & Public Transport Services

Figure 19: Railway Crossing on Kings Highway *(source: Google Maps)*

As detailed in **Table 6**, over the course of a day, only six (6) 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 3:24pm (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 3:20pm. 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 4:00pm, 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 20.**

Figure 20: Pedestrian Facilities at the Railway Crossing Across Kings Highway *(source: Google Maps)*

Whilst 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 proportion 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 new high school.

2.1.3. Crash Data

Crash data obtained from TfNSW's Centre for Road Safety indicates that in the last five (5) years (2017 – 2022), there have been no recorded crashes on Turallo Terrace, Butmaroo Street and Majara Street.

There have been three (3) recorded crashes on Gibraltar Street, as follows:

- One (1) crash involved a vehicle coming off the road and hitting an object, resulting in a minor injury.
- One (1) crash involved a pedestrian being struck and resulted in a moderate injury.
- One (1) crash involved parking vehicles and resulted in a non-casualty (towaway).

The data also indicates that there have been two (2) crashes on Kings Highway, in proximity to Majara Street, associated with vehicles coming off the footpath (RUM code 48). One (1) crash resulted in minor injuries, and one (1) resulted in moderate injuries.

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

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 Catchment: 400 metres, 800 metres and 1.2 kilometres (refer to **Table 7**)
- Cyclists Catchment: 1.2 kilometres, 2.4 kilometres, 3.6 kilometres and 4.8 kilometres (refer to **Table 7**)

The catchment analysis comprised the locations of 147 high school student residences, based upon information provided 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 2.0 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 7**.

Table 7: Catchment Data & Analysis

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 catchment data in **Table 7** indicates that:

- Approximately 47% of students reside within the 15-minute walking (actual) catchment from the proposed new high school in Bungendore.
- Approximately 92% of students live within the 15-minute bike riding (actual) catchment of the proposed new high school in Bungendore. The bicycle network in proximity to the school is limited. Whilst 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% 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. Whilst 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 proportion 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 BBPFP 2019 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 did not cover the entire area of the school catchment displayed in **Figure 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 proportion of students eligible for free transport is likely to exceed 35%.
    - 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% 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% of employed residents drove to work and five percent were car passengers.
- 5% of employed residents worked from home.
- 2% of employed residents walked to work.
- 1% 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 of Key Intersections

To identify the existing traffic conditions in proximity to the proposed new high school in Bungendore subject site, traffic counts were undertaken by Trans Traffic Survey at the following intersections on a typical Thursday, 5/11/2020, as displayed in **Figure 21**:

- Turallo Terrace / Butmaroo Street.
- Turallo Terrace / Majara Street.
- Gibraltar Street / Butmaroo Street.
- Gibraltar Street / Majara Street.
- Kings Highway / Butmaroo Street.
- Kings Highway / Majara Street.

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

- 8:00am – 9:30am.
- 2:30pm – 4:30pm.

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

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

It is noted that the traffic surveys captured the peak vehicle activity associated with the Bungendore Primary School.[2]

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

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

Figure 21: Locations of Key Intersection Surveyed *(source: Google Maps)*

2.5. Surveyed Existing Intersection Performances

The operation of the intersections of interest as outlined in Section 2.4 has been assessed using SIDRA 9.

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 8 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 (6) 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 8: 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 22**.

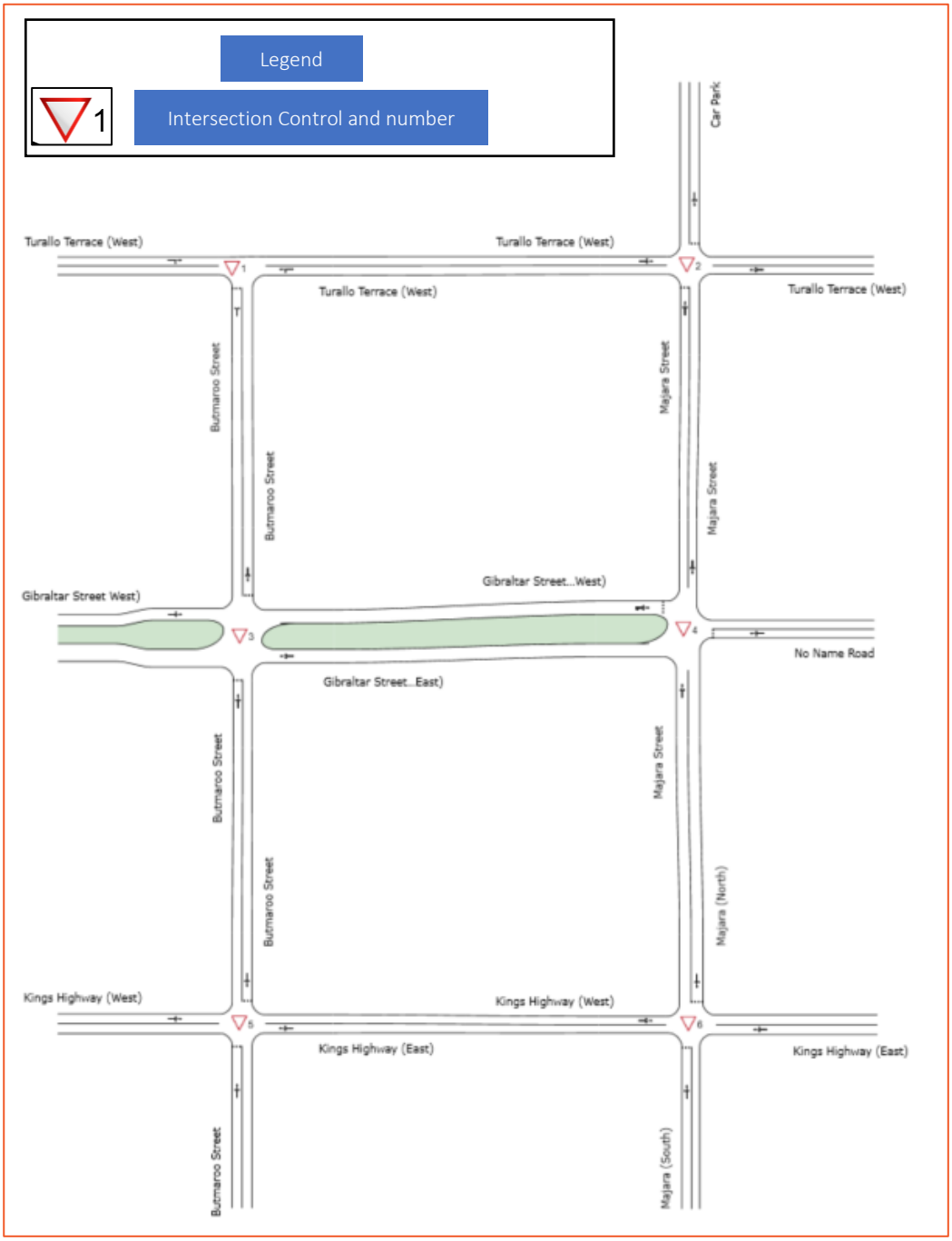


Figure 22: SIDRA Network Layout

The results of the SIDRA intersection modelling analysis, based on the existing traffic volumes and road geometry, are summarised in **Table 9**.

Table 9: SIDRA Results - Existing (2020) Intersection Performances

INTERSECTION	AM PEAK			PM PEAK		
	AVERAGE DELAY (sec)	LOS[1]	AVERAGE BACK OF QUEUE (m)	AVERAGE DELAY (sec)	LOS[1]	AVERAGE BACK OF QUEUE (m)
Turallo Terrace / Butmaroo Street						
Butmaroo Street	5.0	A	0.3	4.8	A	0.3
Turallo Terrace -east	0.9	N/A	0.0	1.2	N/A	0.0
Turallo Terrace -west	1.2	N/A	0.1	0.3	N/A	0.0
Turallo Terrace / Majara Street						
Majara Street	5.0	A	0.3	5.1	A	0.8
Turallo Terrace – east	2.6	N/A	0.2	2.8	N/A	0.1
Car park entry	2.5	A	0.2	2.5	A	0.2
Turallo Terrace – west	2.7	N/A	0.2	2.0	N/A	0.1
Gibraltar Street / Butmaroo Street						
Butmaroo Street – south	5.5	A	0.7	5.1	A	1.0
Gibraltar Street – east	3.6	N/A	0.0	3.7	N/A	0.0
Butmaroo Street – north	5.3	A	0.3	5.3	A	0.2
Gibraltar Street – west	0.6	N/A	0.2	0.9	N/A	0.3
Gibraltar Street / Majara Street						
Majara Street – south	4.4	N/A	0.0	2.7	N/A	0.1
Station access road	5.5	A	0.1	5.4	A	0.3
Majara Street – north	4.4	N/A	0.0	3.3	N/A	0.3
Gibraltar Street – west	5.4	A	0.6	5.0	A	0.7

[1]: Intersection LOS and Major Road Approach LOS values are 'Not Applicable' for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Table 9: SIDRA Results - Existing (2020) Intersection Performances - Continued

INTERSECTION	AM PEAK			PM PEAK		
	AVERAGE DELAY (sec)	LOS[1]	AVERAGE BACK OF QUEUE (m)	AVERAGE DELAY (sec)	LOS[1]	AVERAGE BACK OF QUEUE (m)
Kings Highway / Butmaroo Street						
Butmaroo Street – south	5.8	A	0.3	7.9	A	0.6
Kings Highway – east	3.3	N/A	0.0	3.4	N/A	0.0
Butmaroo Street – north	6.8	A	0.9	7.0	A	0.9
Kings Highway – west	0.7	N/A	0.3	1.3	N/A	0.4
Kings Highway / Majara Street						
Majara Street – south	6.3	A	0.6	7.9	A	0.6
Kings Highway - east	3.6	N/A	0.0	3.4	N/A	0.0
Majara Street – north	6.3	A	0.8	7.0	A	1.4
Kings Highway – west	1.1	N/A	0.2	1.3	N/A	0.1

[1]: Intersection LOS and Major Road Approach LOS values are 'Not Applicable' for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

The results presented in **Table 9** indicates that all the intersections of interest operate with a good LOS and minimal delays during peak periods of school activity.

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 has 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 10**.

Table 10: Regional Secondary School Modal Split

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

- 20% of students will walk.
- 5% of students will cycle.
- 30% of students will catch the bus.
- 5% of students will drive themselves.
- 40% 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:

- 47% of students reside within 1,200 metres of the school.
- 44% of students reside between 2,400 metres and 3,600 metres of the school site.
- 35% of students reside outside 2,900 metres 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% of students may be eligible for free transport.

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

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

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

- 29% of students will walk.
- 28% of students will cycle.
- 43% 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%) and the reach scenario (29%) for walking are similar. For the purposes of analysis, an average of the two being, 25% 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 bicycle 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%) of the overall student population.
- For buses, the baseline scenario is 30%, and the reach scenario (based on the first-principles analysis) is 43%. For the target scenario, a bus mode share, an average of the two being, 37% has been assumed.

- Of the remaining 23 percent of students, it is assumed that 18% will be picked-up / dropped-off and 5% 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 11**.

Table 11: New High School in Bungendore Student Mode Share Target

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 12**.

Table 12: New High School in Bungendore Staff Mode Share Target

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) at the centre of the proposed high school 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 Pedestrians, Bicycles 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 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 (3) unisex shower/change cubicle will be provided near Building A (for use by staff only).

A total of 80 bicycle spaces will be provided including:

- Four (4) bicycle parking spaces will be provided for staff in proximity to Building A, separate from the student parking. The full time staff at the nearby primary school will also be able to use these facilities.
- 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 bicycles is consistent with the target mode share scenario for cycling, as detailed in Section 3.1.3.

All bicycle parking will be provided within the secured, fenced, boundary of the school.

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 23**).

Based on mode share targets in **Table 11**, approximately 167 students are expected to catch a bus to and from school. This is the equivalent of four (4) to five (5) buses, assuming approximately 40 students per bus.

Approximately 100 metres of kerb space is available for the relocated bus zone on Gibraltar Street, which will service up to five (5) large (14.5-metre-long) buses / coaches simultaneously or up to 11 mini-buses (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 Bus and Coach:

- 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 (2) 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 On-Street Pick-up / Drop off Areas

Commentary on the proposed pick-up / drop-off zones are as follows:

- A total of 21 kiss and drop spaces including:
    - Six (6) spaces along the southern kerbside of Turallo Terrace.
    - Four (4) spaces along the northern kerbside of Gibraltar Street.
    - 11 spaces on the western kerbside of Majara Street. It is noted that these spaces will replace and extend the approximately five (5) existing kiss and drop spaces currently located on the southern side of Gibraltar Street.
- The kiss and drop spaces along 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 subject to 'No Parking' restrictions (8:00am – 9:30am and 2:30pm – 4:00pm school days) to encourage vehicle turnover. Outside of these times, the parking may utilised by the general public.

The mode share target for students being dropped off is 18% of the student population, which is the equivalent of 81 students.

3.2.1.4.2 On-Site Car Parking

The QPRC Development Control Plan does not provide a parking rate for high schools. Notwithstanding, based on the proposed student and staff travel mode share targets discussed in **Table 11** and **Table 12**, it is expected that a demand for a total of 52 car spaces including 23 student spaces and 29 staff spaces will be generated by the new high school. In response, the proposed high school will provide a total of 56 car spaces (having a surplus of four (4) spaces). The 56-space provision will be allocated as follows:

- 23 student car spaces.
- 29 staff car spaces.
- Four (4) visitor car spaces.

The 56-space provision is expected to meet the car parking demand based on the travel mode share assessment in Section 3.1.3 and is therefore considered acceptable.

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 mini-bus (comparable to a B99 Design Vehicle).
- Typically, up to three (3) 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.

Having regard for the above discussion, the proposed high school will provide an indented bay, fronting Building C, with a length of approximately 33 metres which would allow for up to five (5) car spaces. Accordingly, the typical demand for three (3) ASTP vehicles would readily accommodate within the on-site indented bay in front of Building C and is therefore considered acceptable.

3.2.1.5 Servicing & Waste Collection

With regards to waste collection, this activity will be undertaken on-site by use of a 10.5-metre-long waste truck as outlined in the Operation Waste Management Plan (OWMP) Bungendore High School prepared by EcCell Environmental Management dated July 2021. Notwithstanding, the waste collection arrangements of the proposed high school has been assessed using a 12.5-metre-long Heavy Rigid Vehicle (HRV) and accordingly, swept path analysis has been undertaken of the waste truck path of travel. The results included as **Appendix D** confirm that a 12.5 metre HRV can satisfactorily manoeuvre within the on-site car park for the purposes of waste collection and more importantly, enter and the site in a forward direction.

To reduce the impact of waste collection on school operation it is considered that the truck undertake waste collection between 6am-7:30am or 4pm-7pm (or otherwise deemed acceptable by Council).

With regards to servicing, it is understood that an 8.8-metre-long flat-bed truck may travel to / from the site to deliver materials to and from the Technology and Applied Studies (TAS) buildings. In this regard, an indented delivery bay, adjacent to the south of the fire pump room is provided. Swept path analysis has also been undertaken of the indented delivery bay arrangements using an 8.8-metre-long Medium Rigid Vehicle (MRV). The results included as **Appendix D** confirm that an 8.8-metre MRV can satisfactorily manoeuvre within the on-site car park and more importantly, enter and exit the site in a forward direction. It is noted that delivery bay may also be utilised by general servicing vehicles should the proposed high school generate such demands.

3.2.2. Adjacent and To-Site Transport Infrastructure

3.2.2.1 Active Transport

With reference to **Figure 23**, the following upgrades to the active transport infrastructure are proposed:

- Provision of two (2) raised wombat crossings including:
    - A crossing along Gibraltar Street near the proposed high school primary entrance.
    - A crossing along Turallo Terrace near the proposed high school secondary entrance.
- Provision of a shared path along the southern side of Turallo Terrace, connecting with the existing shared paths to the east and west. It is noted the shared path extending to the west will be provided south of the existing angled car spaces serving the community centre spaces (to be retained).
- Provision of new walkway along the northern side of Turallo Terrace, between 64 Turallo Terrace (Bungendore Pre-School) in the west and connecting to the existing walkway to the east at Turallo Creek.
- Provision of a north-south shared path between Turallo Terrace and Gibraltar Street, west of Mick Sherd Oval.
- Relocation of the existing bus zone from the western side of Majara Street to the southern side of Gibraltar Street. The bus zone will serve both the new high school and existing primary school.

The above active transport infrastructure upgrades would support the safe and efficient movement of students, staff and guardians accessing and egressing the new high school and existing primary school.

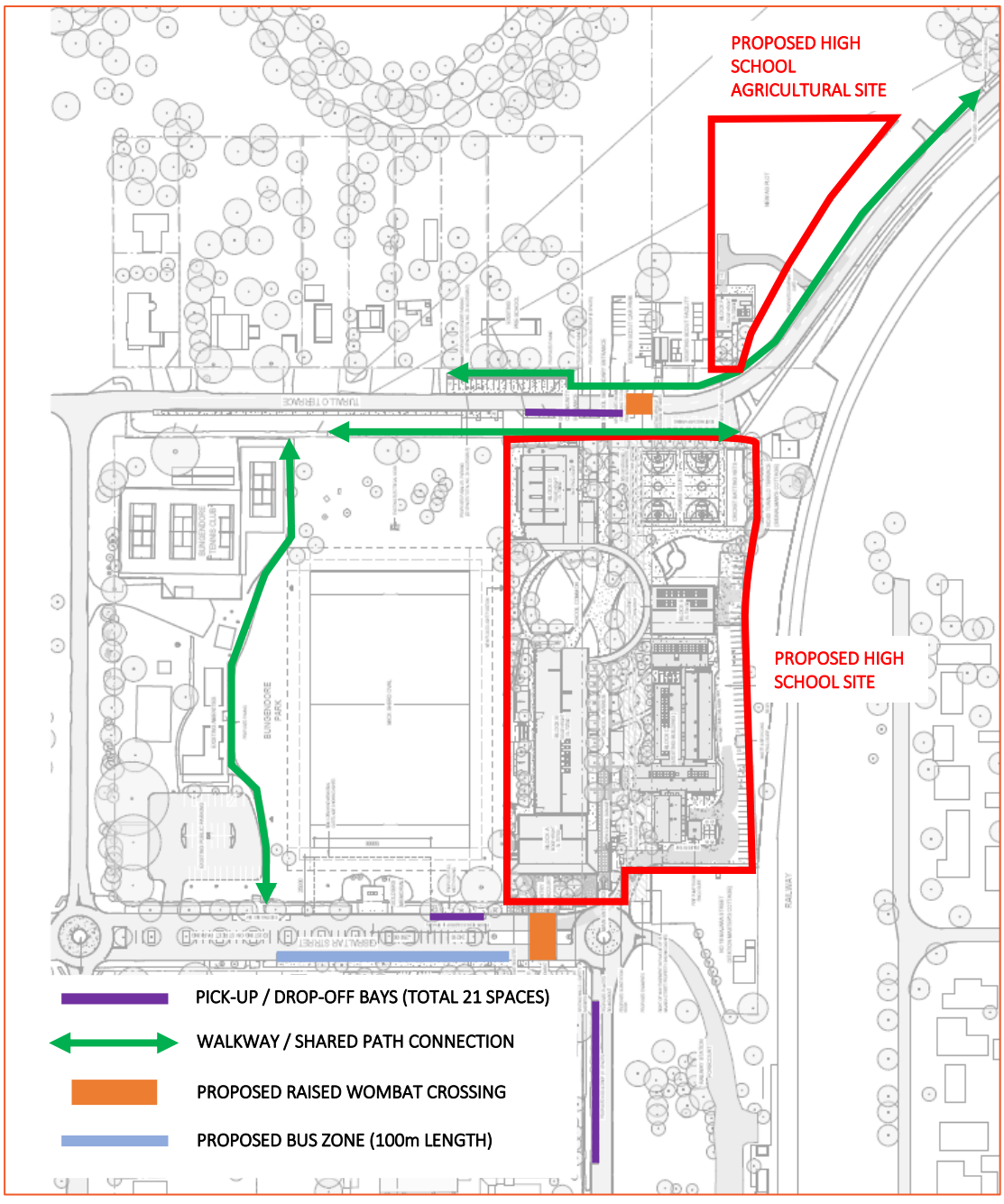


Figure 23: Proposed Public & Active Transport Infrastructure and Pick-Up / Drop-Off Facilities
(Source: TKD Architects)

3.2.2.2 *On-Street Car Parking*

The following on-street parking provision for community use is proposed:

- 22 parallel car parking spaces including two (2) accessible spaces, along the southern kerbside of Turallo Terrace. These spaces will replace the 20 formal car spaces that were provided on Majara Street in front of the Council building.
- 19 indented angled (90-degree) including two (2) accessible spaces, in front of Bungendore Pre-School. These spaces will serve as parking for the pre-school and future replacement of the scout hall car park due to the relocation of the 'Abbeyfield' seniors living development.

Of note is that the existing angled (90-degree) car spaces serving the community centre will be retained.

3.2.2.3 *Intersection Upgrades*

As displayed in **Figure 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 bicycles at the designated bicycle 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 bicycle 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 commencements of the new high school in Bungendore.

3.2.3.3 Vehicles

With respect to vehicle access / egress to 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.
- 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 ASTP, to pick-up / drop-off their students within the staff parking.
- Staff, senior students and visitors would be able to park their vehicle within the on-site car park.

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

It can be expected that there will be a proportion of parents that will have children in both the existing primary school and proposed high school and will potentially be penalised by an excessive stagger when picking-up their children in the afternoon.

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 the 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).

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) locations.
- Bus zones.

[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 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**.

3.2.4.2 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).

3.2.4.3 School Transport Planning

A preliminary School Transport Plan has been prepared separately. As part of the finalisation of the School Transport Plan (STP) consideration will be required for the below items:

- That TfNSW's management of the School Crossing Supervisor Program be noted in the School Transport Plan.
- Before occupation / use of the development as a school, the NSW Department of Education shall:
    - Finalise the STP in consultation with Council and TfNSW.
    - Submit a copy of the final STP to TfNSW and Council.
- Every six (6) months, the operation of the STP shall be reviewed with the travel plan being updated annually. As part of updating the STP, consultation should be had with Council, TfNSW and the school community / parents.
- The final STP will include the following additional details:
    - A provision of additional dedicated staff bike parking spaces, to encourage further mode shift;
    - A detailed analysis of existing public transport provision in the vicinity of the site, and recommendations for any improvements or changes that may be required to effectively service the school catchment; in consideration of the actual residential locations of enrolled students and staff, once known;
    - An analysis of the number of students within a reasonable walking and cycling distance from the site, in accordance with the aforementioned residential data, and adjustment of any corresponding mode share targets that may be necessitated by that information;
    - Finalised content for proposed collateral, namely the Welcome Packs and Student Kits, and Travel Access Guide for the site; and
    - A detailed Communications Plan and an Implementation Strategy / Action Plan for the delivery of key initiatives.

The above items will be considered by the project team for inclusion in the final STP which will be issued to Council and TfNSW for review and endorsement.

3.2.4.4 Gibraltar Street Wombat Crossing – School Crossing Supervisor

TfNSW outlines set criteria for a site to be eligible for a school crossing supervisor under the School Crossing Supervisor Program. As outlined in TfNSW's Centre for Road Safety webpage[4] the criteria are as follows:

- The site must have an existing children's crossing, pedestrian crossing (zebra) or combined crossing (children's and zebra).
- The crossing must be used by infant and/or primary school children.
- The site must be located within a 40km/h school zone.
- In the morning or afternoon, the crossing must register counts of either:
    - 50 or more unaccompanied infant and/or primary school children, or
    - 300 or more passenger car units (heavy vehicles over three tonnes unladen are counted as two passenger car units).
    - The site must be considered a safe working environment for a school crossing supervisor.

The requirement for a school crossing supervisor will be assessed with TfNSW's School Crossing Supervisor Program criteria (per above) and applied for should the warrants be met. Per the Centre of Road Safety webpage (see footer), TfNSW will assess the site against the set criteria.

Having regard for the above, the following is noted:

- The School Crossing Supervisor program is a state-wide program that contributes to the safety of infants and primary school students. Considering the proposed locations of the bus bay (southern side of Gibraltar Street), primary school students would not be required to cross either Gibraltar Street or Majara Street to access these facilities.
- The existing primary school does not provide for a school crossing supervisor.

[4] https://roadsafety.transport.nsw.gov.au/stayingsafe/schools/schoolcrossingsupervisorprogram.html

4. Design Aspects

4.1. Internal Design

4.1.1. Vehicle Access Arrangements

With 56 car parking spaces of User Class 1A, the proposed development requires a Category 1 Driveway under Table 3.1 of AS 2890.1, being a combined entry / exit driveway of width 3.0 metres to 5.5 metres. In response, the development proposes a driveway of width 11.7 metres which forms the northern leg of the Gibraltar Street / Majara Street intersection.

The proposed arrangements have also been assessed using swept path analysis which confirms compliance with AS 2890.1, and that the proposed access arrangements will operate safely and efficiently. The results of this analysis are provided as **Appendix D** for reference. The proposed design of the access is therefore considered acceptable and complies with the relevant requirements of AS 2890.1.

4.1.2. Car Parking and Vehicle Circulation Arrangements

The proposed internal parking arrangements comply with the relevant requirements of AS 2890.1, AS 2890.2, AS 2890.3, AS 2890.5 and AS 2890.6, with the following design aspects considered noteworthy:

Roadway

- The internal roadway, between the vehicle access and staff car park, is provided with a generally flat (0%) grade thereby satisfying Clause 2.5.3 of AS 2890.1.
- The vehicular access has a minimum width of 5.5 metres between kerbs and will therefore accommodate two-lane, two-way traffic flow.
- The proposed internal arrangements have also been assessed using swept path analysis which confirms compliance with AS 2890.1, and that the proposed internal arrangements will operate safely and efficiently. The results of this analysis are provided as **Appendix D** for reference.

Parking Modules

- All angled car parking spaces are generally provided in accordance with the User Class 1A requirements of AS 2890.1, having a minimum space width of 2.5 metres and length of 5.4 metres, with an aisle width of 5.8 metres.
- All accessible car parking spaces are provided with a minimum space width of 2.4 metres and length of 5.4 metres, with a minimum aisle width of 5.8 metres. Additionally, these spaces are located immediately adjacent to a 2.4-metre-wide and 5.4-metre-long shared area, thereby satisfying the requirements of AS 2890.6.

- All parallel car parking spaces are provided in accordance with Figure 2.5 of AS 2890.1.
- All walls and columns are located outside of the space design envelope, as required under Figure 5.2 of AS 2890.1.
- To allow for all entry and exit vehicle movements in a forward direction, a turning bay is provided at the northern end of the car park, between Car Space 42 and 43. The turning bay will primarily be utilised by delivery vehicles, minibuses and parents and guardians that are utilising the indented parallel parking spaces for pick-up and drop-off purposes.

Head Heights

- There are no overhead obstructions above the car parking spaces, roadway or service bay and accordingly, compliant head height clearances are achieved in accordance with Clause 5.3.1 of AS 2890.1, Table 2.1 of AS 2890.2 and Clause 2.4 of AS 2890.6.

Other Design Aspects

- A 2.5 metre by 2.0 metre visual splay is provided on the egress side of the driveway, at the property boundary, in accordance with Figure 3.3 of AS 2890.1.

4.2. External Design

4.2.1. Turallo Terrace

Parking Modules

- All angled and indented car parking spaces (northern side of Turallo Terrace) are provided in accordance with 'High Class' requirements of AS 2890.5, having a minimum space width of 2.6 metres and length of 5.4 metres.
- The parallel and indented car parking spaces (southern side of Turallo Terrace) are provided in accordance with Figure 3.1 of AS 2890.5 with the following space dimensions:
    - End spaces: A minimum space width of 2.3 metres and length of 5.4 metres.
    - Intermediate Spaces: A minimum space width of 2.3 metres and length of 6.7 metres
- The parallel K&D spaces are provided in accordance with Figure 3.1 of AS 2890.5 with the following space dimensions:
    - End spaces: A minimum space width of 2.3 metres and length of 5.4 metres.
    - Intermediate Spaces: A minimum space width of 2.3 metres and length of 6.7 metres

Wombat Crossing

- The wombat crossing is generally provided in accordance with AS 1742.10.

4.2.2. Gibraltar Street & Majara Street

Parking Modules

- The K&D spaces being, parallel car parking spaces, are provided in accordance with Figure 3.1 of AS 2890.5 having the following minimum characteristics:
    - End spaces: Space width of 2.3 metres and length of 5.4 metres.
    - Intermediate spaces: Space width of 2.3 metres and length of 6.7 metres.

Wombat Crossing

- The wombat crossing is generally provided in accordance with AS 1742.10.

In summary, the internal and external parking arrangements have generally been designed in accordance with AS 2890.1, AS 2890.2, AS 2890.3, AS 2890.5, AS 2890.6 and AS 1742.10. Any minor amendments considered necessary can be dealt with prior to the release of a Construction Certificate.

5. Traffic Assessment

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

- Commencement of operation (2023).
- A 10- year time period from the commencement of operation (2033).

5.1. Background Traffic Growth

As detailed in section 1.2, in the BSP 2048, 1,384 new dwellings are projected to be required within Bungendore over the next 30 years to accommodate 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 10 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% outbound and 20% inbound in the AM peak hour.
- 20% outbound and 80% inbound in the PM peak hour.

The peak hour trips associated with the proposed subdivisions are presented in **Table 13**.

Table 13: Subdivision Peak Hour Traffic Generation

SUBDIVISION	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).

For purposes of a conservative assessment, 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 further conservative, an annual growth rate of 2% 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.

5.2. 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 vehicle 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 number 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[5], 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.

The new high school in Bungendore will have a student population of 450 and application of 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:

- 225 trips in the AM peak (113 inbound and 112 outbound).
- 193 trips in the PM peak (97 inbound and 96 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.

5.3. Trip distribution

5.3.1. 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 4**) would access and 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.

However, to be conservative, it is assumed that 30% of residents of the North Elmslea Subdivision will use Turallo Terrace to access and egress Tarago Road / Molonglo Street and the commercial centres of Canberra and Queanbeyan.

[5] 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.

For the Bungendore East Subdivision (Lot 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% of residents of the Bungendore East Subdivision will access / egress the subdivision to and from the west.
- 25% of residents of Bungendore East Subdivision will access / egress the subdivision to and from the east.

5.3.2. School Trips

To support the trip distribution analysis, Bungendore has been divided into six (6) 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).

Each of the six (6) 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 (6) sectors (at the intersection of interest), are displayed in **Table 14**.

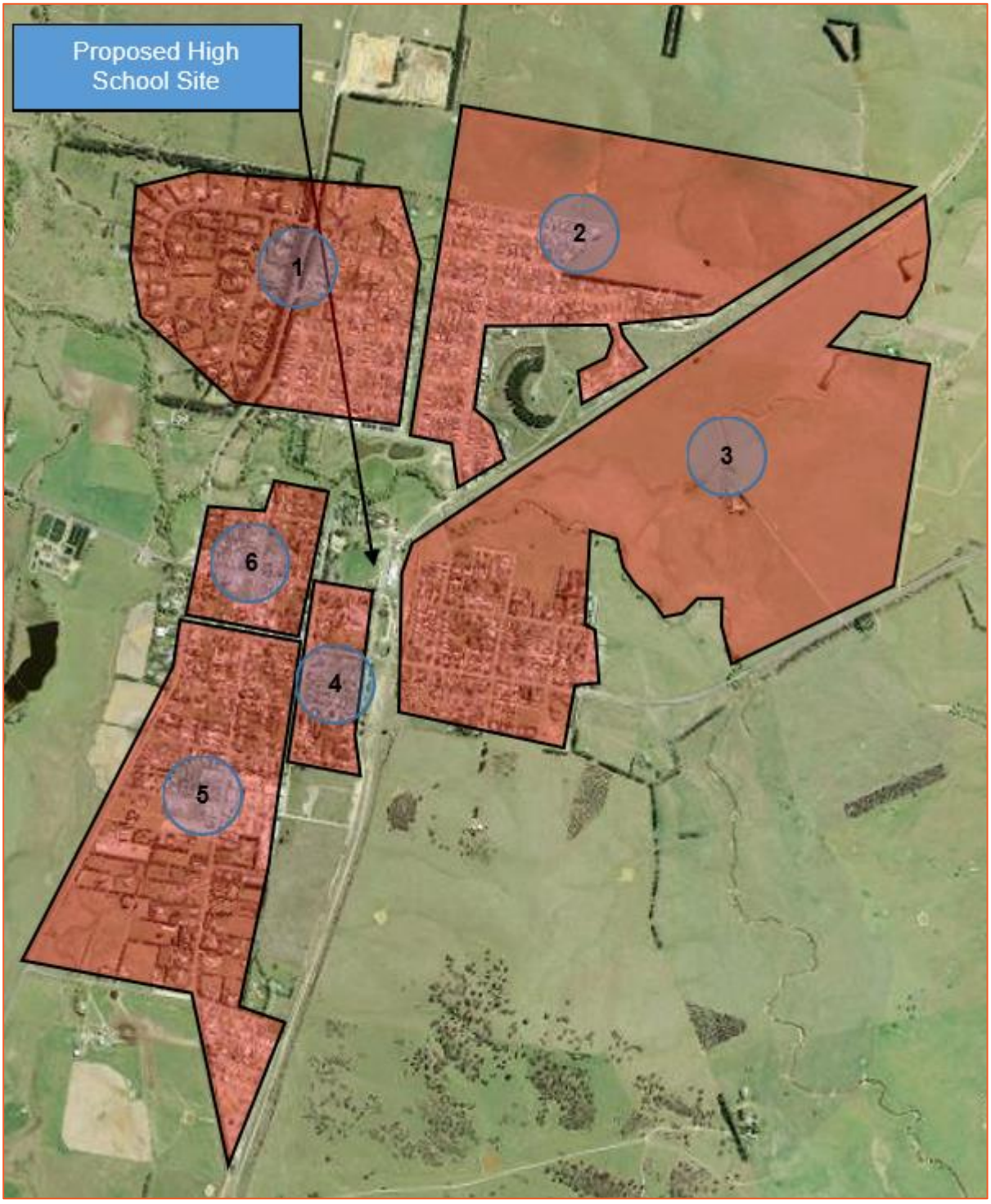
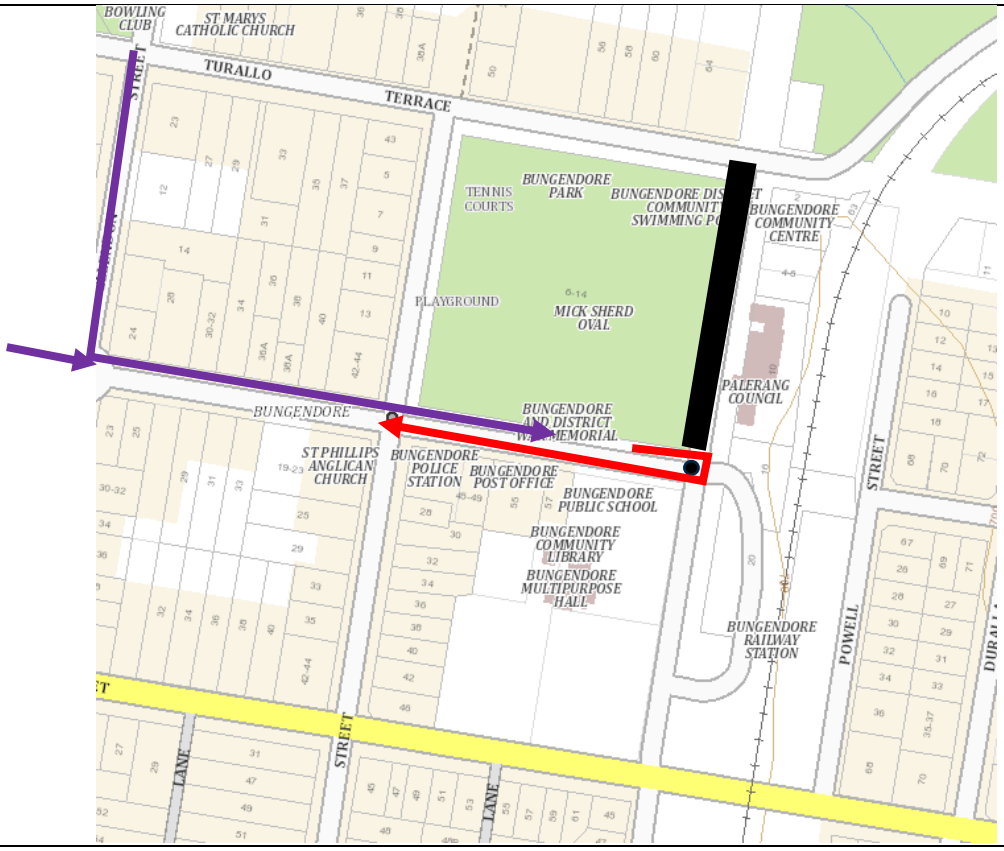
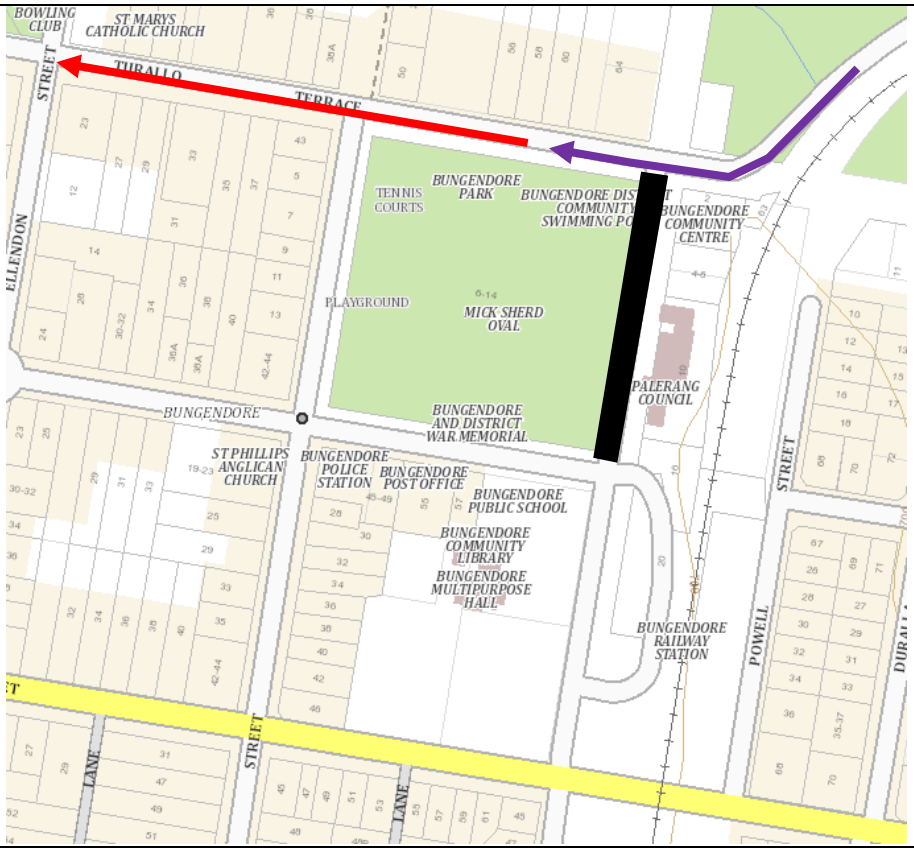


Figure 24: Trip Distribution Sectors

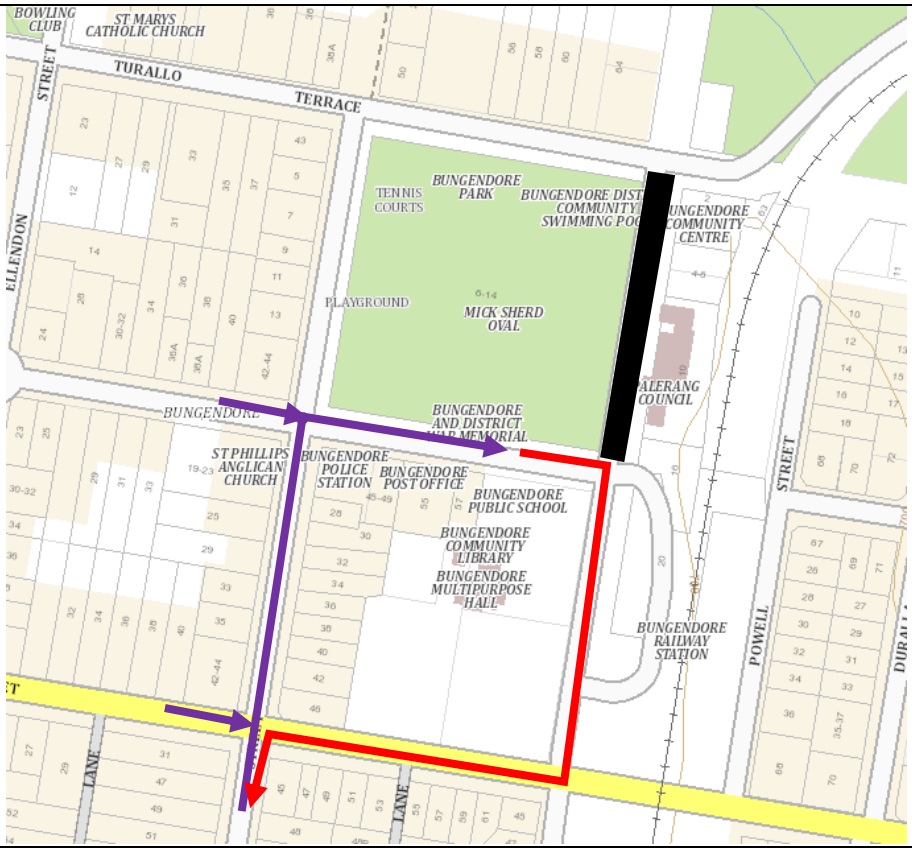
Table 14: School Access Route by Sector

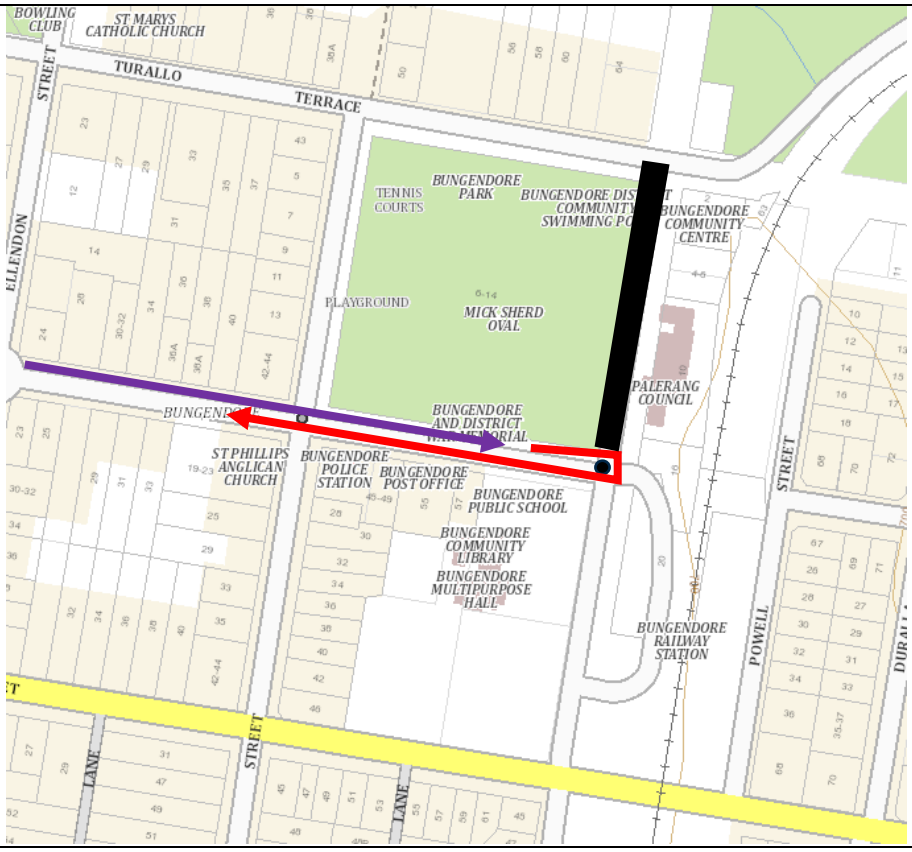
SECTOR	ACCESS ROUTE
1	

SECTOR	ACCESS ROUTE
2	

SECTOR	ACCESS ROUTE
3A	
3B	

SECTOR	ACCESS ROUTE
4A	
4B	

SECTOR	ACCESS ROUTE
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 15**. For the purposes of analysis, it has been assumed that the housing densities are approximately similar for each of the six (6) sectors.

Table 15: 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%***

5.3.3. School AM peak hour

5.3.3.1 Inbound trips

The portions for each of the six (6) sectors, detailed in **Table 15**, have been applied to the access routes detailed in **Table 14** to determine the expected inbound AM peak hour traffic volumes, as displayed in **Table 16**.

Table 16: AM Inbound Trips

SECTOR	PORTION OF TOTAL	TRIPS (INBOUND)
1	16%	18
2	25%	28
3	36%	41
4	3%	3
5	16%	18
6	4%	5
Total	***100%***	***113***

5.3.3.2 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 25**):

- 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.

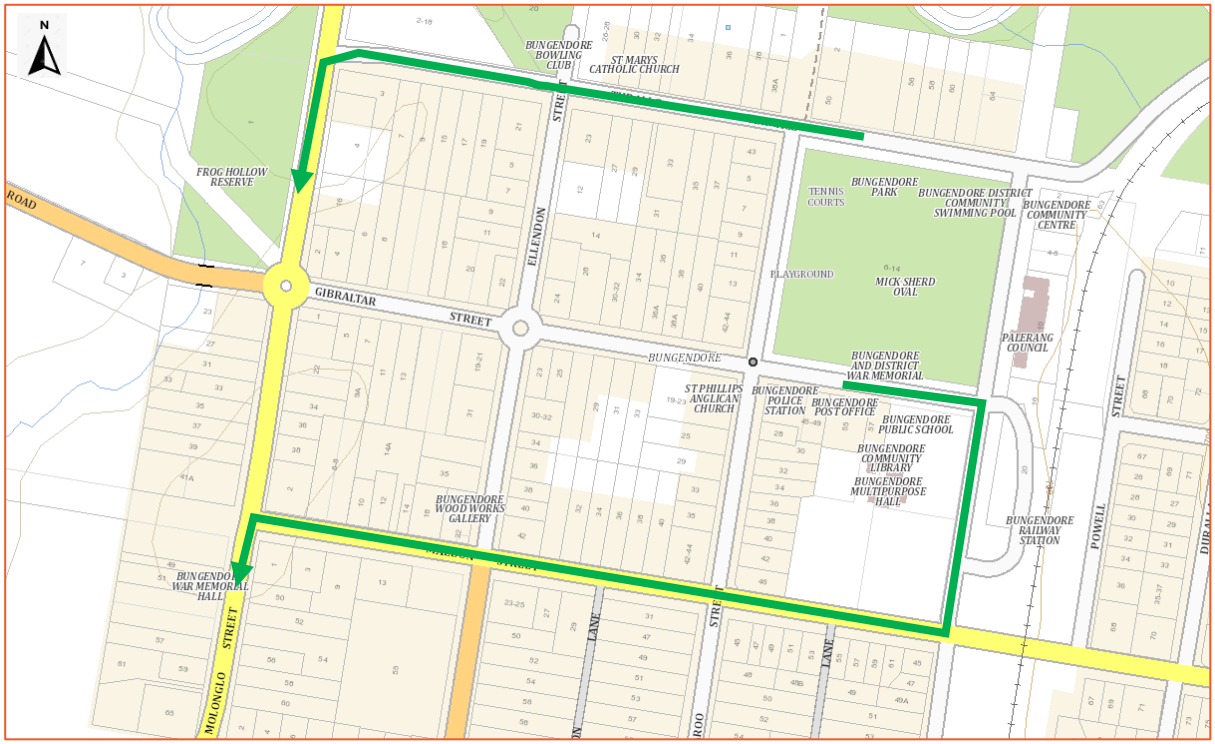


Figure 25: Route from School to Queanbeyan / Canberra Employment Centres *(source: SIX Maps)*

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

- 60% of outbound vehicles will travel to Queanbeyan / Canberra.
- The remaining 40% will return to their places of residence via the routes detailed in **Table 14**.

5.3.4. 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 14**, as displayed in **Table 17**.

Table 17: PM Inbound and Outbound Trips

SECTOR	PORTION OF TOTAL	TRIPS (INBOUND & OUTBOUND)
1	16%	31
2	25%	48
3	36%	69
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**.

5.3.5. 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.

5.4. 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 2% 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 26,** 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.

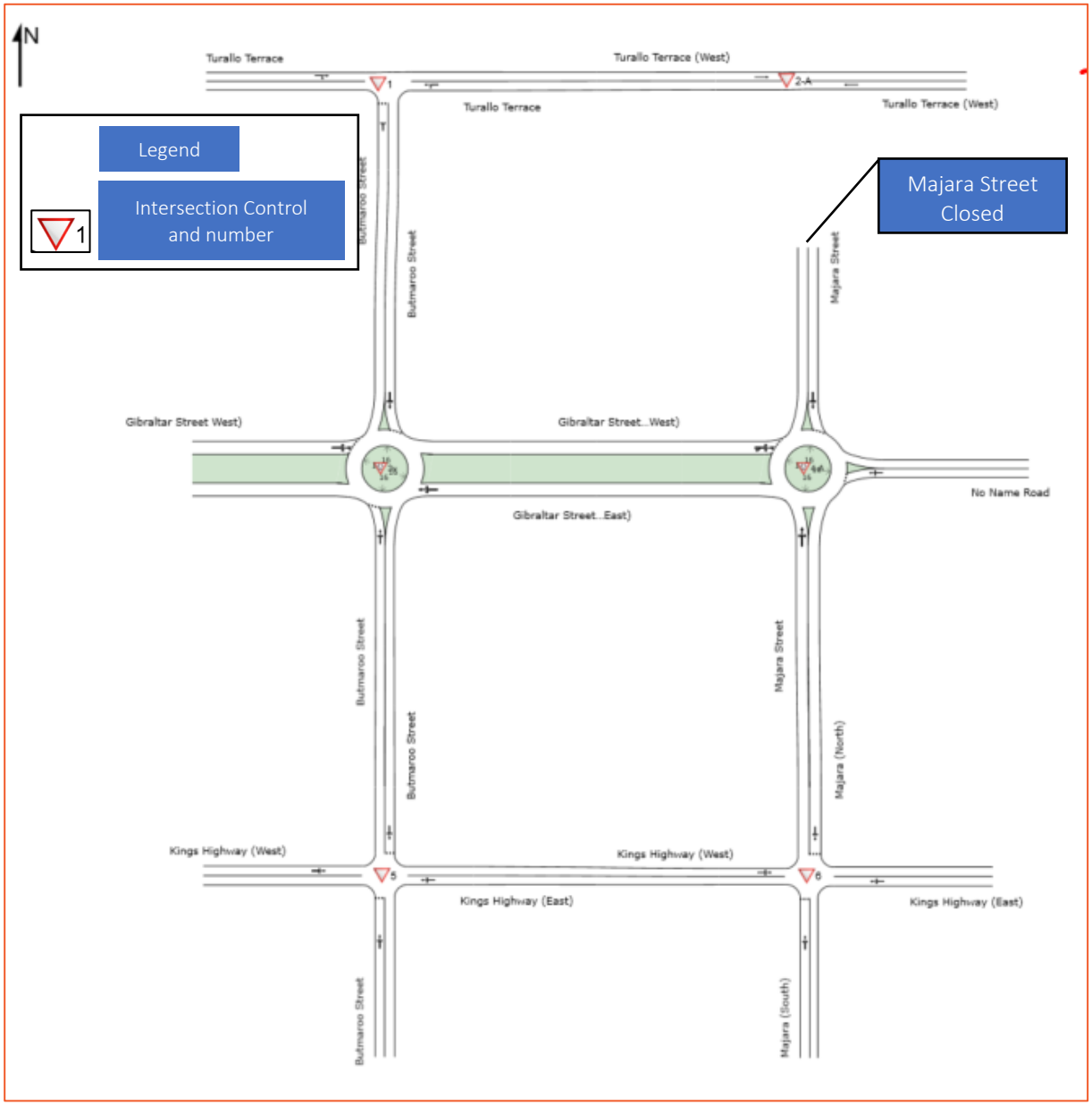


Figure 26: 2033 SIDRA network (Proposed Post-Development Scenario)

The results of the SIDRA analysis for the 2023 horizon year (year of opening) are displayed in **Table 18**, with the results of the SIDRA analysis for the 2033 horizon year are displayed in **Table 19**.

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

Table 18: Intersection Performance 2023 Post-Development (Year of Opening)

INTERSECTION	AM PEAK			PM PEAK		
	AVERAGE DELAY (sec)	LOS[2]	AVERAGE BACK OF QUEUE (m)	AVERAGE DELAY (sec)	LOS[2]	AVERAGE BACK OF QUEUE (m)
Turallo Terrace / Butmaroo Street						
Butmaroo Street	6.2	A	0.8	6.0	A	1.0
Turallo Terrace – east	0.6	N/A	0.0	3.0	N/A	0.0
Turallo Terrace – west	2.6	N/A	0.3	0.8	N/A	0.1
Turallo Terrace / Majara Street[1]						
Turallo Terrace – east	0.0	N/A	0	0.0	N/A	0
Turallo Terrace – west	0.0	N/A	0	0.0	N/A	0
Gibraltar Street / Butmaroo Street						
Butmaroo Street – south	7.0	*A*	*1.4*	*6.3*	A	1.8
Gibraltar Street – east	3.9	*A*	*0.0*	*4.3*	A	0.0
Butmaroo Street – north	6.4	*A*	*1.5*	*5.7*	A	1.2
Gibraltar Street – west	4.9	*A*	*1.9*	*5.2*	A	1.9
Gibraltar Street / Majara Street						
Majara Street – south	4.3	*A*	*0.0*	*5.5*	A	1.5
Station access road	5.5	*A*	*0.2*	*5.5*	A	0.5
Majara Street – north	5.5	*A*	*0.0*	*6.6*	A	0.6
Gibraltar Street – west	8.2	*A*	*0.2*	*7.4*	A	1.1
Kings Highway / Butmaroo Street						
Butmaroo Street – south	7.3	A	0.5	9.4	A	0.8
Kings Highway – east	3.6	N/A	0.0	3.5	N/A	0.0
Butmaroo Street – north	9.2	A	1.6	7.4	A	2.1
Kings Highway – west	0.8	N/A	0.4	5.8	N/A	0.5

[1]: No delay experienced as it is no longer an intersection under the Proposal.

[2]: Intersection LOS and Major Road Approach LOS values are 'Not Applicable' for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Table 18: Intersection Performance 2023 Post-Development (Year of Opening) - Continued

INTERSECTION	AM PEAK			PM PEAK		
	AVERAGE DELAY (sec)	LOS[2]	AVERAGE BACK OF QUEUE (m)	AVERAGE DELAY (sec)	LOS[2]	AVERAGE BACK OF QUEUE (m)
Kings Highway / Majara Street						
Majara Street – south	7.4	A	0.8	7.9	A	0.1
Kings Highway - east	3.9	N/A	0.0	3.7	N/A	0.0
Majara Street – north	8.3	A	2.3	8.2	A	3.2
Kings Highway – west	1.7	N/A	0.2	0.9	N/A	0.1

[1]: No delay experienced as it is no longer an intersection under the Proposal.

[2]: Intersection LOS and Major Road Approach LOS values are 'Not Applicable' for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

The results in **Table 18** indicate that the six (6) intersections of interest are expected to operate satisfactorily, 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 19: Intersection Performance 2033 Post-Development

INTERSECTION	AM PEAK			PM PEAK		
	AVERAGE DELAY (sec)	LOS[2]	AVERAGE BACK OF QUEUE (m)	AVERAGE DELAY (sec)	LOS[2]	AVERAGE BACK OF QUEUE (m)
Turallo Terrace / Butmaroo Street						
Butmaroo Street	6.4	A	0.8	6.2	A	1.3
Turallo Terrace – east	2.2	N/A	0.0	2.9	N/A	0.0
Turallo Terrace – west	2.4	N/A	0.5	0.6	N/A	0.2
Turallo Terrace / Majara Street[1]						
Turallo Terrace – east	0.0	N/A	0.0	0.0	N/A	0.0
Turallo Terrace – west	0.0	N/A	0.0	0.0	N/A	0.0
Gibraltar Street / Butmaroo Street						
Butmaroo Street – south	7.2	A	1.3	6.7	A	2.3
Gibraltar Street – east	3.9	A	0.0	4.3	A	0.0
Butmaroo Street – north	5.1	A	1.8	5.9	A	1.5
Gibraltar Street – west	4.9	A	2.2	5.3	A	2.3

[1]: No delay experienced as it is no longer an intersection under the Proposal.

[2]: Intersection LOS and Major Road Approach LOS values are 'Not Applicable' for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Table 19: Intersection Performance 2033 Post-Development – Continued

INTERSECTION	AM PEAK			PM PEAK		
	AVERAGE DELAY (sec)	LOS[2]	AVERAGE BACK OF QUEUE (m)	AVERAGE DELAY (sec)	LOS[2]	AVERAGE BACK OF QUEUE (m)
Gibraltar Street / Majara Street						
Majara Street – south	4.2	A	0.0	5.3	A	1.7
Station access road	5.5	A	0.2	5.5	A	0.5
Majara Street – north	5.6	A	0.0	6.6	A	0.6
Gibraltar Street – west	8.2	A	1.3	7.3	A	1.2
Kings Highway / Butmaroo Street						
Butmaroo Street – south	12.6	A	0.9	16.7	B	2.7
Kings Highway – east	3.4	N/A	0.0	3.4	N/A	0.0
Butmaroo Street – north	14.9	B	3.4	14.7	B	4.8
Kings Highway – west	0.9	N/A	0.7	6.7	N/A	0.8
Kings Highway / Majara Street						
Majara Street – south	12.8	A	1.8	11.1	A	1.4
Kings Highway - east	3.6	N/A	0.0	3.7	N/A	0.0
Majara Street – north	14.6	B	4.8	13.9	N/A	6.5
Kings Highway – west	1.5	N/A	0.3	0.5	A	0.2

[1]: *No delay experienced as it is no longer an intersection under the Proposal.*

[2]: *Intersection LOS and Major Road Approach LOS values are 'Not Applicable' for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.*

The results in **Table 19** indicate that the six (6) 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 8**, 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 assumption 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 G.**

6. Preliminary Construction Assessment

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

6.1. Construction Outline

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.

6.1.1. 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 (3) cranes per week for a period of two (2) months.
- Truck and dog trailer – likely to be required for the duration of the civil works, approximately four to six (4-6) movements per day (inbound and outbound) for a period of two (2) months.
- Material deliveries – likely to be multiple deliveries per day, in vehicles ranging from utes to pantecs.
- Waste – likely to be one (1) movement every two (2) days.

6.1.2. 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.

6.1.3. Oversize Vehicles

6.4 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 TfNSW 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 TfNSW. Additionally, oversized traffic movements should be carried out, where possible, outside peak road network periods, thereby minimising the impacts on the road network.

6.2. Construction Compound & Management Arrangements

A preliminary Construction Compound Diagram has been prepared by HCA and issued separately. The Construction Compound Diagram details the general on-site arrangements including crane locations, contractor parking, materials handling / laydown areas, vehicle accesses and site offices. The below sub-sections summarise the key operational details of the construction compound as provided by HCA.

6.2.1. Vehicular Site Access

Three (3) construction vehicle accesses are proposed to facilitate the construction of the new high school. These include:

- Gate 1: A construction driveway onto Majara Street and will primarily serve as the primary access for contractors, visitors and delivery of materials via light vehicles of the proposed high school site.
- Gate 2: A construction driveway onto Turallo Terrace and will primarily serve as the primary access for delivery vehicles and floating of construction plant and machinery of the proposed high school site.
- Gate 3: A construction driveway onto Turallo Terrace serving the proposed high school agricultural site and will only be utilised for overflow car parking.

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.

6.2.2. Construction Loading Areas

All loading / unloading activities will be undertaken within the proposed high school site. Per Section 6.2.1, access to the on-site construction loading area will occur via Gate 1 onto Majara Street and Gate 2 onto Turallo Terrace.

Heavy vehicle arrivals will be coordinated to avoid queuing of vehicles outside the site as queuing / marshalling 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.

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.

6.2.3. Contractor Parking

Per the Construction Compound Diagram, HCA has nominated the following provisions for contractor parking:

- An estimated 85 contractor car parking spaces can be provided within the new high school site and accordingly.
- Following the demolition of the existing community centre (north-eastern corner of the new high school site) a further 50 car spaces can be accommodated for contractor parking after mid-2023.
- In the unlikely event that there is greater demand of contractor parking which cannot be accommodated within the new high school site, an overflow car park area has been designated within the new high school agricultural plot site.

6.2.4. 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 Bungendore 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 PCTMP incorporating the Traffic Guidance Scheme (TGS) will need to be developed by the Contractor and 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.

6.2.5. 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.

6.3. Proposed Construction Hours of Work

Construction work is typically restricted to nominated days and times to minimise impacts on neighbouring developments and residences and are typically conditioned and align with NSW Environmental Protection Authority, Draft Construction Noise Guidelines, being:

- Weekdays (Monday – Friday): 7am – 6pm.
- Saturdays: 8am – 1pm.
- Sundays and public holidays: No construction work.

In addition to the above it is proposed that truck egress via Majara Street will be restricted during school peak periods to limit construction vehicle movements coinciding with the typical school peak periods and traffic and pedestrian activity of the Public School. During school peak periods, access to the site would occur via Gate 2 provided onto Turallo Terrace.

6.4. Construction Vehicle Routes

6.4.1. Overview

Given the proximity of the proposed high school site to the existing public school, it is considered appropriate that a restriction be imposed on the arrival and departure times of construction vehicle movements to / from the site via Gate 1. In this regard, it is recommended that no construction vehicles be permitted to arrive at or depart from the site via Gate 1 during the typical school drop-off and pick-up periods of 8-9:30am and 2:30-4pm on school days only. This restriction will provide a superior outcome in terms of safety and is therefore recommended for adoption. The proposed truck routes to / from the site are illustrated by **Figure 27** and can be summarised as follows:

6.4.1.1 *Construction Vehicle Routes to the Site Via Gate 1*

- Inbound: All construction vehicles will arrive at the site via:
  - From the north: Tarago Road, Molonglo Street and Turallo Terrace.
  - From the south: Kings Highway, Molonglo Street and Turallo Terrace.
- Outbound: All construction vehicles will arrive at the site via:
  - To the north: Turallo Terrace, Molonglo Street and Tarago Road.
  - To the south: Turallo Terrace, Molonglo Street and Kings Highway.

6.4.1.2 *Construction Vehicle Routes to the Site Via Gate 2*

- Inbound: All construction vehicles will arrive at the site via:
  - From the north: Tarago Road, Molonglo Street and Malbon Street and Majara Street.
  - From the south: Kings Highway, Malbon Street and Majara Street.
- Outbound: All construction vehicles will arrive at the site via:
  - To the north: Majara Street, Malbon Street, Molonglo Street and Tarago Road.
  - To the south: Majara Street, Malbon Street and Kings Highway.

It is noted that routes to / from the proposed high school agricultural site is not included considering that this site will primarily be utilised as overflow contractor car parking with all construction deliveries to be accommodated at the proposed high school site.

As much as is reasonably practical, use of local roads as part of the heavy vehicle route is kept to a minimum, and is noted the site has relatively good access to the regional and state road network with:

- Turallo Terrace (north of the site) connecting with Molonglo Street (Regional Road) to the west.
- Majara Street (south of the site) connecting with Kings Highway / Malbon Street (State Road) to the south.

Additionally, it is noted that a copy of the above routes and **Figure 27** is required to be provided to all drivers prior to attending the site.

Figure 27: Construction Vehicle Routes

6.5. Construction Impacts

6.5.1. Construction Parking Demand & Impacts

The use of public transport and car-pooling will be actively encouraged by the builder and all sub-contractors to reduce the reliance on private vehicles and minimise parking demands. With regards to on-site parking for the duration of construction, the following is noted:

- It is estimated that a maximum of 110 workers would be on-site at any one time. Applying a car occupancy rate of 1.5 persons / car, this equates to a car parking demand of approximately 74 contractor spaces.
- As previously discussed, the on-site contractor car parking provisions are as follows:
    - An estimated 85 contractor car parking spaces can be provided within the new high school site and accordingly, the anticipated demand for 74 car spaces can be wholly accommodated with no reliance on on-street car parking.
    - Following the demolition of the existing community centre (north-eastern corner of the new high school site) a further 50 car spaces can be accommodated for contractor parking after mid-2023.
    - In the unlikely event that there is greater demand of contractor parking which cannot be accommodated within the new high school site, an overflow car park area has been designated within the new high school agricultural plot site.
- As much as reasonably practical, the builder shall ensure that contractor parking demands are accommodated on-site. To convey the available on-site car parking areas to all on-site workers, workers will undergo a site induction during which, they will be advised to utilise the designated on-site car parking areas.
- Having regard for the above, there are sufficient provisions for on-site contractor parking that would reduce if not, prevent any impacts on the existing on-street parking conditions along nearby local roads including but not limited to, Turallo Terrace, Gibraltar Street and Butmaroo Street.

6.5.2. 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 detailed Construction and Pedestrian Traffic Management Plan which would be prepared post-approval and prior to the issue of a Construction Certificate.

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

Within the construction hours detailed in Section 6.3, up to five (5) trains will access Bungendore Railway 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 0, 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 the PCTMP 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.

7. Summary and Conclusions

7.1. 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.

7.2. Key Findings

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

- The indicative 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 under existing conditions.
- 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 were derived using a first principles assessment 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:

- 225 trips in the AM peak (113 inbound and 112 outbound).
- 193 trips in the PM peak (97 inbound and 96 outbound).

- SIDRA intersection analysis accounting for the high school trips, the proposed subdivision and a two percent annual background traffic growth indicates that the intersections 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.

Appendix A

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TRADING AS

BUNGENDORE
BUS & COACHES

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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

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TRANSPORT FOR NSW ACCREDITATION # RRP 9226
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

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

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

BAROMU PTY LTD
TRADING AS

BUNGENDORE
BUS & COACHES

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www.bungendorebusandcoach.com.au / email: stevenscharter@bigpond.com.au
TRANSPORT FOR NSW ACCREDITATION # RRP 9226
ACT URBAN SERVICES ACCREDITATION #ACTBS005TC

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
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

KINGS HIGHWAY

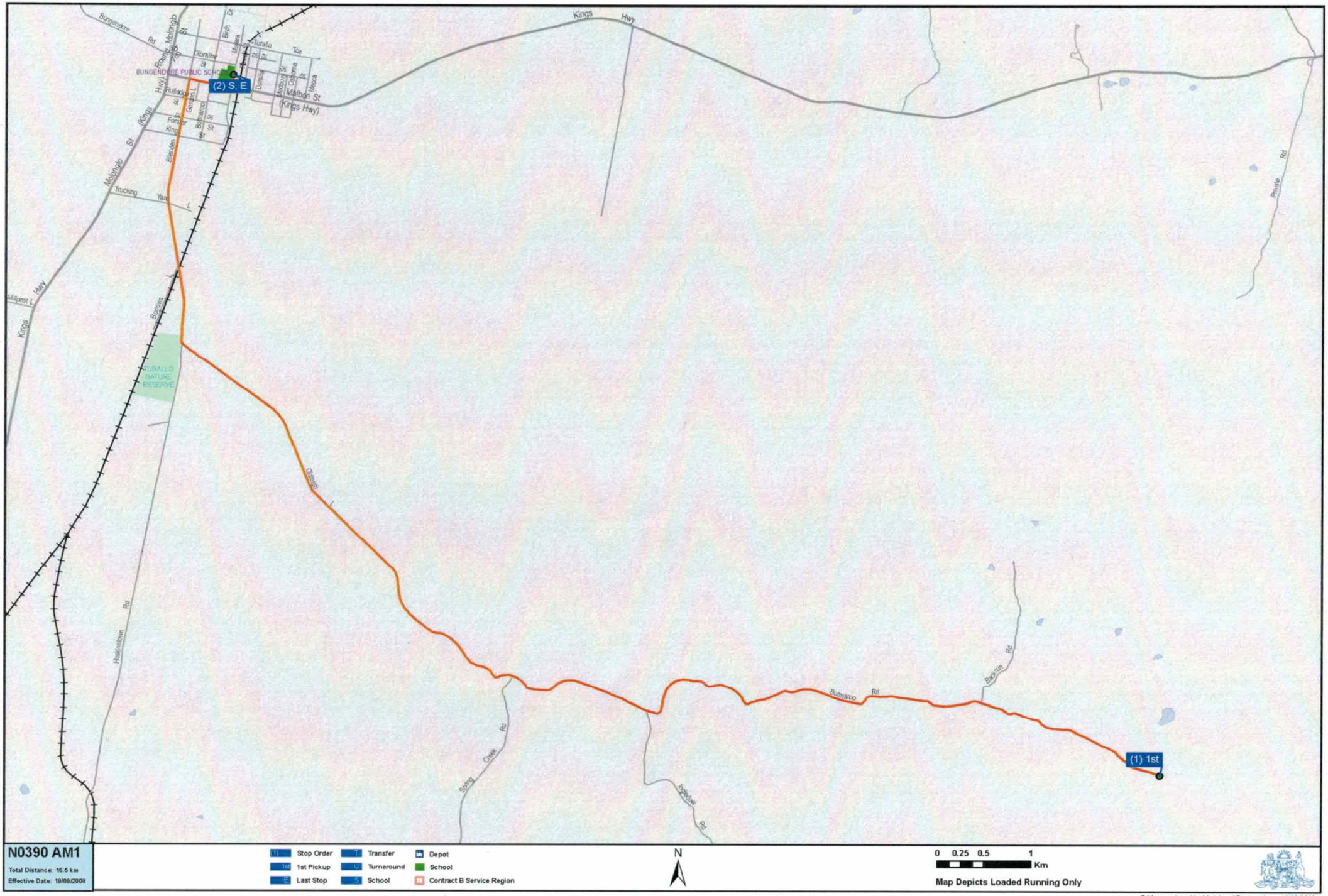
AM Service

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

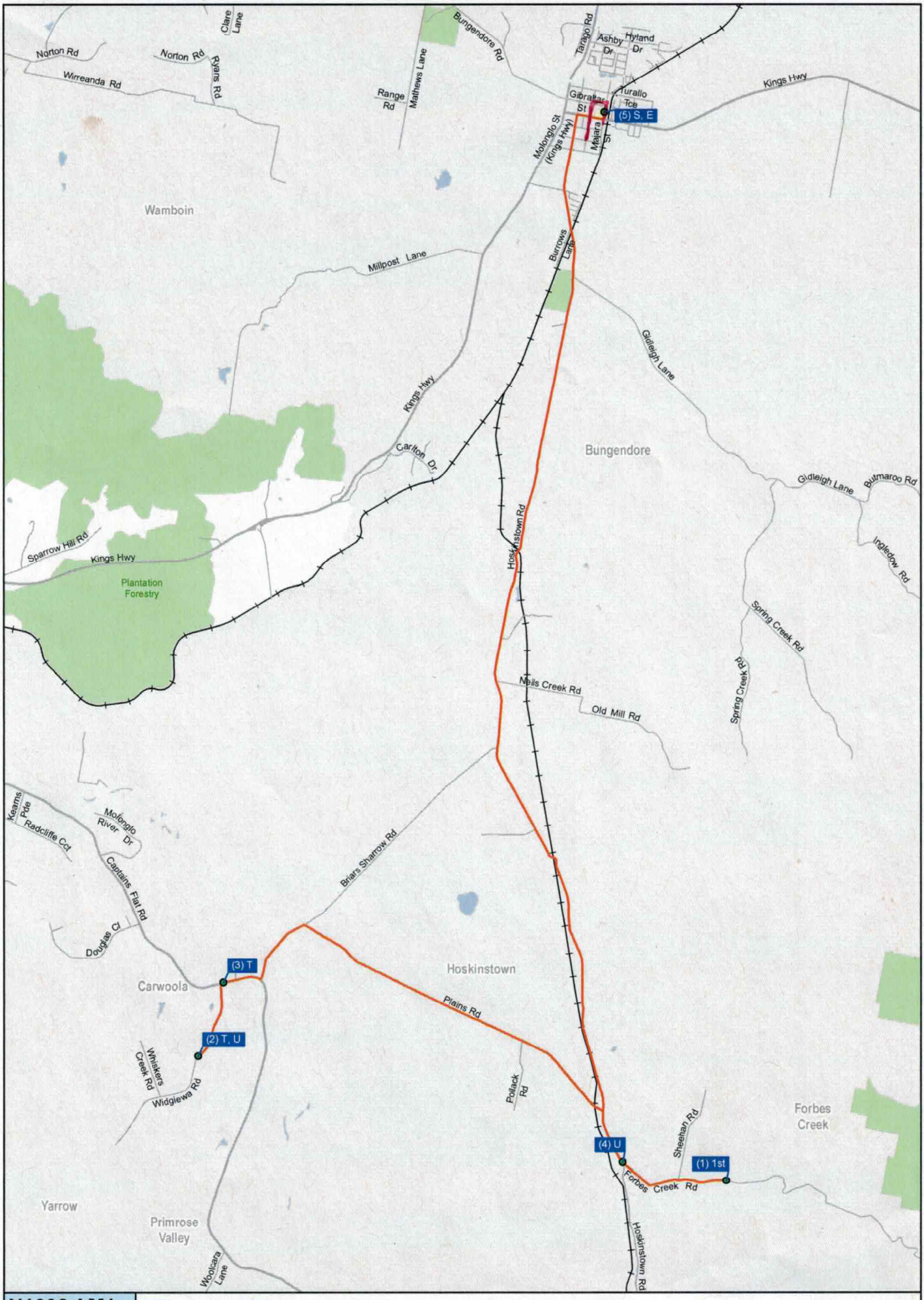
SO Stop Order	T Transfer	Depot	
1st 1st Pickup	TA Turnaround	School	
E Last Stop	S School	Contract B Service Region	

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

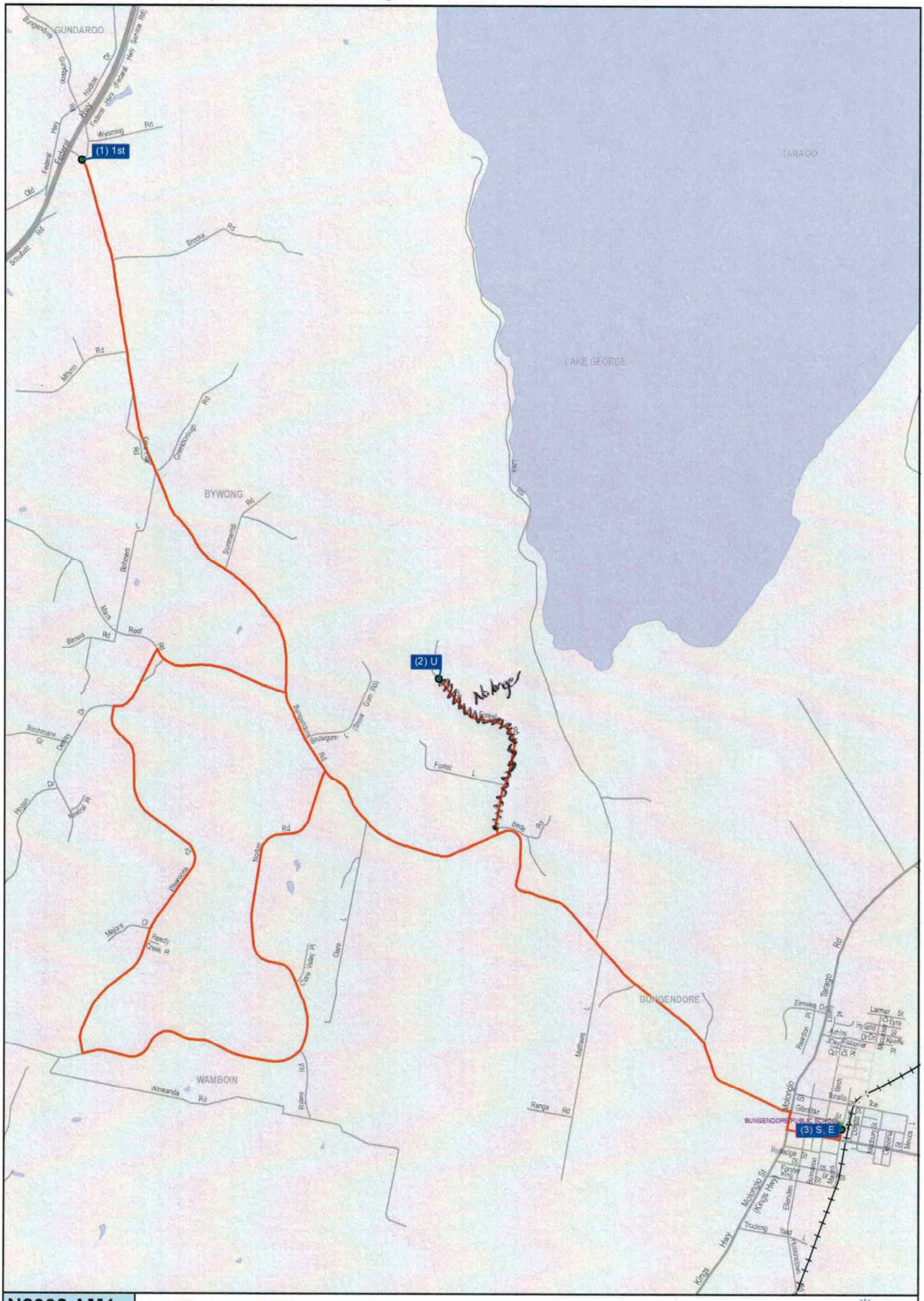
N

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

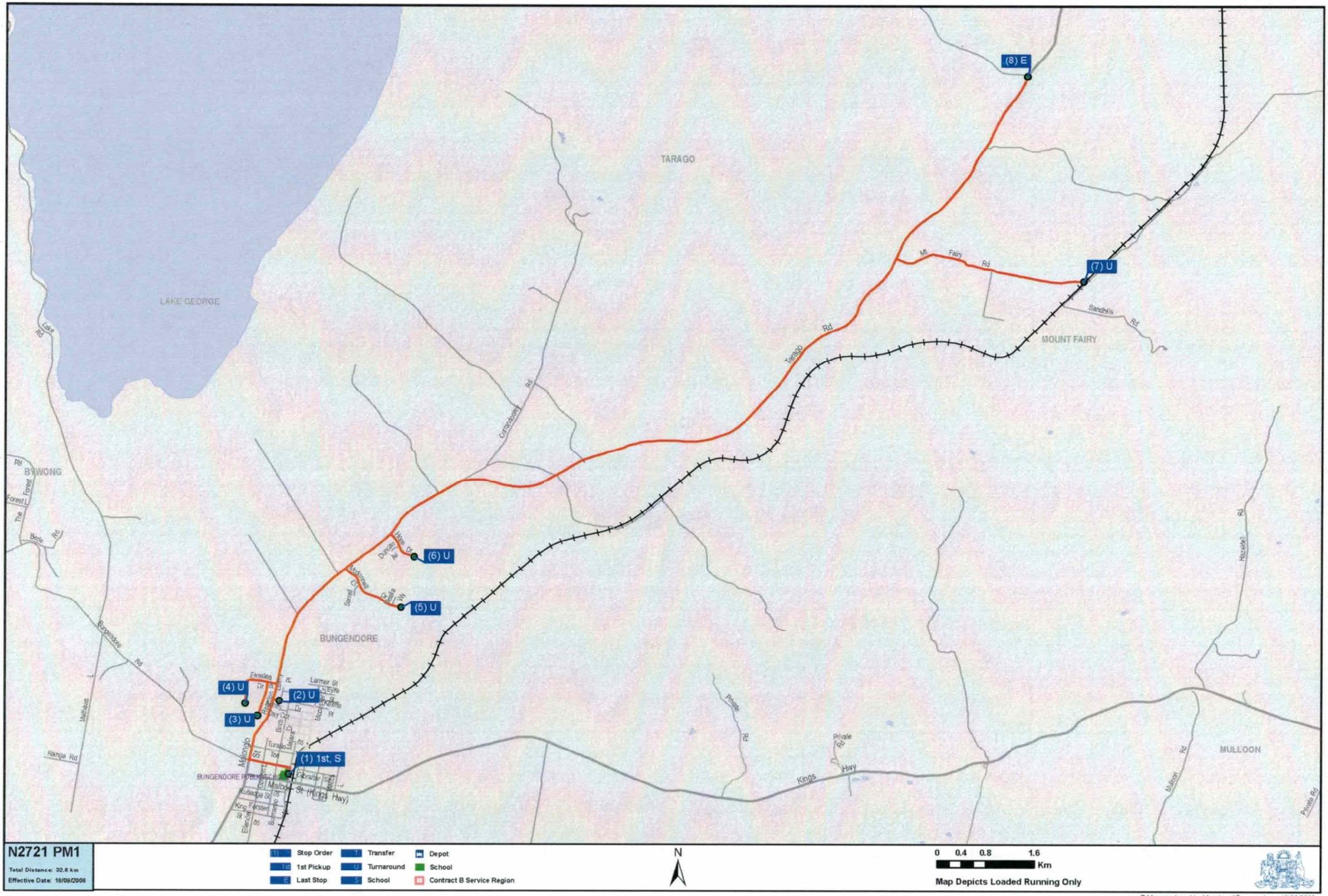
(1)	Stop Order	T	Transfer		Depot
1st	1st Pickup	U	Turnaround		School
E	Last Stop	S	School		Contract B Service Region

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 B

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

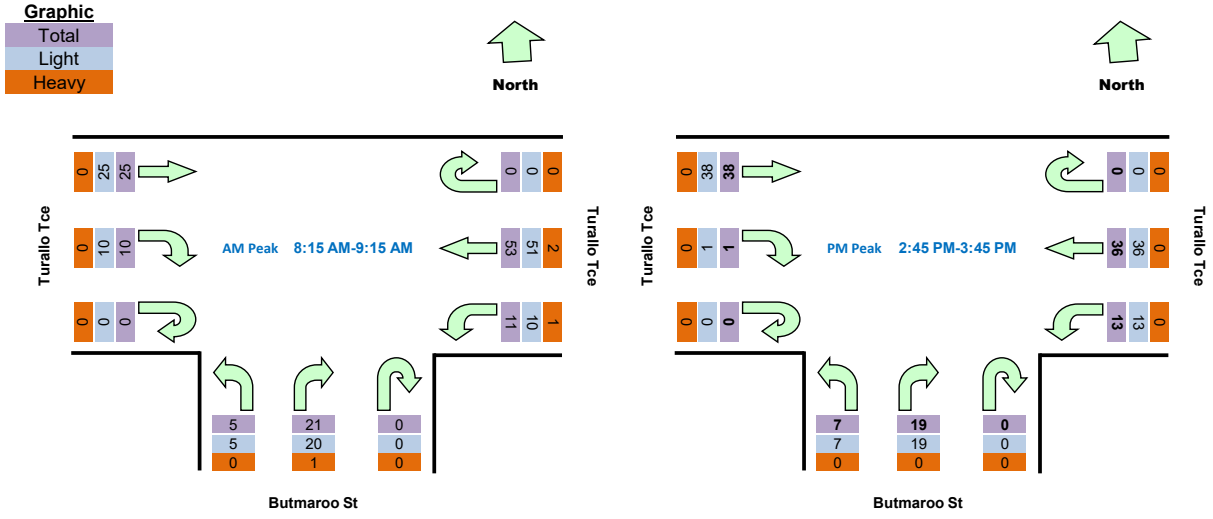
Time		East Approach Turallo Tce			South Approach Butmaroo S			West Approach Turallo Tce			Hourly Total		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak	
8:00	8:15	0	14	4	0	3	2	0	1	3	99		27
8:15	8:30	0	13	2	0	3	2	0	2	3	125	Peak	25
8:30	8:45	0	7	1	0	0	0	0	1	3	122		12
8:45	9:00	0	17	1	0	7	1	0	3	6			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

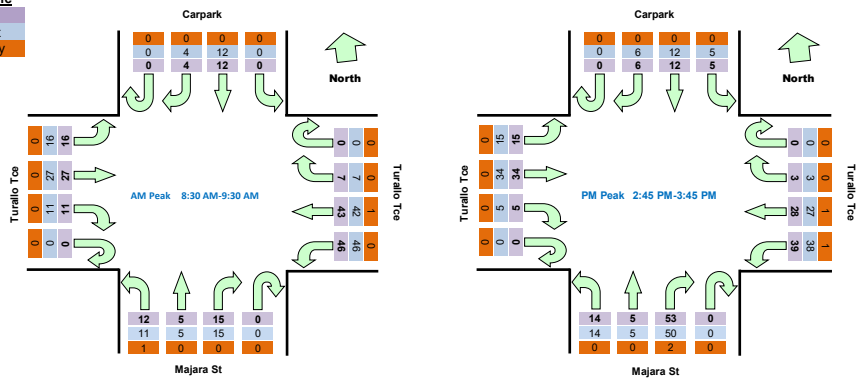
Time		North Approach Carpark				East Approach Turallo Tce				South Approach Majara St				West Approach Turallo Tce				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
8:00	8:15	0	0	0	0	0	0	18	9	0	5	0	1	0	0	5	0	128	38
8:15	8:30	0	0	0	0	0	0	13	8	0	4	0	1	0	0	7	0	189	33
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

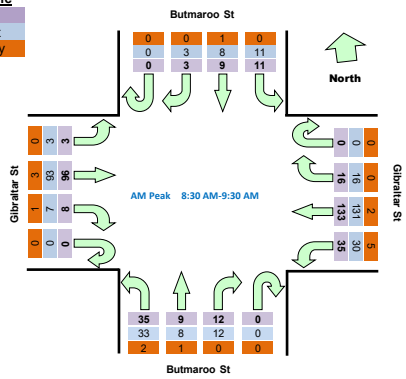
Time		North Approach Butmaroo St				East Approach Gibraltar St				South Approach Butmaroo St				West Approach Gibraltar St				Hourly Total	
Period Start	**Period End**	**U**	**R**	**SB**	**L**	**U**	**R**	**WB**	**L**	**U**	**R**	**NB**	**L**	**U**	**R**	**EB**	**L**	**Hour**	**Peak**
8:00	8:15	0	0	4	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		

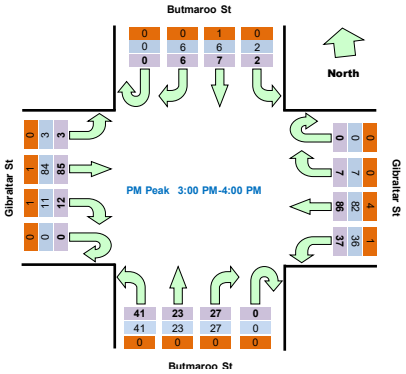
Peak Time		North Approach Butmaroo St				East Approach Gibraltar St				South Approach Butmaroo St				West Approach Gibraltar St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:30	9:30	0	3	9	11	0	16	133	35	0	12	9	35	0	8	96	3	370
15:00	16:00	0	6	7	2	0	7	86	37	0	27	23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

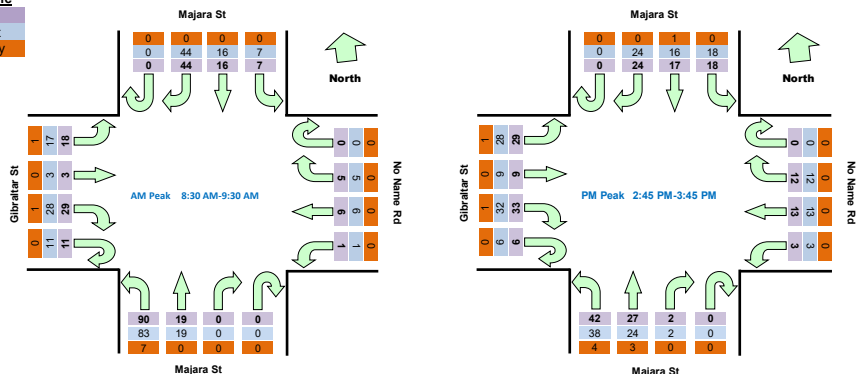
Time		North Approach Majara St				East Approach No Name Rd				South Approach Majara St				West Approach Gibraltar St				Hourly Total	
Period Start	**Period End**	**U**	**R**	**SB**	**L**	**U**	**R**	**WB**	**L**	**U**	**R**	**NB**	**L**	**U**	**R**	**EB**	**L**	**Hour**	**Peak**
8:00	8:15	0	1	6	0	0	0	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

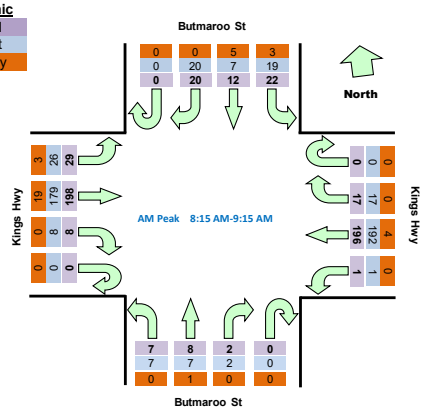
Time		North Approach Butmaroo St				East Approach Kings Hwy				South Approach Butmaroo St				West Approach Kings Hwy				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
8:00	8:15	0	1	2	4	0	4	63	0	0	6	3	3	0	0	20	2	481	
8:15	8:30	0	8	1	2	0	4	58	0	0	0	0	0	0	0	41	11	520	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		

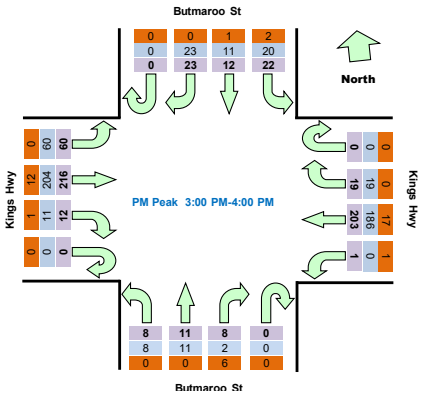
Peak Time		North Approach Butmaroo St				East Approach Kings Hwy				South Approach Butmaroo St				West Approach Kings Hwy				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:15	9:15	0	20	12	22	0	17	196	1	0	2	8	7	0	8	198	29	520
15:00	16:00	0	23	12	22	0	19	203	1	0	8	11	8	0	12	216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

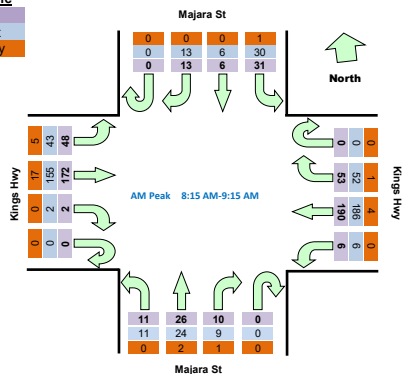
Time		North Approach Majara St				East Approach Kings Hwy				South Approach Majara St				West Approach Kings Hwy				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
8:00	8:15	0	0	4	5	0	10	65	2	0	2	2	2	1	1	27	2	523	
8:15	8:30	0	2	1	7	0	6	58	0	0	2	5	2	0	0	41	2	568	Peak
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		

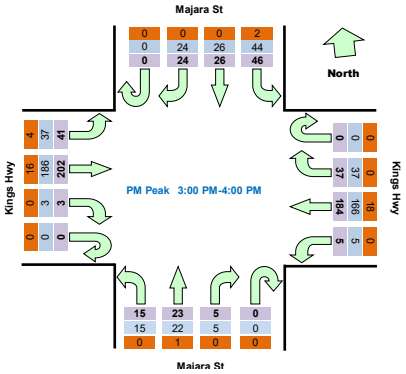
Peak Time		North Approach Majara St				East Approach Kings Hwy				South Approach Majara St				West Approach Kings Hwy				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
8:15	9:15	0	13	6	31	0	53	190	6	0	10	26	11	0	2	172	48	568
15:00	16:00	0	24	26	46	0	37	184	5	0	5	23	15	0	3	202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

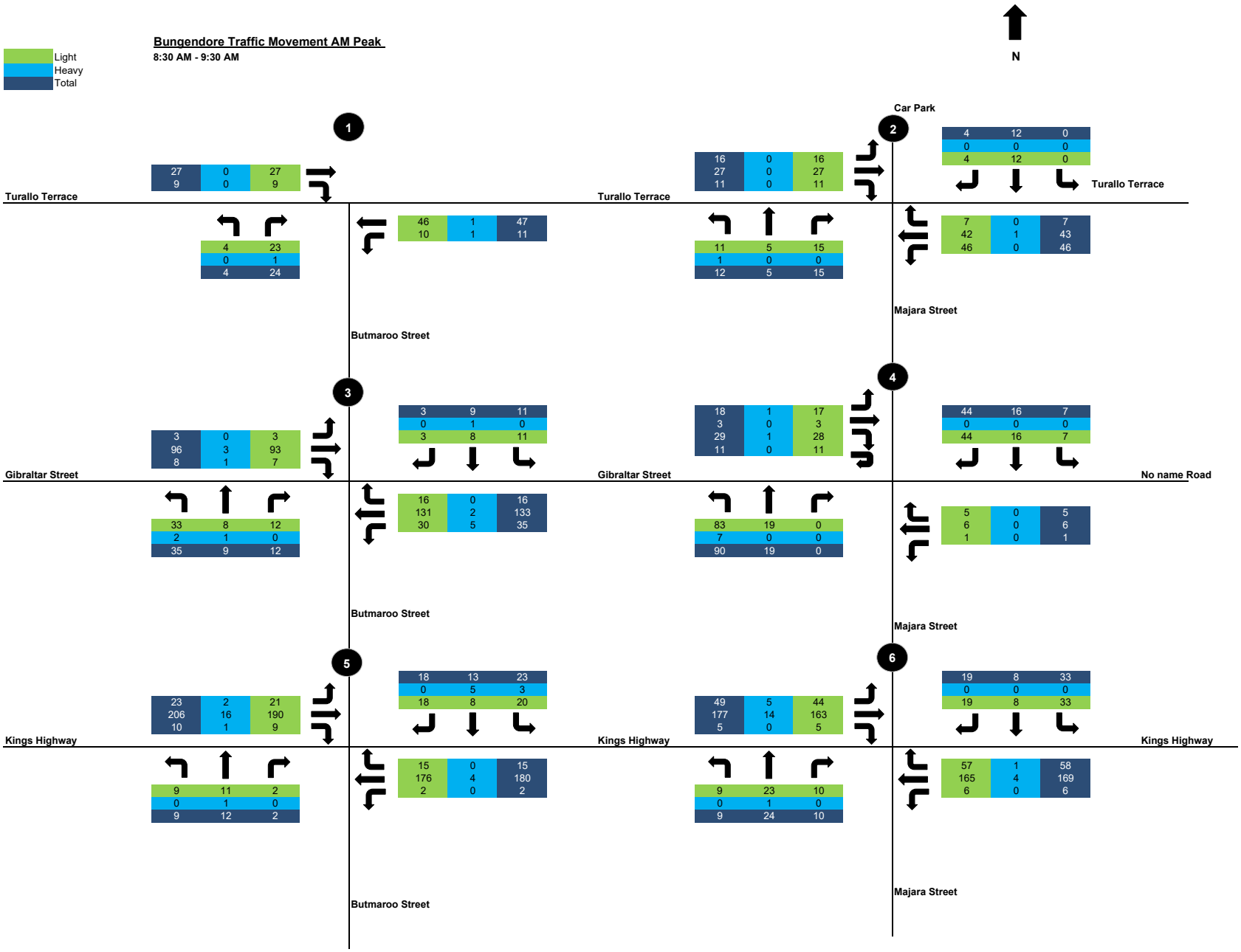
Graphic

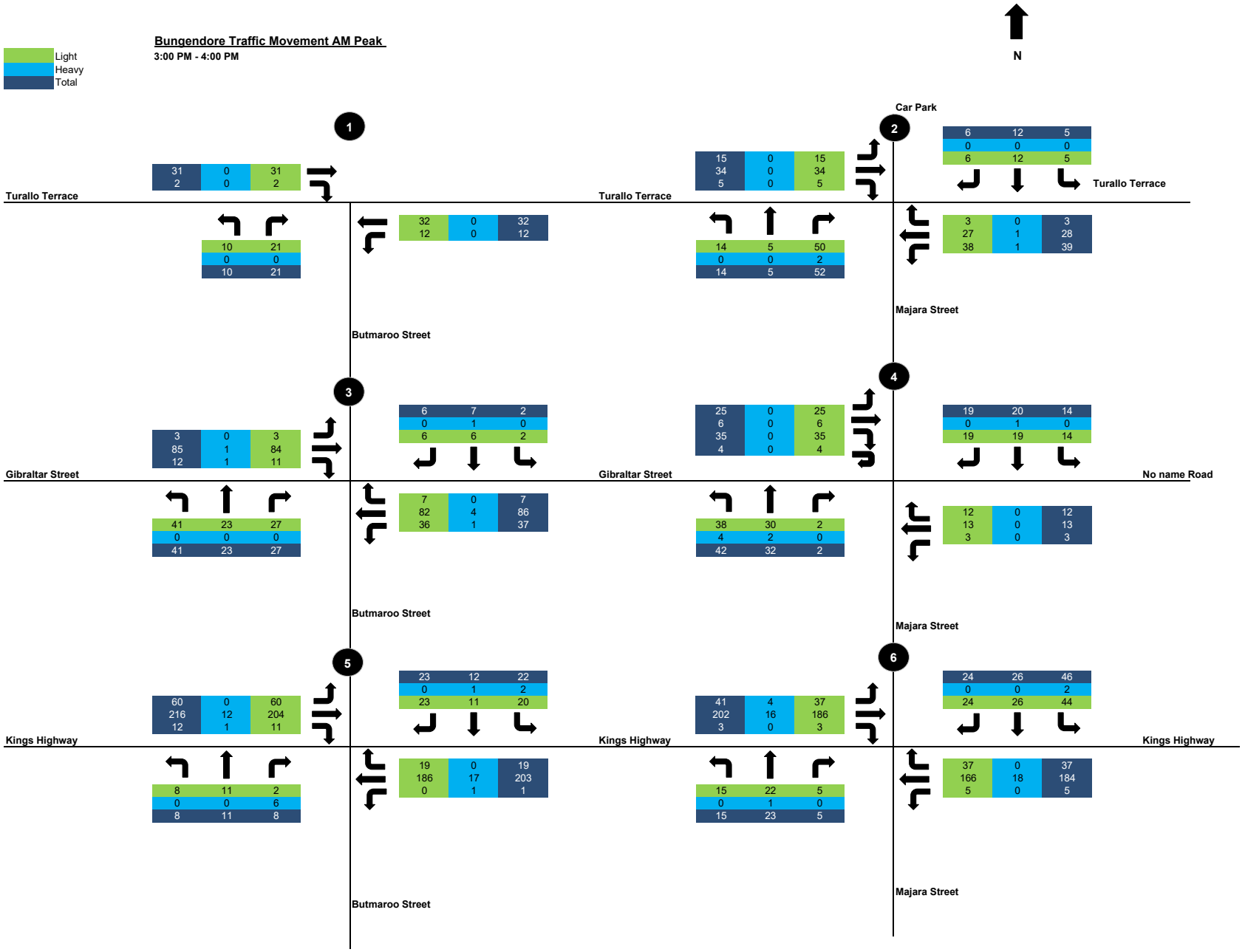
Total
Light
Heavy





Appendix C


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 D

ENTRY & EXIT MOVEMENT

RIDGE HEIGHT
RL 707100

NEW SCHOOL SIGNAGE

NEW BIKE
ENCLOSURE

No.	Date	Description

Swept Path Key
- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

North

Drawing Prepared By

PDC Consultants
Level 14, 100 William Street
Woolloomooloo NSW 2011
t: +61 2 7900 6514
w: www.pdcconsultants.com.au
ABN: 70 615 064 670

Architect
-

Client
Hindmarsh Construction Australia Pty Ltd

Project
New High School in Bungendore

Project No
0593

Drawing Title
Proposed Site Plan
B99 & B85 Design Vehicle Swept Path Analysis
Site Entry / Exit Movements

Sheet Status
NOT FOR CONSTRUCTION

Drawing No.
001

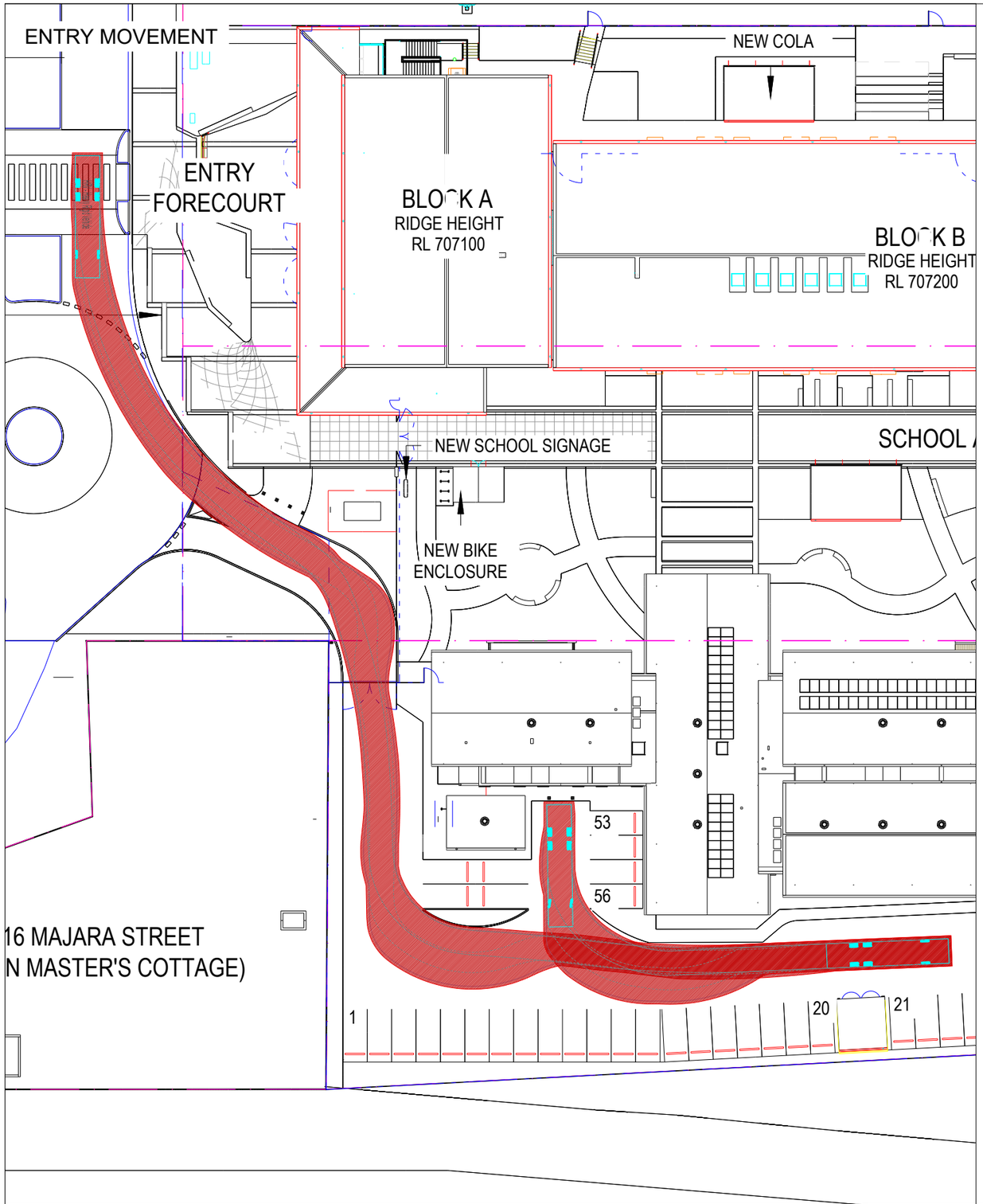
Revision No.
A

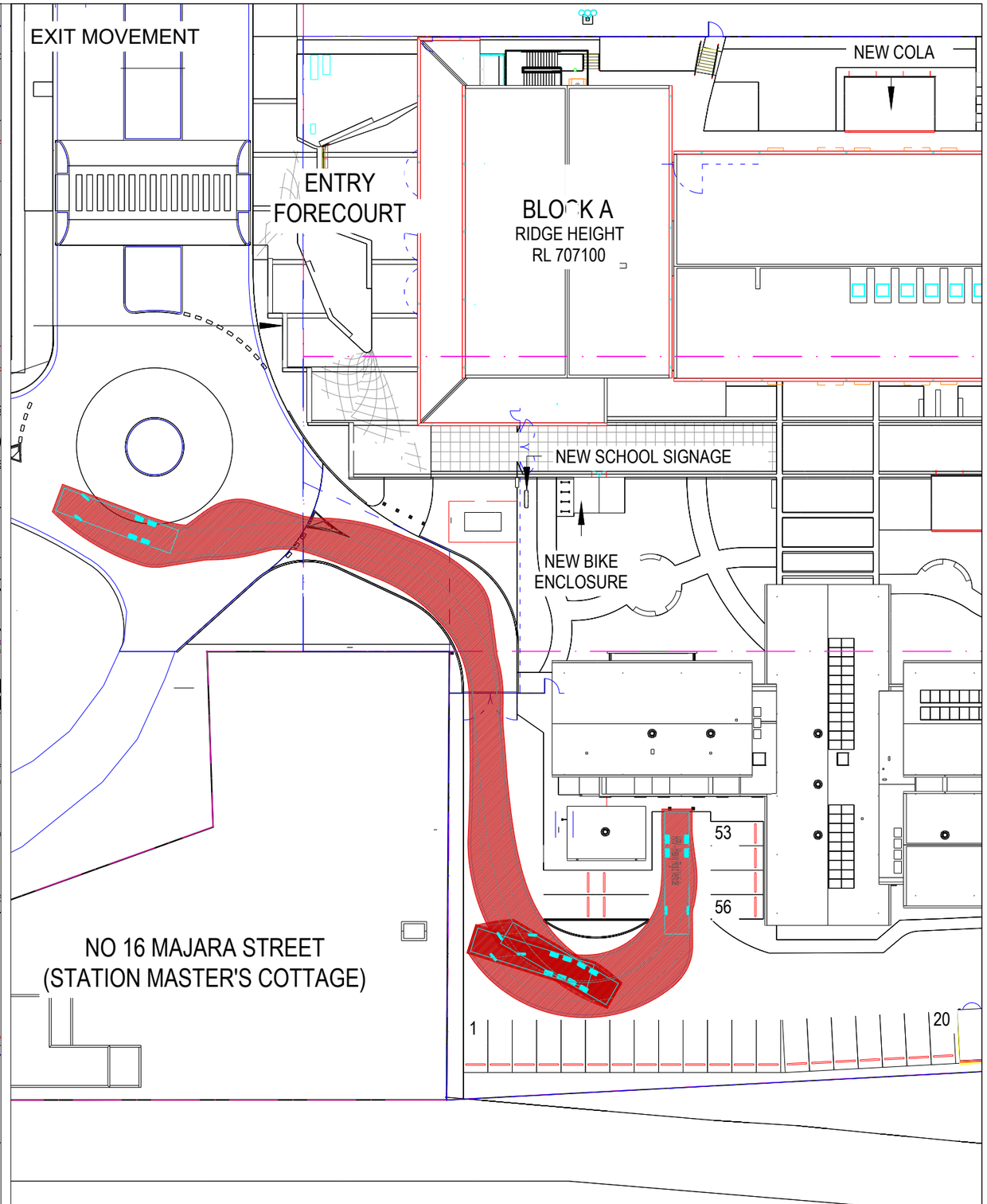
Drawn By
JB

Date
22/11/2022

Scale
1:250 @ A3

0m 2 4 6 8





No. Date Description

Swept Path Key
- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

North

Drawing Prepared By

PDC Consultants
Level 14, 100 William Street
Woolloomooloo NSW 2011
t: +61 2 7900 6514
w: www.pdcconsultants.com.au
ABN: 70 615 064 670

Architect
-

Client
Hindmarsh Construction Australia Pty Ltd

Project
New High School in Bungendore

Project No
0593

Drawing Title
Proposed Site Plan
12.5m Heavy Rigid Vehicle Swept Path Analysis
Site Entry / Exit Movements

Sheet Status
NOT FOR CONSTRUCTION

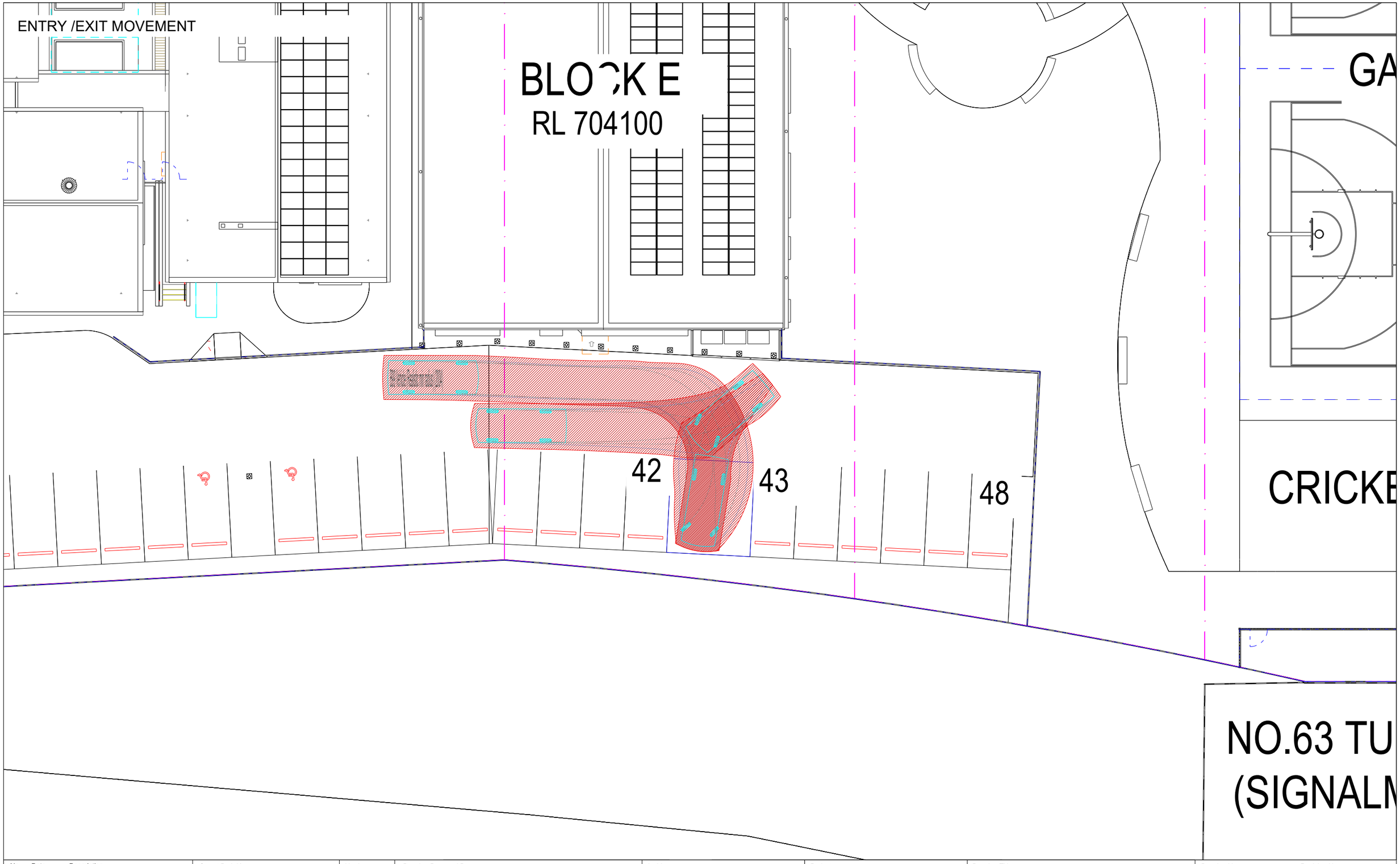
Drawing No.
002

Revision No.
A

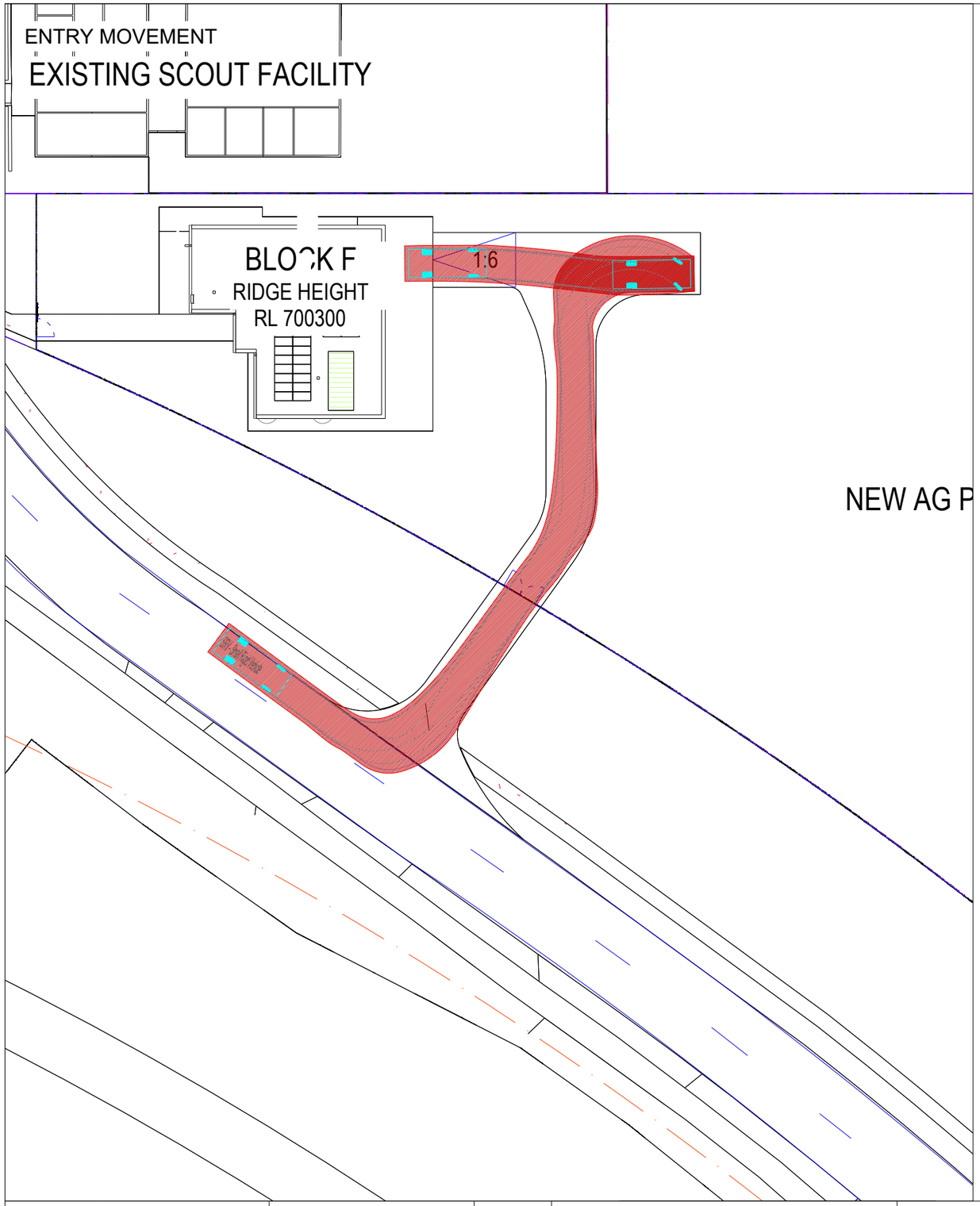
Drawn By
JB

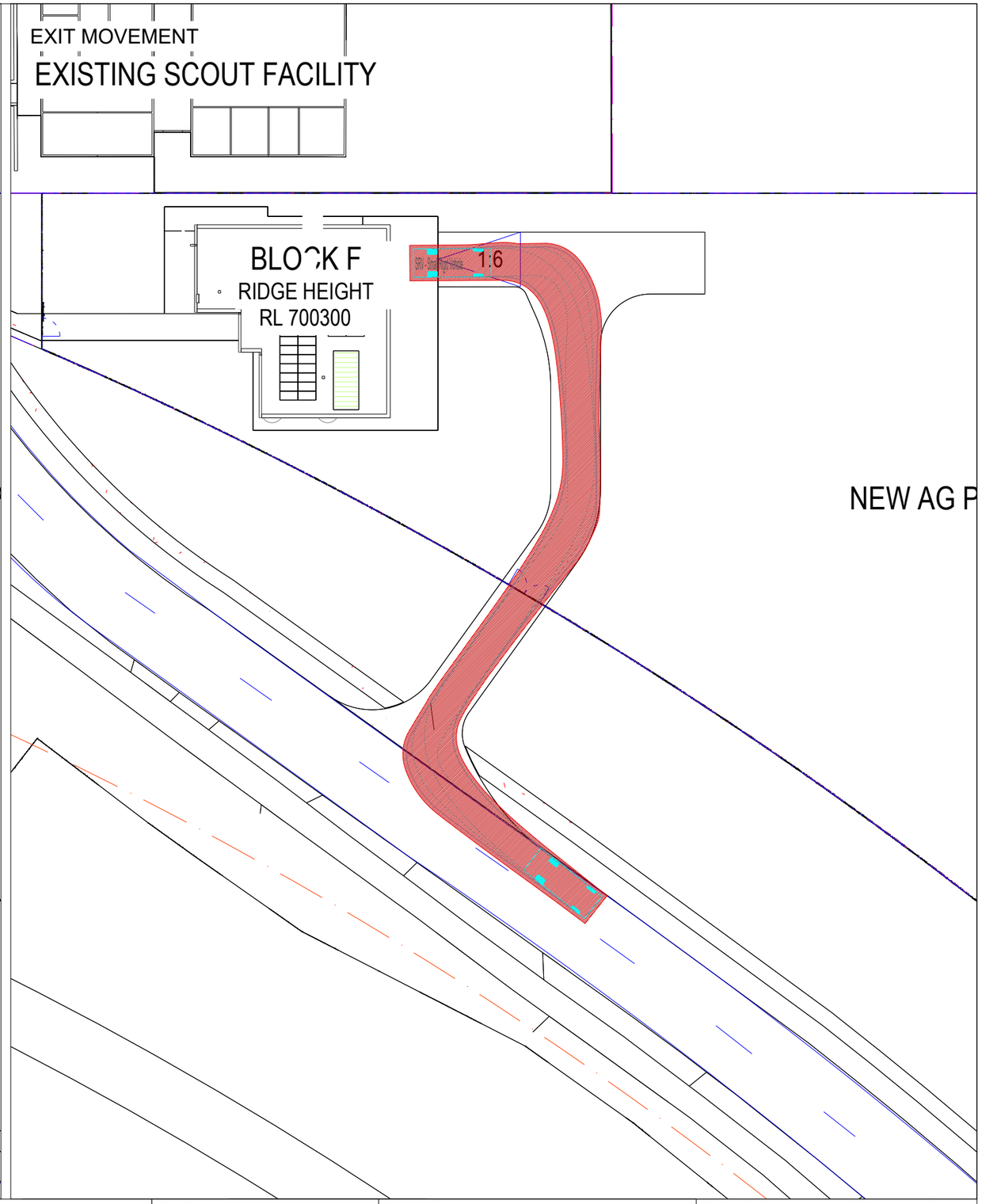
Date
22/11/2022

Scale
1:500 @ A3
0m 5 10 15 20



No. Date Description	Swept Path Key Vehicle Wheel Path Vehicle Body Envelope 300mm Vehicle Clearance	North	Drawing Prepared By PDC Consultants Level 14, 100 William Street Woolloomooloo NSW 2011 t: +61 2 7900 6514 w: www.pdcconsultants.com.au ABN: 70 615 064 670	Architect -	Project New High School in Bungendore	Drawing Title Proposed Site Plan B99 Design Vehicle Swept Path Analysis Vehicle Movements to / from Turning Bay	Drawing No. 003 Revision No. - Drawn By JB Date 22/11/2022
				Client Hindmarsh Construction Australia Pty Ltd	Project No 0593	Sheet Status NOT FOR CONSTRUCTION	Scale 1:200 @ A3 0m 2 4 6 8





No. Date Description	Swept Path Key Vehicle Wheel Path Vehicle Body Envelope 300mm Vehicle Clearance	North	Drawing Prepared By PDC Consultants Level 14, 100 William Street Woolloomooloo NSW 2011 t: +61 2 7900 6514 w: www.pdcconsultants.com.au ABN: 70 615 064 670	Architect -	Project New High School in Bungendore	Drawing Title Proposed Site Plan 6.4m Small Rigid Vehicle Swept Path Analysis Vehicle Movements to / from Block F	Drawing No. 005 Revision No. - Drawn By JB Date 22/11/2022
				Client Hindmarsh Construction Australia Pty Ltd	Project No 0593	Sheet Status NOT FOR CONSTRUCTION	Scale 1:250 @ A3 0m 2 4 6 8

ENTRY MOVEMENT INTO DELIVERY BAY

NEW BIKE ENCLOSURE

MRV - Medium Rigid Vehicle

53

56

1

T
AGE)

EXIT MOVEMENT

NEW BIKE ENCLOSURE

MRV - Medium Rigid Vehicle

53

56

1

)

No. Date Description	Swept Path Key Vehicle Wheel Path Vehicle Body Envelope 300mm Vehicle Clearance	North	Drawing Prepared By PDC Consultants Level 14, 100 William Street Woolloomooloo NSW 2011 t: +61 2 7900 6514 w: www.pdcconsultants.com.au ABN: 70 615 064 670	Architect -	Project New High School in Bungendore	Drawing Title Proposed Site Plan 8.8m Medium Rigid Vehicle Swept Path Analysis Site Entry / Exit Movements	Drawing No. 006 Revision No. - Drawn By JB Date 22/11/2022
				Client Hindmarsh Construction Australia Pty Ltd	Project No 0593	Sheet Status NOT FOR CONSTRUCTION	Scale 1:500 @ A3 0m 5 10 15 20

Appendix E

[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

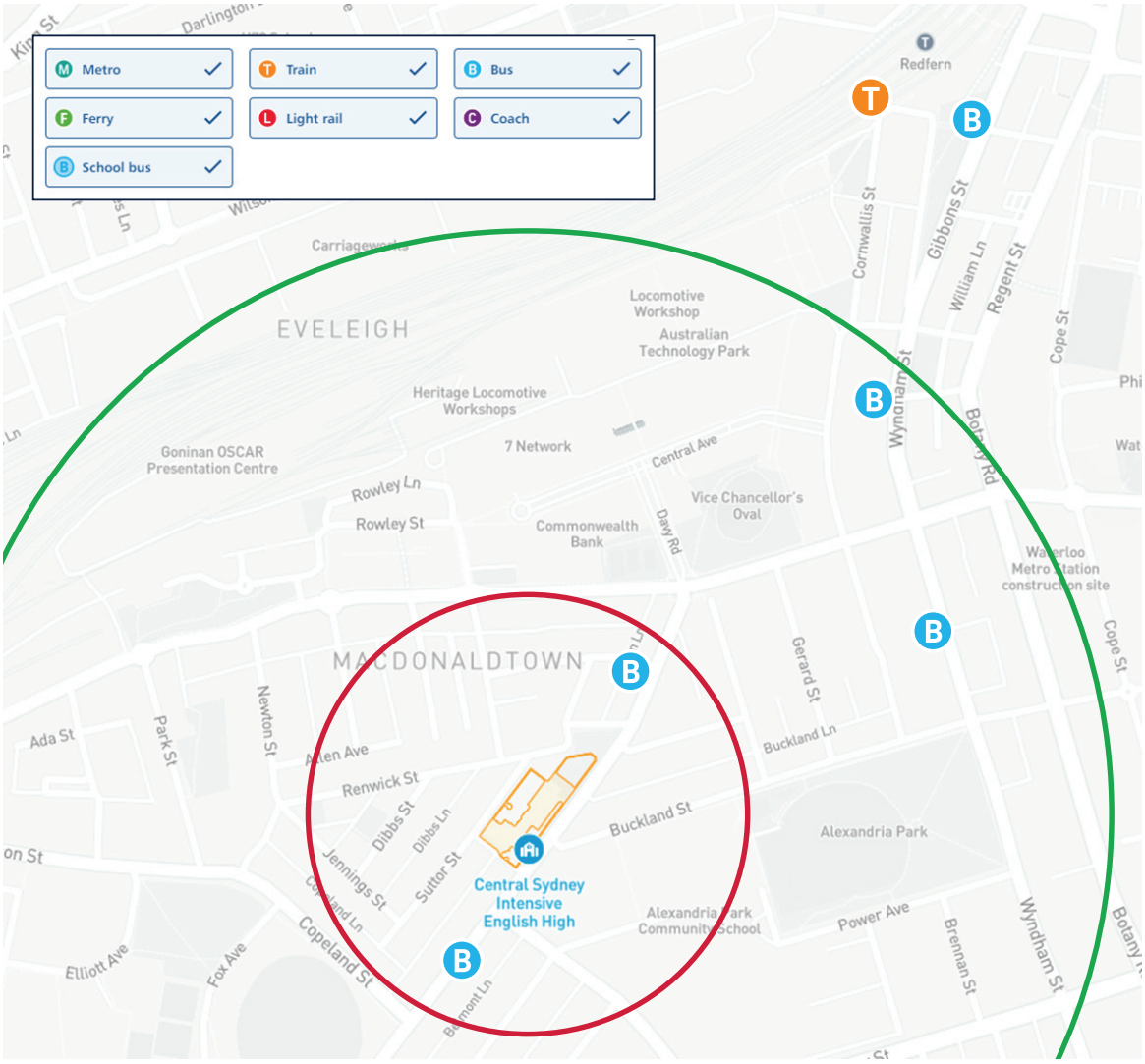
Local map: Public transport

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

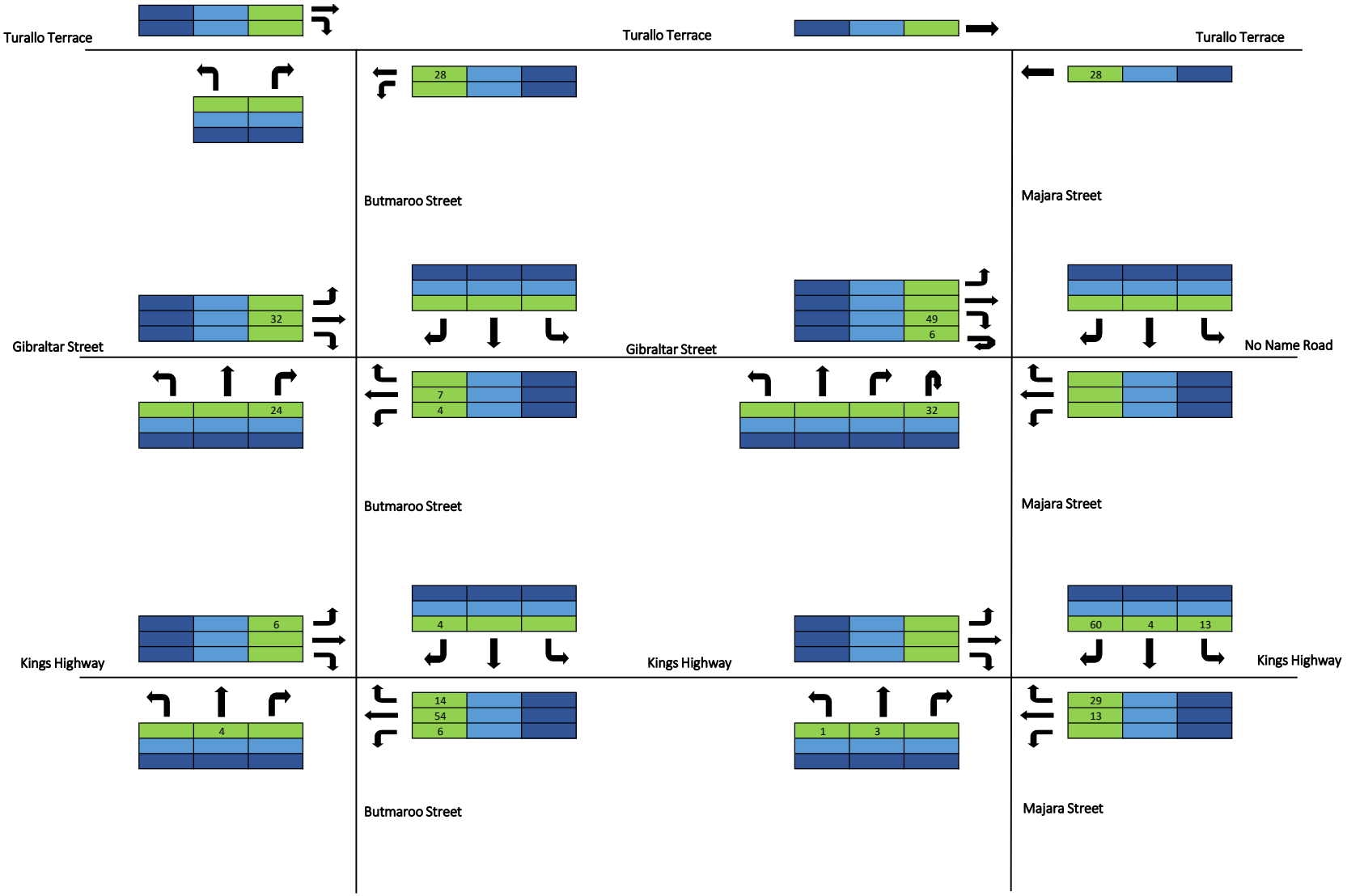
NSW GOVERNMENT

Appendix F

New High School in Bungendore - AM Peak Hour Trips

Light
Heavy
Total

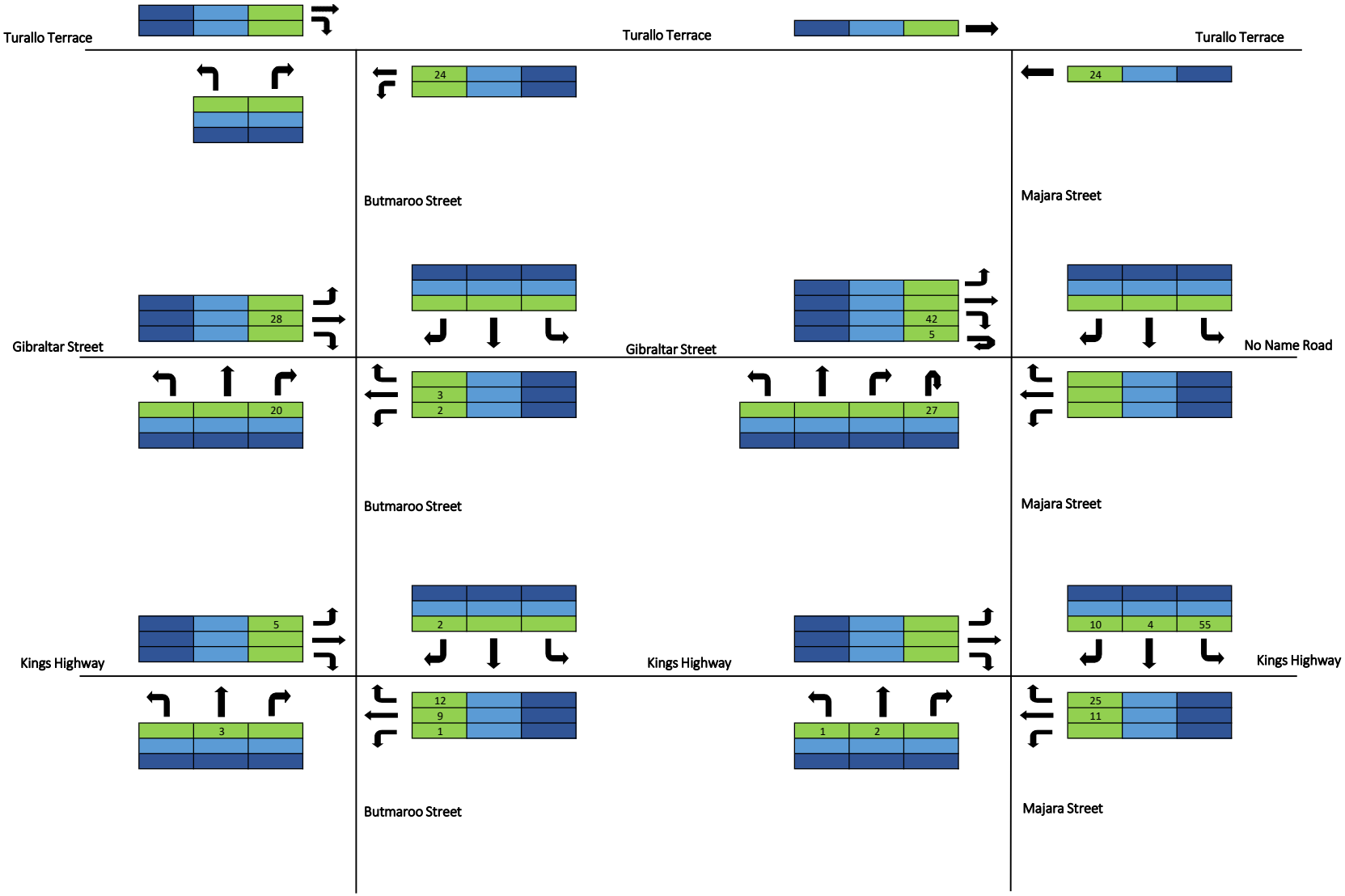
AM TRIPS: 225 trips (113 inbound and 112 outbound)



New High School in Bungendore - PM Peak Hour Trips

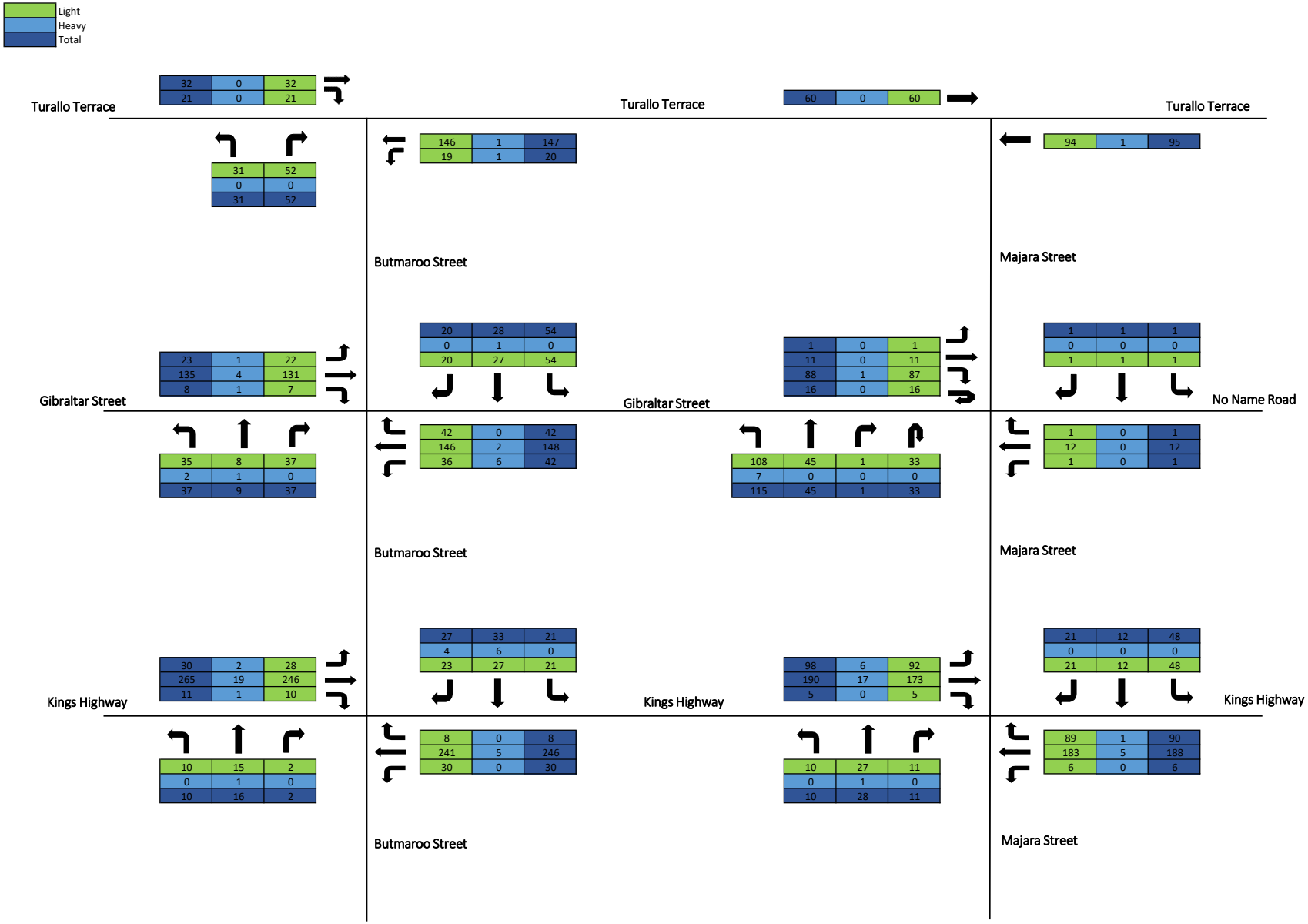
Light
Heavy
Total

AM TRIPS: 193 trips (97 inbound and 96 outbound)

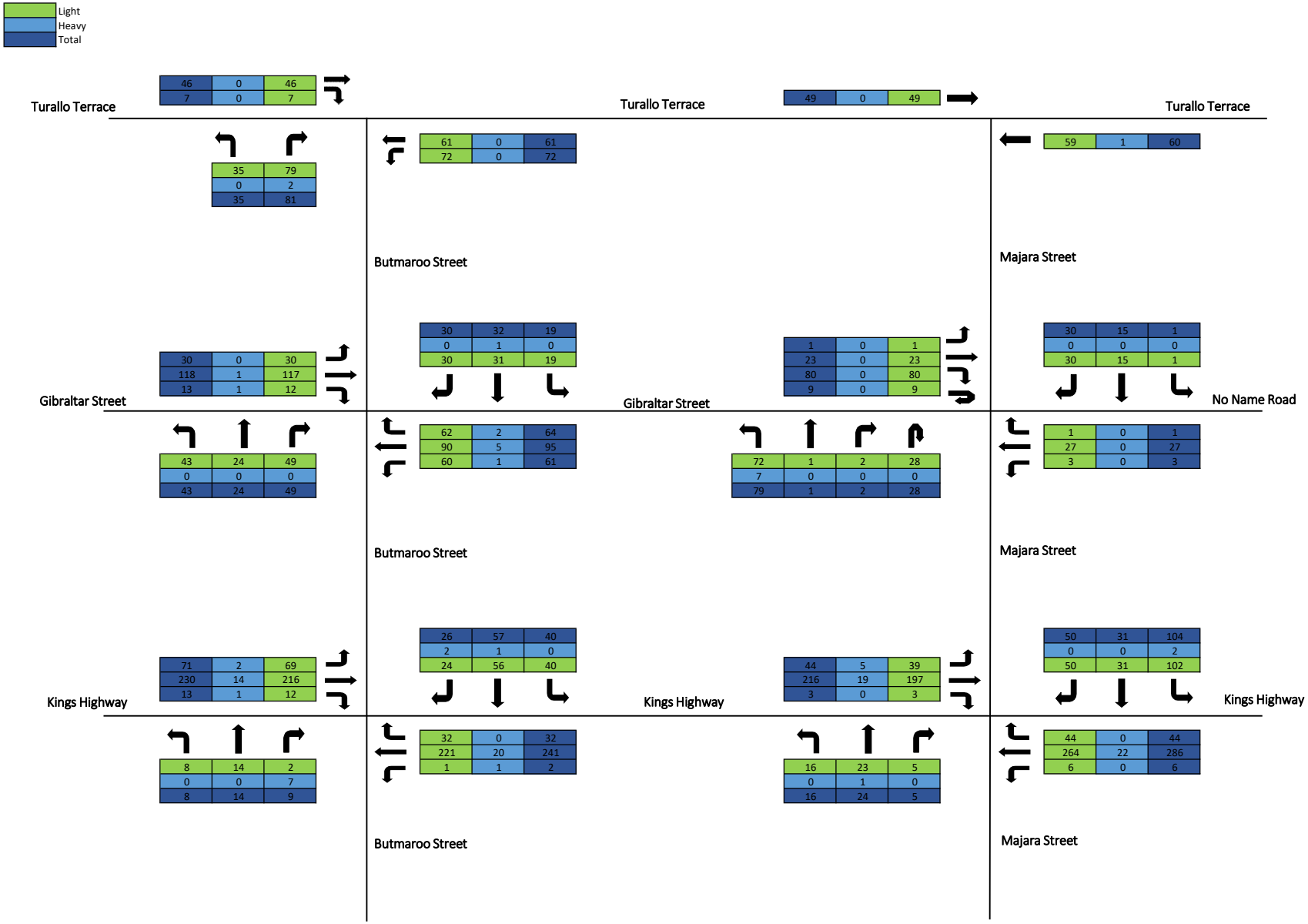


Appendix G

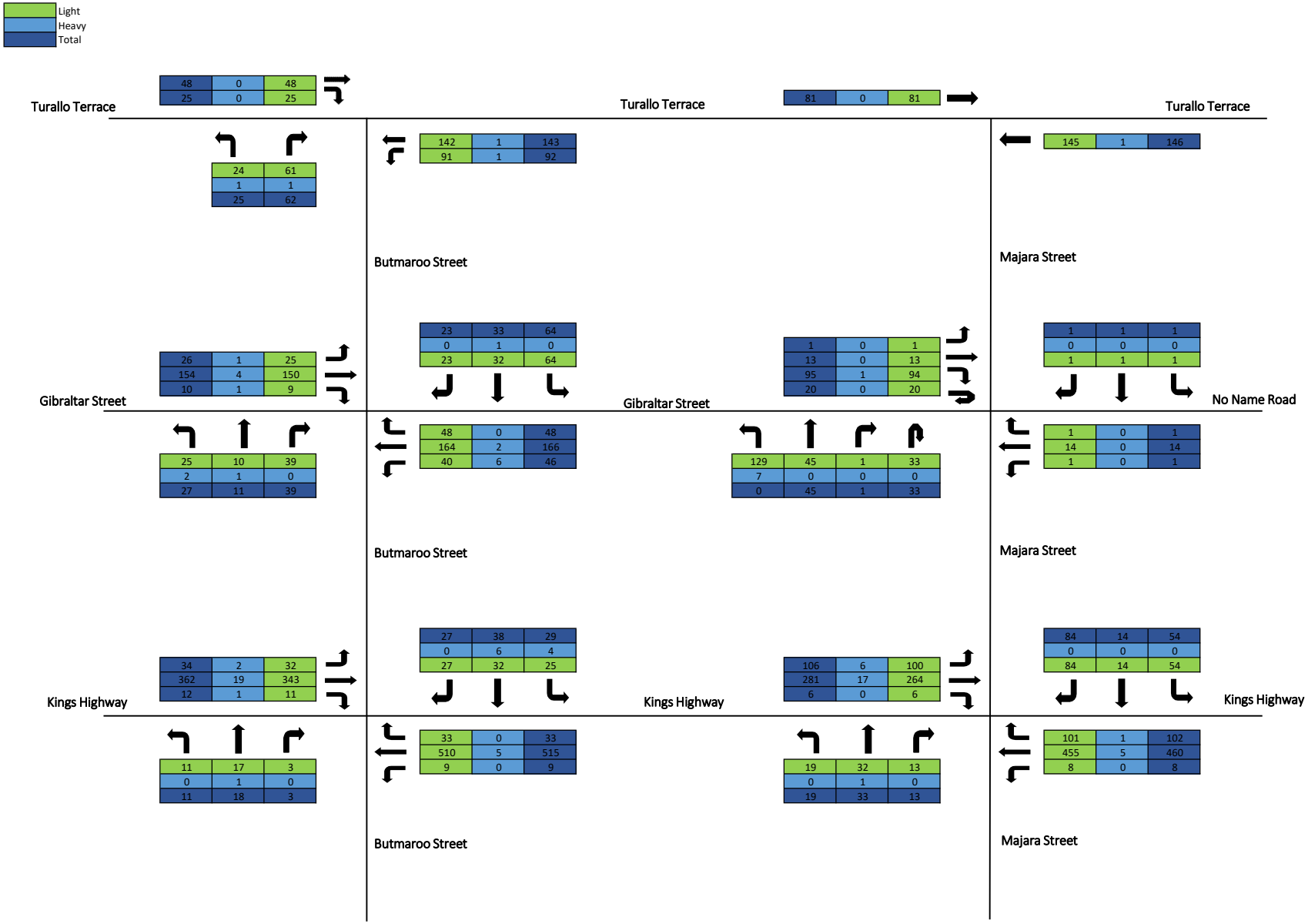
New High School in Bungendore - 2023 Total Volumes - AM Peak



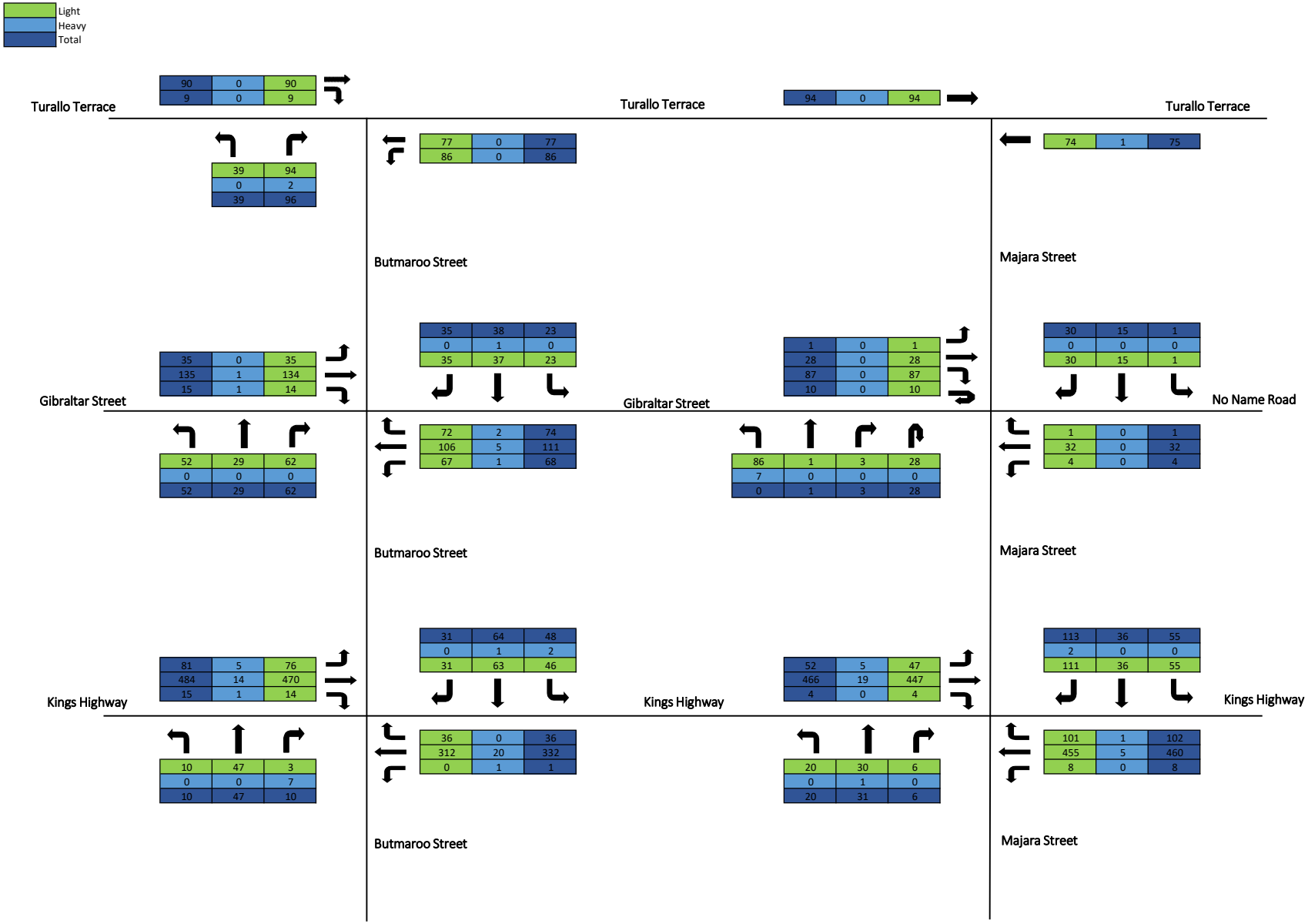
New High School in Bungendore - 2023 Total Volumes - PM Peak



New High School in Bungendore - 2033 Total Volumes - AM Peak



New High School in Bungendore - 2033 Total Volumes - PM Peak



Appendix H

MOVEMENT SUMMARY

Site: 6 [2020_Base_AM Peak_Kings Highway and Majara Street (Site Folder: General)]

Network: N101 [2020_Base_AM Network (Network Folder: General)]

2020_Base_AM Peak_Kings Highway and Majara Street
Site Category: Base_2020_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	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. 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	0.48	0.00	44.1
5	T1	178	2.4	178	2.4	0.129	3.3	LOS A	0.0	0.0	0.00	0.48	0.00	41.2
6	R2	61	1.7	61	1.7	0.129	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	41.2
Approach		245	2.1	245	2.1	0.129	3.7	NA	0.0	0.0	0.00	0.48	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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2020_Base_AM Peak_ Butmaroo Street and Turallo Terrace (Site Folder: General)]

Network: N101 [2020_Base_AM Network (Network Folder: General)]

2020_Base_AM Peak_ Butmaroo Street and Turallo Terrace
Site Category: Base_2020_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	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. 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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [2020_Base_AM Peak_Majara Street and Turallo Terrace (Site Folder: General)]

Network: N101 [2020_Base_AM Network (Network Folder: General)]

2020_Base_AM Peak_Majara Street and Turallo Terrace
Site Category: Base_2020_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	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. 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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3 [2020_Base_AM Peak Gibraltar Street and Butmaroo Street (Site Folder: General)]

Network: N101 [2020_Base_AM Network (Network Folder: General)]

2020_Base_AM Peak Gibraltar Street and Turallo Terrace
Site Category: Base_2020_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	95% 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	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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4 [2020_Base_AM Peak Gibraltar Street and Majara Street (Site Folder: General)]

Network: N101 [2020_Base_AM Network (Network Folder: General)]

2020_Base_AM Peak Gibraltar Street and Majara Street
Site Category: Base_2020_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	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. 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	43.8
8	T1	17	0.0	17	0.0	0.038	3.4	LOS A	0.0	0.0	0.00	0.53	0.00	40.1
9	R2	46	0.0	46	0.0	0.038	4.7	LOS A	0.0	0.0	0.00	0.53	0.00	40.1
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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 5 [2020_Base_AM Peak Butmaroo Street and Kings Highway (Site Folder: General)]

Network: N101 [2020_Base_AM Network (Network Folder: General)]

2020_Base_AM Peak Butmaroo Street and Kings Highway
Site Category: Base_2020_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	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. 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	44.6
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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 6 [2020_Base_PM Peak_Kings Highway and Majara Street (Site Folder: General)]

Network: N101 [2020_Base_PM Network (Network Folder: General)]

2020_Base_PM Peak_Kings Highway and Majara Street
Site Category: Base_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: 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	3.4	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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2020_Base_PM Peak_ Butmaroo Street and Turallo Terrace (Site Folder: General)]

Network: N101 [2020_Base_PM Network (Network Folder: General)]

2020_Base_PM Peak_ Butmaroo Street and Turallo Terrace
Site Category: Base_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	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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [2020_Base_PM Peak_Majara Street and Turallo Terrace (Site Folder: General)]

Network: N101 [2020_Base_PM Network (Network Folder: General)]

2020_Base_PM Peak_Majara Street and Turallo Terrace
Site Category: Base_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: 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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3 [2020_Base_PM Peak Gibraltar Street and Butmaroo Street (Site Folder: General)]

Network: N101 [2020_Base_PM Network (Network Folder: General)]

2020_Base_PM Peak Gibraltar Street and Turallo Terrace
Site Category: Base_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	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	41.1
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	41.1
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	44.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4 [2020_Base_PM Peak Gibraltar Street and Majara Street (Site Folder: General)]

Network: N101 [2020_Base_PM Network (Network Folder: General)]

2020_Base_PM Peak Gibraltar Street and Majara Street
Site Category: Base_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: 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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 5 [2020_Base_PM Peak Butmaroo Street and Kings Highway (Site Folder: General)]

Network: N101 [2020_Base_PM Network (Network Folder: General)]

2020_Base_PM Peak Butmaroo Street and Kings Highway
Site Category: Base_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	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	5.5	LOS A	0.0	0.0	0.00	0.47	0.00	41.7
5	T1	214	8.4	214	8.4	0.128	3.3	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	44.3
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

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	11	0.0	11	0.0	0.082	5.7	LOS A	0.1	0.8	0.47	0.68	0.47	34.8
2	T1	29	3.6	29	3.6	0.082	7.7	LOS A	0.1	0.8	0.47	0.68	0.47	34.8
3	R2	12	0.0	12	0.0	0.082	8.3	LOS A	0.1	0.8	0.47	0.68	0.47	39.5
Approach		52	2.0	52	2.0	0.082	7.4	LOS A	0.1	0.8	0.47	0.68	0.47	36.4
East: Kings Highway (East)														
4	L2	6	0.0	6	0.0	0.161	4.7	LOS A	0.0	0.0	0.00	0.50	0.00	44.7
5	T1	203	2.6	203	2.6	0.161	3.4	LOS A	0.0	0.0	0.00	0.50	0.00	41.6
6	R2	95	1.1	95	1.1	0.161	4.7	LOS A	0.0	0.0	0.00	0.50	0.00	41.6
Approach		304	2.1	304	2.1	0.161	3.9	NA	0.0	0.0	0.00	0.50	0.00	41.7
North: Majara (North)														
7	L2	51	0.0	51	0.0	0.214	6.0	LOS A	0.3	2.3	0.46	0.72	0.46	41.4
8	T1	13	0.0	13	0.0	0.214	7.7	LOS A	0.3	2.3	0.46	0.72	0.46	41.5
9	R2	85	0.0	85	0.0	0.214	9.7	LOS A	0.3	2.3	0.46	0.72	0.46	35.6
Approach		148	0.0	148	0.0	0.214	8.3	LOS A	0.3	2.3	0.46	0.72	0.46	38.8
West: Kings Highway (West)														
10	L2	103	6.1	103	6.1	0.174	4.7	LOS A	0.0	0.2	0.02	0.19	0.02	45.4
11	T1	200	8.9	200	8.9	0.174	0.0	LOS A	0.0	0.2	0.02	0.19	0.02	47.5
12	R2	5	0.0	5	0.0	0.174	5.5	LOS A	0.0	0.2	0.02	0.19	0.02	45.4
Approach		308	7.8	308	7.8	0.174	1.7	NA	0.0	0.2	0.02	0.19	0.02	47.1
All Vehicles		813	3.9	813	3.9	0.214	4.1	NA	0.3	2.3	0.12	0.43	0.12	43.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	6.1	LOS A	0.1	0.8	0.27	0.59	0.27	45.6
3	R2	56	1.9	56	1.9	0.077	6.3	LOS A	0.1	0.8	0.27	0.59	0.27	40.8
Approach		89	2.4	89	2.4	0.077	6.2	LOS A	0.1	0.8	0.27	0.59	0.27	43.2
East: Turallo Terrace														
4	L2	21	5.0	21	5.0	0.092	4.9	LOS A	0.0	0.0	0.00	0.08	0.00	50.6
5	T1	155	0.7	155	0.7	0.092	0.1	LOS A	0.0	0.0	0.00	0.08	0.00	52.6
Approach		176	1.2	176	1.2	0.092	0.6	NA	0.0	0.0	0.00	0.08	0.00	52.5
West: Turallo Terrace														
11	T1	34	0.0	34	0.0	0.032	0.3	LOS A	0.0	0.3	0.21	0.23	0.21	45.0
12	R2	22	0.0	22	0.0	0.032	6.0	LOS A	0.0	0.3	0.21	0.23	0.21	45.0
Approach		56	0.0	56	0.0	0.032	2.6	NA	0.0	0.3	0.21	0.23	0.21	45.0
All Vehicles		321	1.3	321	1.3	0.092	2.5	NA	0.1	0.8	0.11	0.25	0.11	49.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	100	1.1	100	1.1	0.053	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	52.6
Approach		100	1.1	100	1.1	0.053	0.0	NA	0.0	0.0	0.00	0.00	0.00	52.6
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		163	0.6	163	0.6	0.053	0.0	NA	0.0	0.0	0.00	0.00	0.00	51.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.085	4.8	LOS A	0.2	1.4	0.46	0.58	0.46	41.8
2	T1	9	11.1	9	11.1	0.085	4.9	LOS A	0.2	1.4	0.46	0.58	0.46	37.0
3	R2	39	0.0	39	0.0	0.085	9.6	LOS A	0.2	1.4	0.46	0.58	0.46	37.0
Approach		87	3.6	87	3.6	0.085	7.0	LOS A	0.2	1.4	0.46	0.58	0.46	39.8
East: Gibraltar Street (East)														
4	L2	44	14.3	44	14.3	0.123	3.3	LOS A	0.0	0.0	0.00	0.44	0.00	41.4
5	T1	156	1.4	156	1.4	0.123	3.2	LOS A	0.0	0.0	0.00	0.44	0.00	46.6
6	R2	44	0.0	44	0.0	0.123	7.2	LOS A	0.0	0.0	0.00	0.44	0.00	41.4
Approach		244	3.4	244	3.4	0.123	3.9	LOS A	0.0	0.0	0.00	0.44	0.00	45.3
North: Butmaroo Street														
7	L2	21	0.0	21	0.0	0.096	4.2	LOS A	0.2	1.5	0.39	0.56	0.39	36.2
8	T1	29	3.6	29	3.6	0.096	4.3	LOS A	0.2	1.5	0.39	0.56	0.39	36.2
9	R2	57	0.0	57	0.0	0.096	8.2	LOS A	0.2	1.5	0.39	0.56	0.39	43.0
Approach		107	1.0	107	1.0	0.096	6.4	LOS A	0.2	1.5	0.39	0.56	0.39	40.6
West: Gibraltar Street West)														
10	L2	23	4.5	23	4.5	0.137	4.6	LOS A	0.3	1.9	0.23	0.46	0.23	43.4
11	T1	142	3.0	142	3.0	0.137	4.7	LOS A	0.3	1.9	0.23	0.46	0.23	43.4
12	R2	8	12.5	8	12.5	0.137	7.7	LOS A	0.3	1.9	0.23	0.46	0.23	43.4
Approach		174	3.6	174	3.6	0.137	4.9	LOS A	0.3	1.9	0.23	0.46	0.23	43.4
All Vehicles		613	3.1	613	3.1	0.137	5.0	LOS A	0.3	1.9	0.20	0.49	0.20	43.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.114	3.3	LOS A	0.0	0.0	0.00	0.49	0.00	41.0
2	T1	47	0.0	47	0.0	0.114	3.3	LOS A	0.0	0.0	0.00	0.49	0.00	46.7
3	R2	1	0.0	1	0.0	0.114	7.4	LOS A	0.0	0.0	0.00	0.49	0.00	46.8
3u	U	35	0.0	35	0.0	0.114	9.1	LOS A	0.0	0.0	0.00	0.49	0.00	41.0
Approach		204	3.6	204	3.6	0.114	4.3	LOS A	0.0	0.0	0.00	0.49	0.00	43.0
East: No Name Road														
4	L2	1	0.0	1	0.0	0.013	4.9	LOS A	0.0	0.2	0.35	0.45	0.35	42.1
5	T1	13	0.0	13	0.0	0.013	5.2	LOS A	0.0	0.2	0.35	0.45	0.35	42.1
6	R2	1	0.0	1	0.0	0.013	9.3	LOS A	0.0	0.2	0.35	0.45	0.35	48.8
Approach		15	0.0	15	0.0	0.013	5.5	LOS A	0.0	0.2	0.35	0.45	0.35	42.9
North: Majara Street														
7	L2	1	0.0	1	0.0	0.003	4.8	LOS A	0.0	0.0	0.33	0.47	0.33	45.0
8	T1	1	0.0	1	0.0	0.003	3.9	LOS A	0.0	0.0	0.33	0.47	0.33	38.5
9	R2	1	0.0	1	0.0	0.003	7.9	LOS A	0.0	0.0	0.33	0.47	0.33	38.5
Approach		3	0.0	3	0.0	0.003	5.5	LOS A	0.0	0.0	0.33	0.47	0.33	41.4
West: Gibraltar Street (West)														
10	L2	1	0.0	1	0.0	0.097	3.5	LOS A	0.2	1.2	0.20	0.61	0.20	41.8
11	T1	12	0.0	12	0.0	0.097	4.7	LOS A	0.2	1.2	0.20	0.61	0.20	45.4
12	R2	93	1.1	93	1.1	0.097	8.2	LOS A	0.2	1.2	0.20	0.61	0.20	37.5
12u	U	19	0.0	19	0.0	0.097	10.7	LOS A	0.2	1.2	0.20	0.61	0.20	37.5
Approach		124	0.8	124	0.8	0.097	8.2	LOS A	0.2	1.2	0.20	0.61	0.20	38.6
All Vehicles		346	2.4	346	2.4	0.114	5.8	LOS A	0.2	1.2	0.09	0.53	0.09	41.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.046	5.9	LOS A	0.1	0.5	0.46	0.65	0.46	40.6
2	T1	17	6.3	17	6.3	0.046	8.0	LOS A	0.1	0.5	0.46	0.65	0.46	35.3
3	R2	2	0.0	2	0.0	0.046	8.9	LOS A	0.1	0.5	0.46	0.65	0.46	35.3
Approach		29	3.6	29	3.6	0.046	7.3	LOS A	0.1	0.5	0.46	0.65	0.46	37.9
East: Kings Highway (East)														
4	L2	8	0.0	8	0.0	0.157	4.8	LOS A	0.0	0.0	0.00	0.49	0.00	45.6
5	T1	259	2.0	259	2.0	0.157	3.4	LOS A	0.0	0.0	0.00	0.49	0.00	45.8
6	R2	32	0.0	32	0.0	0.157	4.8	LOS A	0.0	0.0	0.00	0.49	0.00	42.7
Approach		299	1.8	299	1.8	0.157	3.6	NA	0.0	0.0	0.00	0.49	0.00	45.6
North: Butmaroo Street														
7	L2	26	16.0	26	16.0	0.144	6.6	LOS A	0.2	1.6	0.51	0.73	0.51	33.7
8	T1	35	18.2	35	18.2	0.144	8.7	LOS A	0.2	1.6	0.51	0.73	0.51	39.1
9	R2	24	0.0	24	0.0	0.144	9.2	LOS A	0.2	1.6	0.51	0.73	0.51	39.2
Approach		85	12.3	85	12.3	0.144	8.2	LOS A	0.2	1.6	0.51	0.73	0.51	38.0
West: Kings Highway (West)														
10	L2	32	6.7	32	6.7	0.177	5.2	LOS A	0.1	0.4	0.05	0.07	0.05	47.8
11	T1	279	7.2	279	7.2	0.177	0.1	LOS A	0.1	0.4	0.05	0.07	0.05	47.8
12	R2	12	9.1	12	9.1	0.177	5.8	LOS A	0.1	0.4	0.05	0.07	0.05	46.5
Approach		322	7.2	322	7.2	0.177	0.8	NA	0.1	0.4	0.05	0.07	0.05	47.7
All Vehicles		736	5.4	736	5.4	0.177	3.1	NA	0.2	1.6	0.10	0.34	0.10	44.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	18	0.0	18	0.0	0.085	6.3	LOS A	0.1	0.8	0.51	0.70	0.51	34.1
2	T1	27	3.8	27	3.8	0.085	8.4	LOS A	0.1	0.8	0.51	0.70	0.51	34.1
3	R2	5	0.0	5	0.0	0.085	10.4	LOS A	0.1	0.8	0.51	0.70	0.51	39.0
Approach		51	2.1	51	2.1	0.085	7.9	LOS A	0.1	0.8	0.51	0.70	0.51	34.9
East: Kings Highway (East)														
4	L2	6	0.0	6	0.0	0.205	4.7	LOS A	0.0	0.0	0.00	0.48	0.00	44.6
5	T1	301	7.7	301	7.7	0.205	3.4	LOS A	0.0	0.0	0.00	0.48	0.00	41.7
6	R2	73	0.0	73	0.0	0.205	4.7	LOS A	0.0	0.0	0.00	0.48	0.00	41.7
Approach		380	6.1	380	6.1	0.205	3.7	NA	0.0	0.0	0.00	0.48	0.00	41.8
North: Majara (North)														
7	L2	109	1.9	109	1.9	0.277	6.7	LOS A	0.5	3.2	0.47	0.70	0.49	41.5
8	T1	33	0.0	33	0.0	0.277	9.0	LOS A	0.5	3.2	0.47	0.70	0.49	40.7
9	R2	53	0.0	53	0.0	0.277	10.7	LOS A	0.5	3.2	0.47	0.70	0.49	35.1
Approach		195	1.1	195	1.1	0.277	8.2	LOS A	0.5	3.2	0.47	0.70	0.49	40.2
West: Kings Highway (West)														
10	L2	46	11.4	46	11.4	0.157	4.7	LOS A	0.0	0.1	0.02	0.10	0.02	47.6
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	5.9	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		902	5.7	902	5.7	0.277	4.0	NA	0.5	3.2	0.13	0.42	0.14	43.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.101	5.7	LOS A	0.1	1.0	0.19	0.58	0.19	46.5
3	R2	85	2.5	85	2.5	0.101	6.1	LOS A	0.1	1.0	0.19	0.58	0.19	41.4
Approach		122	1.7	122	1.7	0.101	6.0	LOS A	0.1	1.0	0.19	0.58	0.19	43.6
East: Turallo Terrace (West)														
4	L2	76	0.0	76	0.0	0.074	5.3	LOS A	0.0	0.0	0.00	0.34	0.00	47.4
5	T1	64	0.0	64	0.0	0.074	0.3	LOS A	0.0	0.0	0.00	0.34	0.00	52.6
Approach		140	0.0	140	0.0	0.074	3.0	NA	0.0	0.0	0.00	0.34	0.00	50.5
West: Turallo Terrace (West)														
11	T1	48	0.0	48	0.0	0.030	0.1	LOS A	0.0	0.1	0.07	0.08	0.07	48.2
12	R2	7	0.0	7	0.0	0.030	5.9	LOS A	0.0	0.1	0.07	0.08	0.07	48.2
Approach		56	0.0	56	0.0	0.030	0.8	NA	0.0	0.1	0.07	0.08	0.07	48.2
All Vehicles		318	0.7	318	0.7	0.101	3.8	NA	0.1	1.0	0.08	0.39	0.08	47.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	63	1.7	63	1.7	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	53.6
Approach		63	1.7	63	1.7	0.034	0.0	NA	0.0	0.0	0.00	0.00	0.00	53.6
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		115	0.9	115	0.9	0.034	0.0	NA	0.0	0.0	0.00	0.00	0.00	51.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.111	4.3	LOS A	0.3	1.8	0.42	0.56	0.42	42.0
2	T1	25	0.0	25	0.0	0.111	4.4	LOS A	0.3	1.8	0.42	0.56	0.42	37.2
3	R2	52	0.0	52	0.0	0.111	9.0	LOS A	0.3	1.8	0.42	0.56	0.42	37.2
Approach		122	0.0	122	0.0	0.111	6.3	LOS A	0.3	1.8	0.42	0.56	0.42	39.6
East: Gibraltar Street (East)														
4	L2	64	1.6	64	1.6	0.118	3.2	LOS A	0.0	0.0	0.00	0.48	0.00	40.5
5	T1	100	5.3	100	5.3	0.118	3.2	LOS A	0.0	0.0	0.00	0.48	0.00	45.9
6	R2	67	3.1	67	3.1	0.118	7.2	LOS A	0.0	0.0	0.00	0.48	0.00	40.5
Approach		232	3.6	232	3.6	0.118	4.3	LOS A	0.0	0.0	0.00	0.48	0.00	43.5
North: Butmaroo Street														
7	L2	20	0.0	20	0.0	0.076	4.1	LOS A	0.2	1.2	0.39	0.52	0.39	37.0
8	T1	34	3.1	34	3.1	0.076	4.2	LOS A	0.2	1.2	0.39	0.52	0.39	37.0
9	R2	32	0.0	32	0.0	0.076	8.2	LOS A	0.2	1.2	0.39	0.52	0.39	43.6
Approach		85	1.2	85	1.2	0.076	5.7	LOS A	0.2	1.2	0.39	0.52	0.39	40.2
West: Gibraltar Street (West)														
10	L2	32	0.0	32	0.0	0.141	4.7	LOS A	0.3	1.9	0.30	0.49	0.30	42.4
11	T1	124	0.8	124	0.8	0.141	5.0	LOS A	0.3	1.9	0.30	0.49	0.30	42.4
12	R2	14	7.7	14	7.7	0.141	7.9	LOS A	0.3	1.9	0.30	0.49	0.30	42.4
Approach		169	1.2	169	1.2	0.141	5.2	LOS A	0.3	1.9	0.30	0.49	0.30	42.4
All Vehicles		608	1.9	608	1.9	0.141	5.2	LOS A	0.3	1.9	0.22	0.51	0.22	41.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.093	3.5	LOS A	0.2	1.5	0.23	0.50	0.23	38.8
2	T1	1	0.0	1	0.0	0.093	3.5	LOS A	0.2	1.5	0.23	0.50	0.23	44.8
3	R2	2	0.0	2	0.0	0.093	8.8	LOS A	0.2	1.5	0.23	0.50	0.23	46.7
3u	U	29	0.0	29	0.0	0.093	10.8	LOS A	0.2	1.5	0.23	0.50	0.23	38.8
Approach		116	6.4	116	6.4	0.093	5.5	LOS A	0.2	1.5	0.23	0.50	0.23	39.1
East: No Name Road														
4	L2	3	0.0	3	0.0	0.029	5.1	LOS A	0.1	0.5	0.37	0.47	0.37	42.1
5	T1	28	0.0	28	0.0	0.029	5.4	LOS A	0.1	0.5	0.37	0.47	0.37	42.1
6	R2	1	0.0	1	0.0	0.029	9.5	LOS A	0.1	0.5	0.37	0.47	0.37	48.8
Approach		33	0.0	33	0.0	0.029	5.5	LOS A	0.1	0.5	0.37	0.47	0.37	42.4
North: Majara Street														
7	L2	1	0.0	1	0.0	0.041	4.8	LOS A	0.1	0.6	0.33	0.54	0.33	43.0
8	T1	16	0.0	16	0.0	0.041	3.9	LOS A	0.1	0.6	0.33	0.54	0.33	36.1
9	R2	32	0.0	32	0.0	0.041	7.9	LOS A	0.1	0.6	0.33	0.54	0.33	36.1
Approach		48	0.0	48	0.0	0.041	6.6	LOS A	0.1	0.6	0.33	0.54	0.33	36.3
West: Gibraltar Street (West)														
10	L2	1	0.0	1	0.0	0.085	3.2	LOS A	0.2	1.1	0.12	0.59	0.12	42.6
11	T1	24	0.0	24	0.0	0.085	4.4	LOS A	0.2	1.1	0.12	0.59	0.12	46.4
12	R2	84	0.0	84	0.0	0.085	8.0	LOS A	0.2	1.1	0.12	0.59	0.12	38.7
12u	U	9	0.0	9	0.0	0.085	10.5	LOS A	0.2	1.1	0.12	0.59	0.12	38.7
Approach		119	0.0	119	0.0	0.085	7.4	LOS A	0.2	1.1	0.12	0.59	0.12	40.9
All Vehicles		316	2.3	316	2.3	0.093	6.4	LOS A	0.2	1.5	0.22	0.54	0.22	39.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.067	5.9	LOS A	0.1	0.8	0.53	0.69	0.53	38.8
2	T1	15	0.0	15	0.0	0.067	7.6	LOS A	0.1	0.8	0.53	0.69	0.53	32.8
3	R2	9	77.8	9	77.8	0.067	15.3	LOS B	0.1	0.8	0.53	0.69	0.53	32.8
Approach		33	22.6	33	22.6	0.067	9.4	LOS A	0.1	0.8	0.53	0.69	0.53	35.0
East: Kings Highway (East)														
4	L2	2	50.0	2	50.0	0.158	5.1	LOS A	0.0	0.0	0.00	0.48	0.00	43.2
5	T1	254	8.3	254	8.3	0.158	3.3	LOS A	0.0	0.0	0.00	0.48	0.00	44.8
6	R2	34	0.0	34	0.0	0.158	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	42.0
Approach		289	7.6	289	7.6	0.158	3.5	NA	0.0	0.0	0.00	0.48	0.00	44.6
North: Butmaroo Street														
7	L2	44	4.8	44	4.8	0.193	6.2	LOS A	0.3	2.1	0.49	0.71	0.49	34.6
8	T1	60	1.8	60	1.8	0.193	7.7	LOS A	0.3	2.1	0.49	0.71	0.49	40.0
9	R2	25	0.0	25	0.0	0.193	9.1	LOS A	0.3	2.1	0.49	0.71	0.49	39.4
Approach		129	2.4	129	2.4	0.193	7.4	LOS A	0.3	2.1	0.49	0.71	0.49	38.6
West: Kings Highway (West)														
10	L2	73	0.0	73	0.0	0.179	4.8	LOS A	0.1	0.5	0.06	0.14	0.06	46.1
11	T1	242	6.1	242	6.1	0.179	0.1	LOS A	0.1	0.5	0.06	0.14	0.06	46.1
12	R2	14	7.7	14	7.7	0.179	5.8	LOS A	0.1	0.5	0.06	0.14	0.06	45.7
Approach		328	4.8	328	4.8	0.179	1.4	NA	0.1	0.5	0.06	0.14	0.06	46.1
All Vehicles		780	6.2	780	6.2	0.193	3.5	NA	0.3	2.1	0.13	0.38	0.13	43.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.084	6.1	LOS A	0.1	0.8	0.29	0.61	0.29	45.3
3	R2	65	1.6	65	1.6	0.084	6.6	LOS A	0.1	0.8	0.29	0.61	0.29	40.6
Approach		92	2.3	92	2.3	0.084	6.4	LOS A	0.1	0.8	0.29	0.61	0.29	42.6
East: Turallo Terrace														
4	L2	97	1.1	97	1.1	0.131	5.1	LOS A	0.0	0.0	0.00	0.26	0.00	48.0
5	T1	151	0.7	151	0.7	0.131	0.3	LOS A	0.0	0.0	0.00	0.26	0.00	52.1
Approach		247	0.9	247	0.9	0.131	2.2	NA	0.0	0.0	0.00	0.26	0.00	51.0
West: Turallo Terrace														
11	T1	51	0.0	51	0.0	0.045	0.4	LOS A	0.1	0.5	0.24	0.20	0.24	45.1
12	R2	26	0.0	26	0.0	0.045	6.2	LOS A	0.1	0.5	0.24	0.20	0.24	45.1
Approach		77	0.0	77	0.0	0.045	2.4	NA	0.1	0.5	0.24	0.20	0.24	45.1
All Vehicles		416	1.0	416	1.0	0.131	3.1	NA	0.1	0.8	0.11	0.33	0.11	48.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	154	0.7	154	0.7	0.081	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	51.6
Approach		154	0.7	154	0.7	0.081	0.0	NA	0.0	0.0	0.00	0.00	0.00	51.6
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		239	0.4	239	0.4	0.081	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.079	4.8	LOS A	0.2	1.3	0.45	0.58	0.45	41.6
2	T1	12	9.1	12	9.1	0.079	4.8	LOS A	0.2	1.3	0.45	0.58	0.45	36.8
3	R2	41	0.0	41	0.0	0.079	9.5	LOS A	0.2	1.3	0.45	0.58	0.45	36.8
Approach		81	3.9	81	3.9	0.079	7.2	LOS A	0.2	1.3	0.45	0.58	0.45	39.1
East: Gibraltar Street (East)														
4	L2	48	13.0	48	13.0	0.137	3.3	LOS A	0.0	0.0	0.00	0.44	0.00	41.4
5	T1	175	1.2	175	1.2	0.137	3.2	LOS A	0.0	0.0	0.00	0.44	0.00	46.6
6	R2	51	0.0	51	0.0	0.137	7.2	LOS A	0.0	0.0	0.00	0.44	0.00	41.4
Approach		274	3.1	274	3.1	0.137	3.9	LOS A	0.0	0.0	0.00	0.44	0.00	45.3
North: Butmaroo Street														
7	L2	67	0.0	67	0.0	0.115	4.3	LOS A	0.3	1.8	0.42	0.53	0.42	37.7
8	T1	35	3.0	35	3.0	0.115	4.4	LOS A	0.3	1.8	0.42	0.53	0.42	37.7
9	R2	24	0.0	24	0.0	0.115	8.4	LOS A	0.3	1.8	0.42	0.53	0.42	44.2
Approach		126	0.8	126	0.8	0.115	5.1	LOS A	0.3	1.8	0.42	0.53	0.42	39.5
West: Gibraltar Street West)														
10	L2	27	3.8	27	3.8	0.158	4.6	LOS A	0.3	2.2	0.25	0.47	0.25	43.1
11	T1	162	2.6	162	2.6	0.158	4.8	LOS A	0.3	2.2	0.25	0.47	0.25	43.1
12	R2	11	10.0	11	10.0	0.158	7.7	LOS A	0.3	2.2	0.25	0.47	0.25	43.1
Approach		200	3.2	200	3.2	0.158	4.9	LOS A	0.3	2.2	0.25	0.47	0.25	43.1
All Vehicles		681	2.8	681	2.8	0.158	4.8	LOS A	0.3	2.2	0.21	0.48	0.21	43.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.125	3.3	LOS A	0.0	0.0	0.00	0.49	0.00	41.1
2	T1	47	0.0	47	0.0	0.125	3.3	LOS A	0.0	0.0	0.00	0.49	0.00	46.8
3	R2	1	0.0	1	0.0	0.125	7.3	LOS A	0.0	0.0	0.00	0.49	0.00	46.9
3u	U	35	0.0	35	0.0	0.125	9.1	LOS A	0.0	0.0	0.00	0.49	0.00	41.1
Approach		226	3.3	226	3.3	0.125	4.2	LOS A	0.0	0.0	0.00	0.49	0.00	42.9
East: No Name Road														
4	L2	1	0.0	1	0.0	0.015	5.0	LOS A	0.0	0.2	0.36	0.46	0.36	42.0
5	T1	15	0.0	15	0.0	0.015	5.3	LOS A	0.0	0.2	0.36	0.46	0.36	42.0
6	R2	1	0.0	1	0.0	0.015	9.4	LOS A	0.0	0.2	0.36	0.46	0.36	48.7
Approach		17	0.0	17	0.0	0.015	5.5	LOS A	0.0	0.2	0.36	0.46	0.36	42.7
North: Majara Street														
7	L2	1	0.0	1	0.0	0.003	4.9	LOS A	0.0	0.0	0.34	0.47	0.34	44.9
8	T1	1	0.0	1	0.0	0.003	3.9	LOS A	0.0	0.0	0.34	0.47	0.34	38.4
9	R2	1	0.0	1	0.0	0.003	8.0	LOS A	0.0	0.0	0.34	0.47	0.34	38.4
Approach		3	0.0	3	0.0	0.003	5.6	LOS A	0.0	0.0	0.34	0.47	0.34	41.4
West: Gibraltar Street (West)														
10	L2	1	0.0	1	0.0	0.105	3.5	LOS A	0.2	1.3	0.20	0.61	0.20	41.8
11	T1	14	0.0	14	0.0	0.105	4.7	LOS A	0.2	1.3	0.20	0.61	0.20	45.4
12	R2	100	1.1	100	1.1	0.105	8.2	LOS A	0.2	1.3	0.20	0.61	0.20	37.4
12u	U	21	0.0	21	0.0	0.105	10.7	LOS A	0.2	1.3	0.20	0.61	0.20	37.4
Approach		136	0.8	136	0.8	0.105	8.2	LOS A	0.2	1.3	0.20	0.61	0.20	38.6
All Vehicles		382	2.2	382	2.2	0.125	5.7	LOS A	0.2	1.3	0.09	0.53	0.09	41.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.096	8.3	LOS A	0.1	0.9	0.70	0.84	0.70	35.8
2	T1	19	5.6	19	5.6	0.096	14.9	LOS B	0.1	0.9	0.70	0.84	0.70	28.7
3	R2	3	0.0	3	0.0	0.096	15.2	LOS B	0.1	0.9	0.70	0.84	0.70	28.7
Approach		34	3.1	34	3.1	0.096	12.6	LOS A	0.1	0.9	0.70	0.84	0.70	31.9
East: Kings Highway (East)														
4	L2	9	0.0	9	0.0	0.305	4.7	LOS A	0.0	0.0	0.00	0.48	0.00	45.1
5	T1	542	1.0	542	1.0	0.305	3.3	LOS A	0.0	0.0	0.00	0.48	0.00	45.3
6	R2	35	0.0	35	0.0	0.305	4.7	LOS A	0.0	0.0	0.00	0.48	0.00	42.3
Approach		586	0.9	586	0.9	0.305	3.4	NA	0.0	0.0	0.00	0.48	0.00	45.2
North: Butmaroo Street														
7	L2	31	13.8	31	13.8	0.290	8.6	LOS A	0.4	3.4	0.72	0.89	0.84	26.4
8	T1	40	15.8	40	15.8	0.290	18.4	LOS B	0.4	3.4	0.72	0.89	0.84	33.6
9	R2	28	0.0	28	0.0	0.290	16.8	LOS B	0.4	3.4	0.72	0.89	0.84	33.7
Approach		99	10.6	99	10.6	0.290	14.9	LOS B	0.4	3.4	0.72	0.89	0.84	32.0
West: Kings Highway (West)														
10	L2	36	5.9	36	5.9	0.236	6.0	LOS A	0.1	0.7	0.07	0.06	0.07	47.6
11	T1	381	5.2	381	5.2	0.236	0.2	LOS A	0.1	0.7	0.07	0.06	0.07	47.6
12	R2	13	8.3	13	8.3	0.236	8.0	LOS A	0.1	0.7	0.07	0.06	0.07	46.4
Approach		429	5.4	429	5.4	0.236	0.9	NA	0.1	0.7	0.07	0.06	0.07	47.6
All Vehicles		1148	3.5	1148	3.5	0.305	3.7	NA	0.4	3.4	0.11	0.37	0.12	43.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	20	0.0	20	0.0	0.189	8.0	LOS A	0.3	1.8	0.71	0.85	0.72	28.3
2	T1	35	3.0	35	3.0	0.189	15.0	LOS B	0.3	1.8	0.71	0.85	0.72	28.3
3	R2	14	0.0	14	0.0	0.189	14.3	LOS A	0.3	1.8	0.71	0.85	0.72	34.9
Approach		68	1.5	68	1.5	0.189	12.8	LOS A	0.3	1.8	0.71	0.85	0.72	30.2
East: Kings Highway (East)														
4	L2	8	0.0	8	0.0	0.313	4.7	LOS A	0.0	0.0	0.00	0.48	0.00	44.5
5	T1	484	1.1	484	1.1	0.313	3.4	LOS A	0.0	0.0	0.00	0.48	0.00	41.7
6	R2	107	1.0	107	1.0	0.313	4.7	LOS A	0.0	0.0	0.00	0.48	0.00	41.7
Approach		600	1.1	600	1.1	0.313	3.6	NA	0.0	0.0	0.00	0.48	0.00	41.7
North: Majara (North)														
7	L2	57	0.0	57	0.0	0.384	8.3	LOS A	0.7	4.8	0.66	0.89	0.88	35.5
8	T1	15	0.0	15	0.0	0.384	16.3	LOS B	0.7	4.8	0.66	0.89	0.88	35.5
9	R2	88	0.0	88	0.0	0.384	18.4	LOS B	0.7	4.8	0.66	0.89	0.88	27.9
Approach		160	0.0	160	0.0	0.384	14.6	LOS B	0.7	4.8	0.66	0.89	0.88	32.1
West: Kings Highway (West)														
10	L2	112	5.7	112	5.7	0.232	4.8	LOS A	0.0	0.3	0.03	0.15	0.03	46.1
11	T1	296	6.0	296	6.0	0.232	0.1	LOS A	0.0	0.3	0.03	0.15	0.03	47.9
12	R2	6	0.0	6	0.0	0.232	7.2	LOS A	0.0	0.3	0.03	0.15	0.03	45.8
Approach		414	5.9	414	5.9	0.232	1.5	NA	0.0	0.3	0.03	0.15	0.03	47.6
All Vehicles		1242	2.5	1242	2.5	0.384	4.8	NA	0.7	4.8	0.13	0.44	0.16	41.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	21	0.0	21	0.0	0.145	6.4	LOS A	0.2	1.4	0.61	0.76	0.61	30.1
2	T1	33	3.2	33	3.2	0.145	13.3	LOS A	0.2	1.4	0.61	0.76	0.61	30.1
3	R2	6	0.0	6	0.0	0.145	15.2	LOS B	0.2	1.4	0.61	0.76	0.61	36.2
Approach		60	1.8	60	1.8	0.145	11.1	LOS A	0.2	1.4	0.61	0.76	0.61	31.1
East: Kings Highway (East)														
4	L2	6	0.0	6	0.0	0.212	4.7	LOS A	0.0	0.0	0.00	0.48	0.00	44.6
5	T1	312	7.4	312	7.4	0.212	3.4	LOS A	0.0	0.0	0.00	0.48	0.00	41.7
6	R2	76	0.0	76	0.0	0.212	4.7	LOS A	0.0	0.0	0.00	0.48	0.00	41.7
Approach		394	5.9	394	5.9	0.212	3.7	NA	0.0	0.0	0.00	0.48	0.00	41.8
North: Majara (North)														
7	L2	119	1.8	119	1.8	0.459	11.2	LOS A	0.9	6.5	0.71	0.98	1.04	36.1
8	T1	38	0.0	38	0.0	0.459	16.1	LOS B	0.9	6.5	0.71	0.98	1.04	35.5
9	R2	58	0.0	58	0.0	0.459	18.0	LOS B	0.9	6.5	0.71	0.98	1.04	28.2
Approach		215	1.0	215	1.0	0.459	13.9	LOS A	0.9	6.5	0.71	0.98	1.04	34.5
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	6.3	LOS A	0.0	0.2	0.01	0.06	0.01	47.0
Approach		549	4.6	549	4.6	0.301	0.5	NA	0.0	0.2	0.01	0.06	0.01	49.2
All Vehicles		1218	4.2	1218	4.2	0.459	4.4	NA	0.9	6.5	0.16	0.39	0.22	43.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.124	5.8	LOS A	0.2	1.3	0.23	0.59	0.23	46.3
3	R2	101	2.1	101	2.1	0.124	6.4	LOS A	0.2	1.3	0.23	0.59	0.23	41.1
Approach		142	1.5	142	1.5	0.124	6.2	LOS A	0.2	1.3	0.23	0.59	0.23	43.3
East: Turallo Terrace (West)														
4	L2	91	0.0	91	0.0	0.091	5.2	LOS A	0.0	0.0	0.00	0.34	0.00	47.3
5	T1	81	0.0	81	0.0	0.091	0.3	LOS A	0.0	0.0	0.00	0.34	0.00	52.3
Approach		172	0.0	172	0.0	0.091	2.9	NA	0.0	0.0	0.00	0.34	0.00	50.3
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	48.6
12	R2	9	0.0	9	0.0	0.056	6.0	LOS A	0.0	0.2	0.06	0.06	0.06	48.6
Approach		104	0.0	104	0.0	0.056	0.6	NA	0.0	0.2	0.06	0.06	0.06	48.6
All Vehicles		418	0.5	418	0.5	0.124	3.5	NA	0.2	1.3	0.09	0.35	0.09	47.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	79	1.3	79	1.3	0.042	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	52.8
Approach		79	1.3	79	1.3	0.042	0.0	NA	0.0	0.0	0.00	0.00	0.00	52.8
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		178	0.6	178	0.6	0.052	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.141	4.6	LOS A	0.3	2.3	0.46	0.58	0.46	41.8
2	T1	31	0.0	31	0.0	0.141	4.7	LOS A	0.3	2.3	0.46	0.58	0.46	36.9
3	R2	65	0.0	65	0.0	0.141	9.3	LOS A	0.3	2.3	0.46	0.58	0.46	36.9
Approach		151	0.0	151	0.0	0.141	6.7	LOS A	0.3	2.3	0.46	0.58	0.46	39.3
East: Gibraltar Street (East)														
4	L2	72	1.5	72	1.5	0.135	3.2	LOS A	0.0	0.0	0.00	0.48	0.00	40.5
5	T1	117	4.5	117	4.5	0.135	3.2	LOS A	0.0	0.0	0.00	0.48	0.00	45.9
6	R2	78	2.7	78	2.7	0.135	7.2	LOS A	0.0	0.0	0.00	0.48	0.00	40.5
Approach		266	3.2	266	3.2	0.135	4.3	LOS A	0.0	0.0	0.00	0.48	0.00	43.6
North: Butmaroo Street														
7	L2	24	0.0	24	0.0	0.093	4.3	LOS A	0.2	1.5	0.43	0.54	0.43	36.8
8	T1	40	2.6	40	2.6	0.093	4.4	LOS A	0.2	1.5	0.43	0.54	0.43	36.8
9	R2	37	0.0	37	0.0	0.093	8.4	LOS A	0.2	1.5	0.43	0.54	0.43	43.4
Approach		101	1.0	101	1.0	0.093	5.9	LOS A	0.2	1.5	0.43	0.54	0.43	40.0
West: Gibraltar Street (West)														
10	L2	37	0.0	37	0.0	0.165	4.9	LOS A	0.3	2.3	0.33	0.51	0.33	42.0
11	T1	142	0.7	142	0.7	0.165	5.1	LOS A	0.3	2.3	0.33	0.51	0.33	42.0
12	R2	16	6.7	16	6.7	0.165	8.0	LOS A	0.3	2.3	0.33	0.51	0.33	42.0
Approach		195	1.1	195	1.1	0.165	5.3	LOS A	0.3	2.3	0.33	0.51	0.33	42.0
All Vehicles		713	1.6	713	1.6	0.165	5.3	LOS A	0.3	2.3	0.25	0.52	0.25	41.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.106	3.6	LOS A	0.2	1.7	0.25	0.50	0.25	38.9
2	T1	1	0.0	1	0.0	0.106	3.5	LOS A	0.2	1.7	0.25	0.50	0.25	44.9
3	R2	3	0.0	3	0.0	0.106	8.9	LOS A	0.2	1.7	0.25	0.50	0.25	46.8
3u	U	29	0.0	29	0.0	0.106	10.8	LOS A	0.2	1.7	0.25	0.50	0.25	38.9
Approach		132	5.6	132	5.6	0.106	5.3	LOS A	0.2	1.7	0.25	0.50	0.25	39.3
East: No Name Road														
4	L2	4	0.0	4	0.0	0.035	5.1	LOS A	0.1	0.5	0.39	0.47	0.39	42.0
5	T1	34	0.0	34	0.0	0.035	5.4	LOS A	0.1	0.5	0.39	0.47	0.39	42.0
6	R2	1	0.0	1	0.0	0.035	9.6	LOS A	0.1	0.5	0.39	0.47	0.39	48.8
Approach		39	0.0	39	0.0	0.035	5.5	LOS A	0.1	0.5	0.39	0.47	0.39	42.3
North: Majara Street														
7	L2	1	0.0	1	0.0	0.042	4.9	LOS A	0.1	0.6	0.34	0.54	0.34	43.0
8	T1	16	0.0	16	0.0	0.042	4.0	LOS A	0.1	0.6	0.34	0.54	0.34	36.0
9	R2	32	0.0	32	0.0	0.042	8.0	LOS A	0.1	0.6	0.34	0.54	0.34	36.0
Approach		48	0.0	48	0.0	0.042	6.6	LOS A	0.1	0.6	0.34	0.54	0.34	36.2
West: Gibraltar Street (West)														
10	L2	1	0.0	1	0.0	0.094	3.3	LOS A	0.2	1.2	0.13	0.59	0.13	42.6
11	T1	29	0.0	29	0.0	0.094	4.4	LOS A	0.2	1.2	0.13	0.59	0.13	46.5
12	R2	92	0.0	92	0.0	0.094	7.9	LOS A	0.2	1.2	0.13	0.59	0.13	38.7
12u	U	11	0.0	11	0.0	0.094	10.5	LOS A	0.2	1.2	0.13	0.59	0.13	38.7
Approach		133	0.0	133	0.0	0.094	7.3	LOS A	0.2	1.2	0.13	0.59	0.13	41.1
All Vehicles		352	2.1	352	2.1	0.106	6.3	LOS A	0.2	1.7	0.23	0.54	0.23	39.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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	0.250	7.6	LOS A	0.4	2.7	0.77	0.90	0.86	32.9
2	T1	49	0.0	49	0.0	0.250	15.3	LOS B	0.4	2.7	0.77	0.90	0.86	25.1
3	R2	11	70.0	11	70.0	0.250	32.2	LOS C	0.4	2.7	0.77	0.90	0.86	25.1
Approach		71	10.4	71	10.4	0.250	16.7	LOS B	0.4	2.7	0.77	0.90	0.86	26.7
East: Kings Highway (East)														
4	L2	2	50.0	2	50.0	0.209	5.1	LOS A	0.0	0.0	0.00	0.48	0.00	43.2
5	T1	349	6.0	349	6.0	0.209	3.3	LOS A	0.0	0.0	0.00	0.48	0.00	44.8
6	R2	38	0.0	38	0.0	0.209	4.6	LOS A	0.0	0.0	0.00	0.48	0.00	42.0
Approach		389	5.7	389	5.7	0.209	3.4	NA	0.0	0.0	0.00	0.48	0.00	44.6
North: Butmaroo Street														
7	L2	51	4.2	51	4.2	0.393	10.5	LOS A	0.7	4.8	0.75	0.96	1.00	26.5
8	T1	67	1.6	67	1.6	0.393	16.3	LOS B	0.7	4.8	0.75	0.96	1.00	33.9
9	R2	33	0.0	33	0.0	0.393	18.0	LOS B	0.7	4.8	0.75	0.96	1.00	33.6
Approach		151	2.1	151	2.1	0.393	14.7	LOS B	0.7	4.8	0.75	0.96	1.00	32.0
West: Kings Highway (West)														
10	L2	85	0.0	85	0.0	0.326	5.0	LOS A	0.1	0.8	0.05	0.09	0.05	47.3
11	T1	509	2.9	509	2.9	0.326	0.1	LOS A	0.1	0.8	0.05	0.09	0.05	47.3
12	R2	16	6.7	16	6.7	0.326	6.7	LOS A	0.1	0.8	0.05	0.09	0.05	46.3
Approach		611	2.6	611	2.6	0.326	1.0	NA	0.1	0.8	0.05	0.09	0.05	47.3
All Vehicles		1221	4.0	1221	4.0	0.393	4.4	NA	0.7	4.8	0.16	0.37	0.20	41.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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