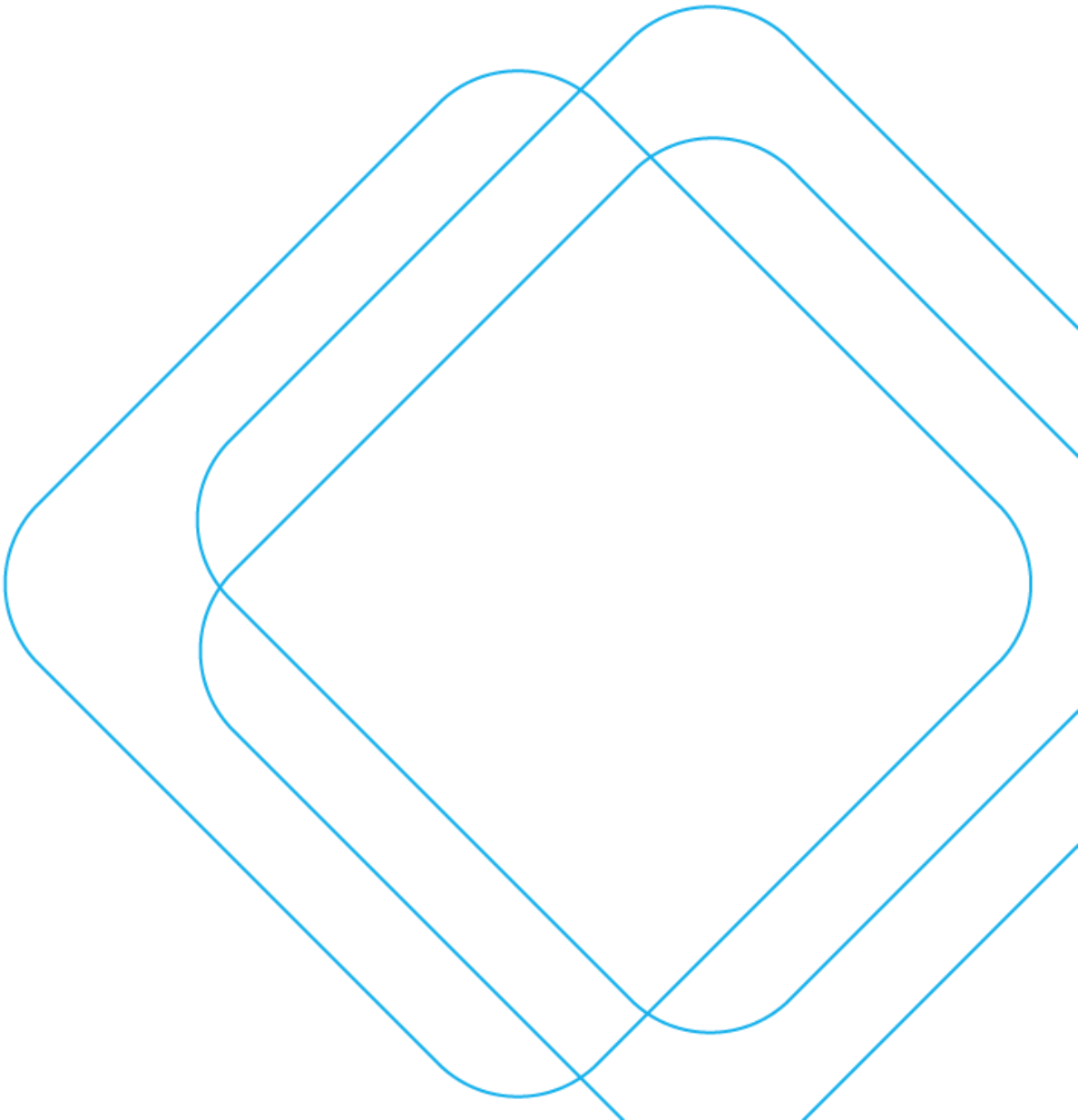
SCT Consulting

WATERWORKS ROAD JUNEE REZONING TRAFFIC IMPACT ASSESSMENT

Draft Report

11 AUGUST 2023

SCT Consulting acknowledges the traditional owners of the lands on which we work.
We pay our respects to Elders past, present and emerging.



Quality Assurance

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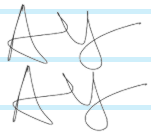
Reviewer:	Andy Yung	Director	
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Executive Summary

Purpose of study

The landowner is preparing a re-zoning application for a rural site at 192 Waterworks Road in Junee in the Junee Shire Council LGA. The site is in the Riverina region, approximately 227km northwest of Canberra and 41km north of Wagga Wagga. The future proposed development site is 78ha in size, with the yield being approximately 300 residential lots.

The purpose of this Traffic Impact Assessment is to support the re-zoning application of the site. The report assesses the impact of the future proposed development of the site based on the net increase in trips, connectivity and access to the surrounding road network, car parking requirements, public and active transport facilities, and any potential infrastructure upgrades.

Existing conditions

The site is bounded by Waterworks Road to the north, while Pitt Street and Cedric Street run west of the site, and Kinvara Road just south of the site. These are local roads of rural nature, with no formal footpaths or formal on-street parking provided. Junee town centre and Junee train station is located a 6-minute drive to the southwest of the site. The state road Olympic Highway (A41) is the key access road between the site and surrounding arterial road network as well as other regional areas. No fatal crashes have been reported in proximity to the site between 2017 and 2021.

Land use in and around the Junee town centre is mainly zoned 'Village' or 'Large lot residential' with pockets of public and private recreation and some community and commercial facilities. Outside of the Junee town centre, much of the surrounding land is rural in nature, with the site having a rural land use zoning named 'Primary production.'

The 2016 Method of Travel to Work data for the Junee Shire LGA suggests that 71 per cent either drive or go as a car passenger to work, with only a small proportion using public or active transport. Approximately 72 per cent of residents live and work within the LGA, while 28 per cent work outside of the LGA, with the Wagga Wagga LGA being the most common work destination.

There are currently no public transport options within 800m walking distance of the site. The site is approximately 2km northeast of the Junee train station, with trains running between Melbourne and Sydney. Bus services are limited to routes 921, 922 and 923, which currently provide a limited bus service between Junee and Wagga Wagga.

As expected with the rural nature of the site's location, there are no dedicated formal cycle lanes or footpaths in the proximity to the site, including along Waterworks Road, Cedric Street or Pitt Street.

The crash data analysis suggested that no fatal crashes and three serious injury crashes have occurred in proximity to the site between 2017 and 2021. The injury crashes occurred at three different locations however, so no specific crash pattern was observed at the one spot in proximity to the site.

The future proposed subdivision and impact assessment

The site proposed to be re-zoned consists of approximately 78ha of rural land, currently accessed from Waterworks Road. Subsequent to re-zoning, a future development of the land is likely to result in a maximum of 300 residential lots, with future access provided via Waterworks Road, Cedric Street and Pitt Street.

The future proposed development is expected to generate 255 vehicles in the AM and PM peak hour respectively, and 2,700 vehicle trips per day. Because the site is currently unoccupied, these trips would be in addition to the existing situation. The highest level of additional trips generated by the future proposed development is expected on the Cedric Street and Pitt Street access points, with 37 and 33 per cent of trips, respectively.

The proposed development is expected to add approximately 100 peak hour trips to each of Pitt Street and Cerdric Street. With currently less than 50 vehicles per hour on both of these streets, the increase will not have a major impact to the residential street nature of these streets. The total expected traffic on Pitt Street and Cerdric Street will still be within the environmental capacity limit of local residential streets, of 300 veh/hr.

SIDRA analysis was undertaken for four intersections in proximity to the site to determine the impact the proposed future development will have on the surrounding road network. The analysis found that with the additional trips, these intersections will continue to perform with a LoS A during both the AM and PM peak hours, with low average vehicle delays and degree of saturation experienced on all approaches.

In accordance with the Junee Shire Council DCP, parking requirements for residential developments are minimum one off-street parking space per dwelling, with two car spaces preferred (may include use of driveway area in front of any car space). Off-street parking provision will minimise the impact of parking on the surrounding local road network.

The surrounding public and active transport facilities are expected to be able to cater for the additional person trips generated by the future development of the site. If more public and active transport options are however implemented in the future, a further shift towards public and active transport could be expected.

With the introduction of the future development of the site, there may be an increased cycling and walking demand, from the site to public transport facilities such as the train station and bus stops. This is especially the case along Cedric Street and Pitt Street, which will be future key connections between the site and the Junee town centre.

Future proposed traffic and transport upgrades

The SIDRA analysis suggests that the trips generated by the future proposed development will not have a major impact on the surrounding road network surrounding the site, and that the nearby intersections and roads will be able to cope with the increase in trips.

Infrastructure upgrades are however required to the site's future proposed external access points at Waterworks Road, Cedric Street and Pitt Street. A new internal road network will also be introduced as part of the future development of the site.

No public transport upgrades are expected to be required because of the increase in demand of public transport services from residents of the future development of the site.

There are currently no footpaths along Pitt Street and Cedric Street, which will be key access routes to the site in the future. With the future development of the site, additional footpaths along these routes, as well as along the internal road network, should be considered to improve connectivity to the wider street network. This would tie into the proposed shared path improvements along sections of Pitt Street and Waterworks Road, as outlined in the Junee Shire Council Walking and Cycling Accessibility Plan.

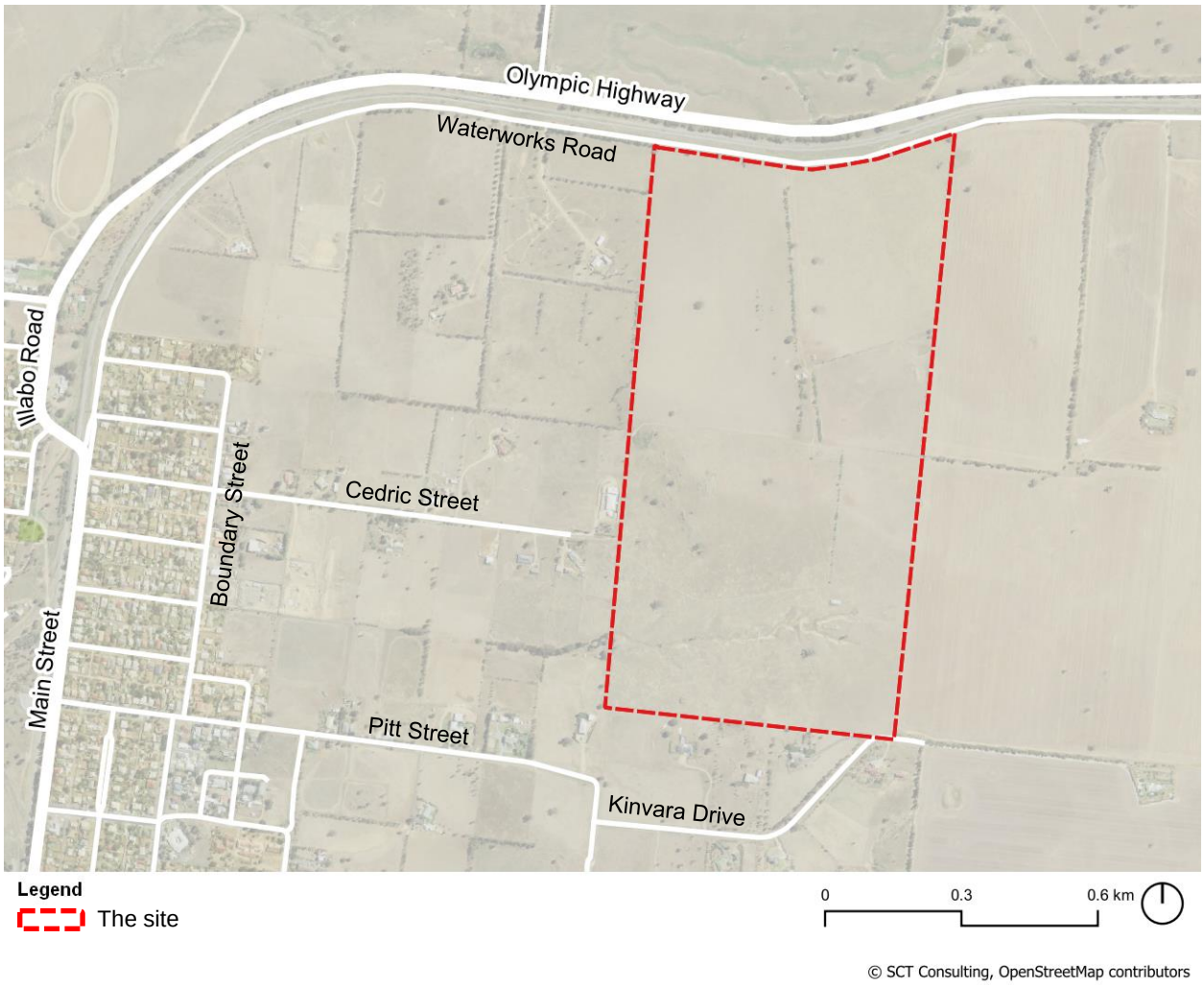
1.0 Introduction

1.1 Background

The landowner is preparing a re-zoning application for a rural site at 192 Waterworks Road in Junee in the Junee Shire Council Local Government Area (LGA) NSW. The future proposed development site is 78ha in size, with the yield being approximately 300 residential lots. Spiire has engaged SCT Consulting to prepare a Traffic Impact Assessment (TIA) to support the re-zoning application.

The site is located in the Riverina region, approximately 227km northwest of Canberra and 41km north of Wagga Wagga and is bounded by Waterworks Road to the north, Cedric Street and Pitt Street to the west, and Kinvara Road just south of the site, as seen in **Figure 1-1**. Junee town centre and Junee train station are located a 6-minute drive to the west of the site, via Waterworks Road and Main Street.

Figure 1-1 The site location



Source: Nearmap, June 2023

1.2 Purpose of report

The purpose of this TIA is to support the proposed re-zoning application for a 78ha site in Junee in the Riverina Region, NSW. The TIA has assessed the impact of the proposed re-zoning and future proposed development in terms of the net increase in trips generated, impact on the surrounding road network, connectivity and access, car parking and servicing requirements, public and active transport facilities, and any potential mitigation measures. The report includes:

- A review of relevant background documentation, trip generation guidelines and the Junee Shire Council Development Control Plan (DCP).
- A desktop review of existing traffic and transport conditions including SIDRA modelling of four nearby intersections and a review of key active and public transport routes to / from the site.
- An estimate of the net increase in trip generation according to relevant guidelines and codes.
- A review of required car parking provision in accordance with the Junee Shire Council DCP.
- An appraisal of traffic impacts on the road network, based on SIDRA modelling, and on the surrounding active and public transport facilities.

1.3 Report Structure

This report has been structured into the following sections:

- **Section 2.0** describes the outcome of the review of relevant background documentation.
- **Section 3.0** describes the existing transport conditions for all modes of transport, including a SIDRA analysis of four nearby intersections.
- **Section 4.0** describes the future development of the site and its access strategy and the likely trip generation and parking requirements because of the proposed re-zoning and future development.
- **Section 5.0** describes the likely impacts for all transport modes, including a SIDRA analysis of four nearby intersections (with development trips) and parking impacts because of the future development of the site.
- **Section 6.0** proposes traffic and transport upgrades based on the potential traffic and transport impact.
- **Section 7.0** summarises the report content and presents the conclusions.

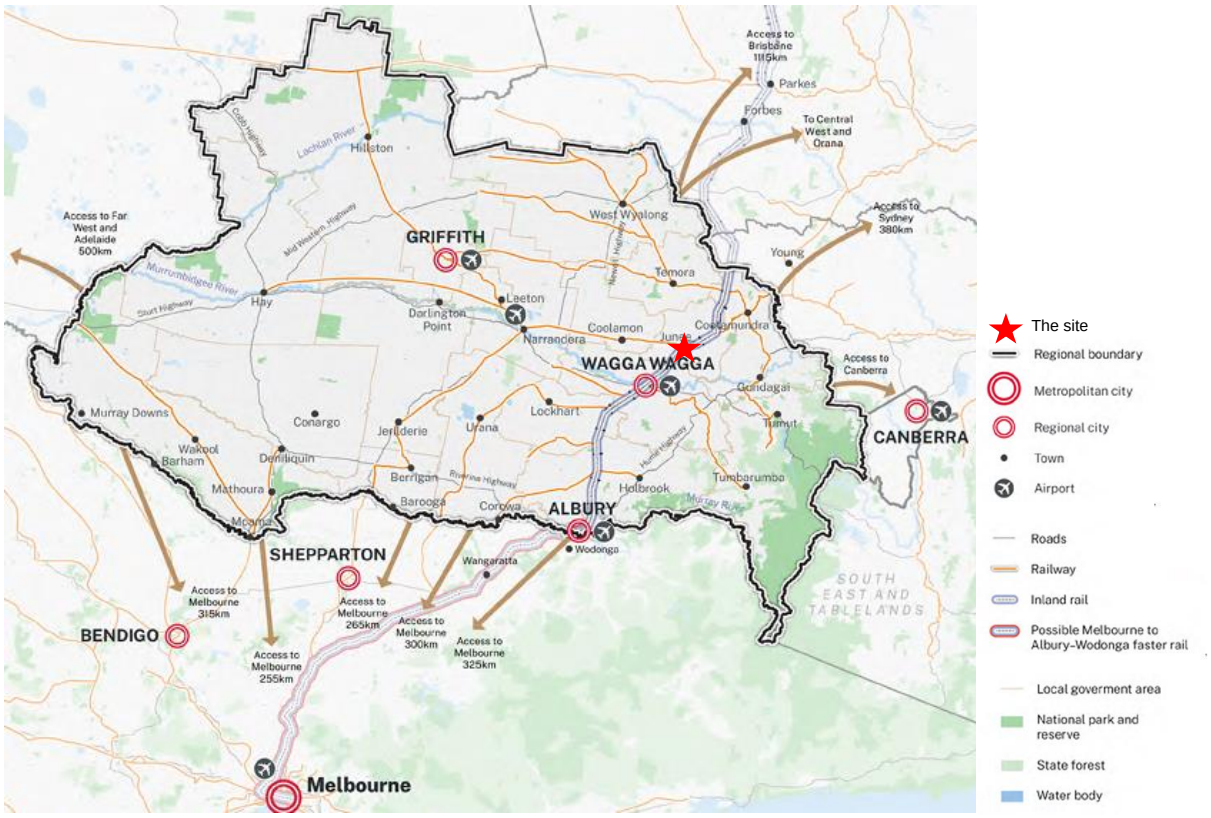
2.0 Strategic Context Review

2.1 The Riverina Murray Regional Plan 2041

The Riverina Murray Regional Plan 2041 is an update to the Riverina Murray Regional Plan 2036, which provided the NSW Government's vision for land uses in the Riverina Murray region. The regional plan covers all facets of land use planning, including the natural environment, future hazards, housing and related infrastructure, industry, employment areas and town centres. Junee's location from a regional context, in proximity to the Metropolitan City of Wagga Wagga, and with proximity to regional rail connections, is shown in **Figure 2-1**.

The Plan states that Wagga Wagga is NSW's largest inland regional city, home to more than 67,000 people, and the central hub for much of the region's east. Approximately 88% of people in the city of Wagga Wagga live and work in the city; others commute from areas within an hour, including from Junee, Coolamon, and Lockhart LGAs.

Figure 2-1 The proposed upgrade works for walking and cycling in proximity to the site



Source: The Riverina Murray Regional Plan 2041 is an update to the Riverina Murray Regional Plan 2036

The vision for the region to 2041 will be implemented through objectives, strategies, and actions for the three sections of the plan (the environment, communities and places, and the economy). Several objectives, which include strategies, actions, or collaboration activities, are listed in the Plan. Objectives relevant to housing and transport include:

– Objective 4 - Ensure housing supply, diversity, affordability, and resilience, with strategies including:
  - New urban developments will integrate land use and transport planning, including outcomes that support public and active transport opportunities.
  - Developments should be designed to support walking and cycle friendly neighbourhoods and connect to existing active transport networks.

– Objective 6 - Support housing in regional cities and their sub-regions, with strategies including:
  - Strategic and statutory planning for the regional cities will aim to coordinate appropriate urban growth and development through structure and master planning, particularly in new urban release areas.

- The department will work with local governments including Junee Shire Council, to respond to potential housing and economic impacts and opportunities from the growth and development of Wagga Wagga.

– Objective 18 – Integrate transport and land use planning, with strategies including:

- Strengthen connectivity and amenity in centres and across the region by planning and designing streets that prioritise walking, cycling and public transport as attractive transport choices.
- Establish connected and accessible green walking and cycling networks supported by appropriate user facilities and integrated with public transport.

2.2 The Junee Shire Council Local Strategic Planning Statement 2040

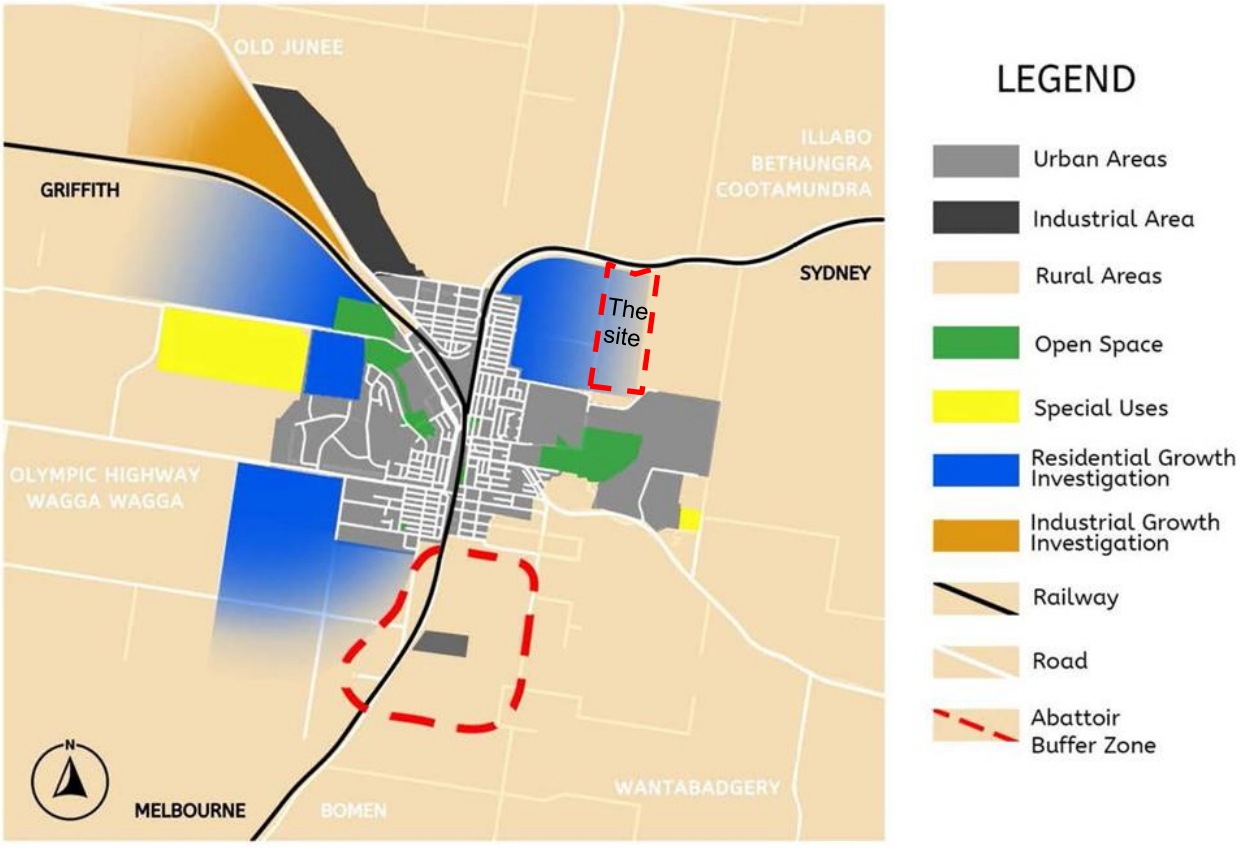
The Junee Shire Council Local Strategic Planning Statement (LSPS) 2040 (adopted in June 2020) states that the Junee Shire Council is forecast to welcome approximately 1,300 new residents to the LGA over the next 20 years, with the majority of growth expected in Junee. This will provide both opportunities and challenges in providing 600 new homes for the new residents.

The LSPS sets out eight planning priorities for the LGA, with those most relevant to housing and transport including:

– Priority 1 – Provide opportunities for housing in the right locations:

- Investigate opportunities for new residential areas and infill development by creating new neighbourhoods that are environmentally sustainable, socially inclusive, easy to get to and healthy and safe.
- With much of the existing residential land in Junee developed, there is a need to investigate options for creating additional and varied housing opportunities (as highlighted in **Figure 2-2**).

Figure 2-2 Junee growth strategy 2040



Source: The Junee Shire Council Local Strategic Planning Statement 2040 (adopted in June 2020)

2.3 The Junee Shire Council Development Control Plan 2021

The Junee Shire Council Development Control Plan (DCP) 2021 outlines a number of objectives and requirements relevant to subdivision and transport, as described int eh following sections.

2.3.1 Subdivision objectives and requirements (Part F)

Site planning - general

General performance criteria (as outlined in Planning – Section F2.1) for the site, related to traffic include:

– Create a legible road and pedestrian / cycle network and connection to surrounding networks.

– Create building envelopes that are free of constraints with suitable access for each lot.

– Integrate with the existing and/or desired subdivision pattern of the area.

Access and entrances - general

As outlined in Section F2.5 (Access and Entrances) of the DCP, the general objectives for subdivision are to:

– Provide all lots with safe, legal, and practical vehicle access and manoeuvring.

– Provide safe and suitable access and manoeuvring for emergency vehicles and larger vehicles for servicing (as required).

– Provide safe and suitable pedestrian / cycle access and facilities to encourage walking and / or cycling.

– Promote safe and efficient road and footpath environments for motorists, public transport, cyclists, and pedestrians.

The performance criteria for any accesses and entrances for new subdivisions are:

– Each allotment must have safe, legal access to a public road or Crown Road (duly formed or upgraded for the purpose and transferred to Council) either through a direct frontage, a right of-way arrangement, or by consolidation with an existing allotment that has such access.

– New access points to classified roads (highways and state and regional roads) are not preferred unless there is no alternative access available and must be located and constructed in accordance with NSW Government (RMS) requirements.

Access and entrances – zone specific

In addition, the DCP also outlines requirements that apply to subdivision of land in a zoning of ‘Primary production,’ to provide safe and efficient access points to / from proposed lots to rural roads. For this zoning, the following additional performance criteria apply:

– Access points must be grouped at existing or limited access points (wherever feasible) to ensure adequate sight.

– Lines and minimise the traffic impact and risk of additional access points to the public road system.

– Entrances or security gates must be setback from the edge of the existing / proposed road formation (to permit a small truck or car and trailer to park in the entrance without blocking the road) not less than the following distances:

  - 15m; or
  - If it is access to a classified road, a distance agreed with Roads & Maritime Services.

2.3.2 Vehicle parking and access objectives and requirements (Part C8)

The following sections outline a review of any proposed car parking, driveways, and pedestrian access requirements for new residential developments (C8 – Access and Parking) as per the Junee Development Control Plan (DCP) 2021.

Vehicle parking

The objective for vehicle parking is to 'ensure there is sufficient on-site car parking for the proposed use(s) so there is not an unreasonable reliance on on-street or off-site parking that impacts on other users.'

The required number of parking spaces for residential developments, depending on dwelling type, are outlined in **Table 2-1**. All parking spaces, manoeuvring areas, and driveways must be designed in accordance with Australian Standard AS2890 – Parking Facilities and the RMS - Guide to Traffic Generating Developments.

Table 2-1 DCP Off-street car parking requirements for residential developments

Residential dwelling type	Parking for residents	Visitor parking
Single dwelling houses, secondary dwellings, dual occupancies, semi-detached dwellings, and attached dwellings (townhouses) including second hand (relocatable) and transportable dwellings	Minimum one (1) off-street car parking space on the property for each dwelling located behind the dwelling setback to the street lot boundary ('building line'). Two (2) car spaces are preferred and may include use of the driveway area in front of any garage/carport	Not required. On-street or in driveway sufficient.
Multi-dwelling housing and residential flat buildings	Minimum one (1) off-street car parking space for each unit plus an additional one (1) space per four (4) units or part thereof	Minimum one (1) space per five (5) units or part thereof.

Source: The Junee Shire Council DCP 2021

New driveways and entrances

The objectives for new driveways and entrances in urban areas are:

– Ensure new driveways and garage entrances are located to maximise vehicle and pedestrian safety with appropriate sightlines and separations from intersections / other driveways / pedestrian access paths.

– Ensure for developments (other than a single dwelling, secondary dwelling, or dual occupancy on a lot) all vehicles can enter and leave the site in a forward direction.

– Ensure driveways, garages and carports do not dominate the street or the proposed development, are integrated with the design, and there is sufficient landscaping to soften visual impact.

The performance criteria for any R5 lots off less than one hectare in area are:

– Safety: Any driveway must provide sufficient separation from nearby intersections and sightlines for pedestrian and vehicle safety.

– Driveway Width:

  - Driveways serving one (1) dwelling shall be a minimum width of 3m.
  - Shared driveways serving three (3) or more dwellings shall have a minimum width of 4.5m increasing to 5.5m forward of the front building line or for passing bays (as required) justified based on the size of the development.

– Vehicle Turning: There must be sufficiently sized and appropriately located vehicle turning space(s) to enable all vehicle sizes that are expected to access the development to enter and leave the site travelling in a forward direction (not required for dwellings with direct single driveway access to the street).

2.4 The Junee Shire Council Walking and Cycling Accessibility Plan

The Junee Shire Council's Walking and Cycling Accessibility Plan (September 2020) was prepared to assess existing and future pedestrian and cyclist needs and provide management of resources and funding to meet these needs. The plan will seek to provide increased facilities and enhance the quality of life for pedestrians and cyclists of all ages and mobility in the Junee township, as well as the rural villages within the shire.

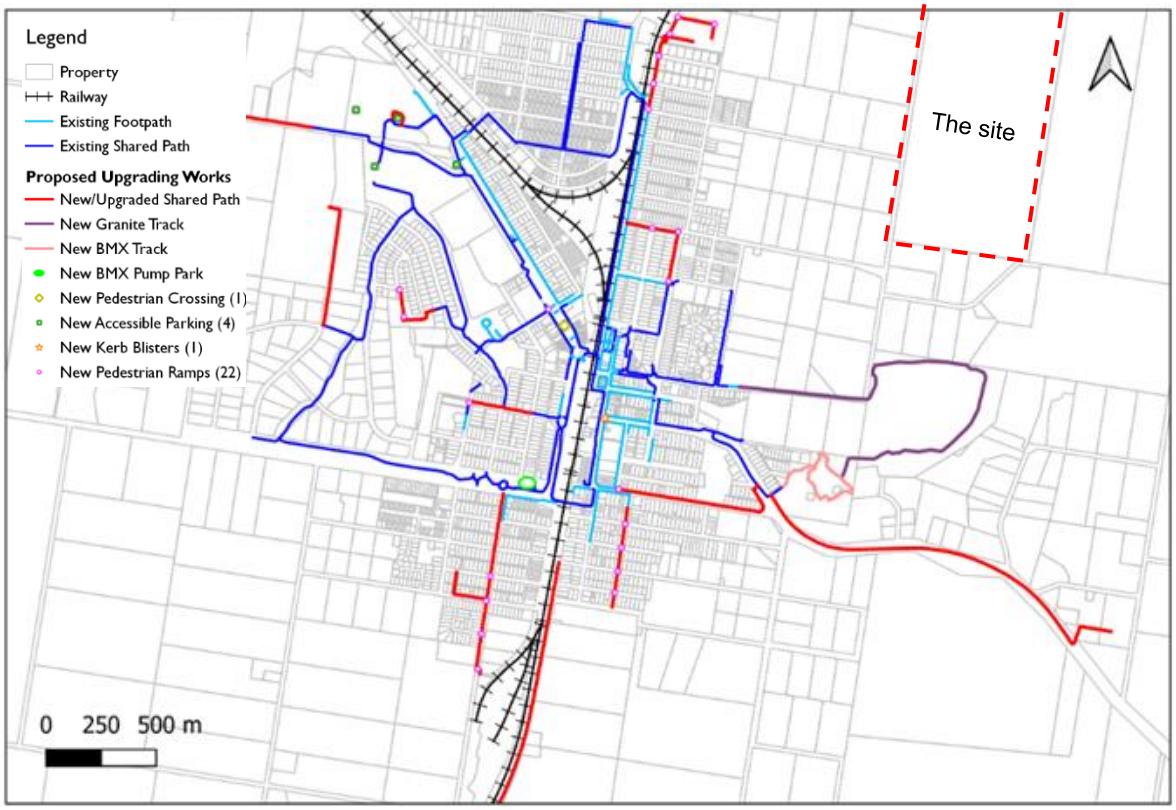
The Plan lists several proposed improvements to cycling and walking within and around the township of Junee. In addition, the Plan also outlines that it is essential for Council to ensure that the provision of adequate and complying walking and cycling facilities are in place to serve new development areas such as the north-eastern residential area in proximity to the site.

Some proposed projects in the Plan are still in conception stage, while others may require the cooperation of third-party stakeholders, land managers or landowners. Projects listed in the Plan in proximity to the site (**Figure 2-3**) include walking and cycling corridors along:

– Waterworks Road subdivision (North of Ridge St) to the existing walking and cycling network.

– Main Street to Cooinda Court via Pitt Street, identified using recreational walking and cycling route data from Strava.

Figure 2-3 The proposed upgrade works for walking and cycling in proximity to the site



Source: The Junee Shire Council Walking and Cycling Accessibility Plan (September 2020)

2.5 The RMS Guide to Traffic Generating Developments

2.5.1 Vehicle trip generation

The *Guide to Traffic Generating Developments (RTA, October 2002)* was reviewed to determine the likely number of vehicles generated by the future proposed development of the site. The Guide states that residential dwelling houses are expected to generate:

– 0.85 vehicle trips per dwelling during the AM and PM peak hours respectively

– Nine vehicle trips per dwelling per day

2.5.2 Person trip generation

Surveys at locations with low density residential developments and a low public transport accessibility score were chosen from the *Guide to Traffic Generating Development's Update Surveys (TDT 2013 / 04a)* for person trip generation estimation for the future proposed development of the site. The average peak hour person trip rates were estimated to be 1.27 trips per dwelling during the peak hour.

3.0 Existing Conditions

3.1 The site

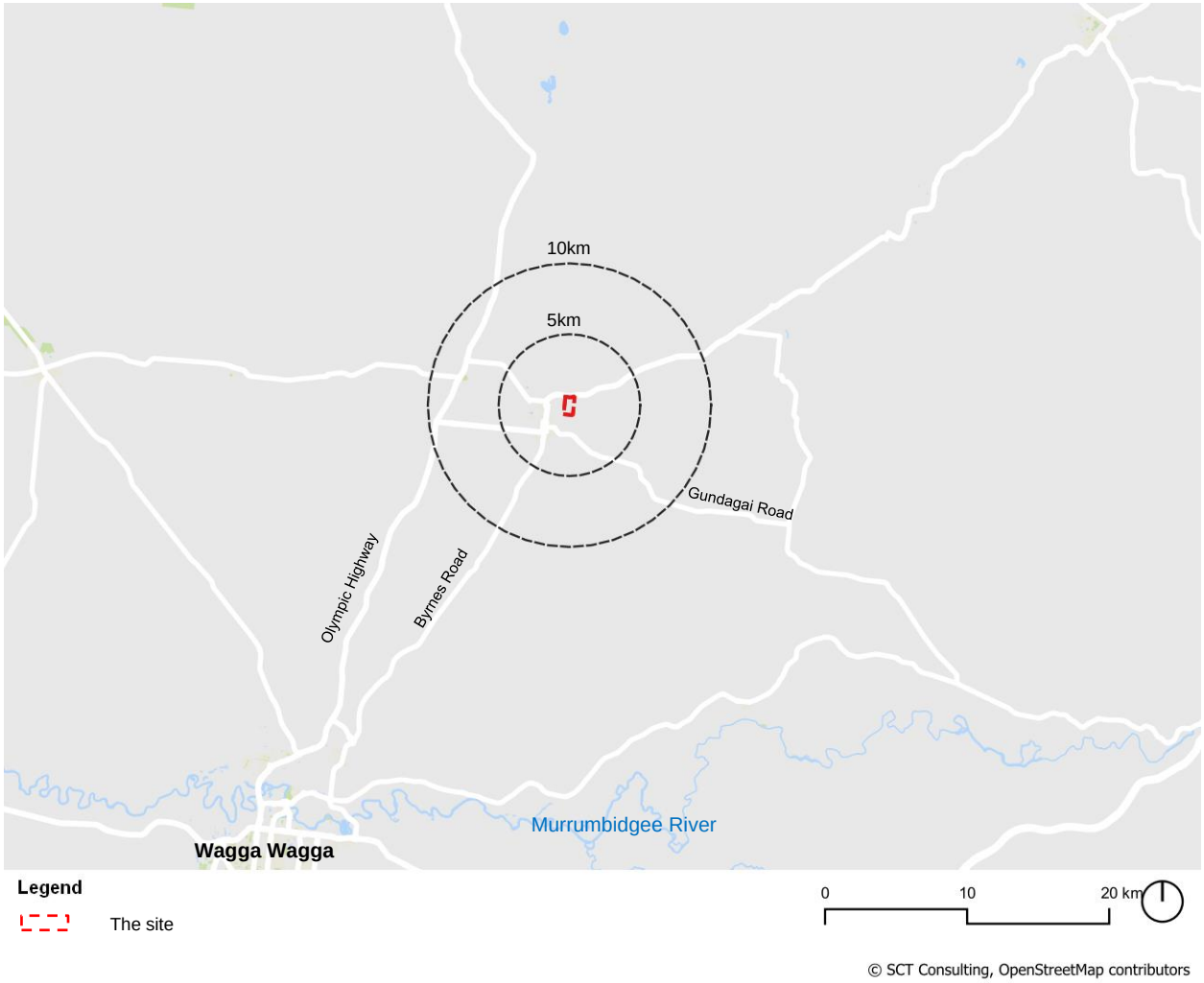
The site has an area of 78ha and is located at 192 Waterworks Road in Junee, in the Riverina Region, within the Junee Shire Council LGA, NSW.

There are currently some buildings including sheds and two dams on the existing property. The site can currently be accessed from Waterworks Road in the north, while Cedric Street and Pitt Street / Kinvara Road run in an east-west direction and ends just at the site boundary.

The site is located approximately 227km northwest of Canberra and 41km north of Wagga Wagga and is bounded by Waterworks Road to the north, while Pitt Street and Cedric Street runs west of the site, and Kinvara Road just south of the site. Junee town centre and Junee train station is located a 6-minute drive to the west of the site, via Waterworks Road and Main Street.

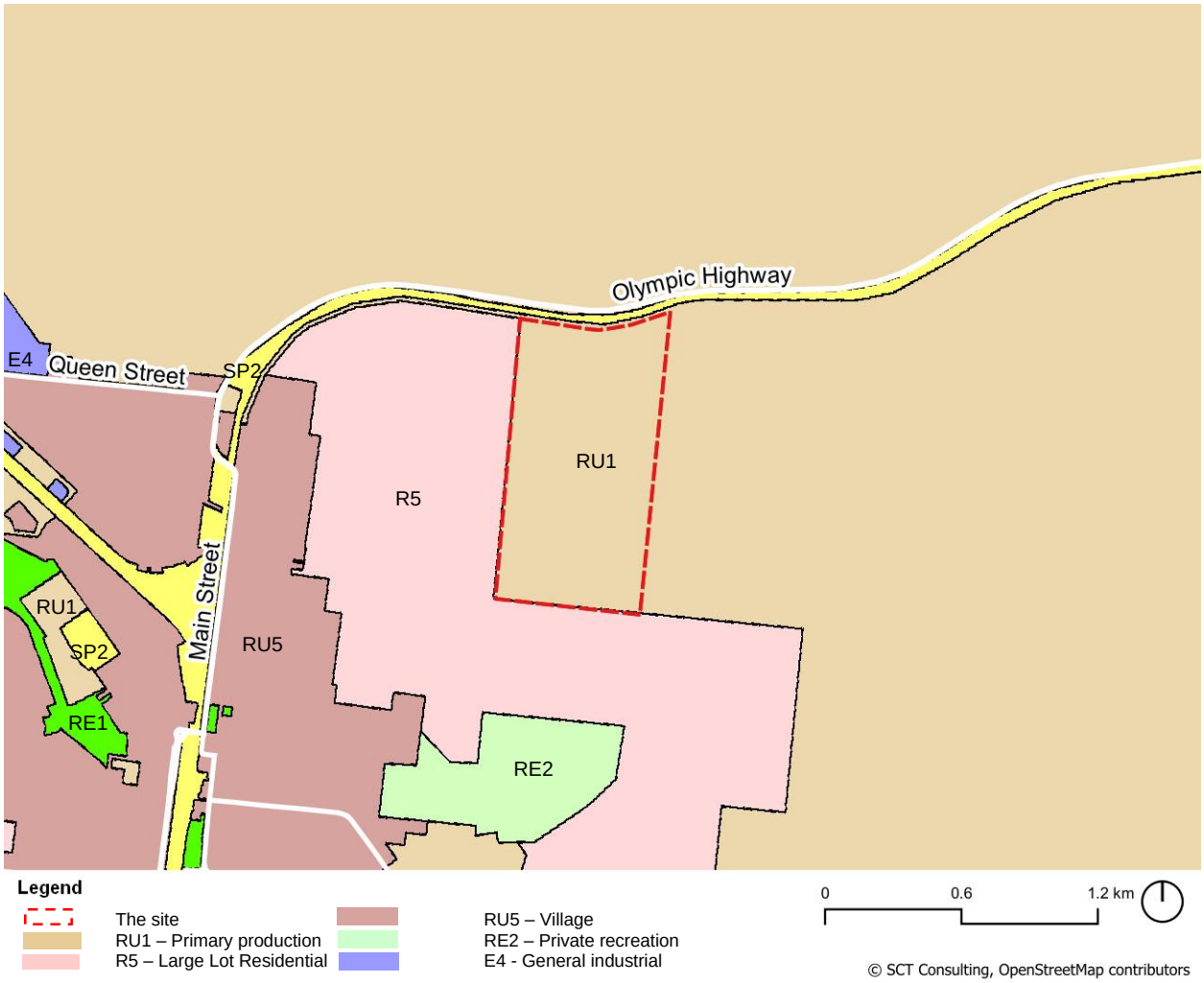
The location of the site in a regional context is shown in **Figure 3-1**.

Figure 3-1 The site location in a regional context



Land use in and around the Junee town centre is mainly zoned 'Village' or 'Large lot residential' with pockets of public and private recreation and some community and commercial facilities, to service the community. Outside of the Junee town centre, much of the surrounding land is rural in nature, with the site having a rural land use zoning named 'Primary production.' The existing zoning of the site and surrounding areas is shown in **Figure 3-2**.

Figure 3-2 The current zoning of the site and surrounding area



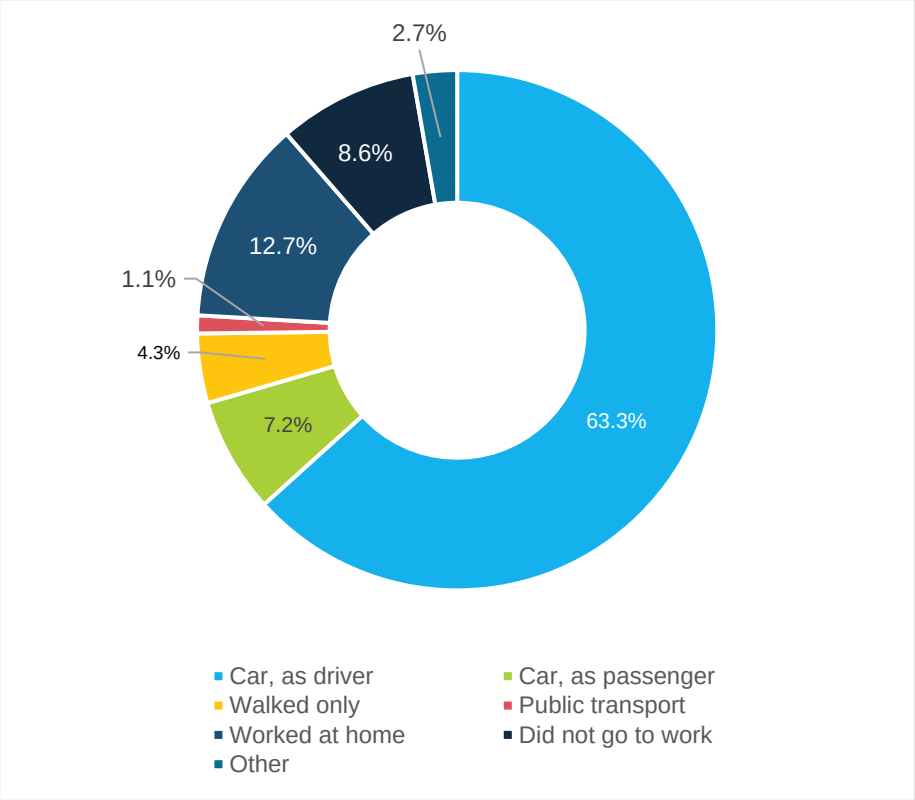
3.2 Travel behaviour

The 2016 Method of travel to work data for the Junee Shire LGA was analysed to understand how existing residents in the LGA currently travel to get to work. At the time of data collected, 2,151 responses were received for the LGA. The year of 2016 was used for analysis instead of 2021, for travel patterns not to be influenced by Covid lockdowns.

As seen in **Figure 3-3**, the analysis suggests that a large proportion (71 per cent) either drive or is a car passenger to get to work, while only one percent currently travel to work by public transport. As expected for a rural LGA, only a small proportion (four per cent) walked only to get to work, while no one cycled.

The journey to work analysis shows that approximately 72 per cent of residents of the Junee Shire LGA live and work within the LGA, while 28 per cent live in the area but work outside of the LGA. Most residents not working in the Junee Shire LGA, work in the Wagga Wagga LGA (16%), the Cootamundra-Gundagai Regional LGA (5%) and the Coolamon and Temora LGAs (with two per cent respectively).

Figure 3-3 Method of travel to work for the Junee Shire LGA



Source: https://economy.id.com.au/junee/workers-travel-to-work, July 2023

3.3 Road network

3.3.1 Road classification

The site is bounded by Waterworks Road to the north, while Kinvara Road runs just south of the site and Cedric Street and Pitt Street west of the site. Waterworks Road which is classified as a local road currently provides the main access point from the north, while Cedric Street and Pitt Street / Kinvara Road run in an east-west direction and ends just at the site boundary. The road network surrounding the site is shown in **Figure 3-4**, and their key characteristics are:

– **The Olympic Highway (A41)** is a two-lane state road that runs in an east-west direction north of the site, between Bathurst in the north and Wagga Wagga and Albury (via the M31) in the south. It is the key access road between Waterworks Road and surrounding arterial road network and other regional areas. Just north of the site, the speed limit is 100km/h, with no parking permitted. The Olympic Highway runs through the Junee town centre, where it becomes Main Street, between Lillian Street in the north and Humphrey Street in the south.

– **Waterworks Road** is a local two-way, two-lane road that runs in an east-west direction north of the site, between Main Street in the west and Ballengoarrah Lane in the east. Waterworks Road connects to the Olympic Highway east of the site (just west of Marinna Drive) via a two-way connecting access lane between the two roads. Waterworks currently provides the key access from the site to the surrounding regional road network, as well as to the Junee town centre west of the site.

– **Cedric Street** is a local two-way, two-lane road, which runs in an east-west direction from Main Street in the west and ends just west of the site boundary. No footpaths are currently provided along the road, and informal parallel parking is permitted on both sides.

– **Pitt Street** is a local two-way, two-lane road that runs in an east-west direction between Main Street in the west and a rural property in the east, via Kinvara Road. No footpaths are currently provided along the road, and informal parallel parking is permitted on both sides.

– **Kinvara Road** is a narrow local two-way, two-lane road that runs south of the site in an east-west direction between Pitt Street in the west and ends east of the site, just at the boundary. No footpaths are currently provided along the road.

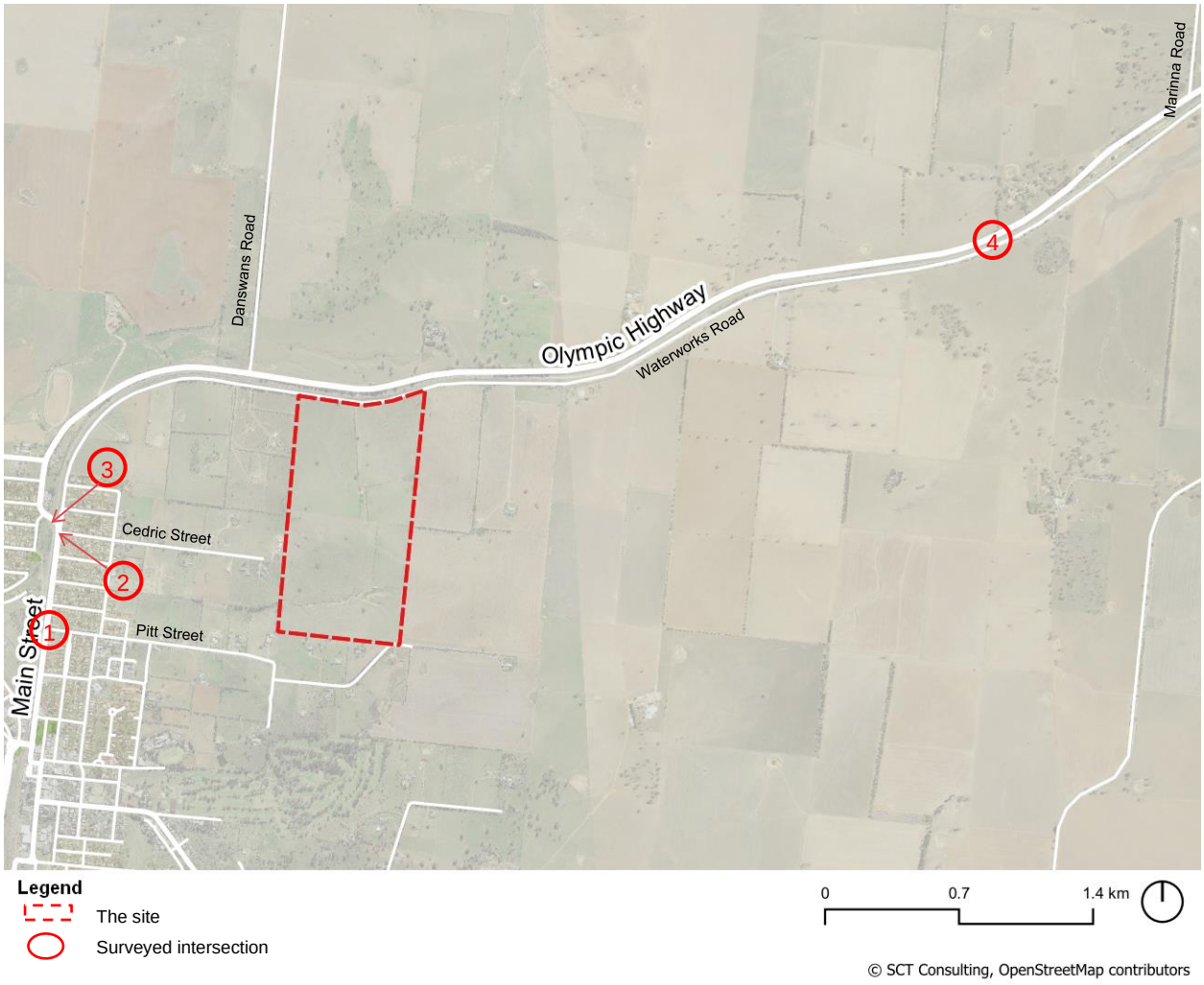
Figure 3-4 Road network around the site

3.3.2 Traffic volumes

Intersection turning movement counts were undertaken at the following four intersections (**Figure 3-5**) in proximity to the site, on Thursday 20 July 2023 during the AM (7-9AM) and PM (3-5PM) peak periods:

1. The Olympic Highway / Pitt Street intersection
2. The Olympic Highway / Cedric Street intersection
3. The Olympic Highway / Main Street intersection
4. The Olympic Highway / Waterworks Road access road intersection

Figure 3-5 Surveyed intersections in proximity to the site



Based on the intersection turning movement counts, the mid-block traffic volumes on the nearby roads were determined, as presented in **Table 3-1**. Based on the traffic volumes, it was determined that the common peak hour for all intersections is between 8:00AM and 9:00AM in the morning and between 3:00PM and 4:00PM in the afternoon, except for the Olympic Highway / Waterworks Road intersection which has a peak hour of 7:45AM to 8:45AM and from 3:45PM to 4:45PM.

3.3.3 Intersection performance

Operational performance is typically measured through an assessment of the throughput of network, with average delay per vehicle used to access the performance of an individual intersection. The average delay per vehicle measure is linked to a Level of Service (LoS) index which characterises the intersection's operational performance. **Table 3-2** provides a summary of the LoS performance bands, as defined by the TfNSW Traffic Modelling Guidelines.

Intersection performance is also measured using the degree of saturation (DoS), which is a measure of the spare capacity of each intersection. A degree of DoS greater than 1.0 implies that the turning movement is at capacity and not acceptable.

Table 3-1 Existing traffic volumes at key roads within and in proximity to the site

Location	Direction	Traffic volumes (vehicles per hour)	
		Weekday AM Peak (8AM-9AM)*	Weekday PM Peak (3PM-4PM)**
Main Street, south of Pitt Street	NB	88	205
	SB	151	149
Main Street, north of Pitt Street	NB	91	202
	SB	156	150
Pitt Street, east of Olympic Highway	EB	19	28
	WB	17	24
Main Street, south of Cedric Street	NB	90	181
	SB	138	143
Main Street, north of Olympic Highway	NB	7	21
	SB	19	16
Cedric Street, east of Olympic Highway	EB	5	14
	WB	9	14
Olympic Highway, west of Waterworks Road (west of Marinna Rd)	EB	73	112
	WB	69	85
Olympic Highway, east of Waterworks Road (west of Marinna Rd)	EB	73	114
	WB	68	85
Waterworks Road access road to Olympic Highway, south of Olympic Road	NB	3	4
	SB	2	2

* With the exception of the AM Peak Hour for the Waterworks Road / Olympic Highway intersection, which is from 7:45AM to 8:45AM

** With the exception of the PM Peak Hour for the Waterworks Road / Olympic Highway intersection, which is from 3:45PM to 4:45PM

Source: Trans Traffic Survey, July 2023

Table 3-2 Level of Service categories

Level of Service	Average delay per vehicle (seconds)	Performance explanation
A	Less than 14.5	Good operation
B	14.5 to 28.4	Good with acceptable delays and spare capacity
C	28.5 to 42.4	Satisfactory
D	42.5 to 56.4	Operating near capacity
E	56.5 to 70.4	At capacity, at signals incidents will cause excessive delays. Roundabouts require other control method.
F	70.5 or greater	At capacity, at signals incidents will cause excessive delays. Roundabouts require other control method.

Source: Roads and Maritime Services (2002), Traffic Modelling Guidelines

The existing levels of service at the surveyed intersections were analysed, as outlined in **Table 3-3**. Given the proximity between the Olympic Highway / Main Street and the Olympic Highway / Cedric Street intersections (as seen in **Figure 3-5**), these two intersections were modelled as one give way intersection rather than two. The control type of all modelled intersections is priority controlled as give way intersections.

Table 3-3 Intersection performance at intersections within the study area

Intersection (priority controlled)	Weekday AM Peak			Weekday PM Peak		
	DoS	Delay (secs)	LoS	DoS	Delay (secs)	LoS
Olympic Highway / Pitt Street	0.11	6.0	A	0.11	5.9	A
Olympic Highway / Main Street / Cedric Street	0.08	6.0	A	0.11	6.0	A
Olympic Highway / Waterworks Road access road	0.05	7.8	A	0.06	7.8	A

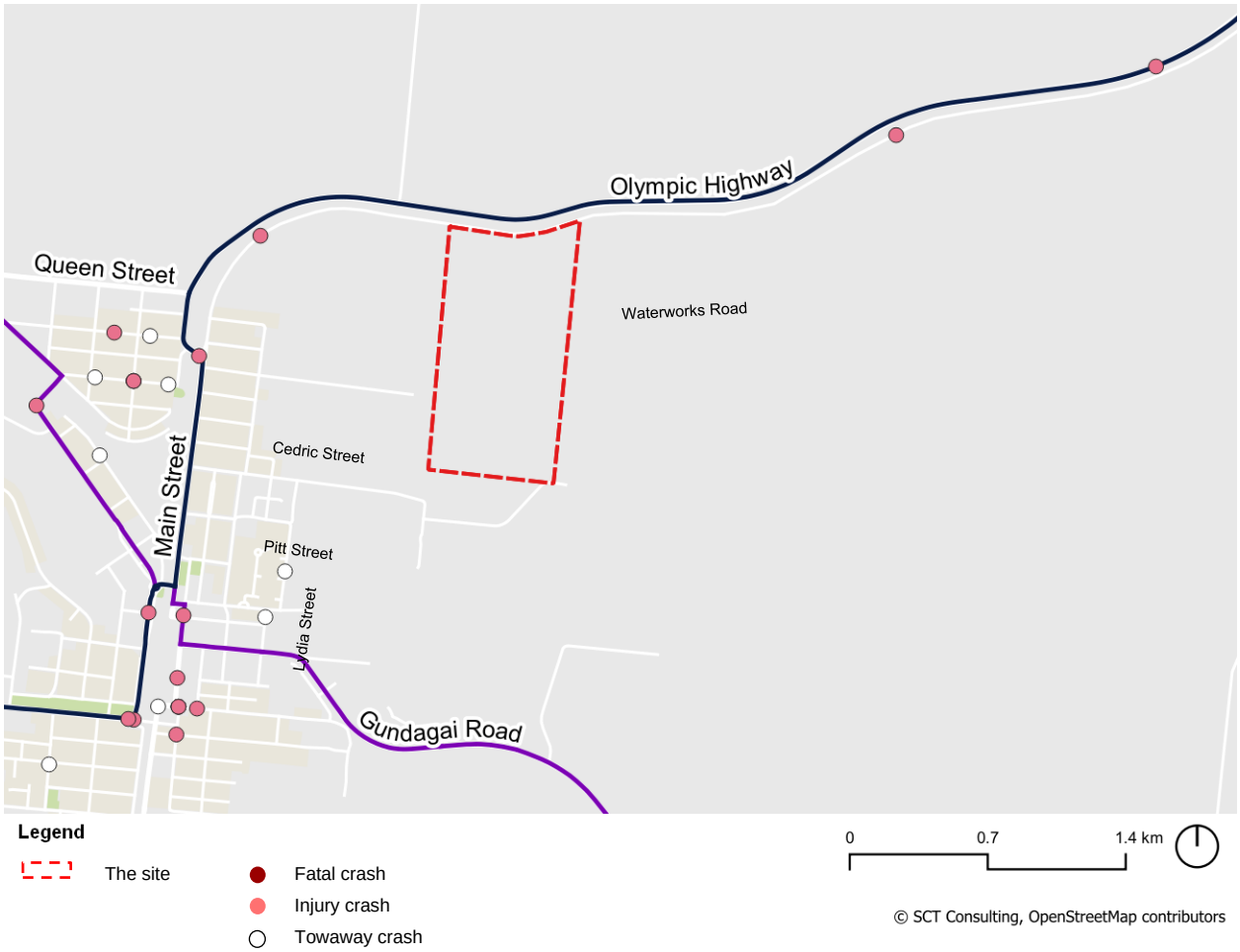
Notes: DoS = Degree of Saturation, where 1.0 means the intersection is at capacity, LoS = Level of service (average of all arms of the intersection). For priority and roundabout intersections, the DoS, delay and LoS for the worst performing movement is reported.

As seen in **Table 3-3**, the surveyed intersections all currently perform with a LoS A during both the AM and PM peak hours, with low average vehicle delays and degree of saturation experienced on all approaches.

3.3.4 Crash data analysis

Crash data over five years (from 2017 to 2021) was analysed to determine where crashes have occurred in the proximity to the site, as well as the severity of these, as shown in **Figure 3-6**.

Figure 3-6 Crash data severity (2017 – 2021) in proximity to the site



As seen in **Figure 3-6**, no fatal crashes have occurred in proximity to the site between 2017 and 2021, while the injury and towaway crashes in proximity to the site are described in **Table 3-4**. All of the three serious injury crashes in proximity to the site occurred on the carriageway and not at an intersection. However, the head-on collision on Olympic Highway just west of Main Street occurred just north of the Olympic Highway / Main Streeet intersection. None of the crashes that occurred during the analysed time period involved pedestrians.

Table 3-4: Details of the injury and towaway crashes in proximity to the site (2017 – 2021)

Location	Detailed degree of crash	Type of crash	Time and date of crash
The Olympic Highway, west of Marinna Road	Moderate injury	Rear end	March, 2021
Waterworks Road, west of Marinna Road	Serious injury	Off right bend into object	March, 2020
Waterworks Road, west of Danswans Road	Minor injury	Off right bend into object	November, 2020
Olympic Highway, west of Main Street	Serious injury	Opposite direction – head on	July, 2018
Lorne Street, north of Lisgar Street	Serious injury	Out of control on carriageway	June, 2020
Lydia Street, north of Waratah Street	Towaway	Left off carriageway into object	June, 2020
Dagmar Lane, north of Lisgar Street	Towaway	Right off carriageway into object	March, 2020

Source: NSW Road Crash Data, 2017 - 2021

3.4 Public Transport

Junee train station provides access to train services for the area, while there are limited bus services in proximity to the site, as shown in **Figure 3-7**. There are however currently no public transport options within an 800m walking distance of the site.

3.4.1 Train

The site is located approximately 2km northeast of the Junee train station, which is accessible from Railway Square and serviced by the Southern NSW train services between Melbourne and Sydney. One train in each direction (to Sydney and Melbourne respectively) runs past Junee daily during both weekdays and weekends. In addition, one service runs from Junee to Sydney, during Thursdays and Sundays only.

Goulburn Station provides an interchange option for passengers from Junee to access the train service that runs between Sydney and Canberra.

3.4.2 Bus

As seen in **Figure 3-7**, the nearest bus stops to the site are located on Cedric Street and Pitt Street, with routes 921, 922 and 923, operated by Junee Buses, currently providing a limited regular and school bus service between Junee and Wagga Wagga. During school days, two morning services run from Junee to Wagga, and returns in the afternoon. During school holidays, three daily services are provided in each direction, with an additional Thursday route, between Junee and Wagga.

Figure 3-7 Public transport services in proximity to the site

3.4.3 Active transport

As expected with the rural nature of the site's location, there are no dedicated formal cycle lanes or footpaths in the proximity to the site, including along Waterworks Road, Cedric Street or Pitt Street.

Several shared paths are located within the Junee town centre west of the site, including along Main Street, Commins Street, Lydia Street and Waratah Street, as seen in **Figure 3-8**. These routes are however isolated to within the town centre and do currently not provide a connection to the regional cycle network.

Figure 3-8 Active transport network in proximity to the site

4.0 Propsoed development

4.1 Future proposed subdivision layout and yield

The site proposed for future re-zoning is located in the Riverina region, approximately 227km northwest of Canberra and 41km north of Wagga Wagga and is bounded by Waterworks Road to the north, while Kinvara Road runs just south of the site. The site is currently zoned 'RU1 – Primary production' and consists of approximately 78ha of rural land. Subsequent to re-zoning, a future development of the land is likely to result in a maximum of 300 residential lots and some green areas, with four different access points, as shown conceptually in **Figure 4-1**.

4.2 Future proposed access arrangements and road layout

Vehicles traveling to and from the site will be able to access the site at four different access points, being two at Waterworks Road, one at Pitt Street and one at Cedric Street. The proposed access points will all connect to an internal road network within the site, via T-intersections, except for the Cedric Street access point which will be a four-way intersection, between Cedric Street and the internal road network. The proposed internal road network and access points to the external road network are shown in **Figure 4-1**.

Figure 4-1 The site's future proposed location and layout

Source: Spiire, July 2023

4.3 Parking requirements

As outlined in **Section 2.3**, the objective for vehicle parking is to 'ensure there is sufficient on-site car parking for the proposed use(s) so there is not an unreasonable reliance on on-street or off-site parking that impacts on other users'.

The required number of parking spaces for residential developments based on the Junee Shire Council DCP 2021, depending on dwelling type, are outlined in **Table 2-1**. All parking spaces, manoeuvring areas, and driveways must be designed in accordance with Australian Standard AS2890 – Parking Facilities and the RMS - Guide to Traffic Generating Developments.

Table 4-1 DCP Off-street car parking requirements for residential developments

Residential dwelling type	Parking for residents	Visitor parking
Single dwelling houses, secondary dwellings, dual occupancies, semi-detached dwellings, and attached dwellings (townhouses) including second hand (relocatable) and transportable dwellings	Minimum one (1) off-street car parking space on the property for each dwelling located behind the dwelling setback to the street lot boundary ('building line'). Two (2) car spaces are preferred and may include use of the driveway area in front of any garage/carport	Not required. On-street or in driveway sufficient.
Multi-dwelling housing and residential flat buildings	Minimum one (1) off-street car parking space for each unit plus an additional one (1) space per four (4) units or part thereof	Minimum one (1) space per five (5) units or part thereof.

Source: The Junee Shire Council DCP 2021

4.4 Trip generation and distribution

A trip generation review has been undertaken based on the future proposed development's indicative yield to:

– Understand likely weekday peak hours (AM and PM) and weekday vehicular and person trip generation.

– Understand likely impacts on the surrounding road network (compared to the existing situation).

4.4.1 Vehicle trip generation

According to the *Guide to Traffic Generating Developments (RTA, October 2002),* residential dwelling houses are expected to generate:

– 0.85 vehicle trips per dwelling during the AM and PM peak hours respectively

– Nine vehicle trips per dwelling per day

Based on the expected yield of a maximum of **300 dwellings** the future proposed development of the site is expected to generate a maximum of **255 vehicles in the AM and PM peak hour** respectively and **2,700 vehicle trips per day**. Because the site is currently unoccupied, these trips would all be in addition to the existing situation.

4.4.2 Traffic distribution

As described in **Section 3.2**, the journey to work analysis showed that approximately 72 per cent of residents of the Junee Shire LGA live and work within the LGA, while 28 per cent live in the area but work in another LGA. Most residents not working in the Junee Shire LGA, work in the Wagga Wagga LGA (16%), the Cootamundra-Gundagai Regional LGA (5%) and the Coolamon and Temora LGAs (with two per cent respectively). This distribution has been used as a guide to understand where residents would travel to and from the site, to get to work.

It has been assumed that future residents of the site would use the shortest route to get to and from surrounding employment areas. In addition, the following assumptions were also made with regards to trip distribution:

– The vehicles traveling south to and from the site will travel via Main Street, with 50 per cent using the Pitt Street access and 50 per cent using the Cedric Street access.

– All vehicles traveling west to and from the site will do so via the Olympic Highway and access the site via the Cedric Street access.

– All vehicles traveling north to and from the site will do so via the two Waterworks Road access points, with a 50 / 50 split of trips between the two.

Based on the above, the AM and PM peak hour trips would be distributed to the surrounding road network as outlined in **Table 4-2**.

Table 4-2 Traffic distribution between the access points and to the surrounding road network

Location	Proportion of trips (AM / PM peak hour)	Number of two-way trips (AM / PM peak hour)
Site access point		
Pitt Street	33%	99
Cedric Street	37%	111
Waterworks Road (western access)	15%	45
Waterworks Road (eastern access)	15%	45
Total	**100%**	**300**
Surrounding roads		
Main Street south of Pitt Street	66%	189
Olympic Highway west of Main Street	4%	12
Waterworks Road east of the site	30%	90
Olympic Highway east of Waterworks Road	30%	90
Intersection		
Main Street / Pitt Street	45%	178
Main Street / Cedric Street	28%	111
Olympic Highway / Main Street	4%	12
Olympic Highway / Waterworks Road	23%	90

Source: SCT Consulting, July 2023

As seen in **Table 4-2**, the highest level of additional trips generated by the future proposed development is expected on the Cedric Street and Pitt Street access points, with 37 and 33 per cent of trips respectively. The highest number of trips are expected to travel on Main Street (south of Pitt Street), followed by Waterworks Road and Olympic Highway east of the site, with 66 and 30 per cent of trips respectively using these roads to get to the site. The Pitt Street and Cedric Street intersections with Main Street will have the highest number of additional trips because of the future proposed development, with 178 and 111 additional trips on these intersections, respectively.

4.4.3 Person trip generation

Surveys at locations with low density residential developments and a low public transport accessibility score were chosen from the *Guide to Traffic Generating Development's Update Surveys (TDT 2013 / 04a)* for person trip generation estimation for the future proposed development of the site. The average peak hour person trip rates were estimated to be 1.27 trips per dwelling during the peak hour.

Based on a yield of 300 dwellings, the person trip generation for the future proposed development of the site is expected to be **381 person trips per peak hour**. This however includes the person trips that arrive to the site by car. The net peak hour person trip generation (without the car trips) is shown in **Table 4-3**.

Table 4-3 Net peak hour person trip generation

Future proposed activity	Yield	Person trip rates^	
		AM Peak	PM Peak
Residential	+300 dwellings	1.27	1.27
Total	**+300 dwellings**	**381 trips**	**381 trips**
Less people in cars		*-306 trips*	*-306 trips*
Total non-car trips		**75 trips**	**75 trips**

Source: SCT Consulting, 2023
^*Assuming the car occupancy for the vehicle trip generation is 1.2 person / vehicles. Weekday AM and PM Peak trip generation = 255*1.2 = 31 persons*

The 75 non-car tips are expected to be using surrounding public transport services, and / or walking or cycling from trip origins The Journey to Work data (2016) presented in **Section 3.2** however indicates that public transport trips undertaken in the area is currently minimal, with only one per cent of all trips undertaken, while four per cent are walk only trips. If more public transport options are implemented in the future, a further shift towards public and active transport away from cars could be expected. This would result in a larger number of non-car person trips to and from the site.

5.0 Transport and Traffic Impact Assessment

5.1 Road network impacts

As described in **Section 4.4**, the future proposed development of the site is expected to generate **255 AM and PM peak hour trips respectively, and 2,700 daily vehicle trips**. The highest level of additional trips is expected on the Cedric Street and Pitt Street access points, with 37 and 33 per cent of trips respectively. Most trips are expected to travel on Main Street (south of Pitt Street), followed by Waterworks Road and Olympic Highway east of the site, with 66 and 30 per cent of trips respectively using these roads to get to the site.

The proposed development is expected to add approximately 100 peak hour trips to each of Pitt Street and Cerdric Street. With currently less than 50 vehicles per hour on both of these streets, the increase will not have a major impact to the residential street nature of these streets. The total expected traffic on Pitt Street and Cerdric Street will still be within the environmental capacity limit of local residential streets, of 300 veh/hr.

The Pitt Street and Cedric Street intersections with Main Street will have the highest number of additional trips because of the future proposed development, with 178 and 111 additional trips on these intersections, respectively. To determine the impact on the surrounding road network, SIDRA analysis was undertaken on the same intersections analysed for the existing scenario. The performance of these intersections, compared to the existing scenarios are presented in **Table 5-1**.

As for the existing scenario, the Olympic Highway / Main Street and the Olympic Highway / Cedric Street intersections were modelled as one give way intersection. The control type of all modelled intersections is priority controlled as give way intersections.

Table 5-1 Intersection performance without and with development (AM and PM Peak Hour)

Intersection	Weekday AM Peak Hour				Weekday PM Peak Hour			
	Volume (veh/h)	DoS	Delay (seconds)	LoS	Volume (veh/h)	DoS	Delay (seconds)	LoS
Olympic Highway / Pitt Street (Existing)	275	0.11	6.0	A	399	0.11	6.0	A
Olympic Highway / Pitt Street (With Dev)	462	0.13	6.4	A	524	0.16	5.9	A
Olympic Highway / Main Street / Cedric Street (Existing)	260	0.08	6.0	A	381	0.11	6.0	A
Olympic Highway / Main Street / Cedric Street (With Dev)	377	0.08	6.0	A	513	0.14	6.0	A
Olympic Highway / Waterworks Road access road (Existing)	152	0.05	7.8	A	212	0.06	7.8	A
Olympic Highway / Waterworks Road access road (With Dev)	245	0.05	7.8	A	306	0.09	7.8	A

Notes: DoS = Degree of Saturation, where 1.0 means the intersection is at capacity, LoS = Level of service (average of all arms of the intersection). For priority and roundabout intersections, the DoS, delay and LoS for the worst performing movement is reported.

As seen in **Table 5-1**, with the introduction of the trips generated by the future proposed development, the surveyed intersections will continue to perform with a LoS A during both the AM and PM peak hours, with low average vehicle delays and degree of saturation experienced on all approaches. This suggests that the trips generated by the future proposed development will not have a major impact on the surrounding road network surrounding the site, and that the nearby intersections will be able to cope with the increase in trips.

5.2 Parking impacts

Off-street parking for the site can be provided in accordance with the Junee Shire Council DCP requirements for residential developments. The provision of off-street parking will reduce the need for drivers to park on the road and hence minimise the impact of parking on the surrounding local road network.

5.3 Public and active transport demand

There are currently limited public and active transport options in proximity to the site. An additional 75 non-car trips are expected to be generated by the future development of the site. These trips can be expected to arrive to the site via public or active transport. The small number of person trips are however not expected to have a negative impact on the existing public and active transport facilities in proximity to the site.

If more public and active transport options are implemented in the future, a further shift towards public and active transport could however be expected. This would result in a larger number of public and active transport trips to and from the site.

With the introduction of the future development of the site, there may also be an increased cycling demand in the future, from the site to public transport facilities such as the Junee train station and bus stops. As outlined in **Section 2.4**, the Junee Shire Council Walking and Cycling Accessibility Plan proposes several improvements to the area surrounding the site, such as future shared paths along sections of Waterworks Road and Pitt Street. This would improve cycling and walking from the site and provide an opportunity for further improvements to walking and cycling along the entire section of Pitt Street from the site, to encourage a shift towards active transport.

6.0 Future Proposed Traffic and Transport Upgrades

6.1 Road network upgrades

As described in **Section 5.1**, the existing road network surrounding the site is adequate to cater for the increased number of vehicle trips likely to be generated by the future development of the site as intended by this proposed re-zoning proposal.

Infrastructure upgrades will however be required to the site's proposed external access points because of the future development of the site. These include:

– An upgrade to two T-intersections at the proposed two access points at Waterworks Road, between Waterworks Road and future north-south internal roads.

– An extension of Cedric Street to the site's internal road network and the introduction of a new four-way intersection between Cedric Street and a future north-south internal road.

– The introduction of a new T-intersection between a new north-south internal road and Pitt Street.

6.2 Public and active transport upgrades

As described in **Section 5.3**, there are currently limited public transport options in proximity to the site. An additional 75 non-car trips are expected to be generated by the future development of the site. These trips can be expected to arrive to the site via public or active transport.

No public transport upgrades are expected to be required because of the increase in demand of public transport services from residents of the future development of the site. However, if more public and active transport options are implemented in the future, a further shift towards public and active transport could be expected.

There are currently no footpaths along Pitt Street and Cedric Street, which will be key access routes to the site in the future. With the future development of the site, additional footpaths along these routes, as well as along the internal road network, should be considered to improve connectivity to the wider street network. This would tie into the proposed shared path improvements along sections of Pitt Street and Waterworks Road, as outlined in the Junee Shire Council Walking and Cycling Accessibility Plan.

7.0 Summary and Conclusion

7.1 Summary

7.1.1 Background

The landowner is preparing a re-zoning application for a rural site at 192 Waterworks Road in Junee in the Junee Shire Council Local Government Area (LGA) NSW. The site is in the Riverina region, approximately 227km northwest of Canberra and 41km north of Wagga Wagga. The future proposed development site is 78ha in size, with the yield being approximately 300 lots. Spiire has engaged SCT Consulting to prepare a Traffic Impact Assessment to support the re-zoning application.

7.1.2 Existing conditions

The site is bounded by Waterworks Road to the north, while Pitt Street and Cedric Street runs west of the site, and Kinvara Road just south of the site. These are local roads of rural nature, with no formal footpaths or formal on-street parking provided. Junee town centre and Junee train station is located a 6-minute drive to the west of the site, via Waterworks Road and the Olympic Highway. The State road Olympic Highway (A41) is the key access road between the site and surrounding arterial road network as well as other regional areas. No fatal crashes have been reported in proximity to the site between 2017 and 2021.

The 2016 Method of Travel to Work data for the Junee Shire LGA suggests that a large proportion (71 per cent) either drive or go as a car passenger to get to work, with only a small proportion using public or active transport.

The site is located approximately 2km east of the Junee train station, which is accessible from Railway Square and serviced by the Southern NSW train services between Melbourne and Sydney, while bus services near the site are limited. As expected with the rural nature of the site's location, there are no dedicated formal cycle lanes or footpaths in the proximity to the site, including along Waterworks Road, Cedric Street or Pitt Street. Several shared paths are however located within the Junee town centre, west of the site.

The crash data analysis suggested that no fatal crashes and three serious injury crashes have occurred in proximity to the site between 2017 and 2021. The injury crashes occurred at three different locations however, so no specific crash pattern was observed at the one spot in proximity to the site.

7.1.3 Impacts of future proposed subdivision

The future proposed development of the site is likely to result in a maximum of 300 residential lots and some green areas, with four different access points from Waterworks Road, Cedric Street and Pitt Street. Based on a yield of 300 dwellings, the future proposed development is expected to generate 255 vehicles in the AM and PM peak hour respectively, and 2,700 vehicle trips per day. Because the site is currently unoccupied, these trips would be in addition to the existing situation. The highest level of additional trips generated by the future proposed development of the site is expected on the Cedric Street and Pitt Street access points, with 37 and 33 per cent of trips, respectively.

The proposed development is expected to add approximately 100 peak hour trips to each of Pitt Street and Cerdric Street. With currently less than 50 vehicles per hour on both of these streets, the increase will not have a major impact to the residential street nature of these streets. The total expected traffic on Pitt Street and Cerdric Street will still be within the environmental capacity limit of local residential streets, of 300 veh/hr.

SIDRA analysis was undertaken of four intersections in proximity to the site to determine the impact the proposed future development will have on the surrounding road network. The analysis found that with the introduction of the trips generated by the future proposed development, the surveyed intersections will continue to perform with a LoS A during both the AM and PM peak hours, with low average vehicle delays and degree of saturation experienced on all approaches.

Off-street parking for the site can be provided in accordance with the Junee Shire Council DCP requirements for residential developments. The future provision of off-street parking will reduce the need for drivers to park on the road and hence minimise the impact of parking on the surrounding local road network.

The surrounding public and active transport facilities are expected to be able to cater for the additional person trips generated by the future development of the site. If more public and active transport options are however implemented in the future, a further shift towards public and active transport could be expected.

With the introduction of the future development of the site, there may be an increased cycling and walking demand in the future, from the site to public transport facilities such as the train station and bus stops. This is especially the case along Cedric Street and Pitt Street, which will be key future connections between the site and the Junee town centre.

7.2 Conclusion

The SIDRA analysis undertaken suggests that the trips generated by the future proposed development will not have a major impact on the road network surrounding the site, and that the nearby intersections and roads will be able to cope with the increase in trips.

Infrastructure upgrades are however required to the site's future proposed external access points at Waterworks Road, Cedric Street and Pitt Street. A new internal road network will also be introduced as part of the future development of the site.

No public transport upgrades are expected to be required because of the increase in demand of public transport services from residents of the future development of the site.

There are currently no footpaths along Pitt Street and Cedric Street, which will be key access routes to the site in the future. With the future development of the site, additional footpaths along these routes, as well as along the internal road network, should be considered to improve connectivity to the wider street network. This would tie into the proposed shared path improvements along sections of Pitt Street and Waterworks Road, as outlined in the Junee Shire Council Walking and Cycling Accessibility Plan.

APPENDIX A

SIDRA MODELLING OUTPUTS

MOVEMENT SUMMARY

Site: 1 [AM Peak Main Street / Pitt Street (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Main Street														
2	T1	84	14	88	16.7	0.052	0.0	LOS A	0.0	0.2	0.03	0.04	0.03	49.7
3	R2	4	0	4	0.0	0.052	5.6	LOS A	0.0	0.2	0.03	0.04	0.03	48.4
Approach		88	14	93	15.9	0.052	0.3	NA	0.0	0.2	0.03	0.04	0.03	49.7
East: Pitt Street														
4	L2	10	0	11	0.0	0.006	4.9	LOS A	0.0	0.2	0.24	0.49	0.24	45.4
6	R2	7	0	7	0.0	0.005	4.9	LOS A	0.0	0.1	0.19	0.54	0.19	45.4
Approach		17	0	18	0.0	0.006	4.9	LOS A	0.0	0.2	0.22	0.51	0.22	45.4
North: Main Street														
7	L2	15	1	16	6.7	0.092	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	48.3
8	T1	141	19	148	13.5	0.092	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.6
Approach		156	20	164	12.8	0.092	0.5	NA	0.0	0.0	0.00	0.05	0.00	49.5
All Vehicles		261	34	275	13.0	0.092	0.7	NA	0.0	0.2	0.03	0.08	0.03	49.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [With Dev AM Peak Main Street / Pitt Street (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Main Street														
2	T1	84	14	88	16.7	0.063	0.0	LOS A	0.2	1.4	0.19	0.20	0.19	48.7
3	R2	24	0	25	0.0	0.063	6.4	LOS A	0.2	1.4	0.19	0.20	0.19	47.4
Approach		108	14	114	13.0	0.063	1.4	NA	0.2	1.4	0.19	0.20	0.19	48.4
East: Pitt Street														
4	L2	89	0	94	0.0	0.054	5.1	LOS A	0.2	1.7	0.32	0.53	0.32	45.2
6	R2	7	0	7	0.0	0.006	5.1	LOS A	0.0	0.1	0.23	0.56	0.23	45.3
Approach		96	0	101	0.0	0.054	5.1	LOS A	0.2	1.7	0.31	0.53	0.31	45.2
North: Main Street														
7	L2	15	1	16	6.7	0.134	4.7	LOS A	0.0	0.0	0.00	0.03	0.00	48.4
8	T1	220	19	232	8.6	0.134	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.7
Approach		235	20	247	8.5	0.134	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.7
All Vehicles		439	34	462	7.7	0.134	1.7	NA	0.2	1.7	0.11	0.18	0.11	48.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [PM Peak Main Street / Pitt Street (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Main Street														
2	T1	189	10	199	5.3	0.114	0.0	LOS A	0.1	0.9	0.06	0.06	0.06	49.6
3	R2	16	0	17	0.0	0.114	5.9	LOS A	0.1	0.9	0.06	0.06	0.06	48.3
Approach		205	10	216	4.9	0.114	0.5	NA	0.1	0.9	0.06	0.06	0.06	49.5
East: Pitt Street														
4	L2	11	0	12	0.0	0.006	4.9	LOS A	0.0	0.2	0.24	0.49	0.24	45.4
6	R2	13	1	14	7.7	0.011	5.2	LOS A	0.0	0.2	0.24	0.57	0.24	45.1
Approach		24	1	25	4.2	0.011	5.1	LOS A	0.0	0.2	0.24	0.53	0.24	45.3
North: Main Street														
7	L2	12	2	13	16.7	0.086	4.7	LOS A	0.0	0.0	0.00	0.04	0.00	48.3
8	T1	138	12	145	8.7	0.086	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.7
Approach		150	14	158	9.3	0.086	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.6
All Vehicles		379	25	399	6.6	0.114	0.7	NA	0.1	0.9	0.05	0.09	0.05	49.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [With Dev PM Peak Main Street / Pitt Street (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Main Street														
2	T1	189	10	199	5.3	0.156	0.0	LOS A	0.7	5.0	0.24	0.25	0.24	48.3
3	R2	95	0	100	0.0	0.156	5.9	LOS A	0.7	5.0	0.24	0.25	0.24	47.0
Approach		284	10	299	3.5	0.156	2.0	NA	0.7	5.0	0.24	0.25	0.24	47.9
East: Pitt Street														
4	L2	31	0	33	0.0	0.018	4.9	LOS A	0.1	0.6	0.26	0.50	0.26	45.4
6	R2	13	1	14	7.7	0.012	5.5	LOS A	0.0	0.2	0.28	0.59	0.28	45.0
Approach		44	1	46	2.3	0.018	5.1	LOS A	0.1	0.6	0.27	0.52	0.27	45.3
North: Main Street														
7	L2	12	2	13	16.7	0.097	4.7	LOS A	0.0	0.0	0.00	0.04	0.00	48.3
8	T1	158	12	166	7.6	0.097	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.8
Approach		170	14	179	8.2	0.097	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.7
All Vehicles		498	25	524	5.0	0.156	1.7	NA	0.7	5.0	0.16	0.20	0.16	48.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [AM Peak Main Street / Cedric Street (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Main Street														
1a	L1	88	16	93	18.2	0.057	4.6	LOS A	0.0	0.2	0.00	0.53	0.00	45.7
2	T1	3	0	3	0.0	0.057	0.0	LOS A	0.0	0.2	0.00	0.53	0.00	47.2
3	R2	3	0	3	0.0	0.057	4.6	LOS A	0.0	0.2	0.00	0.53	0.00	46.0
Approach		94	16	99	17.0	0.057	4.5	NA	0.0	0.2	0.00	0.53	0.00	45.7
East: Cedric Street														
4	L2	5	1	5	20.0	0.003	5.1	LOS A	0.0	0.1	0.25	0.48	0.25	45.1
6a	R1	4	0	4	0.0	0.004	3.9	LOS A	0.0	0.1	0.23	0.45	0.23	46.4
Approach		9	1	9	11.1	0.004	4.6	LOS A	0.0	0.1	0.24	0.46	0.24	45.7
NorthEast: Main Street approach														
24a	L1	14	0	15	0.0	0.008	3.9	LOS A	0.0	0.2	0.22	0.45	0.22	46.2
Approach		14	0	15	0.0	0.008	3.9	LOS A	0.0	0.2	0.22	0.45	0.22	46.2
North: Main Street														
9b	R3	5	1	5	20.0	0.005	6.0	LOS A	0.0	0.1	0.23	0.58	0.23	44.5
Approach		5	1	5	20.0	0.005	6.0	LOS A	0.0	0.1	0.23	0.58	0.23	44.5
NorthWest: Olympic Highway														
27b	L3	4	0	4	0.0	0.078	5.4	LOS A	0.4	2.8	0.04	0.51	0.04	46.1
27a	L1	2	0	2	0.0	0.078	3.5	LOS A	0.4	2.8	0.04	0.51	0.04	46.4
29a	R1	119	13	125	10.9	0.078	4.2	LOS A	0.4	2.8	0.04	0.51	0.04	45.9
Approach		125	13	132	10.4	0.078	4.2	NA	0.4	2.8	0.04	0.51	0.04	45.9
All Vehicles		247	31	260	12.6	0.078	4.3	NA	0.4	2.8	0.05	0.51	0.05	45.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [With Dev AM Peak Main Street / Cedric Street (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Main Street														
1a	L1	88	16	93	18.2	0.065	4.6	LOS A	0.1	1.0	0.01	0.53	0.01	45.6
2	T1	3	0	3	0.0	0.065	0.0	LOS A	0.1	1.0	0.01	0.53	0.01	47.2
3	R2	23	0	24	0.0	0.065	4.6	LOS A	0.1	1.0	0.01	0.53	0.01	46.0
Approach		114	16	120	14.0	0.065	4.5	NA	0.1	1.0	0.01	0.53	0.01	45.7
East: Cedric Street														
4	L2	84	1	88	1.2	0.047	4.9	LOS A	0.2	1.6	0.24	0.50	0.24	45.4
6a	R1	14	0	15	0.0	0.013	4.0	LOS A	0.0	0.2	0.24	0.47	0.24	46.4
Approach		98	1	103	1.0	0.047	4.8	LOS A	0.2	1.6	0.24	0.50	0.24	45.5
NorthEast: Main Street approach														
24a	L1	14	0	15	0.0	0.008	3.9	LOS A	0.0	0.3	0.25	0.45	0.25	46.1
Approach		14	0	15	0.0	0.008	3.9	LOS A	0.0	0.3	0.25	0.45	0.25	46.1
North: Main Street														
9b	R3	5	1	5	20.0	0.005	6.0	LOS A	0.0	0.1	0.23	0.58	0.23	44.5
Approach		5	1	5	20.0	0.005	6.0	LOS A	0.0	0.1	0.23	0.58	0.23	44.5
NorthWest: Olympic Highway														
27b	L3	4	0	4	0.0	0.081	5.4	LOS A	0.4	2.9	0.08	0.50	0.08	46.0
27a	L1	2	0	2	0.0	0.081	3.5	LOS A	0.4	2.9	0.08	0.50	0.08	46.3
29a	R1	121	13	127	10.7	0.081	4.2	LOS A	0.4	2.9	0.08	0.50	0.08	45.8
Approach		127	13	134	10.2	0.081	4.3	NA	0.4	2.9	0.08	0.50	0.08	45.9
All Vehicles		358	31	377	8.7	0.081	4.5	NA	0.4	2.9	0.11	0.51	0.11	45.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [PM Peak Main Street / Cedric Street (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Main Street														
1a	L1	174	8	183	4.6	0.106	4.5	LOS A	0.0	0.4	0.00	0.53	0.00	45.9
2	T1	7	0	7	0.0	0.106	0.0	LOS A	0.0	0.4	0.00	0.53	0.00	47.2
3	R2	7	0	7	0.0	0.106	4.6	LOS A	0.0	0.4	0.00	0.53	0.00	46.0
Approach		188	8	198	4.3	0.106	4.3	NA	0.0	0.4	0.00	0.53	0.00	45.9
East: Cedric Street														
4	L2	8	0	8	0.0	0.004	4.9	LOS A	0.0	0.1	0.23	0.48	0.23	45.4
6a	R1	6	0	6	0.0	0.006	4.2	LOS A	0.0	0.1	0.28	0.47	0.28	46.3
Approach		14	0	15	0.0	0.006	4.6	LOS A	0.0	0.1	0.25	0.48	0.25	45.8
NorthEast: Main Street approach														
24a	L1	8	1	8	12.5	0.005	4.1	LOS A	0.0	0.2	0.25	0.45	0.25	46.0
Approach		8	1	8	12.5	0.005	4.1	LOS A	0.0	0.2	0.25	0.45	0.25	46.0
North: Main Street														
9b	R3	8	0	8	0.0	0.008	6.0	LOS A	0.0	0.1	0.27	0.60	0.27	44.8
Approach		8	0	8	0.0	0.008	6.0	LOS A	0.0	0.1	0.27	0.60	0.27	44.8
NorthWest: Olympic Highway														
27b	L3	10	2	11	20.0	0.090	5.6	LOS A	0.4	3.2	0.07	0.50	0.07	45.8
27a	L1	7	1	7	14.3	0.090	3.6	LOS A	0.4	3.2	0.07	0.50	0.07	46.2
29a	R1	127	9	134	7.1	0.090	4.2	LOS A	0.4	3.2	0.07	0.50	0.07	45.9
Approach		144	12	152	8.3	0.090	4.2	NA	0.4	3.2	0.07	0.50	0.07	45.9
All Vehicles		362	21	381	5.8	0.106	4.3	NA	0.4	3.2	0.05	0.51	0.05	45.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [With Dev PM Peak Main Street / Cedric Street (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Main Street														
1a	L1	174	8	183	4.6	0.143	4.5	LOS A	0.5	3.4	0.05	0.51	0.05	45.8
2	T1	11	0	12	0.0	0.143	0.0	LOS A	0.5	3.4	0.05	0.51	0.05	47.1
3	R2	86	0	91	0.0	0.143	4.6	LOS A	0.5	3.4	0.05	0.51	0.05	45.9
Approach		271	8	285	3.0	0.143	4.3	NA	0.5	3.4	0.05	0.51	0.05	45.9
East: Cedric Street														
4	L2	28	0	29	0.0	0.016	4.9	LOS A	0.1	0.5	0.24	0.49	0.24	45.4
6a	R1	8	0	8	0.0	0.009	4.5	LOS A	0.0	0.2	0.32	0.50	0.32	46.2
Approach		36	0	38	0.0	0.016	4.8	LOS A	0.1	0.5	0.26	0.50	0.26	45.6
NorthEast: Main Street approach														
24a	L1	8	1	8	12.5	0.005	4.3	LOS A	0.0	0.2	0.33	0.47	0.33	45.8
Approach		8	1	8	12.5	0.005	4.3	LOS A	0.0	0.2	0.33	0.47	0.33	45.8
North: Main Street														
9b	R3	8	0	8	0.0	0.008	6.0	LOS A	0.0	0.1	0.28	0.61	0.28	44.8
Approach		8	0	8	0.0	0.008	6.0	LOS A	0.0	0.1	0.28	0.61	0.28	44.8
NorthWest: Olympic Highway														
27b	L3	10	2	11	20.0	0.109	5.6	LOS A	0.5	3.9	0.14	0.49	0.14	45.6
27a	L1	17	1	18	5.9	0.109	3.6	LOS A	0.5	3.9	0.14	0.49	0.14	46.1
29a	R1	137	9	144	6.6	0.109	4.5	LOS A	0.5	3.9	0.14	0.49	0.14	45.8
Approach		164	12	173	7.3	0.109	4.4	NA	0.5	3.9	0.14	0.49	0.14	45.8
All Vehicles		487	21	513	4.3	0.143	4.4	NA	0.5	3.9	0.10	0.50	0.10	45.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [AM Peak Olympic Highway / Waterworks Road (Site Folder: General)]

New Site

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Waterworks Road														
1	L2	2	0	2	0.0	0.002	4.7	LOS A	0.0	0.0	0.14	0.50	0.14	56.8
3	R2	1	0	1	0.0	0.002	4.8	LOS A	0.0	0.0	0.14	0.50	0.14	56.5
Approach		3	0	3	0.0	0.002	4.7	LOS A	0.0	0.0	0.14	0.50	0.14	56.7
East: The Olympic Highway														
4	L2	1	0	1	0.0	0.039	7.8	LOS A	0.0	0.0	0.00	0.01	0.00	88.3
5	T1	67	7	71	10.4	0.039	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.6
Approach		68	7	72	10.3	0.039	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.4
West: The Olympic Highway														
11	T1	72	20	76	27.8	0.046	0.0	LOS A	0.0	0.0	0.01	0.01	0.01	99.5
12	R2	1	0	1	0.0	0.046	7.6	LOS A	0.0	0.0	0.01	0.01	0.01	65.0
Approach		73	20	77	27.4	0.046	0.1	NA	0.0	0.0	0.01	0.01	0.01	98.8
All Vehicles		144	27	152	18.8	0.046	0.2	NA	0.0	0.0	0.01	0.02	0.01	97.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [With Dev AM Peak Olympic Highway / Waterworks Road (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Waterworks Road														
1	L2	2	0	2	0.0	0.054	4.7	LOS A	0.1	0.9	0.15	0.55	0.15	56.8
3	R2	73	0	77	0.0	0.054	4.8	LOS A	0.1	0.9	0.15	0.55	0.15	56.5
Approach		75	0	79	0.0	0.054	4.8	LOS A	0.1	0.9	0.15	0.55	0.15	56.5
East: The Olympic Highway														
4	L2	18	0	19	0.0	0.049	7.8	LOS A	0.0	0.0	0.00	0.14	0.00	84.9
5	T1	67	7	71	10.4	0.049	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	95.2
Approach		85	7	89	8.2	0.049	1.7	NA	0.0	0.0	0.00	0.14	0.00	92.8
West: The Olympic Highway														
11	T1	72	20	76	27.8	0.046	0.0	LOS A	0.0	0.0	0.01	0.01	0.01	99.5
12	R2	1	0	1	0.0	0.046	7.6	LOS A	0.0	0.0	0.01	0.01	0.01	65.0
Approach		73	20	77	27.4	0.046	0.1	NA	0.0	0.0	0.01	0.01	0.01	98.8
All Vehicles		233	27	245	11.6	0.054	2.2	NA	0.1	0.9	0.05	0.23	0.05	78.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [PM Peak Olympic Highway / Waterworks Road (Site Folder: General)]

New Site

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Waterworks Road														
1	L2	1	0	1	0.0	0.003	4.7	LOS A	0.0	0.1	0.16	0.52	0.16	56.8
3	R2	3	0	3	0.0	0.003	4.8	LOS A	0.0	0.1	0.16	0.52	0.16	56.5
Approach		4	0	4	0.0	0.003	4.8	LOS A	0.0	0.1	0.16	0.52	0.16	56.6
East: The Olympic Highway														
4	L2	1	0	1	0.0	0.049	7.8	LOS A	0.0	0.0	0.00	0.01	0.00	88.4
5	T1	84	9	88	10.7	0.049	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.7
Approach		85	9	89	10.6	0.049	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.5
West: The Olympic Highway														
11	T1	111	11	117	9.9	0.064	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	99.7
12	R2	1	0	1	0.0	0.064	7.6	LOS A	0.0	0.0	0.00	0.01	0.00	65.0
Approach		112	11	118	9.8	0.064	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.3
All Vehicles		201	20	212	10.0	0.064	0.2	NA	0.0	0.1	0.01	0.02	0.01	97.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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 [With Dev PM Peak Olympic Highway / Waterworks Road (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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: Waterworks Road														
1	L2	1	0	1	0.0	0.017	4.8	LOS A	0.0	0.3	0.18	0.55	0.18	56.7
3	R2	21	0	22	0.0	0.017	4.9	LOS A	0.0	0.3	0.18	0.55	0.18	56.4
Approach		22	0	23	0.0	0.017	4.9	LOS A	0.0	0.3	0.18	0.55	0.18	56.5
East: The Olympic Highway														
4	L2	73	0	77	0.0	0.090	7.8	LOS A	0.0	0.0	0.00	0.32	0.00	81.0
5	T1	84	9	88	10.7	0.090	0.0	LOS A	0.0	0.0	0.00	0.32	0.00	90.4
Approach		157	9	165	5.7	0.090	3.7	NA	0.0	0.0	0.00	0.32	0.00	85.8
West: The Olympic Highway														
11	T1	111	11	117	9.9	0.064	0.0	LOS A	0.0	0.0	0.01	0.01	0.01	99.7
12	R2	1	0	1	0.0	0.064	7.8	LOS A	0.0	0.0	0.01	0.01	0.01	65.0
Approach		112	11	118	9.8	0.064	0.1	NA	0.0	0.0	0.01	0.01	0.01	99.2
All Vehicles		291	20	306	6.9	0.090	2.4	NA	0.0	0.3	0.02	0.21	0.02	86.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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).
Queue Model: SIDRA Standard.
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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