Wagga Wagga City Council

Planning Proposal

Amendment to the Wagga Wagga Local Environmental Plan 2010

LEP19/0002 – Morgan Street

Amendment to:

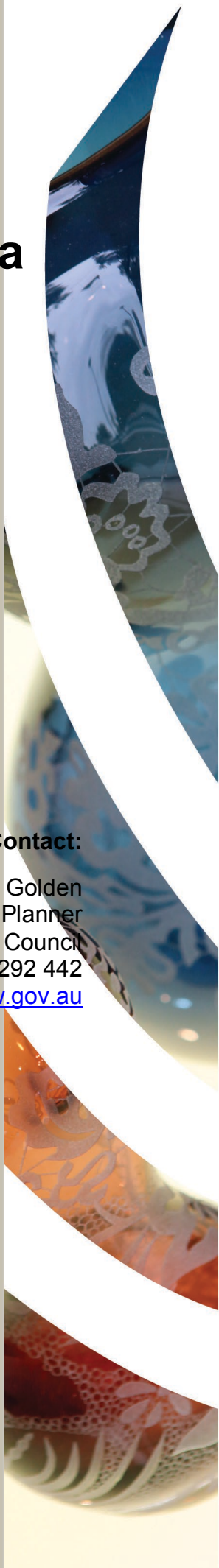
- Land classification
- Zoning
- Height of building
- Floor space ratio

Date of Planning Proposal:

26 June 2019

Contact:

Crystal Golden
Senior Strategic Planner
Wagga Wagga City Council
Phone: 1300 292 442
Email: council@wagga.nsw.gov.au



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ADDENDUM

Council is in receipt of a planning proposal to amend the Wagga Wagga Local Environmental Plan. The application is provided in appendix 1.

Council endorses the planning proposal with the following addendums:

- Explanation of provisions – Schedule 4 amendment
- Justification - reclassification
- Mapping
- Community consultation
- Project Timeline

A Gateway determination under Section 3.34 of the *Environmental Planning and Assessment Act 1979* is requested.

The items included in the Planning Proposal have been supported by Council. A copy of the report and minutes is provided with the planning proposal.

As this planning proposal involves Council owned land and a reclassification, Council is not seeking delegations to make this plan. The completed Information Checklist is provided with this proposal.

PART 2 – EXPLANATION OF THE PROVISIONS

The explanation of provisions in the application refers to Schedule 4, Part 2 – *'land classified, or reclassified, as operational land – no interests changed'*. There are no known interests on the land to be reclassified and the amendment will result in listing of the property in Schedule 4, Part 1 – *'land classified, or reclassified, as operational land – interests changed'.*

PART 3 – JUSTIFICATION

Additional Justification in accordance with NSW Government Planning and Environment – LEP Practice Note – Classification and reclassification of public land though a local environmental plan:

The planning proposal proposes to reclassify Lot A DP 331461 and Lot 1 DP 375748, 205 Morgan Street, Wagga Wagga. Additional information addressing the matters outlined in the LEP Practice note and the land titles are provided as attachments.
The views of State and Commonwealth public authorities will be sought once the Gateway Determination has been issued.

PART 4 – MAPPING

Council requests the ability to lodge the template maps at S3.36 stage rather than prior to exhibition. The maps provided as part of the planning proposal are detailed enough for public exhibition purposes.

PART 5 – COMMUNITY CONSULTATION

The planning proposal is considered to be major in nature and it is considered that a 28 day exhibition period is appropriate.

As part of community consultation, notification will be provided to adjoining and affected land owners.

As the proposal involves a reclassification of community land to operational, a public hearing will be arranged through an independent chair.

PART 6 – PROJECT TIMELINE

Task	Anticipated timeframe
Anticipated date of Gateway Determination	July 2019
Anticipated timeframe for completion of required technical information	N/A
Timeframe for Government agency consultation	September
Commencement and completion dates for public exhibition.	September
Dates for public hearing	September
Timeframe for consideration of submissions	October
Timeframe for the consideration of a proposal post exhibition	November
Date of submission to the Department to finalise the LEP	December
Anticipated date RPA will make the plan	January
Anticipated date RPA will forward to the Department for notification	March

City of Wagga Wagga

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Wagga Wagga NSW 2650

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Application to amend Local Environmental Plan & Development Control Plan

Environmental Planning & Assessment Act 1979

Applicant Details

Title: Mr [✓] Mrs [ ] Ms [ ] Other

Given Name/s: Manuel

Surname: Donebus

Company: Damasa Pty Ltd

ABN: 63 266 122 690

Postal Address: PO Box 5664, Wagga Wagga Postcode: 2650

Phone Number: 02 6971 7477 Mobile: Work:

E Mail: manuel@damasa.com.au

Signature: Manuel Donebus Date: 28.2.19

Office Use Only

LEP No:

Date:

CSO:

Site Details

Address: Morgan Street, Murray Street and Forsyth Street, as per attached site description table.

Lot No. Section DP / SP

Description of Planning Proposal

[✓] LEP Amendment [ ] DCP Amendment

Amendment of Zoning, Height of Buildings and Floor Space Ration maps and Reclassification of Public land, as per attached Planning Proposal report.

Pre-Lodgement Meeting

Prior to lodging your application, you need to have a pre-lodgement meeting to ensure that you have sufficient information. Have you phoned Council's Strategic Planners on 1300 292 442 to make an appointment?

[X] Yes [ ] No If yes, whom did you phone: Meetings & discussions with Strategic Planning

Applicant and Landowner Declaration

If you are the applicant, are you:

- ☐ 1. A Wagga Wagga City Councillor?
- ☐ 2. A Wagga Wagga City Council Staff Member?
- ☐ 3. A company where a director of the company is a person referred to at 1 or 2 above?
- ☐ 4. Acting on behalf of a person or company referred to at 1,2, or 3 above?
- ☐ 5. A relative of a person referred to at 1 or 2 above?
- ☐ 6. A company where a director of the company is a relative of a person referred to at 1 or 2 above?
- ☐ 7. Acting on behalf of a person or company referred to at 5 or 6 above?
- ☒ 8. None of the above

If you are the land owner, are you:

- ☐ 1. A Wagga Wagga City Councillor?
- ☐ 2. A Wagga Wagga City Council Staff Member?
- ☐ 3. A company where a director of the company is a person referred to at 1 or 2 above?
- ☐ 4. A relative of a person referred to at 1 or 2 above?
- ☐ 5. A company where a director of the company is a relative of a person referred to at 1 or 2 above?
- ☒ 6. None of the above

Consent of ALL owner(s) of the subject property

I declare that all the information in this application is to the best of my knowledge, true and correct. I also understand pursuant to the Environmental Planning and Assessment legislation that if the information is incomplete the application may be delayed, rejected, or refused without notice. I acknowledge that if the information provided is misleading any approval granted 'may be void'. I agree to the use of the documentation provided in support of this application for advertising and notification purposes.

Name MANUEL DONEBUS Signature

Name DANIEL DONEBUS Signature

Name Signature

Notes:

- If there is more than one landowner, every owner must sign
- Company Ownership – A company can provide owners consent with or without a common seal and the application or authorisation letter must be signed by:
  - a) two (2) directors of the company; or
  - b) a director and a company secretary of the company; or
  - c) for a proprietary company that has a sole director who is also the sole company secretary – that director.

Copyright and Privacy

Please be advised that Council may make copies (including electronic copies) of the planning proposal and accompanying documents for the purpose of complying with its obligations under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 and Council's Notification Policy. In addition, Council may make such further copies as, in its opinion are necessary to facilitate a thorough consideration of the planning proposal. This may include making copies of the advertised plans, supporting documentation on Council's website to be viewed or printed out by members of the public. The Applicant is responsible for obtaining all copyright licences necessary from the copyright owners for this purpose.

Office Use Only

The fees and charges payable are in accordance with Council's Revenue and Pricing Policy at the time of lodgement.

- ☐ Minor LEP amendment (Low Complexity)
- ☐ Medium LEP Amendment (Medium Complexity)
- ☐ Major LEP Amendment (High Complexity)
- ☐ Minor DCP Amendment to (Existing chapter / control) (Low Complexity)
- ☐ Major DCP Amendment (New chapter / new controls)

Receipt No: Amount: $ Cheque Requisite: ☐ Yes ☐ No

SUBJECT LAND

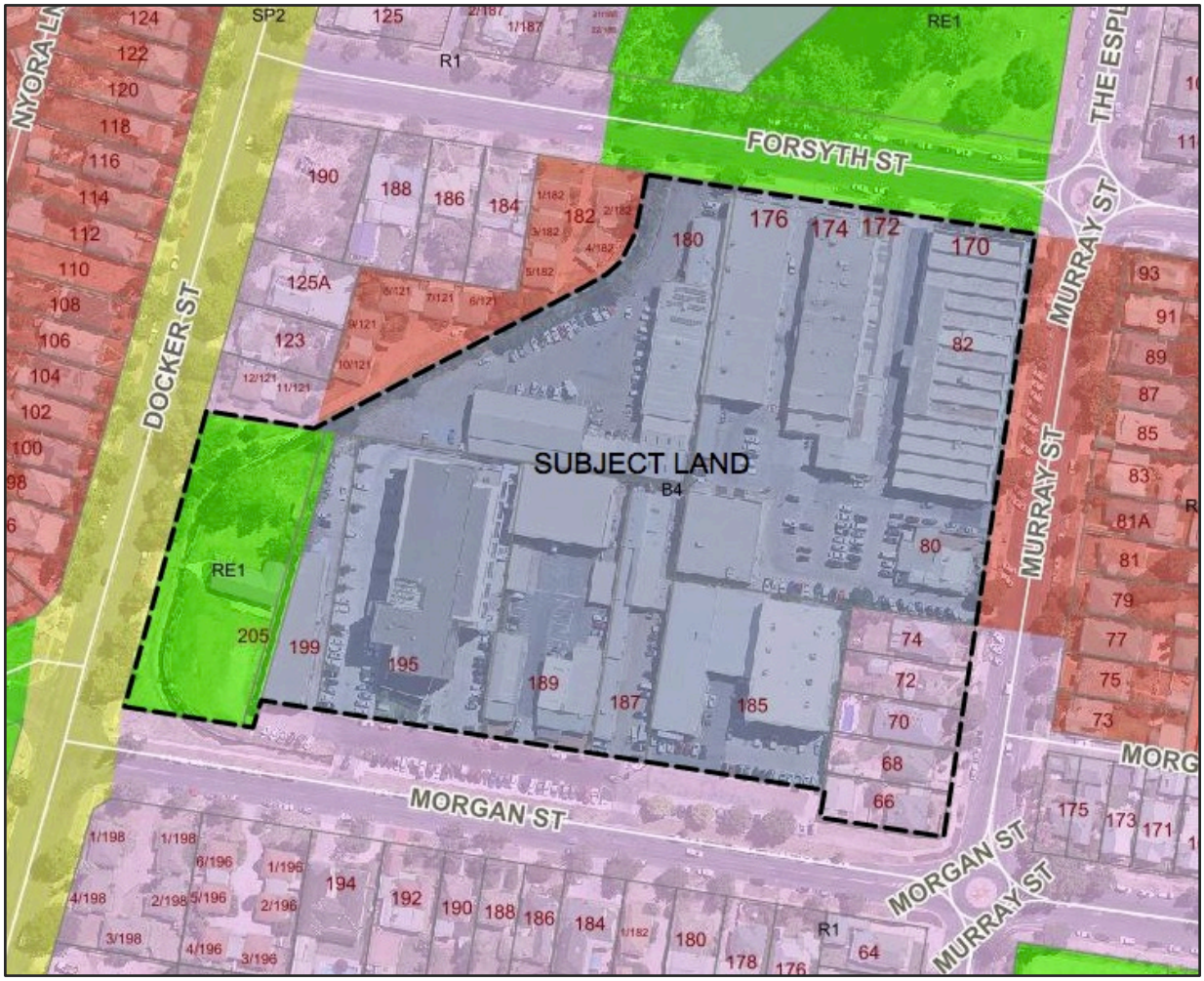


Figure 1: Subject Land (Source: WWCCGIS & SP2019)

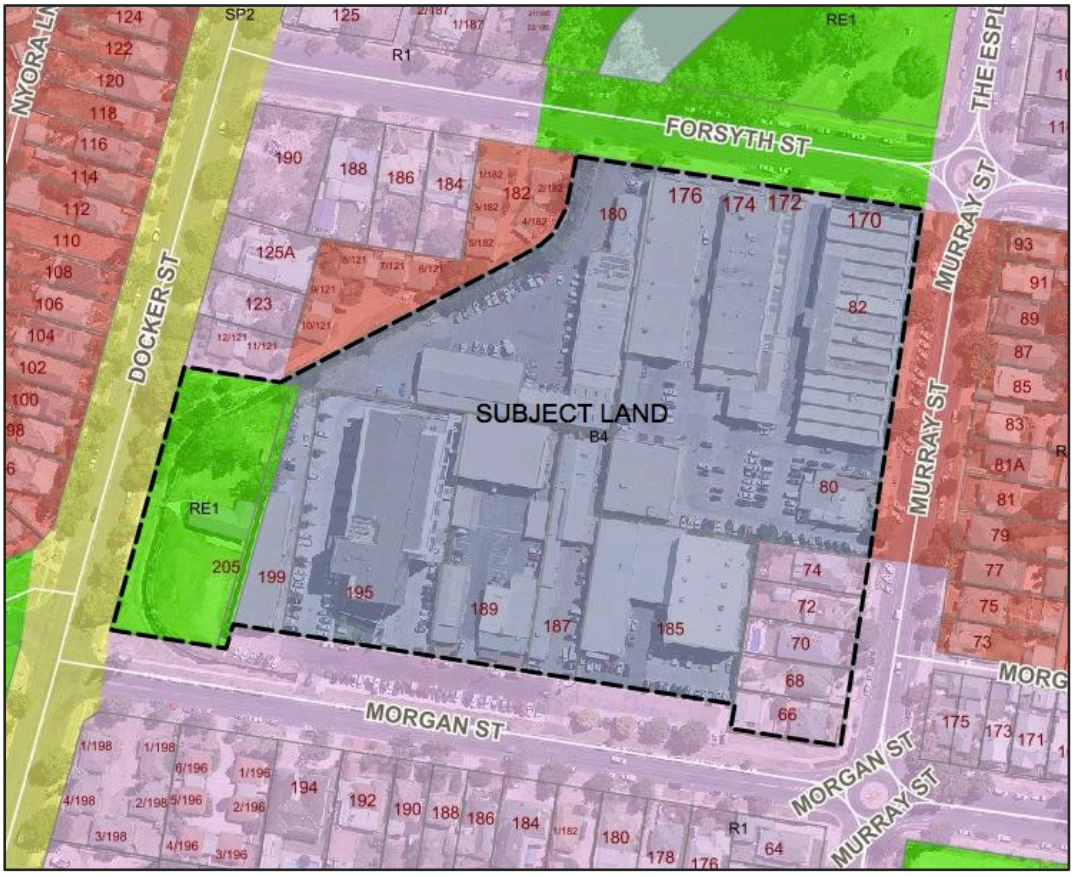
Table 1: Subject Land Details

Legal Description	Street Address
Lot A DP331461	205 Morgan Street
Lot 1 DP375748	205 Morgan Street
Lot 7 DP203835	199 Morgan Street
Lot 456 DP1212902	195 Morgan Street
Lot 23 DP869492	189 Morgan Street
Lot 1 DP203835	187 Morgan Street
Lot 1 DP550746	185 Morgan Street
Lot 1 DP1027240	80-82 Murray Street, 170 Forsyth Street & 174-176 Forsyth Street
Lot 1 DP617715	172 Forsyth Street
Lot 2 DP620649	180 Forsyth Street
Lots 1 – 5 DP20847	66 – 74 Murray Street
Lot 3 DP620649	Stormwater Drainage

PLANNING PROPOSAL

salvestroplanning
innovation . sustainability . excellence

Proposed Amendment to LEP2010 Provisions
Height – Floor Space Ratio –Zoning
MORGAN/MURRAY/FORSYTH/DOCKER STREETS PRECINCT MASTERPLAN



Prepared for Damasa P/L

Rev 2.0 - Feb 2019

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Proposed Amendment to LEP2010 Provisions Height – Floor Space Ratio –Zoning MORGAN/MURRAY/FORSYTH/DOCKER STREETS PRECINCT MASTERPLAN

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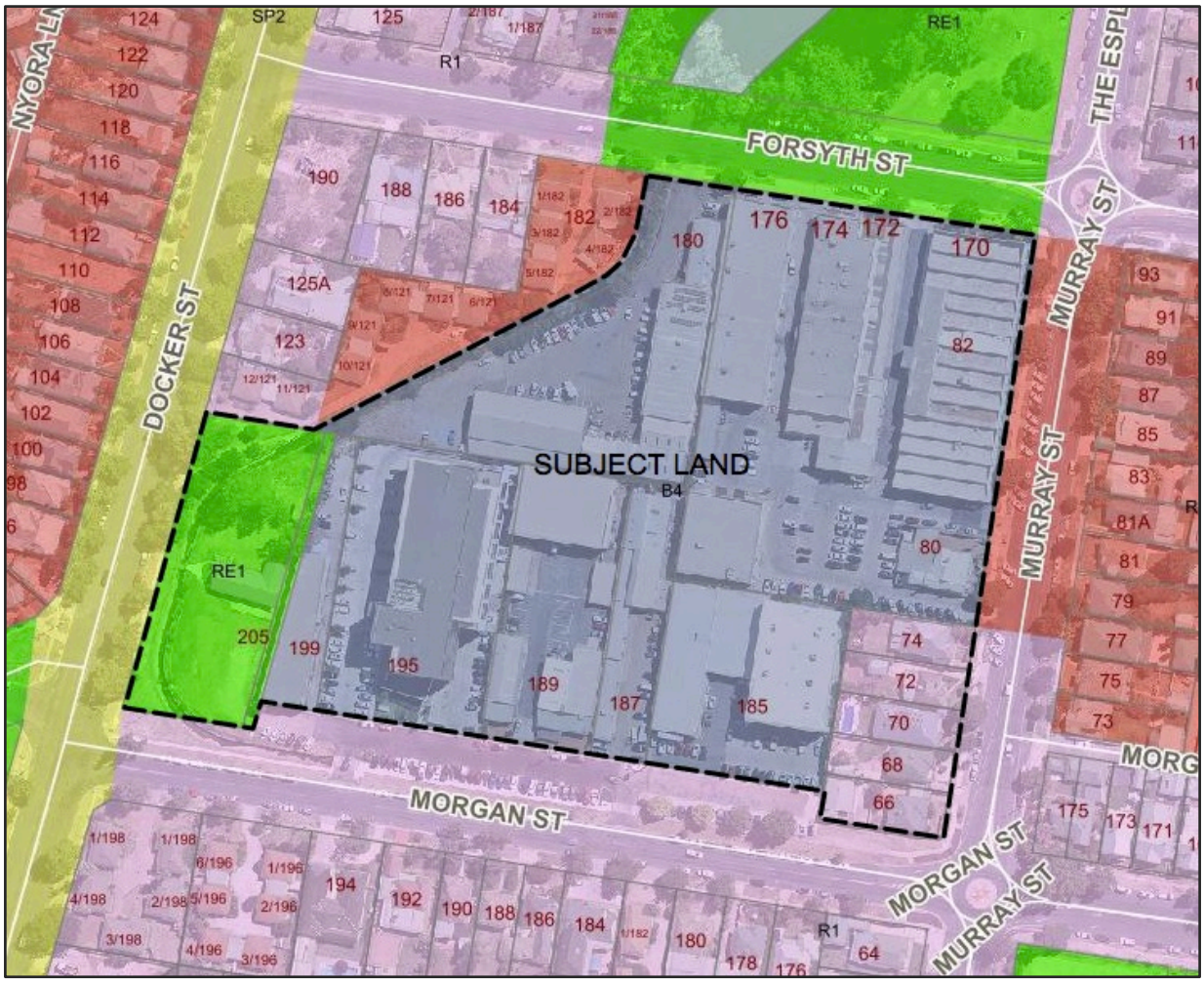
Proposed Amendment to LEP2010 Provisions Height – Floor Space Ratio –Zoning MORGAN/MURRAY/FORSYTH STREETS PRECINCT MASTERPLAN

1 INTRODUCTION

The following planning proposal is to be read in conjunction with the attached supporting reports and maps. It has been prepared in respect of land bounded by Morgan, Murray, Forsyth and Docker Streets, Wagga Wagga as identified in the figure and table below.



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Lot 1 DP617715	172 Forsyth Street
Lot 2 DP620649	180 Forsyth Street
Lots 1 – 5 DP20847	66 – 74 Murray Street
Lot 3 DP620649	Stormwater Drainage

2 OBJECTIVES OR INTENDED OUTCOMES

To amend the Wagga Wagga Local Environmental Plan 2010 to facilitate redevelopment of the subject site for higher density mixed-use development including commercial, residential and car parking.

3 EXPLANATION OF PROVISIONS

The proposed outcomes of this planning proposal will be achieved by introducing the following amending provisions that apply to the subject land.

- Reclassification of Public Land - Schedule 4 Part 2 to be amended by identifying Part Lot A DP331461 and Lot 1 DP375748 as operational land;
- Rezoning of Land - Lot A DP331461 and Lot 1 DP375748 to be rezoned from RE1 Public Recreation to B4 Mixed Use;
- Rezoning of Land – Lots 1 – 5 DP20847 to be rezoned from R1 General Residential to B4 Mixed Use;
- Height of Buildings Map – to be amended by identifying all the subject land as having a maximum building height development standard of 35 metres; and
- Floor Space Ratio Map – to be amended by removing the maximum floor space ratio development standard that applies to the relevant subject land.

3.1 Reclassification of Public Land

Part Lot A DP331461 and Lot 1 DP375748 are currently classified as Community Land. To enable the proposal to be achieved, these lots will be required to be reclassified to Operational Land. The mapping below shows the current and proposed land classification.

Schedule 4 Part 1 Land classified, or reclassified, as operational land – no interests changed of Wagga Wagga Local Environmental Plan 2010 will require amending to include the identified land as land reclassified.

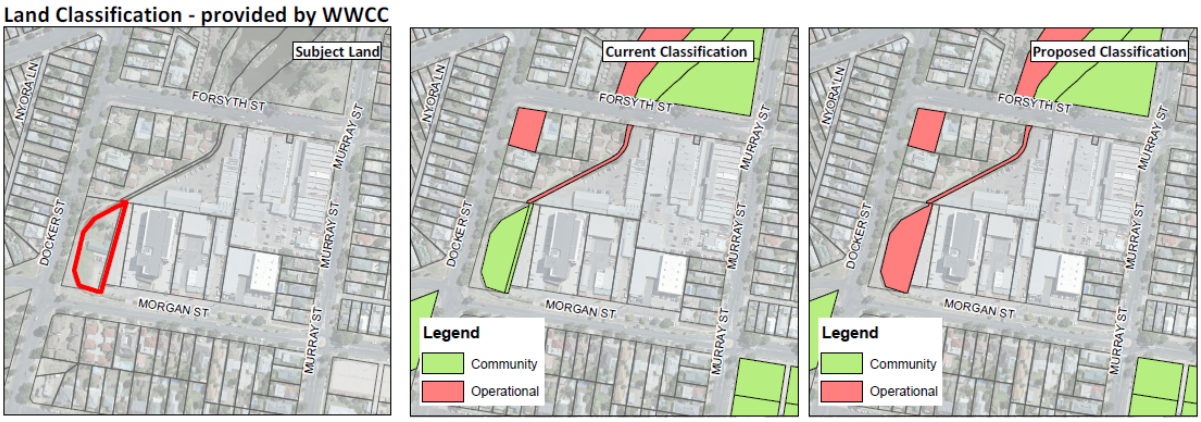

Figure 2: Land Reclassification Map (Source: WWCC & SP2019)

No mapping amendments are required as part of the reclassification.

3.2 Zoning

Lot A DP331461 and Lot 1 DP375748 are currently zoned RE1 Public Recreation. Lots 1 – 5 DP20847 are currently zoned R1 General Residential. To enable the proposal to be achieved, this land will be required to be rezoned to B4 Mixed Use.

The urban design report does not include Lots 1-5 DP20847 as part of the development concept, as this land is in separate ownership. For the purposes of the planning proposal, these sites have been included to consider the development potential for the precinct rather than just the site. This proposal will provide opportunities for the land owners to undertake further development on their site.

The proposed amendments will be achieved by amending the land zoning map sheet LZN_003C as shown below:

Land Zoning Map - provided by WWCC

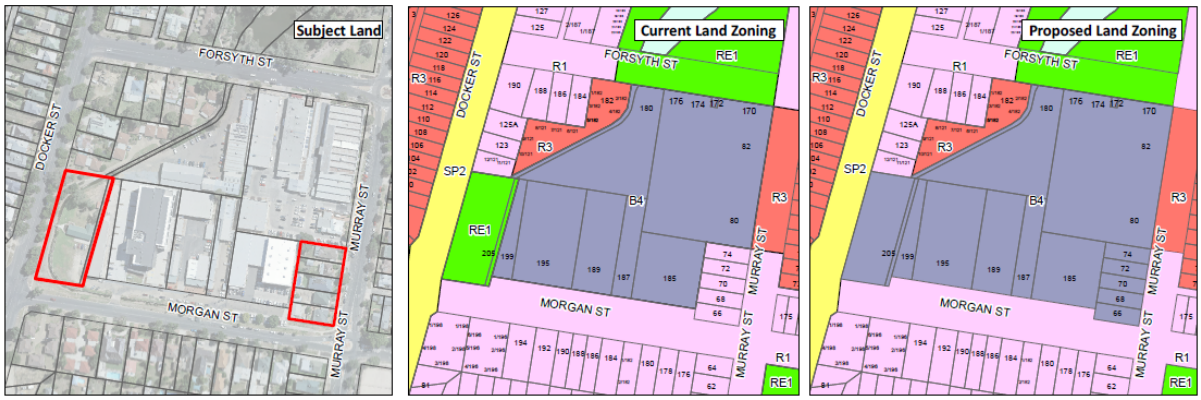

Figure 3: Land Zoning Map (Source: WWCC & SP2019)

3.3 Height of Buildings

The subject land, excluding Lot A DP331461, Lot 1 DP375748 and Lots 1 – 5 DP20847, are currently identified as subject to Clause 4.3 of WWLEP 2010 and applicable Height of Buildings Map. The applicable Map indicates a building height limit of 16 metres for the land. The proposal is to amend the height of building to 35 metres.

The proposed amendment will be achieved by amending the height of building map sheet HOB_003C as shown below:

Height of Buildings Map - provided by WWCC

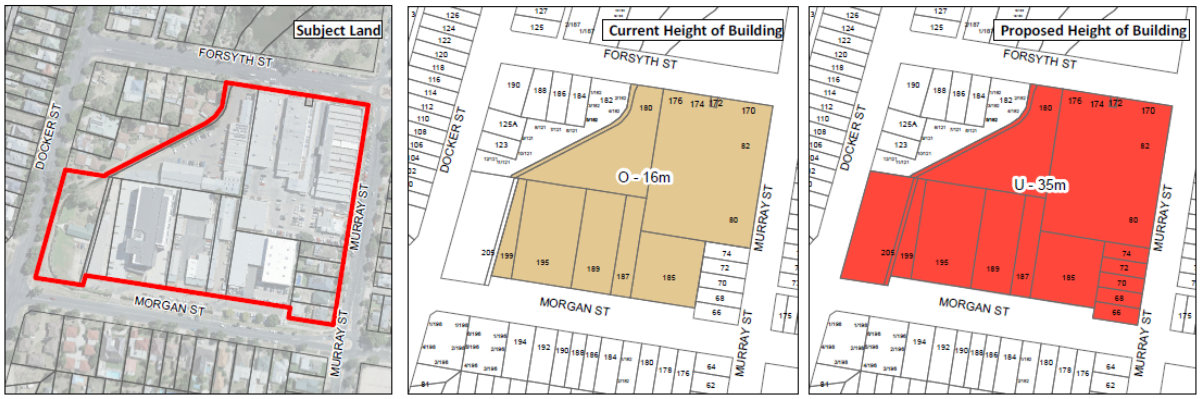

Figure 4: Height of Buildings Map (Source: WWCC & SP2019)

3.4 Floor Space Ratio

The subject land, excluding Lot A DP331461, Lot 1 DP375748 and Lots 1 – 5 DP20847, are currently identified as subject to Clause 4.4 of WWLEP 2010 and applicable Floor Space Ratio Map. The applicable Map indicates a maximum floor space ratio of 2:1. The proposal is to remove the Floor Space Ratio provisions.

The proposed amendment will be achieved by amending the Floor Space Ratio map sheet FSR_003C as shown below:

Floor Space Ratio Map - provided by WWCC

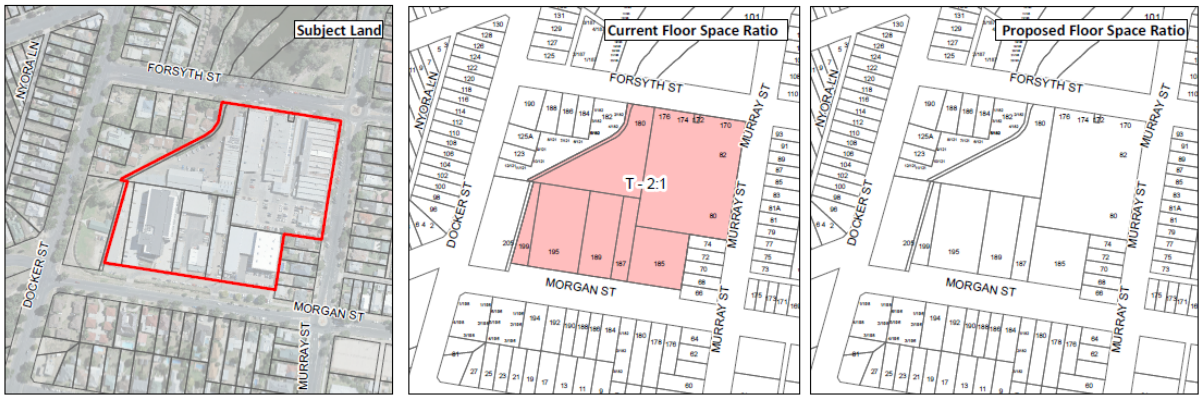

Figure 5: Floor Space Ratio Map (Source: WWCC & SP2019)

4 JUSTIFICATION

Justification for the proposal, including its strategic relevance, is outlined in the sections below.

4.1 Need for the planning proposal

4.1.1 Is the planning proposal a result of any strategic study or report?

The planning proposal is the result of a masterplan and urban design report that make the following conclusions:

- The subject land provides a significant opportunity for mixed use development at a higher density to encourage more efficient use of existing infrastructure and local services;
- Higher density development of the land will encourage stronger social and economic connections with the surrounding local neighbourhood;
- Alterations of the local planning provisions that are applicable, will align with the strategic directions promoted under current local and regional strategies;
- The density proposed for the subject land is appropriate in relation to strategic projections for infill housing, infrastructure, facilities and transport;
- The proposal will deliver precinct changes consistent with future character objectives indicated under local strategic goals;
- The proposal will embellish connectivity throughout the central Wagga Wagga precinct; and
- The public realm will benefit from greater access to open space, activity areas and sustainable living opportunities, including improvements to general local amenity and urban character.

4.1.2 Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The planning proposal is considered to be the best means to achieve the objectives and intended outcomes for the subject land.

Reclassification and rezoning of part of the subject land will be required to enable the development of the land to proceed and achieve the objectives and intended outcomes. There is only one means of reclassifying land under current planning provisions.

The use of existing provisions such as Clause 4.6 was considered, however, the level of variation to the standards would be outside of the scope of reasonable justification under the current standards without clearly identifying the overall objectives and outcomes of the proposal. In addition, the existing flexibility contained in LEP2010 does not extend over all the subject land.

4.2 Relationship to strategic planning framework

4.2.1 Is the planning proposal consistent with the objectives and actions of the applicable regional, sub-regional or district plan or strategy (including any exhibited draft plans or strategies)?

The proposal is consistent with the directions of relevant plans, including the *NSW State Plan, Premiers Priorities and Riverina Murray Regional Plan 2036.*

In particular, the goals and directions outlined in the Riverina Murray Regional Plan 2036 relevant to the proposal include:

Table 2: Relevant goals and directions of Riverina Murray Regional Plan 2036

Goal / Direction	Comment
A growing and diverse economy	The proposal is consistent with this direction. The change in zoning and development standards will enable a broader range of business activities over the subject land as outlined in the draft Masterplan and Urban Design Report. Additional commercial floor space and residential units, together with improved amenity and design will encourage greater business activity as a result of construction and ongoing land use.
Efficient transport and infrastructure network	The proposal is connected to existing transport and essential infrastructure networks. Additional development density will make better use of existing networks and augment systems as necessary to continued and sustainable use of public resources.
Strong, Connected and Healthy Communities	The proposal will increase the supply of housing units and commercial floor space that will increase job opportunities throughout the construction and operational phases of the project.
Build housing capacity to meet demand	Additional residential units will address the need for additional housing for a growing population. The project will be staged to align with population growth and demand for housing within the central city area.
Provide greater housing choice	The additional higher density housing units will provide an alternative housing choice to address affordability and variety of housing options.
Deliver healthy built environments and improved urban design	The proposal will be underpinned by a comprehensive urban design report that integrates housing and commercial choice with quality built environments, including connectivity with open space and community networks to ensure a healthy living environment for the well-being of future residents.

In relation to Wagga Wagga City in general, the regional plan notes as a priority, amongst other matters, to:

- Establish an environment conducive to entrepreneurship and start-up businesses, with the aim of inspiring innovation and advances in technology
- Support the establishment of health precincts around Wagga Wagga Rural Referral Hospital
- Contribute to a sustainable environment for future generations through proactive waste management and responsible sustainable practices.
- Increase the range of housing options within the existing urban area.

The subject land is located within the existing urban area and is connected to existing essential urban infrastructure.

4.2.2 Is the planning proposal consistent with a Council's local strategy or other local strategic plan?

The proposal has been discussed with Council's strategic planning staff and measured against the *Wagga Wagga Spatial Plan 2013-2043*.

Wagga Wagga Spatial Plan 2013-2043

The purpose of Wagga Wagga Spatial Plan 2013-2043 is:

> *…… to provide clear strategic indicators for the development of Wagga Wagga over the next 30 years and beyond, but with the flexibility required to respond to change. It is the key strategic planning document for informing and managing urban growth and change.*

The planning proposal is also consistent with this plan by addressing key goals and directions including:

> *Goals: • We have opportunities and places for connection. • We are a community that is informed and involved in decisions impacting us. • We live in a safe community • We look after and enhance our natural environment. • We are happy with our standard of living. • Our community grows. • We plan for resilient and sustainable built environments.*
>
> *Directions: • We use sports, recreation, arts and leisure as ways of staying connected. • We protect our heritage to keep what was. • We have a variety of transport options. • We are provided the opportunity to be involved with decisions impacting us. • We improve the quality of our environment. • We plan for a growing community. • We maintain our current and future infrastructure. • Arrangements are in place to respond to and recover from natural disasters. • We have access to affordable housing options. • There is growing business investment in our community.*

Specifically, the proposal satisfies objectives of key components and initiatives outlined under the headings of *'Resilient and Sustainable Built Environments'*, *'Plan for a Growing Community', 'Our Standard of Living'* and *'Our Community Grows'.*

Table 3: Relevant Strategic Components of Wagga Wagga Spatial Plan 2013-2043

Objective	Consistency
Accommodating population growth through adequate supplies of well planned residential, industrial and business land, providing a variety of housing options to achieve housing choice and affordability. *Well serviced areas displaying design excellence, which in turn enhance the security and wellbeing of individuals and families, and provide a base for strong, resilient communities.*	The proposal is consistent with these strategic objectives by applying excellence in design in an appropriate location to facilitate mixed uses. The proposal addresses various short, medium, long term and ongoing action timeframes as listed in the strategy. These include: • Reviewing development controls across all zones and tailored for particular precincts. • Reviewing controls to encourage innovative housing and design, and quality built environments. • Undertake masterplanning to encourage place making principles. • Identify areas in Central Wagga Wagga that cater for 'empty nesters' and community demand. • Provide a range of densities in neighbourhoods that respond to community demand. • Investigate areas identified as 'potential intensification' for the provision of services. • Identify sites suitable for redevelopment and investigate the potential to concentrate development to infill sites to accommodate future growth.

	• Investigate incentives that encourage infill development and provide high quality medium and high density residential development. • Development to occur in liaison with infrastructure providers to ensure efficient and cost effective provision of services. • Provision of traffic cycleways and pedestrian connections in conjunction with infrastructure providers.
Facilitate the provision of physical infrastructure in a coordinated and cost effective manner. *Facilitate improved efficiency of urban infrastructure such as road networks, water supply, wastewater management, stormwater management, electricity and telecommunications*	The proposal is consistent with these strategic objectives by ensuring that existing infrastructure is augmented and additional services provided utilising best practice and innovative design to ensure efficiency and sustainability.
Ongoing commitment to promotion of affordable housing in locations with access to services.	The proposal is consistent with this strategic objective by promoting housing choice in a suitable location and aiming to achieve specific action items of the plan including: • *Master planning to identify the suitability of areas for residential intensification. Investigations will ensure these areas are consistent with sustainable planning principles, including proximity to existing infrastructure, transport, services and facilities and environmental constraints*. • *Work with private stakeholders in the redevelopment of key sites.*
Facilitate the development of a prosperous city. *Support viable neighbourhood centres.* *Provide flexible opportunities and appropriate locations for establishing and growing business.* *Provide opportunities for key businesses established in Wagga Wagga to grow further.*	The proposal is consistent with these strategic objectives by facilitating development and aiming to achieve specific action items of the plan including: • *Develop commercial precincts to facilitate future development.* • *Review potentials and limitations of permissible and prohibited land uses for the business zones.* • *Investigate the full range of options for tourism accommodation and related accommodation with development control plan controls.* • *Review controls to provide flexibility in floor space ratios.* • *Review range of business zones and the potential for additional zones.*

4.2.3 Is the planning proposal consistent with the applicable State Environmental Planning Policies?

The proposal is consistent with applicable State Environmental Planning Policies (SEPPs), as identified in the table below.

Table 4: Applicable SEPPs

SEPP Title	Consistency
SEPP55 – Remediation of Land	The land is not identified on Council's potentially contaminated land register. The land has been subject to various geotechnical reports that indicate the land is suitable for mixed use development that has occurred on the site under the existing B4 Mixed Use zone The land to be rezoned from RE1 Public Recreation and R1 General Residential to B4 Mixed Use does not propose to allow development that is more sensitive to what currently exists on the site.
SEPP65 – Design Quality of Residential Apartment Development	The planning proposal will facilitate a mixed use development including multi-level residential accommodation in the form of shop-top housing and residential flat buildings. The Urban Design Report considers the opportunities and proposed development for the site and addresses the design quality principles and SEPP 65. This will be further considered through the development application process.

4.2.4 Is the planning proposal consistent with applicable Ministerial Directions (s117 directions)?

The following table outlines the relevant s117 directions and the level of consistency of this planning proposal to them.

Table 5: s117 Directions

Direction title	Consistency
1.1 Business and Industrial Zones	The proposal is consistent with this direction as it: • Encourages employment growth • Retains existing areas and located of existing employment land • Retains existing areas and locations of employment land • Does not reduce potential floor space for employment uses • Is consistent with Council's endorsed Strategy • Will support the viability of the central business district Removing the floor space ratio provision, increasing the height and expanding the B4 Mixed Use zone will increase employment opportunities.
3.1 Residential Zones	The proposal will rezone existing R1 residential zoned land to B4 mixed use. The proposal is consistent with this direction because the proposed B4 zone will continue to permit residential development at a greater density. It will also broaden the choice of dwelling type, make more efficient use of existing infrastructure and services, reduce the consumption of land for urban development on the urban fringe, and be of demonstrated good design.
3.4 Integrating Land Use and Transport	The proposal is consistent with this direction by ensuring mixed use development will occur in a location with access to a variety of transport modes that reduce dependence on cars and promotes connection to other efficient and viable transport systems.
5.10 Implementation of Regional Plans	The proposal is consistent with this direction by ensuring the proposal achieves relevant Goals/Directions of the Riverina Murray Regional Plan 2036, including those referring to *Efficient transport and infrastructure networks* and *Strong, connected and healthy communities*.

4.3 Environmental, Social and Economic Impact

4.3.1 Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

No, there is no critical habitat or threatened species, populations or ecological communities, or their habitats located on the site that are likely to be significantly affected as a result of this proposal, as shown in the relevant mapping below.

4.3.2 Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

There are no significant environmental effects anticipated as a result of the planning proposal. LEP 2010 mapping indicates that sensitive areas for biodiversity are contained within the subject land, however, the extent of sensitive areas is very minor.

The subject land is located within Council's Biocertification Area and consideration of potential adverse impacts of this land is not required as a result of any future proposal for development.

No removal of native vegetation is proposed to facilitate the planning proposal.

There are no known items or places of European or Aboriginal cultural heritage located within proximity to the subject site.

In determining the likelihood of contamination, reference has been made to documented history of the site from Council records, landowner information and the content of recent geotechnical reports. There are no known areas of contamination on the site that would impact the future use of the land under the terms of this planning proposal.

4.3.3 Has the planning proposal adequately addressed any social and economic effects?

Social Impact

The proposal will facilitate mixed use development that will add commercial activity and residential accommodation, with the potential to contribute to social and community infrastructure of the area. Over the duration of development of the site under the proposed LEP changes, an evolving social network will add to the culture of the area and contribute to creating stronger community values to those who will live and work in the locality.

More efficient use of existing social infrastructure including schools, day care centres and hospitals will occur. The site is located within close proximity to schools and day care centres and currently has a strong link to the existing health services industry of the City, and this is expected to strengthen as a result of this proposal.

The proposal will assist in ensuring the future planning of the subject area will accommodate improvements to social networks and community infrastructure. There is a strong local connection to public areas including the lagoon, CBD, pedestrian networks, cycleway networks and Riverside Precinct area. The proposal will assist in reinforce the social connections that evolve from the local and future communities use of these networks.

The proposal will also contribute to building community in the local area, building stronger connections with established infrastructure including businesses, neighbourhood centres and transportation networks.

The removal of the floor space ratio and the increase in height enables the site to accommodate higher density development. To enhance amenity and ensure intensification does not have an adverse impact on adjoining properties, the bulk and scale will be controlled through a site specific DCP chapter with detailed controls establishing setbacks, transition and stepping.

Council will provide details on the social impact of the land reclassification and will conduct the required public hearing as part of consultation.

Economic Impact.

The proposal will enable future development of the site to be undertaken more efficiently and potentially contribute significantly to job growth, commercial construction activity, residential construction activity, and expansion/improvements to infrastructure and service networks.

Over the life of projects to be generated by this proposal, and estimated 1000 jobs, 32000m^2 commercial floor space, 201 residential dwellings and significant improvements to public infrastructure are envisaged. This would represent an injection of over $180 million to the local economy over the next 10-15 years, taking into account direct capital investment and potential multiplier effects.

The proposal will facilitate the addition of commercial floor space with a combination of retail (8600m^2 GFA) and office space (24000m^2 GFA). This is in addition to the existing 6000m^2 of office space included in the recently completed and occupied "Enixus" building in Morgan Street.

The additional 201 dwellings will address the future needs of inner city dwellings being located in connected areas to ensure a sustainable city of the future.

The proposal will have minimal impact on the CBD precincts (Baylis and Fitzmaurice Street precincts) as there are no core retailing activities to be targeted for the site. The site will focus on quality commercial office space and upper level residential living units that cannot currently be provided in any significant degree in the CBD due to various existing building constraints.

4.4 State and Commonwealth Interests

4.4.1 Is there adequate public infrastructure for the planning proposal?

There is adequate public infrastructure to support the outcomes of the planning proposal. The nature of the development will result in more efficient use of existing infrastructure services currently installed adjacent to and nearby the site.

Other infrastructure networks and services, including public transport/school bus, roads, waste management/recycling, health, education, emergency, mail and other community services are accessible to the subject site.

4.4.2 What are the views of State and Commonwealth public authorities consulted in accordance with the Gateway determination?

The views of State and Commonwealth public authorities will be sought following the issue of a Gateway determination for this planning proposal.

5 MAPPING

The planning proposal seeks to amend the following maps:

- Land Zoning Map – LZN_003C
- Height of Buildings Map – HOB_003C
- Floor Space Ratio Map – FSR_003C

6 COMMUNITY CONSULTATION DETAILS

Community consultation will be undertaken in accordance with relevant sections of the Act and Regulations. In addition, the Gateway determination will confirm the extent and nature of community consultation to be undertaken for the purposes of this proposal.

7 PROJECT TIMELINE

Following lodgement of the planning proposal, Council will develop a project timeline.

17018: Document History

Revision No.	Date	Authorised By Name/Position	Signature	Notes
Rev 1.0 – Draft	30/10/17	Rohan Johnston Town Planner	RJ	For internal review
Rev 1.1 – Draft	4/12/17	Garry Salvestro Director	GS	For initial client review
Rev 1.2 – Edited Draft	9/2/18	Garry Salvestro Director	GS	For further client review
Rev 1.3 – Edited Draft	13/2/18	Garry Salvestro Director	GS	For Council review
Rev 1.4 – Edited Draft	2/6/18	Garry Salvestro Director	GS	For further client & Council review
Rev 1.5 – Edited Draft	21/11/18	Garry Salvestro Director	GS	For further client & Council review
Rev 1.5 – Edited Draft	21/11/18	Garry Salvestro Director	GS	For further client & Council review
Rev 2.0 – Final	28/2/19	Garry Salvestro Director	GS	Issued for printing & lodgement

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ATTACHMENT 1: URBAN DESIGN REPORT

ATTACHMENT 2: TRANSPORT & TRAFFIC ANALYSIS REPORT

TRAFFIC AND PARKING IMPACT ASSESSMENT OF PLANNING PROPOSAL (MIXED USE) AT MORGAN STREET, WAGGA WAGGA

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Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness

17487.02FA - 18 February 2019

Development Type: **Planning Proposal (Mixed Use)**

Site Address: **Morgan Street, Wagga Wagga**

Prepared for: **Damasa Pty Ltd**

Document reference: **17487.02FA**

Status	Issue	Prepared By	Checked By	Date
Draft	A	PK/TS/SI		31 October 2018
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1 INTRODUCTION

M^cLaren Traffic Engineering (MTE) was commissioned by *Damasa Pty* Ltd to provide a Traffic and Parking Impact Assessment of the Planning Proposal (Mixed Use) at Morgan Street, Wagga Wagga. The indicative masterplan scheme is reproduced in **Annexure A** for reference.

1.1 Description and Scale of Development

The planning proposal include modifications to the Council planning instruments to allow for a height limit of 35m the removal of the FSR limit to accommodate an 8-storey mixed-use development according to the concept plan in **Annexure A**.

As part of this proposal, a masterplan has been created to demonstrate a potential land use outcome for the site including a reasonable mix of community, commercial and residential uses. For the purposes of this study, the GFA assumptions have been made as shown in **Table 1**, and are provided only as speculative development outcome whereas each portion of the development will require future detailed assessment in their own right.

TABLE 1: INDICATIVE LAND USE FOR ANALYSIS

Land Use	Scale
1-bed unit	38 units
2-bed unit	131 units
3-bed unit	19 units
Town House	13 town houses
Ground Floor Retail/Commercial	8,628 sqm GFA
Office (includes 5942sqm existing)	29,820 sqm GFA
Total	69,331 sqm GFA

It is expected that vehicular access to the development will be from a combination of driveways on Morgan Street, Murray Street and Forsyth Street, subject to detailed design.

1.2 State Environmental Planning Policy (Infrastructure) 2007

The proposed development does qualify as a development with relevant size and/or capacity under Clause 104 of the SEPP (Infrastructure) 2007. Accordingly, formal referral to the Roads and Maritime Services (RMS) is necessary within 7 days following the submission of the planning proposal application. It is noted that no changes to the road environment will occur as a direct result of the subject proposal, though planning for subsequent development applications requires consideration for some aspects of the traffic assessment at this stage in the process.

1.3 Site Description

The site is located within the Wagga Wagga Local Government Area, also known as the City of Wagga Wagga. The site is primarily governed by the Wagga Wagga Local Environmental Plan 2010 (LEP). Within the Wagga Wagga LEP, the site is zoned primarily *"B4 – Mixed Use"*, though the south-western side of the site identified as 205 Morgan Street Wagga Wagga NSW is zoned as *"RE1 – Public Recreation"*.

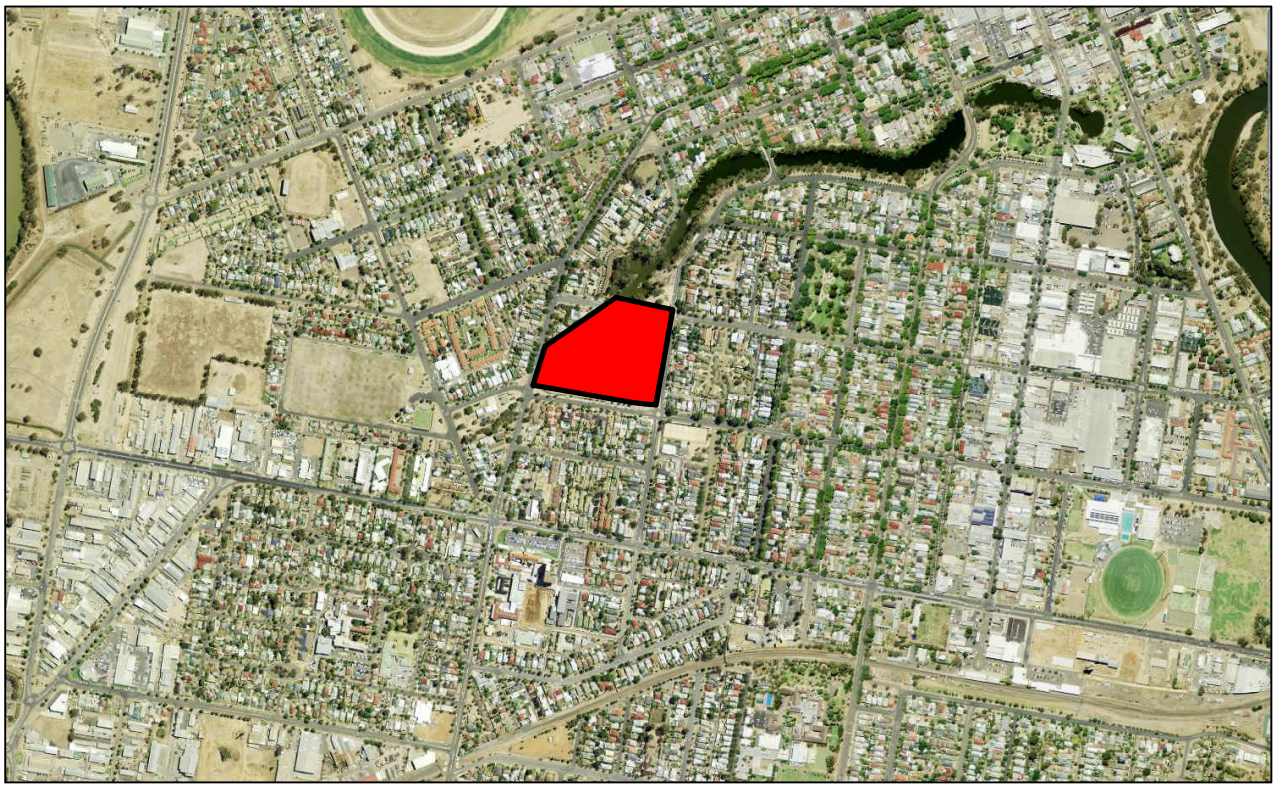
The site is generally surrounded by low and medium density housing with the Wagga Wagga Town Centre precinct 900m to the east of the site, with a commercial/industrial precinct located 900m to the south-west of the site.

Wagga Train Station is located to the south-east of the site and the site is surrounded by recreational sport fields and Collins Park to the east.

The site has road frontages to Forsyth Street to the north, Murray Street to the east, Morgan Street to the south and Docker Street to the west.

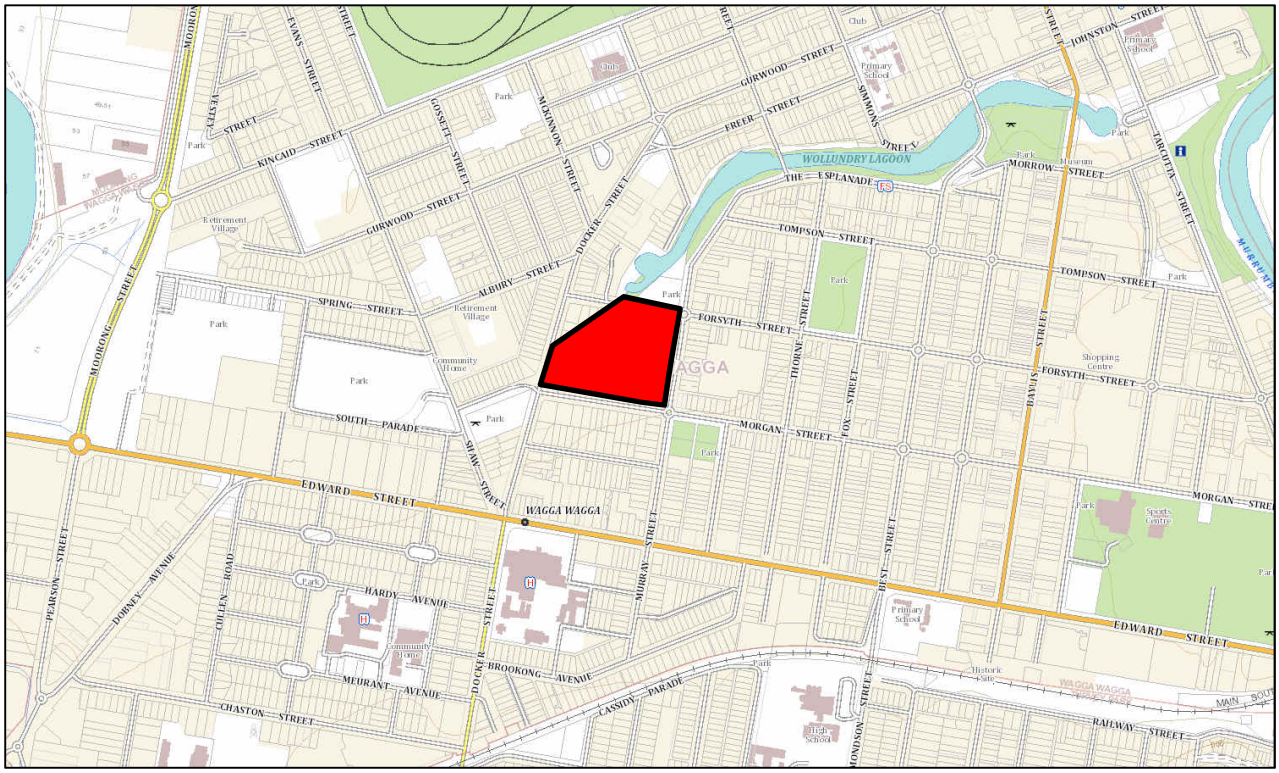
1.4 Site Context

The site location is shown on aerial imagery and a map in **Figure 1** & **Figure 2** respectively.



Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

2 EXISTING TRAFFIC AND PARKING CONDITIONS

2.1 Road Hierarchy

The public road network surrounding the site have the characteristics outlined in the following sub-sections.

2.1.1 Morgan Street

- Unclassified LOCAL Road;
- Approximately 12m wide carriageway facilitating one traffic flow lane in each direction and parking on both sides of the road;
- 50km/h speed restriction applies;
- Unrestricted kerbside parking permitted on both sides of the road.

2.1.2 Docker Street

- Unclassified LOCAL Road, functioning as a collector road;
- Approximately 19m wide carriageway facilitating two traffic flow lanes in each direction and parking on both sides of the road;
- Signposted 50km/h carriageway;
- Unrestricted kerbside parking permitted on both sides of the road.

2.1.3 Forsyth Street

- Unclassified LOCAL Road;
- Approximately 19m wide carriageway facilitating two traffic flow lanes in each direction and parking on both sides of the road;
- 50km/h speed restriction applies;
- Unrestricted kerbside parking permitted on both sides of the road.

2.1.4 Murray Street

- Unrestricted LOCAL Road;
- Approximately 18m wide carriageway facilitating one traffic flow lane in each direction and parking on both sides of the road;
- 50km/h speed restriction applies;
- Road shoulder on both sides of the road for kerbside parallel and angle parking and bicycle lane, no signposted parking restrictions apply beyond localised effects of roundabouts.

2.1.5 The Esplanade

- Unclassified LOCAL Road;
- Approximately 18m wide carriageway facilitating one traffic flow lane in each direction and parking on both sides of the road;
- 50km/h speed restriction applies;
- Road shoulder on both sides of the road for parking and bicycle lane, no signposted parking restrictions apply beyond localised effects of roundabouts.

2.1.6 Bolton Street

- Unrestricted LOCAL Road;
- Approximately 12m wide carriageway facilitating one traffic flow lane in each direction and parking on both sides of the road;
- 50km/h speed restriction applies;
- Unrestricted kerbside parking permitted on both sides of the road.

2.1.7 Existing Traffic Management

- Roundabout controlled intersection of Morgan Street / Murray Street;
- Roundabout controlled intersection of Murray Street / Forsyth Street / The Esplanade;
- Priority controlled intersection of Forsyth Street / Docker Street;
- Give Way controlled intersection of Docker Street / Bolton Street / Morgan Street.

2.2 Existing Traffic Environment

Intersection counts at relevant intersection surrounding the site were undertaken on Thursday 30/11/17, Saturday 02/12/17 and Tuesday 05/12/17 between the hours of 7 am to 9 am & 4 pm to 6 pm on weekdays and 10 am to 3 pm on the Saturday. The peak two-way traffic movements for the AM/PM/WE periods are shown below with the full turning movement counts reproduced in **Annexure B**. The results of the counts are summarised in **Table 2** and illustrated in **Figure 3**; the detailed survey sheets are provided in **Annexure B** for reference.

TABLE 2: EXISTING LOCAL TRAFFIC VOLUMES

Road	Weekday AM(1)	Weekday PM(1)	Weekend	Functional Road Classification
Murray Street South of Morgan	225	212	171	Local Road
Murray Street North of Forsyth	381	407	321	Collector
Forsyth Street East of Murray	431	511	480	Collector
Docker Street North of Forsyth	532	599	457	Collector / Sub-Arterial
Bolton Street	108	131	85	Access-Way
Docker Street South of Morgan	1249	1482	1229	Sub-Arterial
Morgan Street East of Murray	498	391	436	Collector
Total	**3424**	**3733**	**3179**	**-**

Notes:
(1) The volumes shown are those recorded on Thursday 30/11/17, as this was the busier of the two weekdays surveyed.

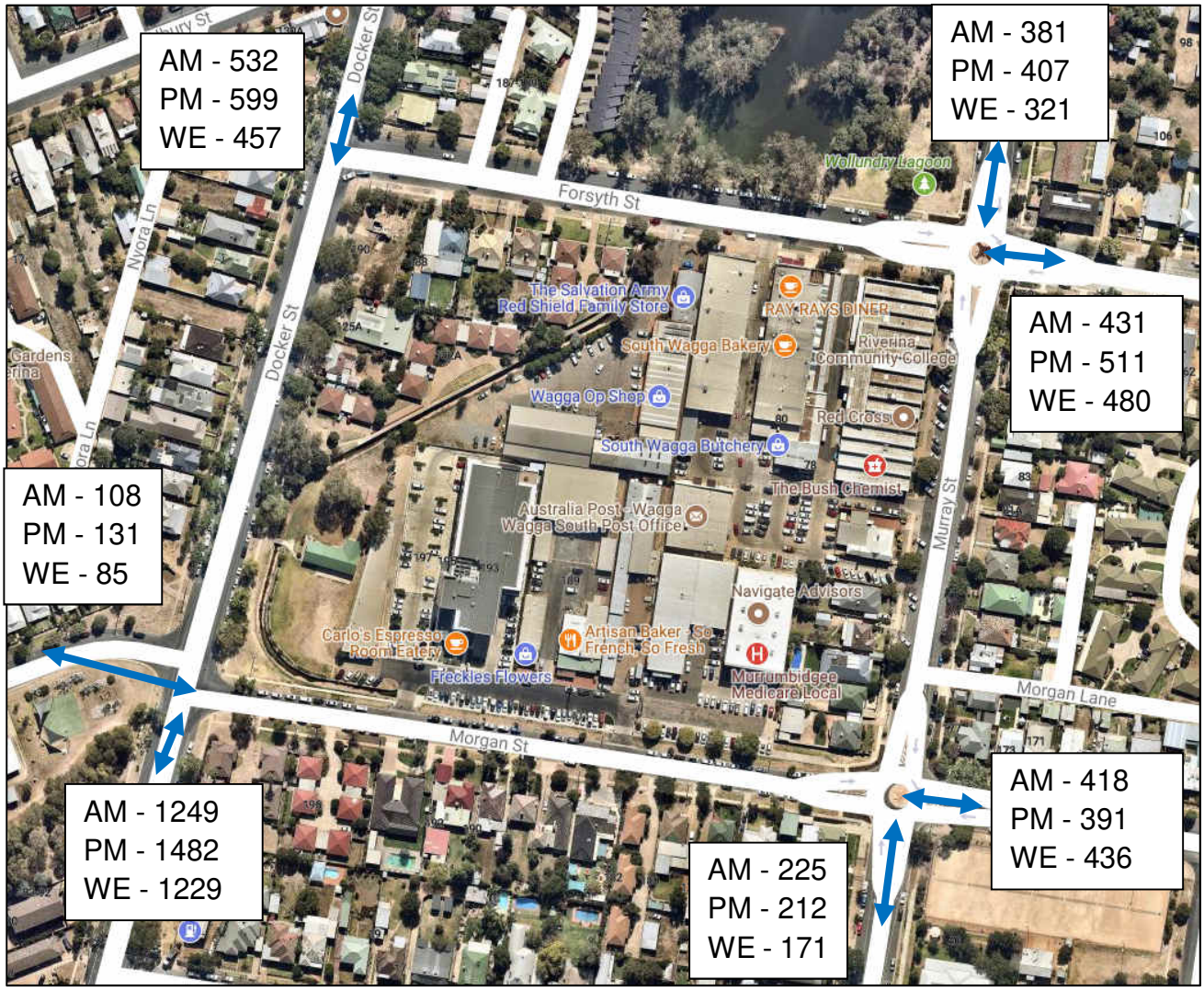


FIGURE 3: EXISTING TWO-WAY PEAK HOUR TRAFFIC FLOWS

2.2.1 Existing Intersection Performances

Existing intersection performances have been assessed using SIDRA INTERSECTION 8.0, the results of this analysis are summarised in **Table 3**. The detailed results of the SIDRA analysis are provided in **Annexure C** for reference.

Considering that the surveys demonstrate that Saturdays have noticeably less traffic than the weekday peaks, the data from Thursday 30/11/2017, the busier of the two weekdays surveyed, was used as the basis of the traffic analysis.

It is reasonable to assume that delays on weekend peaks will be lower than those reflected in **Table 3**.

TABLE 3: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 8.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3]	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
Docker Street / Morgan Street	AM	0.48	5.9 (Worst: >70)	**N/A** (Worst: F)	Give Way	RT from Bolton Street (W)	4.2 veh (29.5m) Docker Street (S)
	PM	0.75	9.3 (Worst >70)	**N/A** (Worst: F)		RT from Bolton Street (W)	2.3 veh (16.2m) Docker Street (S)
Docker Street / Forsyth Street	AM	0.46	3.9 (Worst: 16.6)	**N/A** (Worst: B)	Give Way	RT from Forsyth Street (E)	2.8 veh (19.6m) Docker Street (S)
	PM	0.31	3.2 (Worst: 14.1)	**N/A** (Worst: A)		RT from Forsyth Street (E)	0.4 veh (2.8m) Docker Street (S)
Murray Street / The Esplanade	AM	0.15	3.6 (Worst: 10.4)	**A** (Worst: A)	Roundabout	UT from The Esplanade (N)	0.7 veh (5.1m) Forsyth Street (W)
	PM	0.21	4.3 (Worst: 10.6)	**A** (Worst: A)		UT from Murray Street (S)	0.4 veh (2.7m) The Esplanade (N)
Murray Street / The Esplanade	AM	0.15	4 (Worst: 10.2)	**A** (Worst: A)	Roundabout	UT from Murray Street (S)	0.7 veh (4.8m) Morgan Street (W)
	PM	0.15	3.5 (Worst: 10.3)	**A** (Worst: A)		UT from The Esplanade (N)	0.3 veh (2m) Morgan Street (E)

NOTES:
(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

As shown, other than the intersection of Docker Street and Morgan Street, all intersections immediately surrounding the site are operating with a high level of efficiency. The intersection of Docker Street and Morgan Street experiences long delays on the Bolton Street approach, with the "through" and "right turn" movements both operating at a level of service of "F", which is indicative of a movement at capacity.

The RMS' *Guide to Traffic Generating Developments* provides a level of service criteria for intersections, as reproduced as **Figure 4**. As shown, for "Give Way" controlled intersections, where a Level of Service of "E" or worse is experienced, the intersection is at capacity and another control mode should be implemented. It is the responsibility of Wagga Wagga Council to upgrade this intersection as it is already at its operating capacity, however, some modelling has been undertaken in **Section 4** of this report to outline potential options for future upgrades.

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

FIGURE 4: RMS LEVEL OF SERVICE CRITERIA

2.3 Public Transport

The site is located approximately 350m walking distance from the Wagga Wagga Base Hospital bus stop which provides access to bus routes 961, 962 and 963 throughout the day at hourly intervals from 7:30 am to approximately 5 pm. This provides good connectivity to residential lands to the south and east of the site and through to the employment, retail and recreation lands within the town centre.

There is an additional bus stop approximately 500m walking distance to the west of the site, for bus routes 964 and 966, though servicing of this route is at 2-hour intervals. The context of the site with respect to public transport is shown in **Figure 5**.

2.4 Future Road and Infrastructure Upgrades

From Wagga Wagga Council development tracking website, Policies (DCP and LEP) and Integrated Transport Strategy 2040, there does not appear to be any proposed road or transport infrastructure upgrades or impacts which will affect the subject proposal.

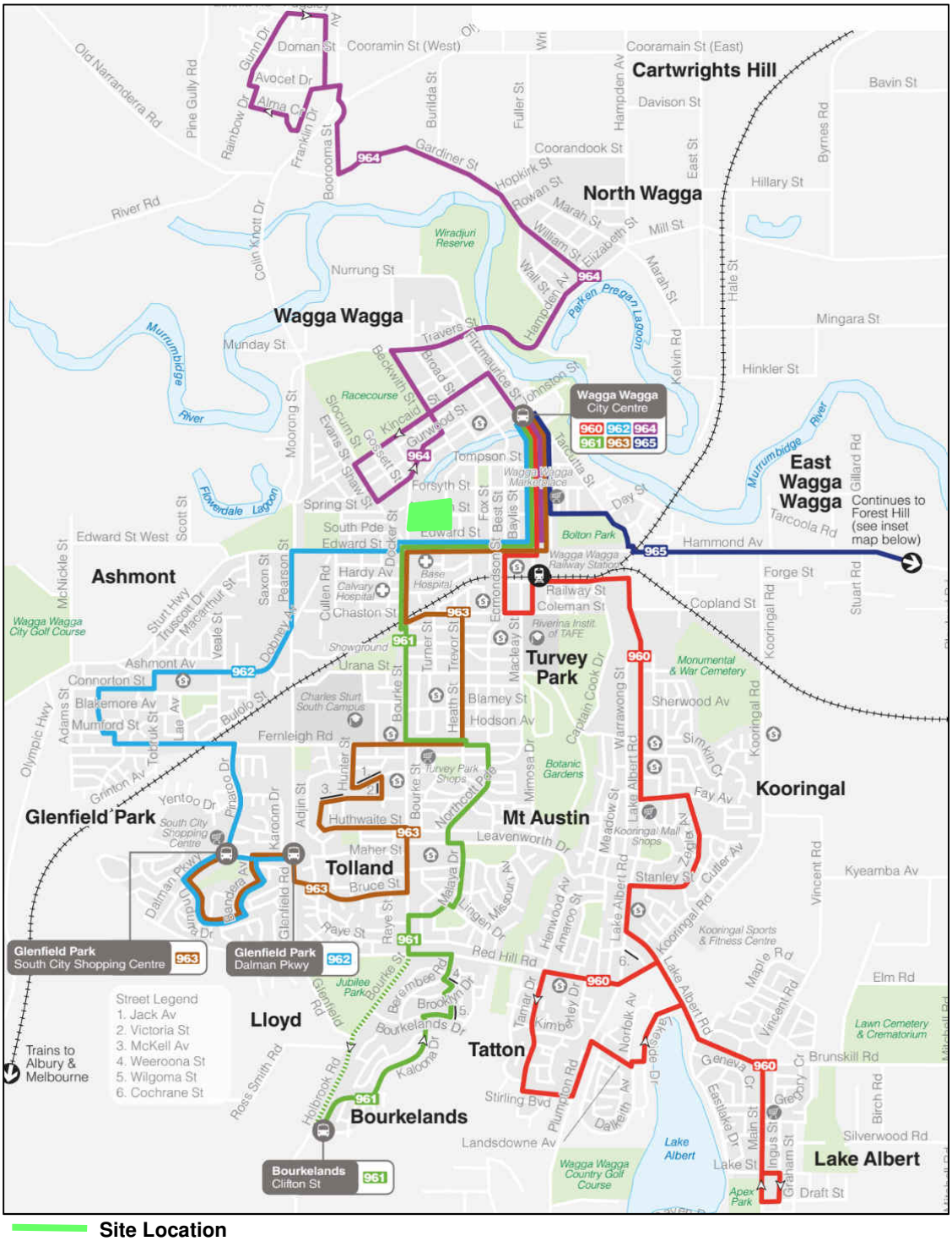


FIGURE 5: SITE CONTEXT - PUBLIC TRANSPORT

3 PARKING ASSESSMENT

The proposal will generate demand for parking by residents, visitors and staff. Estimation of the likely demand for parking at the site should be considered in conjunction with local planning policies, contextual effects such as regional location and individual land uses. For the purposes of the assessment, a comparison is made between the Wagga Wagga Development Control Plan 2010 (DCP), RMS' *Guide to Traffic Generating Developments*, as amended, and the most recently available census data.

3.1 Council Parking Requirement

3.1.1 DCP Extracts

Section 2.2 - Off-Street Parking of the Wagga Wagga Development Control Plan outlines a range of controls that need to be considered in terms of the design and implementation of off-street parking facilities to support developments within the Wagga Wagga Council. Key points are reproduced below, with the relevant parking requirements reproduced in **Figure 6**.

> *Explanatory Note: The minimum parking requirements are shown in Table 1 on page 2. The requirement(s) can be varied where adequate justification is provided and supported during assessment of the Development Application.*
>
> *C1 - Parking is to be provided in accordance with the table below. For uses not listed, similar land uses should be used as a guide in assessing car parking requirements.*
>
> *C2 – The design and layout of parking is to be in accordance with the relevant Australian Standard at the time of lodgement of an application*
>
> *C3 – Parking spaces are to be provided for disabled persons. Accessible parking spaces to comply with the relevant Australian Standards at time of lodgement of an application.*
>
> *C4 – For mixed use developments, the parking required is the total requirements for each use. Variations can be considered where it can be demonstrated that the peak demand for each land use component is staggered for that development as a whole generates less parking the separable parts.*
>
> *C5 – In the case of a redevelopment or change of use (other than in the B3 zone) the parking requirements are to be calculated by:*
> *a. Determining the parking requirement of the current or previous use in accordance with the table, then,*
> *b. Determining the parking requirement for the new land use, then*

c. Subtracting the existing requirement from the requirement proposed use to determine the number of spaces required (i.e. a credit is provided for any shortfall that exists on the site for the current use).

C9 – provide trees within the parking area at a rate of 1 per 5 spaces in a row. Each tree to have a minimum mature spread of 5m and to be located in a planting bed with a minimum width of 1.5m (between back of kerbs) and minimum area of 3.5sqm,

C10 – Planting beds located within a car park are to have a subsoil drainage system connected into the stormwater system of the site.

C11 – To ensure sightlines are maintained for drivers and pedestrians, trees used within or adjacent to car parking areas shall have a minimum clear trunk height of 2.5m, with shrubs and ground covers not to exceed 500mm in height.

Dwelling house, dual occupancy, attached dwellings, semi-detached dwellings	1 space/2 bedroom house 1 spaces/3 bedroom or larger house
Residential flat buildings	1 space/1 or 2 bedroom unit 2 spaces/3 bedroom or larger unit Visitor spaces – 1/5 units where there are more than 5 units
Business and office premises, public administration buildings	Within the Wagga Wagga city centre (B3 Zone) and mixed use areas (B4 Zone): 1 space/ 45m^2 GFA All other areas: 1 space/ 33m^2 GFA
Shops and retail (other than uses listed below)	Within the Wagga Wagga city centre (B3 Zone) and mixed use areas (B4 Zone): 1 space/ 45m^2 GFA
Health and professional consulting rooms, medical centres and veterinary hospitals	3 spaces/ surgery or health care professional practising at any one time plus 1 space/ receptionist/ support staff
Churches, places of worship/ assembly	1 space/ 4 seats or 1 space/ 10m^2 GFA whichever is greater

FIGURE 6: EXTRACTS FROM WAGGA WAGGA DCP CAR PARKING REQUIREMENTS TABLE

3.1.2 DCP Parking Requirement

The parking rates contained within the DCP are designed for isolated developments without direct consideration to daily usage periods, street parking and the like. It is reasonable to consider these in conjunction with the objectives of the DCP. In any case, the individual rates are calculated below in **Table 4**.

TABLE 4: DCP PARKING RATES

Land Use	Scale	Unit	Parking Rate	Parking Quantum
1-bed unit	38	units	1 per unit	38
2-bed unit	131	units	1 per unit	131
3-bed unit	19	units	2 per unit	38
Town House	13	units	2 per unit	26
Residential Visitor	188	units	0.2 per unit	38
Ground Floor Retail/Commercial	8,628	sqm	1 space/45sqm	192
Office (includes 5942sqm existing)	29,820	sqm	1 space/45sqm	663
Total Combined				**1126**

3.2 RMS Parking Rates

Parking studies have been carried out by RMS since the 1980s to determine the actual demand for parking per land use, in a variety of settings where applicable. Demand rates which are relevant to this site can be found within the *RMS Guide to Traffic Generating Developments 2002* and the subsequent amendments after 2013.

A summary of the relevant parking requirements from this RMS Guide is provided below, based off Table 5.14 of the RMS Guide.

Residential

Multi-dwelling housing
1 space/ 1-bedroom dwelling
1.5 spaces / 2-bedroom dwelling
2 spaces / 3 or more bedrooms or larger dwelling
Visitor Spaces – 1 per 4 dwellings where there are more than 4 dwellings (1 space required per 5-7 dwellings, 2 spaces per 9-11 dwellings, etc.)

High Density Residential Flat Buildings in Metropolitan sub-regional centres
0.6 spaces per 1-bedroom unit
0.9 spaces per 2-bedroom unit
1.40 spaces per 3-bedroom unit
+1 spaces per 5 units (visitor parking)

Office and Commercial

Commercial Premises
Unrestrained situation:
1 space per 40sqm GFA

Retail – Shopping Centres
For GLFA (sqm) of 0-10,000
6.1 spaces per 100sqm GLFA
For GLFA (sqm) of 10,000-20,000
5.6 spaces per 100sqm GLFA
For GLFA (sqm) of 20,000-30,000
4.3 spaces per 100sqm GLFA
For GLFA (sqm) over 30,000
4.1 spaces per 100sqm GLFA

Special Shops
45 spaces per 1000sqm GLFA

The parking rates contained within the RMS Guide are designed for isolated developments without direct consideration to daily usage periods, street parking and the like. It is reasonable to consider these in conjunction with the objectives of the local DCP. In any case, the individual rates are calculated below in **Table 5**.

TABLE 5: RMS PARKING RATES

Land Use	Scale	Unit	Parking Rate	Parking Quantum
1 bed unit	38	units	0.6 per unit	22.8
2-bed unit	131	units	0.9 per unit	117.9
3-bed unit	19	units	1.4 per unit	26.6
Town House	13	units	1 per dwelling	13
Residential Visitor	201	units	0.2 per unit	40.2
Ground Floor Retail/Commercial	8,628	sqm	45 spaces per 1000sqm	388.3
Office (includes 5942sqm existing)	29,820	sqm	1 per 40sqm	745.5
Total Combined				**1354.3**

3.3 Census Data

The 2011 Australian Census is the most recent study with publicly available data. The motor vehicle ownership rates for the LGA of Wagga Wagga were filtered to determine the following existing demand for residential occupier parking for multi-dwelling housing, medium density residential and other flat or semi-detached housing, with the results shown in **Table 6**.

TABLE 6: CENSUS PARKING RATES

Land Use	Scale	Unit	Dwelling Mix	Average Parking Demand	Parking Quantum
1 bed unit	38	Units	20%	0.58 per unit	22
2 bed unit	131	Units	70%	1.07 per unit	140
3 bed unit	19	Units	10%	1.49 per unit	28
4-bed townhouse	13	Units	N/A	2.15 per unit	28

3.4 Recommended Parking Rates for Land Use Planning

Based on previous experience by this firm and giving strong consideration to all the DCP, RMS and census data parking rates, actual usage of parking throughout the day, week and year can combine to provide a more accurate estimation of parking demand. This develops a more contextually accurate parking demand, reflecting the behaviour of people who might visit or live on the site, such as residents wanting to store a vehicle during the week even if they walk to work. In examining the behaviour of office staff, workers attend the premises on schedules which are focused around daylight hours and tend to be highest from 9 am to 5 pm though there is very little parking demand after that time.

The list of parking demand estimates below adheres to the objectives of the DCP and generally aligns with the rates as well, though with the key difference of recognising the variable usage of parking by visitors and staff throughout the day. Minor consideration has been given to multi-use trips where generally the food premises are ancillary to the other tenancies such that an office worker or resident going downstairs to a café does not need a second car space.

- 1 space per one/two-bedroom unit for residents;
- 1.5 spaces per three-bedroom unit for residents;
- 1 space per 5 residential units for visitors, outside of office hours (20% during office hours);
- 2 spaces per townhouse;
- 1 space per 45sqm office, during office hours (10% outside office hours);
- 1 space per 45sqm retail/business premises, during office hours (50% outside office hours).

The above parking rates when calculated against the indicative land use mix gives maximum estimated parking demand during the middle of the day of 1,085 spaces.

By providing parking spaces in line with the above rates, sufficient parking will be available for residents and commercial uses will be provided with sufficient parking, without allowing for excess parking which might encourage unnecessary private vehicle travel to and from the site where public transport options would otherwise be used.

A rule of thumb for carpark design efficiency is 1 parking space per 40sqm. The site covers some 38,000sqm and therefore the provision for parking will be readily achievable by an inclusion of a multilevel carpark and/or basement carparks. It appears there are 500 ground level car spaces plus the 450 in the multi-level above-ground carpark plus a basement for 375 residential tenant spaces, which satisfies the demand of 1,085 parking spaces at peak times.

3.5 Bicycle & Motorcycle Parking Requirements

The Wagga Wagga DCP does not require a specific rate of provision of bicycle facilities nor motorcycle parking. Any subsequent application could consider the demand for bicycle parking residential tenants, office staff and shop visitors.

3.6 Integration with Existing Parking Demands

The subject site is generally surrounded by low-density residential properties which rely on the existing on-street car parking for visitor parking and the parking of second or supplementary vehicles. Whilst the proposed development will include sufficient car parking to cater for each proposed use, it is typical that some visitors may choose to park on the streets in the surrounds of large mixed-use precincts, removing the car parking previously available to residents.

It is suggested that time restrictions could be established on Morgan Street, Murray Street, Docker Street and Forsyth Street and a parking permit system be established for existing low-density residential premises to ensure that car parking is available to residents at all times.

3.7 Car Parking Design Requirements

Car parking areas shall be designed in accordance with AS2890.1:2004 and AS2890.6:2009 where applicable. The notable design criteria of these two standards are as follows:

- Residential tenant and commercial staff car parking spaces (if staff spaces are separated from visitors) shall measure a minimum of 2.4m in width by 5.4m in length (Class 1A);
- Long stay visitor car parking spaces shall measure a minimum of 2.5m in width by 5.4m in length (Class 2);
- Short stay visitor car parking spaces shall measure a minimum of 2.6m in width by 5.4m in length (Class 3);
- Aisle widths shall be a minimum of 5.8m with consideration given to widening on high volume internal roads;
- A 1.0m aisle extension is required for blind aisles;
- An additional 300mm clearance on top of the base parking dimension is required to obstructions and walls;
- Disabled parking spaces shall measure 2.4m wide by 5.4m in length, with an adjacent shared zone of the same dimension;

- Headroom for passenger cars shall be minimum 2.2m in all locations, increasing to 2.5m above disabled parking spaces and shared zones.

Loading areas and bays shall be designed in accordance with AS2890.2:2002. Notably, the following design criteria should be met:

- Minimum Loading Bay Widths:
    - SRV – 6.4m x 3.5m;
    - MRV – 8.8m x 3.5m;
    - HRV – 12.5m x 3.5m;
    - AV – 19m x 3.5;
    - The above are minimum widths.
- Loading Area Grade:
    - No greater than 4% in any direction.
- Access Ramps to Loading Area:
    - SRV – Maximum grade of 15.4% with grade changes of 8.3% over 4m;
    - MRV & HRV – Maximum grade of 15.4% with grade changes of 6.25% over 7m;
    - AV – Maximum grade of 15.4% with grade changes of 6.25% over 10m.
- Headroom Requirements:
    - SRV – 3.5m above loading and all areas within the vehicular path of travel;
    - MRV, HRV & AV – 4.5m above loading and all areas within the vehicular path of travel.

4 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections. For this assessment, it is proposed to utilise surveys of similar sites conducted by RMS and where possible utilise regional contextual values to be sufficiently similar to the subject site location within Wagga Wagga.

4.1 RMS Traffic Generation Rates

Reference is made to the RMS Guide to Traffic Generating Developments and the RMS *Technical Direction 2013/04a* published in August 2013. The RMS Guide provides guidance on traffic generation rates for various land use developments and other matters relating to traffic and parking.

The Technical Direction provides updated traffic generation rates that replace some sections of the RMS Guide. Most notable is the updated trip generation for high-density residential flat buildings.

The traffic generation rates for each development type are as follows:

Medium Density Residential Flat Buildings

Smaller units and flats (up to two bedrooms):
Weekday peak hour vehicle trips = 0.4-0.5 per dwelling.

Larger units and townhouses (three or more bedrooms):
Weekday peak hour vehicle trips = 0.5-0.65 per dwelling.

High Density Residential Flat Buildings (Regional)
Morning peak hour = 0.53 trips per dwelling
Evening peak hour = 0.35 trips per dwelling

Office Blocks (Regional)
Morning peak hour vehicle trips = 0.99 per 100sqm
Evening peak hour vehicle trips = 0.96 per 100 sqm gross floor area.

Shopping Centres
Thursday peak hour generation = 12.3 per 100sqm GFA

Speciality Shops
Evening peak hour = 5.6 per 100sqm GFA

4.2 Existing Traffic Generation

The site currently generates traffic according to scale and land use and has not been discounted from the background traffic surveys. For the purposes of comparing existing traffic to future traffic volumes, without double counting trips, the existing traffic will be expected to generate traffic according to the following scale:

- 1,200sqm medical;
- 850sqm shops;
- 6,150sqm industrial;
- 4,870sqm office;
- 5,942sqm Enixus office building;
- Assume only 75% site occupancy during survey;
- Assume weekend traffic 30% of weekday;
- Assume traffic is distributed equally to the future estimates.

The existing traffic, distributed between seven (7) driveways, is estimated to be 157 two-way peak hour trips in the AM and PM peak hours with 53 trips on weekends. While the current rates are very likely to be higher than these, that is indeed the intention of the conservative rates and is soundly based in traffic engineering practice in the assessment of development traffic impacts. Consideration could be given to the full development potential of the site without the planning proposal, which would be even higher than the current traffic volume, though that has not been conducted in this case.

4.3 Proposed Traffic Generation

The RMS estimated traffic generation for the subject site, excluding any discounts for multi-use trips is produced in **Table 7** below.

TABLE 7: RMS TRAFFIC GENERATION RATES

Land Use	Scale	Unit	AM/PM Generation Rate	Trips AM IN/OUT	Trips PM IN/OUT
High Density Residential	188	Units	0.53/0.32 per unit	19/80	48/12
Townhouse	13	Dwellings	0.6/0.6 per dwelling	6/2	6/2
Ground Floor Retail/Commercial	8,628	Ground Floor Retail/Commercial	5.6 per 100sqm	241/241	241/241
Office (includes 5942sqm existing)	29,820	Office (includes 5942sqm existing)	0.99/0.96 per 100sqm	265/30	29/257
Total				**531/353**	**324/512**
Total Combined				**884**	**836**

The subject proposal would generate 884 (531 IN/353 OUT) peak hour trips in the AM peak and 836 (324 IN/512 OUT) peak hour trips in the PM peak hour. Weekend traffic would be approximately half of this volume or less, recognising the high weekday contribution by the office land uses which do not generate on weekends.

4.4 Traffic Assignment

The internal design, local road network and regional residential locations have been considered regarding assigning future traffic onto the road network. For this assessment the following internal and local network assignment will be used:

Driveways

- Morgan Street - 50% IN and 50% OUT
- Murray Street – 25% IN and 25% OUT
- Forsyth Street – 25% IN and 25% OUT

Local Road Network

- South West – 35%
- South East – 35%
- North East - 20%
- North West – 10%

The resulting traffic distribution from the estimated traffic generation and the above traffic assignment is illustrated in **Figure 7**.

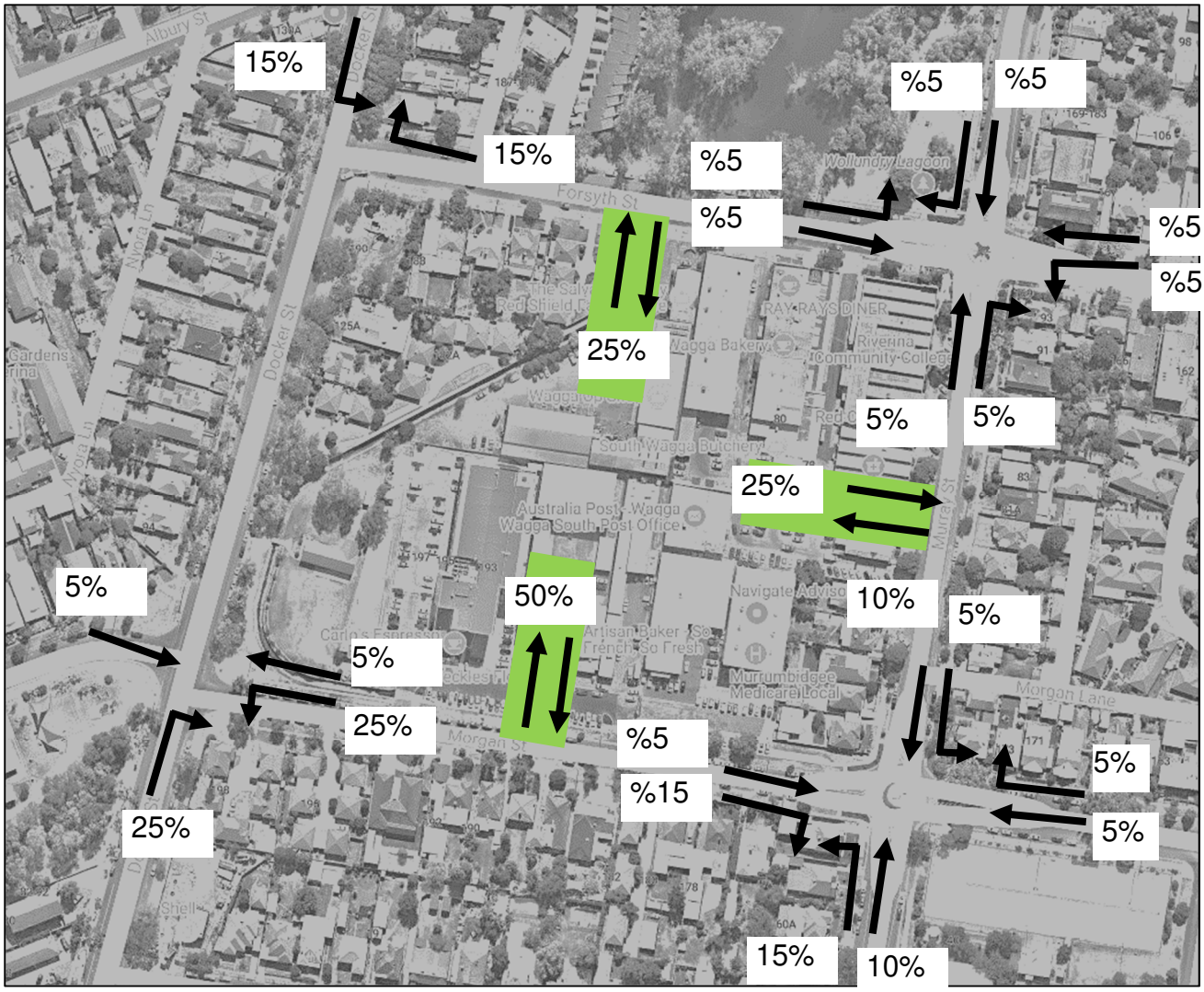


FIGURE 7: NEW TRIP ASSIGNMENT RATIO

4.5 Intersection Performance Post Development

The traffic generation outlined above, minus existing site traffic, has been added to the existing traffic volumes recorded. SIDRA INTERSECTION 8.0 was used to assess the intersections' performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 8**. The detailed SIDRA results are provided in **Annexure D** for reference.

TABLE 8: FUTURE INTERSECTION PERFORMANCES (SIDRA INTERSECTION 7.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3]	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
Docker Street / Morgan Street	AM	0.48	5.9 (Worst: >70)	**N/A** (Worst: F)	Give Way	RT from Bolton Street (W)	4.2 veh (29.5m) Docker Street (S)
	PM	0.75	9.3 (Worst >70)	**N/A** (Worst: F)		RT from Bolton Street (W)	2.3 veh (16.2m) Docker Street (S)
Docker Street / Forsyth Street	AM	0.46	3.9 (Worst: 16.6)	**N/A** (Worst: B)	Give Way	RT from Forsyth Street (E)	2.8 veh (19.6m) Docker Street (S)
	PM	0.31	3.2 (Worst: 14.1)	**N/A** (Worst: A)		RT from Forsyth Street (E)	0.4 veh (2.8m) Docker Street (S)
Murray Street / The Esplanade	AM	0.15	3.6 (Worst: 10.4)	**A** (Worst: A)	Roundabout	UT from The Esplanade (N)	0.7 veh (5.1m) Forsyth Street (W)
	PM	0.21	4.3 (Worst: 10.6)	**A** (Worst: A)		UT from Murray Street (S)	0.4 veh (2.7m) The Esplanade (N)
Murray Street / The Esplanade	AM	0.15	4 (Worst: 10.2)	**A** (Worst: A)	Roundabout	UT from Murray Street (S)	0.7 veh (4.8m) Morgan Street (W)
	PM	0.15	3.5 (Worst: 10.3)	**A** (Worst: A)		UT from The Esplanade (N)	0.3 veh (2m) Morgan Street (E)
FUTURE PERFORMANCE							
Docker Street / Morgan Street	AM	0.98	14.9 (Worst: >70)	**N/A** (Worst: F)	Give Way	RT from Bolton Street (W)	7.2 veh (50.9m) Docker Street (S)
	PM	1.27	18.7 (Worst: >70)	**N/A** (Worst: F)		RT from Bolton Street (W)	3.2 veh (22.5m) Bolton Street (W)
Docker Street / Forsyth Street	AM	0.50	4.9 (Worst: 19.3)	**N/A** (Worst: B)	Give Way	RT from Forsyth Street (E)	3.2 veh (22.5m) Docker Street (S)
	PM	0.34	4.1 (Worst: 17.1)	**N/A** (Worst: B)		RT from Forsyth Street (E)	0.6 veh (4m) Forsyth Street (E)
Murray Street / The Esplanade	AM	0.17	3.8 (Worst: 10.5)	**A** (Worst: A)	Roundabout	UT from The Esplanade (N)	0.8 veh (5.7m) Forsyth Street (W)
	PM	0.23	4.3 (Worst: 10.7)	**A** (Worst: A)		UT from Murray Street (S)	0.4 veh (3m) The Esplanade (N)
Murray Street / The Esplanade	AM	0.20	4.4 (Worst: 10.5)	**A** (Worst: A)	Roundabout	UT from Morgan Street (W)	1 veh (6.9m) Morgan Street (W)
	PM	0.22	4.2 (Worst: 10.6)	**A** (Worst: A)		UT from The Esplanade (N)	0.4 veh (3m) Morgan Street (E)

NOTES:
(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

4.6 Traffic Impact

As shown in **Table 8**, the surrounding intersections remain generally unaltered under the future scenario. Other than at the Morgan Street/Docker Street intersection, the east approach of which is already at capacity, all intersections will continue to operate with a high level of efficiency and short delays. Possible options for the upgrade of the Morgan Street/Docker Street intersection are discussed in **Section 4.7**.

The site is surrounded by residential lands and a grid-based road network, presenting a clear hierarchy of access roads, collector roads and regional roads. The functional class of the roads surrounding the site will not change as a result of the proposal. It is noted that Murray Street, south of Morgan Street, currently experiences approximately 200-220 trips in the peak hour (local street). While this would likely increase to 310 peak hour trips and that would exceed the RMS Guide threshold of 300 trips for a local street, it is not anticipated to significantly affect the amenity of residents due to the existing nature and volume of through trips and the proximity to the State Road of Edward Street.

The proposed increase in permissible gross floor area will generate additional traffic which can be readily and reasonably absorbed by the local traffic network. The estimated traffic impact is supported on grounds of road congestion and traffic impact. It would be expected that any Development Application for the site would be accompanied by a more detailed traffic generation estimate once designs and land uses are refined.

4.7 Suggested Docker Street/Morgan Street Intersection Treatment

Whilst it is emphasised that the intersection of Docker Street and Morgan Street is already at capacity and that it is, therefore, the responsibility of Wagga Wagga Council to upgrade it, some modelling has been undertaken for two possible intersection improvements. The two intersection treatments modelled are illustrated in **Figure 8**.

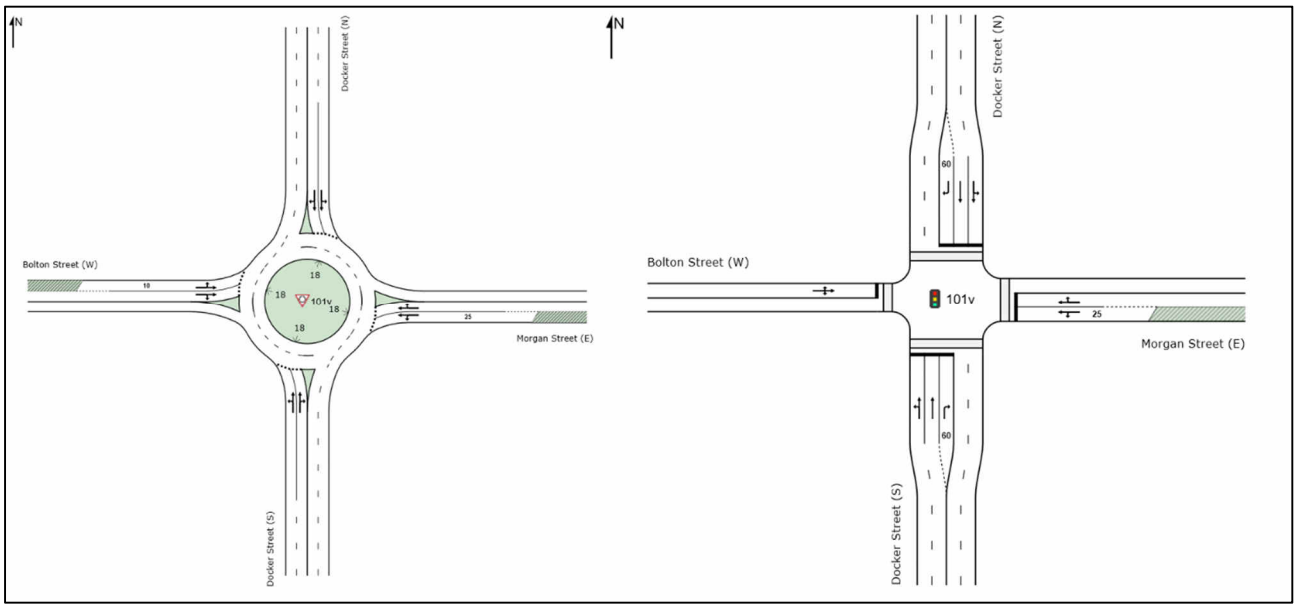


FIGURE 8: POSSIBLE INTERSECTION UPGRADES – DOCKER ST/MORGAN ST

The results of the SIDRA analysis of each of these intersection treatments are summarised in **Table 9**. Similar to the previous traffic analysis, the volumes used are those for Thursday 30/11/17, plus the traffic volumes associated with the planning proposal.

TABLE 9: INTERSECTION PERFORMANCES
DOCKER ST/MORGAN ST CONCEPTS

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3]	Control Type	Worst Movement	95th Percentile Queue
Docker Street / Bolton Street	AM	0.30	5 (Worst: 10.8)	**A** (Worst: A)	**Roundabout**	RT from Morgan Street (E)	1.9 veh (13.3m) Docker Street (S)
	PM	0.35	5.3 (Worst: 12.8)	**A** (Worst: A)		RT from Morgan Street (E)	1.9 veh (13.4m) Morgan Street (E)
Docker Street / Bolton Street	AM	0.54	14.1	**A**	**Signals**	LT from Bolton Street (W)	7.2 veh (50.9m) Docker Street (S)
	PM	0.66	15.7	**B**		LT from Bolton Street (W)	9.8 veh (68.9m) Morgan Street (E)

NOTES:
(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

As shown, either option would provide for a high level of operational efficiency, reflecting a Level of Service of "A". For the purposes of maintaining the lowest delays, it is recommended that a roundabout be built at the Morgan Street/Docker Street intersection.

4.8 Carriageway Capacity and Residential Amenity

The *Roads and Maritime Services'* Guide to Traffic Generating Developments provides guidelines for the environmental capacity of *new* residential streets, as shown in the extract provided as **Figure 9**.

The existing and two-way traffic volumes along each of the roads in the surrounds of the site are summarised in
Table 10. As shown, each of the roads surrounding the site exceeds the suggested volumes for local roads, with each road other than Murray Street also exceeding the recommended maximum volume for a collector road. It is evident then that residential amenity is already compromised along each of these streets and that any increase in traffic would not cause any detriment in this respect.

Table 4.6
Environmental capacity performance standards on residential streets

Road class	Road type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)
Local	Access way	25	100
	Street	40	200 environmental goal
			300 maximum
Collector	Street	50	300 environmental goal
			500 maximum

Note: Maximum speed relates to the appropriate design maximum speeds in new residential developments. In existing areas maximum speed relates to 85th percentile speed.

FIGURE 9: RMS ENVIRONMENTAL CAPACITY GUIDES

TABLE 10: EXISTING TWO-WAY TRAFFIC VOLUMES

Road	Peak Period	Existing Volume (LoS)		
		Tuesday	Thursday	Saturday
Morgan Street	AM	532	435	439
	PM	389	487	391
Forsyth Street	AM	514	556	645
	PM	681	665	547
Docker Street	AM	866	929	905
	PM	1016	1130	808
Murray Street	AM	443	385	384
	PM	282	390	305

5 CONCLUSIONS

The traffic and parking impacts of the Planning Proposal (Mixed Use) at Morgan Street, Wagga Wagga, as shown in reduced plans in **Annexure A** to this report, have been assessed.

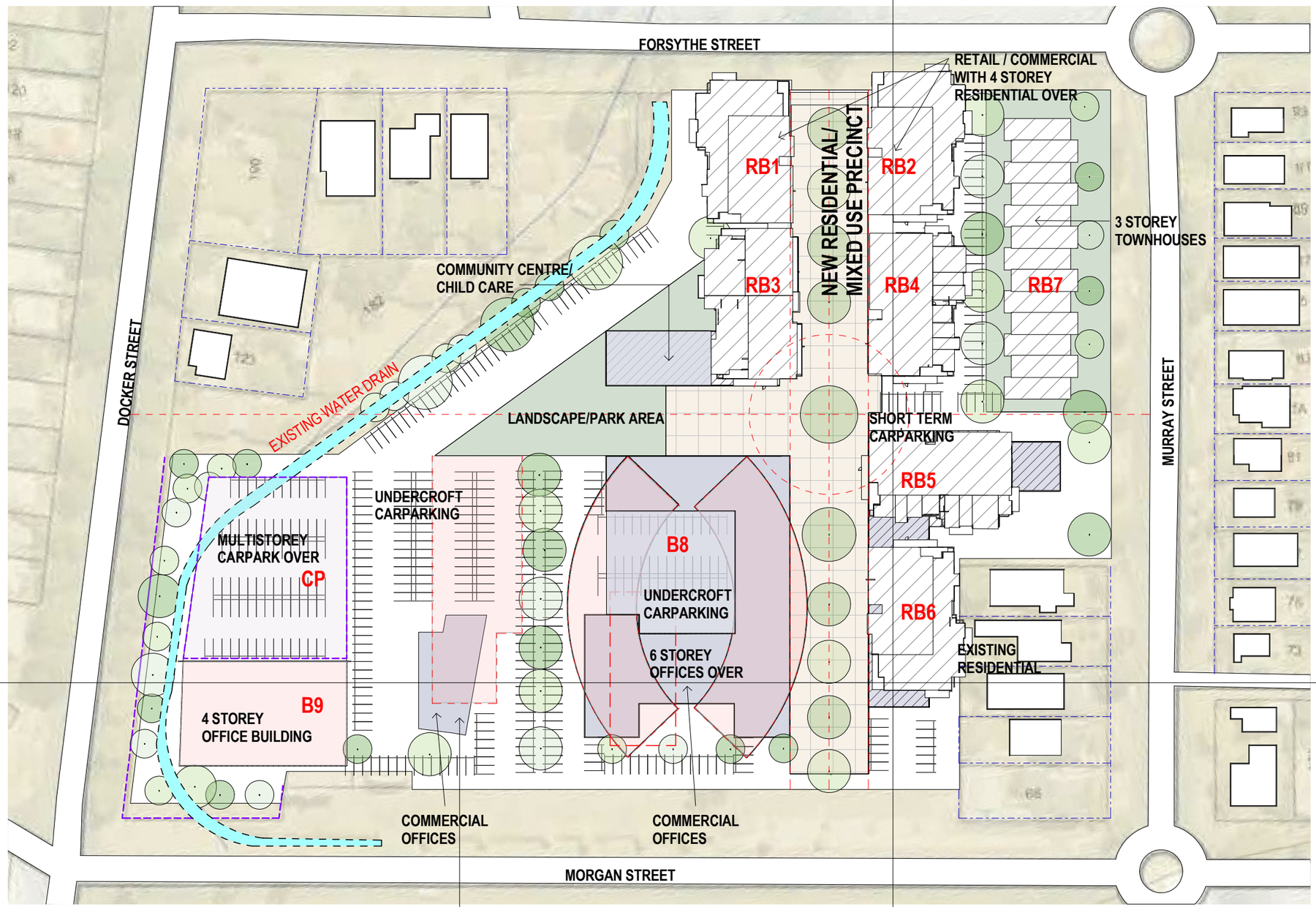
The proposal includes a minor zoning type change , an increase in the permissible height and the removal of the FSR limit. The ultimate development would most likely consist of a mix of residential, commercial and retail uses in a combined arrangement. For the purposes of assessment, it has been assumed that an FSR of 1:1.96 can be achieved amongst a variety of land uses.

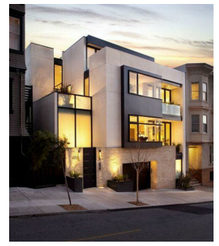
The proposal is anticipated to generate demand for some 1,083 parking spaces for tenants, staff and visitors to the site at peak times which would be weekdays during office hours. Any future application should consider the parking demand rates provided herein which meet the controls of the DCP while following a shared parking arrangement for visitors to the site. The site can provide parking to meet the demand for the chosen land uses. The site can accommodate the required parking supply and is supported for the planning proposal.

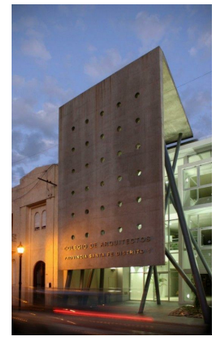
The traffic generation for the proposal has been estimated to be in the order of 884 trips in the AM and 836 trips in the PM weekday commuter peak hours. The new trips will minorly increase delays at key intersections and will retain intersection performance generally. It is not considered that the proposal would generate sufficient traffic to warrant traffic management on the local road system beyond the driveways of the site. Any changes to future proposed land uses may affect the demand for traffic management treatments and should be assessed at the development application stage if applicable. The site and local road network can accommodate the anticipated traffic generation impacts and the traffic impacts of the planning proposal are supported.

In view of the foregoing, the traffic and parking impacts of the mixed-use planning proposal are fully supported.

ANNEXURE A: INDICATIVE MASTERPLAN LAYOUT







N

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CLIENT
DAMASA

PROJECT
PROJECT NAME
MORGAN ST / MURRAY ST / FORSYTHE ST PRECINCT MASTERPLAN

DRAWING TITLE
CONCEPT MASTERPLAN

N:\2760 - Damasa - MUD - Masterplan\WORKING\#01-SKETCH\2760_Damasa_MUD_Masterplan_V16_RECONCILED.rvt

REV	DATE	AMENDMENT	INITIALS	CHECK
1	2017-05-10	FOR INFORMATION	DT	
2	2017-05-17	FOR INFORMATION	DT	
3	2018-03-12	FOR INFORMATION	DT	

PROJECT NO.	DRAWING NO.	REVISION
2760	1	3

SCALE	1 : 1250 @ A1
DRAWN	G. OLLERTON
PROJECT PRINCIPLE	G. OLLERTON
DATE	17.09.2013

Morrison Design Partnership
ARCHITECTS
Since 1969

	Storeys (above ground level)	No Units	Sqm
Residential Towers			
RB1	6	31	4563
RB2	5	24	3730
RB3	7	42	5844
RB4	6	32	4714
RB5	6	32	4714
RB6	5	27	3730
Subtotal		188	27295
Residential Town Houses			
TH1	3		276
TH2	3		276
TH3	3		276
TH4	3		276
TH5	3		276
TH6	3		276
TH7	3		276
TH8	3		276
TH9	3		276
TH10	3		276
TH11	3		276
TH12	3		276
TH13	3		276
Subtotal		0	3588
Office Buildings			
Building 8	8		18532
Building 9	4		5346
Subtotal			23878
Ground Floor Retail / Commercial Spaces			
Building 1 & 3	1		2311
Building 2 & 4	1		1827
Building 5 & 6	1		1730
Building 8	1		2760
Subtotal			8628
Enixus (Existing)			
Level 3			1685
Level 2			1915
Level 1			1915
Ground Level			427
Subtotal			5942
Total GFA			69331
Total Site Area			35432
FSR		1:	1.96

ANNEXURE B: TRAFFIC SURVEY RESULTS

(12 SHEETS)

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Murray St and Morgan St, Wagga Wagga

Date:	Tue 05/12/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	Murray St
East:	Morgan St
South:	Murray St
West:	Morgan St

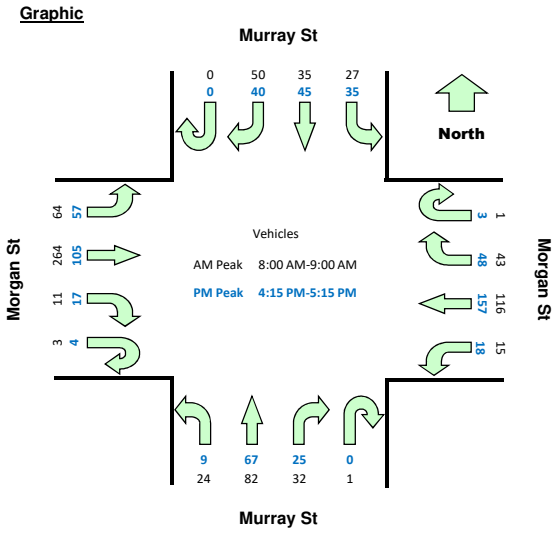
Survey Start	AM:	7:00	PM:	16:00
Vehicular Peakhour		**Pedestrians Peakhour**		
AM:	8:00 AM-9:00 AM	AM:	N/A	
PM:	4:15 PM-5:15 PM	PM:	N/A	

All Vehicles

Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan 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**
7:00	7:15	0	4	7	1	0	3	13	4	0	2	5	1	0	2	12	2	385	
7:15	7:30	0	4	4	1	0	6	17	0	0	3	4	2	0	1	39	1	494	
7:30	7:45	0	8	7	4	0	4	24	1	0	2	5	7	1	2	33	9	592	
7:45	8:00	0	6	7	2	0	4	25	1	0	1	12	8	1	1	61	11	685	
8:00	8:15	0	8	9	5	1	8	32	0	1	6	15	3	0	6	63	8	768	Peak
8:15	8:30	0	13	8	5	0	8	20	4	0	12	19	3	0	2	76	10		
8:30	8:45	0	14	7	8	0	13	29	5	0	6	23	11	1	2	61	20		
8:45	9:00	0	15	11	9	0	14	35	6	0	8	25	7	2	1	64	26		
16:00	16:15	0	16	10	6	0	14	38	1	0	3	18	1	1	3	31	14	624	
16:15	16:30	0	13	7	7	0	11	43	3	0	7	21	5	0	5	32	16	630	Peak
16:30	16:45	0	8	15	10	1	15	36	6	0	5	12	1	1	3	20	11	617	
16:45	17:00	0	11	8	6	1	11	37	2	0	7	20	2	1	6	30	12	598	
17:00	17:15	0	8	15	12	1	11	41	7	0	6	14	1	2	3	23	18	568	
17:15	17:30	0	13	8	5	1	14	44	8	0	4	18	1	0	2	24	15		
17:30	17:45	0	9	13	4	1	6	40	4	0	2	8	2	0	1	30	5		
17:45	18:00	0	3	9	8	1	5	42	5	0	4	9	2	0	2	32	2		

Peak Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:00	9:00	0	50	35	27	1	43	116	15	1	32	82	24	3	11	264	64	768
16:15	17:15	0	40	45	35	3	48	157	18	0	25	67	9	4	17	105	57	630

Graphic



Light Vehicles

Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	4	7	1	0	3	13	4	0	2	5	1	0	1	12	2
7:15	7:30	0	4	4	1	0	6	17	0	0	3	4	2	0	1	38	0
7:30	7:45	0	7	6	3	0	4	23	1	0	2	5	6	1	2	33	8
7:45	8:00	0	6	7	2	0	4	25	1	0	1	12	8	1	1	60	10
8:00	8:15	0	8	9	5	1	8	32	0	1	6	14	3	0	6	61	8
8:15	8:30	0	11	8	5	0	7	20	4	0	12	19	3	0	2	75	10
8:30	8:45	0	14	7	8	0	13	29	5	0	6	23	10	1	2	61	20
8:45	9:00	0	14	11	9	0	14	33	6	0	8	25	7	2	1	64	26
16:00	16:15	0	16	9	6	0	14	38	1	0	3	18	1	1	1	31	14
16:15	16:30	0	13	7	7	0	11	43	3	0	7	21	4	0	5	31	16
16:30	16:45	0	8	15	10	1	15	36	6	0	5	12	1	1	3	20	11
16:45	17:00	0	11	8	6	0	11	36	2	0	7	20	2	1	5	30	12
17:00	17:15	0	8	15	12	1	11	41	7	0	6	14	1	2	3	23	18
17:15	17:30	0	13	8	5	1	14	43	8	0	4	17	1	0	2	24	15
17:30	17:45	0	9	13	4	1	6	40	4	0	2	8	2	0	1	30	5
17:45	18:00	0	3	9	8	1	4	42	5	0	4	9	2	0	2	31	2

Heavy Vehicles

Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
7:15	7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:30	7:45	0	1	1	1	0	0	1	0	0	0	0	1	0	0	0	1
7:45	8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
8:00	8:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
8:15	8:30	0	2	0	0	0	1	0	0	0	0	0	0	0	0	1	0
8:30	8:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:45	9:00	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0
16:00	16:15	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0
16:15	16:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
16:30	16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0
17:00	17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Murray St and Morgan St, Wagga Wagga

Date:	Thu 30/11/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	Murray St
East:	Morgan St
South:	Murray St
West:	Morgan St

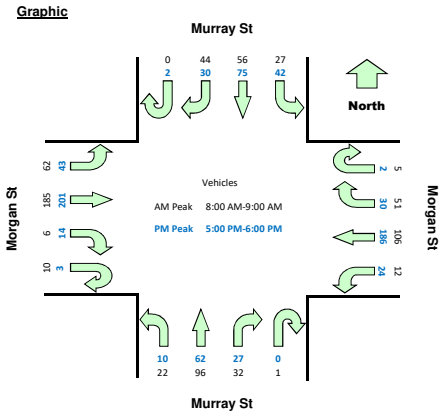
Survey Start	AM:	7:00	PM:	17:00
Vehicular Peakhour		**Pedestrians Peakhour**		
AM:	8:00 AM-9:00 AM	AM:	N/A	
PM:	5:00 PM-6:00 PM	PM:	N/A	

All Vehicles

Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan 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**
7:00	7:15	0	5	4	4	0	2	8	2	0	1	4	2	0	1	16	4	323	
7:15	7:30	0	4	8	3	0	4	14	2	0	0	6	1	0	0	23	2	410	
7:30	7:45	0	11	7	0	0	9	14	2	0	3	12	3	0	2	20	6	511	
7:45	8:00	0	5	12	1	0	10	28	4	0	3	7	2	1	1	34	6	612	
8:00	8:15	0	10	8	4	0	13	28	1	0	2	15	2	2	2	42	11	715	Peak
8:15	8:30	0	6	15	7	2	8	25	3	1	7	29	9	1	3	34	18		
8:30	8:45	0	10	18	10	0	12	25	6	0	13	18	6	0	0	55	17		
8:45	9:00	0	18	15	6	3	18	28	2	0	10	34	5	7	1	54	16		
17:00	17:15	2	12	19	10	0	11	40	9	0	7	21	3	0	5	63	21	751	Peak
17:15	17:30	0	5	19	14	1	8	57	5	0	5	12	2	1	7	52	11	652	
17:30	17:45	0	9	23	10	1	8	51	6	0	8	12	4	1	0	41	8	554	
17:45	18:00	0	4	14	8	0	3	38	4	0	7	17	1	1	2	45	3	469	
18:00	18:15	0	1	9	11	0	5	34	5	0	5	11	2	0	0	38	3	409	
18:15	18:30	1	0	6	5	0	3	38	3	0	6	8	1	0	1	29	0	350	
18:30	18:45	1	1	4	3	0	1	34	2	0	5	10	1	1	0	30	4	329	
18:45	19:00	0	2	8	0	0	1	25	3	0	3	7	1	0	2	34	1	296	
19:00	19:15	0	3	7	1	0	3	26	3	0	1	4	1	0	0	16	0	277	
19:15	19:30	0	3	4	0	1	1	28	3	0	2	6	1	0	1	29	1	263	
19:30	19:45	0	2	6	2	1	3	20	3	0	4	6	0	0	0	14	3	240	
19:45	20:00	0	4	4	2	0	3	22	5	0	3	4	2	0	1	16	2	232	
20:00	20:15	0	2	5	1	0	1	23	2	0	1	5	1	0	0	9	1	203	
20:15	20:30	0	1	5	1	1	0	26	2	0	4	3	0	0	0	13	1		
20:30	20:45	0	1	1	2	1	1	25	2	0	1	9	0	0	0	13	0		
20:45	21:00	0	0	7	0	0	0	18	1	0	1	3	0	0	0	9	0		

Peak Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:00	9:00	0	44	56	27	5	51	106	12	1	32	96	22	10	6	185	62	715
17:00	18:00	2	30	75	42	2	30	186	24	0	27	62	10	3	14	201	43	751

Graphic



Light Vehicles

Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	5	4	4	0	2	7	1	0	1	3	2	0	1	16	4
7:15	7:30	0	4	7	3	0	4	14	2	0	0	6	1	0	0	22	2
7:30	7:45	0	11	6	0	0	9	14	2	0	3	11	3	0	1	18	6
7:45	8:00	0	5	12	1	0	10	27	4	0	3	7	2	1	1	32	6
8:00	8:15	0	8	7	3	0	11	26	1	0	2	15	1	2	1	42	11
8:15	8:30	0	6	15	7	2	8	24	3	1	7	28	9	1	3	34	18
8:30	8:45	0	10	18	10	0	12	25	6	0	13	18	5	0	0	55	17
8:45	9:00	0	18	15	6	3	18	28	2	0	10	34	5	7	1	54	16
17:00	17:15	2	12	19	10	0	11	40	8	0	7	21	3	0	5	63	21
17:15	17:30	0	5	19	14	1	8	56	5	0	5	12	2	1	7	52	11
17:30	17:45	0	9	23	10	1	8	51	6	0	8	12	4	1	0	41	8
17:45	18:00	0	4	14	8	0	3	37	4	0	7	17	1	1	2	45	3
18:00	18:15	0	1	9	11	0	5	34	5	0	5	10	2	0	0	38	3
18:15	18:30	1	0	6	5	0	3	38	3	0	6	8	1	0	1	29	0
18:30	18:45	1	1	4	3	0	1	34	2	0	5	10	1	1	0	30	4
18:45	19:00	0	2	8	0	0	1	25	3	0	3	7	1	0	2	34	1
19:00	19:15	0	3	7	1	0	3	25	3	0	1	4	1	0	0	16	0
19:15	19:30	0	3	4	0	1	1	28	3	0	2	6	1	0	1	29	1
19:30	19:45	0	2	5	2	1	3	20	3	0	4	6	0	0	0	14	3
19:45	20:00	0	4	4	2	0	3	22	5	0	3	4	2	0	1	16	2
20:00	20:15	0	2	5	1	0	1	23	2	0	1	5	1	0	0	9	1
20:15	20:30	0	1	5	1	1	0	25	2	0	4	3	0	0	0	13	1
20:30	20:45	0	1	1	2	1	1	25	2	0	1	9	0	0	0	13	0
20:45	21:00	0	0	7	0	0	0	18	1	0	1	3	0	0	0	9	0

Heavy Vehicles

Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0
7:15	7:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
7:30	7:45	0	0	1	0	0	0	0	0	0	0	1	0	0	1	2	0
7:45	8:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
8:00	8:15	0	2	1	1	0	2	2	0	0	0	0	1	0	1	0	0
8:15	8:30	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
8:30	8:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:45	9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	19:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
19:15	19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:30	19:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
19:45	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	20:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
20:30	20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Murray St and Morgan St, Wagga Wagga

Date:	Sat 02/12/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	Murray St
East:	Morgan St
South:	Murray St
West:	Morgan St

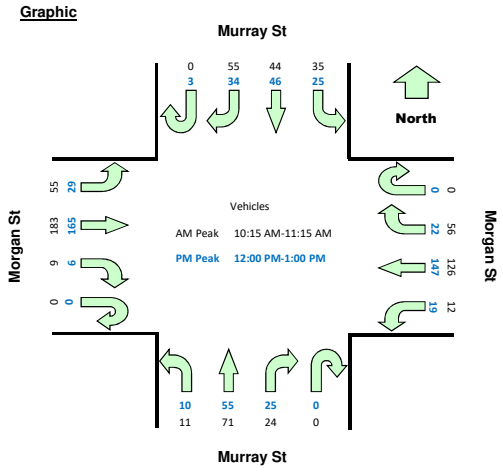
Survey Start	AM:	10:00	PM:	12:00
Vehicular Peakhour		**Pedestrians Peakhour**		
AM:	10:15 AM-11:15 AM	AM:	N/A	
PM:	12:00 PM-1:00 PM	PM:	N/A	

All Vehicles

Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan 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**
10:00	10:15	0	10	8	7	0	11	21	2	0	3	8	2	1	5	35	12	637	
10:15	10:30	0	16	13	7	0	17	33	2	0	5	22	1	0	3	43	15	681	Peak
10:30	10:45	0	18	10	15	0	19	27	6	0	11	22	3	0	2	49	11	646	
10:45	11:00	0	12	10	7	0	8	21	1	0	4	14	4	0	2	43	16	615	
11:00	11:15	0	9	11	6	0	12	45	3	0	4	13	3	0	2	48	13	625	
11:15	11:30	1	8	6	7	0	9	36	4	0	9	15	1	0	0	37	9		
11:30	11:45	0	6	9	6	1	15	37	4	0	3	16	3	0	3	44	15		
11:45	12:00	0	9	15	9	0	8	40	2	0	1	11	1	0	3	46	7		
12:00	12:15	2	10	12	5	0	6	31	6	0	5	15	0	0	2	49	7	586	Peak
12:15	12:30	1	8	18	7	0	4	27	7	0	11	18	4	0	2	35	12	536	
12:30	12:45	0	9	6	4	0	7	49	4	0	7	12	2	0	2	47	5	500	
12:45	13:00	0	7	10	9	0	5	40	2	0	2	10	4	0	0	34	5	448	
13:00	13:15	0	3	6	2	0	4	34	5	0	3	9	2	0	0	28	4	399	
13:15	13:30	0	4	9	3	1	3	34	3	0	7	9	3	0	0	39	3	403	
13:30	13:45	0	3	8	0	0	1	32	6	0	8	9	4	0	1	29	1	381	
13:45	14:00	0	5	6	3	1	3	22	3	0	3	5	2	0	1	23	2	374	
14:00	14:15	0	4	9	5	0	4	38	3	0	2	3	2	0	2	27	5	387	
14:15	14:30	0	2	10	1	0	2	38	6	0	0	11	3	0	1	20	2		
14:30	14:45	0	1	7	4	0	4	35	4	0	6	11	0	0	0	20	3		
14:45	15:00	0	1	7	1	0	3	34	5	0	4	9	0	0	0	27	1		

Peak Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
10:15	11:15	0	55	44	35	0	56	126	12	0	24	71	11	0	9	183	55	681
12:00	13:00	3	34	46	25	0	22	147	19	0	25	55	10	0	6	165	29	586

Graphic



Light Vehicles

Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	10	8	7	0	11	21	2	0	3	8	2	1	5	35	12
10:15	10:30	0	16	13	6	0	17	33	2	0	5	21	1	0	3	43	15
10:30	10:45	0	18	10	15	0	19	26	6	0	11	21	3	0	2	49	11
10:45	11:00	0	12	10	7	0	8	20	1	0	4	14	4	0	2	43	16
11:00	11:15	0	9	11	6	0	12	45	3	0	4	13	3	0	2	48	13
11:15	11:30	1	8	6	7	0	8	36	4	0	9	15	1	0	0	37	9
11:30	11:45	0	6	9	5	1	15	36	4	0	3	16	3	0	3	44	15
11:45	12:00	0	9	15	9	0	8	40	2	0	1	11	1	0	3	46	7
12:00	12:15	2	10	12	5	0	6	31	6	0	5	15	0	0	2	49	7
12:15	12:30	1	8	18	7	0	4	27	7	0	11	18	4	0	2	35	12
12:30	12:45	0	9	6	3	0	7	48	4	0	7	12	2	0	2	47	5
12:45	13:00	0	7	10	9	0	5	39	2	0	2	9	4	0	0	34	5
13:00	13:15	0	3	6	2	0	4	34	5	0	3	9	2	0	0	27	4
13:15	13:30	0	4	9	3	1	3	33	3	0	7	9	3	0	0	38	3
13:30	13:45	0	3	8	0	0	1	32	6	0	8	9	4	0	1	29	1
13:45	14:00	0	5	6	3	1	3	21	3	0	3	5	2	0	1	23	2
14:00	14:15	0	4	9	5	0	4	38	3	0	2	3	2	0	2	27	5
14:15	14:30	0	1	10	1	0	2	37	6	0	0	11	3	0	1	19	2
14:30	14:45	0	1	7	4	0	4	35	4	0	6	11	0	0	0	20	3
14:45	15:00	0	1	7	1	0	3	34	5	0	4	9	0	0	0	27	1

Heavy Vehicles

Time		North Approach Murray St				East Approach Morgan St				South Approach Murray St				West Approach Morgan St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	10:30	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
10:30	10:45	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
10:45	11:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11:00	11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	11:30	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
11:30	11:45	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	12:45	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:15	13:30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
13:30	13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	14:30	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0
14:30	14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of The Esplanade and Forsyth St, Wagga Wagga

Date:	Tue 05/12/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	The Esplanade
East:	Forsyth St
South:	Murray St
West:	Forsyth St

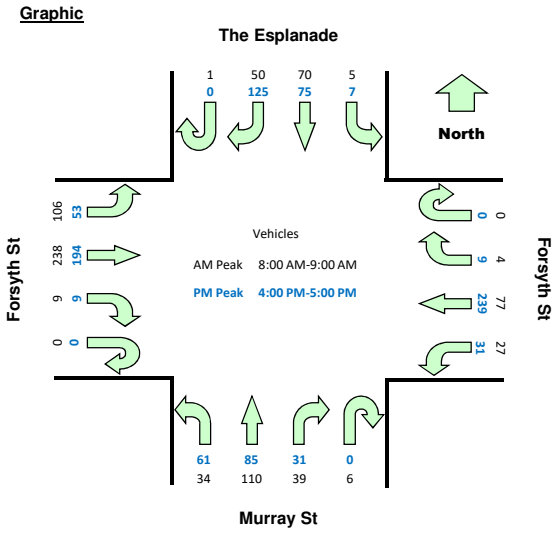
Survey Start	AM:	7:00	PM:	16:00
Vehicular Peakhour		**Pedestrians Peakhour**		
AM:	8:00 AM-9:00 AM	AM:	N/A	
PM:	4:00 PM-5:00 PM	PM:	N/A	

All Vehicles

Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth 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**
7:00	7:15	0	5	10	0	0	0	8	1	0	3	7	0	0	1	6	5	294	
7:15	7:30	0	4	8	0	0	0	7	1	0	1	8	2	0	0	18	10	383	
7:30	7:45	0	3	15	1	0	0	7	3	0	4	16	2	0	1	16	9	515	
7:45	8:00	0	7	11	2	0	0	22	2	0	2	19	6	0	2	28	11	663	
8:00	8:15	0	8	13	1	0	0	14	9	0	8	20	3	0	0	45	14	776	Peak
8:15	8:30	0	8	19	3	0	1	23	4	2	9	23	3	0	1	64	31		
8:30	8:45	0	17	19	0	0	1	21	6	1	11	32	12	0	3	67	35		
8:45	9:00	1	17	19	1	0	2	19	8	3	11	35	16	0	5	62	26		
16:00	16:15	0	39	21	2	0	2	63	8	0	11	16	19	0	2	54	19	919	Peak
16:15	16:30	0	35	21	3	0	1	55	1	0	6	33	9	0	5	59	16	909	
16:30	16:45	0	25	17	0	0	3	64	15	0	9	15	16	0	1	43	9	860	
16:45	17:00	0	26	16	2	0	3	57	7	0	5	21	17	0	1	38	9	829	
17:00	17:15	1	57	26	3	1	1	62	7	0	7	18	18	0	2	33	10	779	
17:15	17:30	0	37	17	2	0	0	50	7	0	7	26	14	0	1	24	10		
17:30	17:45	0	42	15	3	0	2	58	7	1	3	9	6	0	2	29	9		
17:45	18:00	0	26	11	2	0	0	49	3	0	4	10	2	0	6	31	8		

Peak Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:00	9:00	1	50	70	5	0	4	77	27	6	39	110	34	0	9	238	106	776
16:00	17:00	0	125	75	7	0	9	239	31	0	31	85	61	0	9	194	53	919

Graphic



Light Vehicles

Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	5	10	0	0	0	7	1	0	3	7	0	0	1	6	5
7:15	7:30	0	4	8	0	0	0	7	1	0	1	7	2	0	0	18	10
7:30	7:45	0	3	12	1	0	0	6	3	0	4	15	2	0	1	15	9
7:45	8:00	0	7	11	2	0	0	22	2	0	2	18	6	0	2	28	10
8:00	8:15	0	8	13	1	0	0	12	9	0	8	19	3	0	0	44	14
8:15	8:30	0	8	17	3	0	1	23	4	2	9	23	2	0	1	64	31
8:30	8:45	0	16	19	0	0	1	20	6	1	11	32	12	0	3	67	35
8:45	9:00	1	16	19	1	0	2	19	8	3	11	35	16	0	4	61	25
16:00	16:15	0	38	21	2	0	2	63	7	0	11	16	19	0	2	53	18
16:15	16:30	0	35	21	3	0	1	55	1	0	6	33	9	0	5	58	16
16:30	16:45	0	25	17	0	0	3	64	15	0	9	15	16	0	1	43	9
16:45	17:00	0	26	16	2	0	3	56	7	0	5	21	17	0	1	38	9
17:00	17:15	1	56	26	3	1	1	62	7	0	7	18	18	0	2	33	10
17:15	17:30	0	37	17	2	0	0	50	7	0	7	25	14	0	1	24	10
17:30	17:45	0	41	15	3	0	2	57	7	1	3	9	6	0	2	29	9
17:45	18:00	0	26	11	2	0	0	49	3	0	4	9	2	0	6	31	8

Heavy Vehicles

Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:30	7:45	0	0	3	0	0	0	1	0	0	0	1	0	0	0	1	0
7:45	8:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
8:00	8:15	0	0	0	0	0	0	2	0	0	0	1	0	0	0	1	0
8:15	8:30	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0
8:30	8:45	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45	9:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1
16:00	16:15	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	1
16:15	16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16:30	16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:00	17:15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
17:30	17:45	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of The Esplanade and Forsyth St, Wagga Wagga

Date:	Thu 30/11/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	The Esplanade
East:	Forsyth St
South:	Murray St
West:	Forsyth St

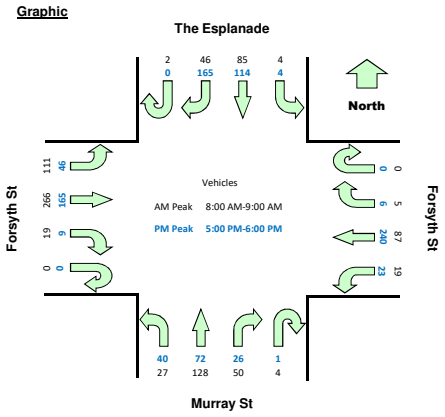
Survey Start	AM:	7:00	PM:	17:00
Vehicular Peakhour		**Pedestrians Peakhour**		
AM:	8:00 AM-9:00 AM	AM:	N/A	
PM:	5:00 PM-6:00 PM	PM:	N/A	

All Vehicles

Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth 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**
7:00	7:15	0	6	5	0	0	0	7	8	0	2	8	0	0	0	10	5	338	
7:15	7:30	0	11	5	0	0	0	2	9	0	2	8	3	1	1	16	6	451	
7:30	7:45	0	5	15	1	0	2	11	1	0	9	13	4	0	2	18	10	599	
7:45	8:00	0	13	14	2	0	0	23	3	0	6	16	2	0	1	41	11	731	
8:00	8:15	0	7	13	1	0	2	21	4	0	7	29	3	0	5	44	28	853	Peak
8:15	8:30	0	12	21	1	0	0	25	6	0	18	33	4	0	1	66	25		
8:30	8:45	0	14	30	1	0	2	20	3	3	10	27	7	0	2	71	33		
8:45	9:00	2	13	21	1	0	1	21	6	1	15	39	13	0	11	85	25		
17:00	17:15	0	51	35	0	0	6	67	5	0	11	28	16	0	2	43	14	911	Peak
17:15	17:30	0	32	27	0	0	0	71	7	0	6	17	9	0	4	52	6	797	
17:30	17:45	0	40	32	3	0	0	42	5	1	5	12	11	0	3	31	14	697	
17:45	18:00	0	42	20	1	0	0	60	6	0	4	15	4	0	0	39	12	599	
18:00	18:15	0	23	17	0	0	2	48	4	0	6	9	4	0	0	38	13	482	
18:15	18:30	0	21	10	1	2	3	45	1	1	4	5	2	0	0	29	7	403	
18:30	18:45	0	5	5	6	1	1	42	2	0	2	12	2	1	2	15	5	343	
18:45	19:00	0	22	4	0	0	0	28	4	0	2	7	0	0	2	12	5	316	
19:00	19:15	0	17	7	3	0	1	28	2	0	1	3	3	0	2	16	2	306	
19:15	19:30	0	10	5	1	0	0	28	2	0	3	4	1	0	0	13	4	277	
19:30	19:45	0	16	8	1	0	1	20	2	0	2	10	0	0	0	12	2	276	
19:45	20:00	1	19	10	3	0	0	18	0	0	3	3	3	0	0	13	3	249	
20:00	20:15	0	7	5	0	0	0	21	1	0	1	6	0	0	2	12	1	217	
20:15	20:30	0	17	4	2	0	1	27	0	0	1	2	1	0	3	8	4		
20:30	20:45	0	9	4	0	0	0	15	0	0	1	8	1	1	0	8	0		
20:45	21:00	0	8	6	1	0	0	15	1	0	1	1	1	0	0	9	1		

Peak Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:00	9:00	2	46	85	4	0	5	87	19	4	50	128	27	0	19	266	111	853
17:00	18:00	0	165	114	4	0	6	240	23	1	26	72	40	0	9	165	46	911

Graphic



Light Vehicles

Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	6	5	0	0	0	7	8	0	2	7	0	0	0	9	5
7:15	7:30	0	11	4	0	0	0	1	9	0	2	8	3	1	1	15	6
7:30	7:45	0	5	14	1	0	2	11	1	0	9	13	4	0	2	18	10
7:45	8:00	0	13	14	2	0	0	23	3	0	6	15	2	0	1	38	11
8:00	8:15	0	7	9	1	0	2	21	4	0	7	27	3	0	5	42	28
8:15	8:30	0	10	21	1	0	0	25	6	0	18	32	4	0	1	65	23
8:30	8:45	0	14	30	1	0	2	20	3	3	10	27	7	0	2	70	33
8:45	9:00	2	12	21	1	0	1	21	6	1	15	39	13	0	11	84	25
17:00	17:15	0	50	35	0	0	6	67	5	0	11	28	16	0	2	43	14
17:15	17:30	0	32	27	0	0	0	71	7	0	6	17	9	0	4	52	6
17:30	17:45	0	40	32	3	0	0	42	5	1	5	12	11	0	3	31	14
17:45	18:00	0	42	20	1	0	0	59	6	0	4	15	4	0	0	39	12
18:00	18:15	0	22	17	0	0	2	48	4	0	6	8	4	0	0	38	13
18:15	18:30	0	21	10	1	2	3	45	1	1	4	5	2	0	0	29	7
18:30	18:45	0	5	5	6	1	1	42	2	0	2	12	2	1	2	15	5
18:45	19:00	0	22	4	0	0	0	28	4	0	2	7	0	0	2	12	5
19:00	19:15	0	17	7	3	0	1	28	2	0	1	3	3	0	2	16	2
19:15	19:30	0	10	5	1	0	0	28	2	0	3	4	1	0	0	13	4
19:30	19:45	0	16	7	1	0	1	20	2	0	2	10	0	0	0	11	2
19:45	20:00	1	18	10	3	0	0	18	0	0	3	3	3	0	0	13	3
20:00	20:15	0	7	5	0	0	0	21	1	0	1	6	0	0	2	12	1
20:15	20:30	0	17	4	2	0	1	27	0	0	1	2	1	0	3	8	4
20:30	20:45	0	9	4	0	0	0	15	0	0	1	8	1	1	0	8	0
20:45	21:00	0	8	6	1	0	0	15	1	0	1	1	1	0	0	9	1

Heavy Vehicles

Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
7:15	7:30	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
7:30	7:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	8:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
8:00	8:15	0	0	4	0	0	0	0	0	0	0	2	0	0	0	2	0
8:15	8:30	0	2	0	0	0	0	0	0	0	0	1	0	0	0	1	2
8:30	8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:45	9:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
17:00	17:15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
18:00	18:15	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:15	19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:30	19:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
19:45	20:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of The Esplanade and Forsyth St, Wagga Wagga

Date:	Sat 02/12/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	The Esplanade
East:	Forsyth St
South:	Murray St
West:	Forsyth St

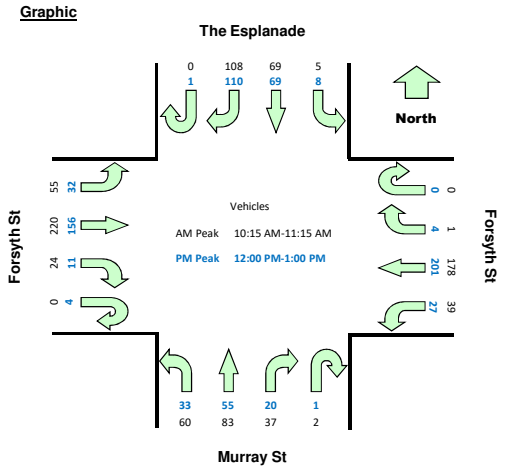
Survey Start	AM:	10:00	PM:	12:00
Vehicular Peakhour		**Pedestrians Peakhour**		
AM:	10:15 AM-11:15 AM	AM:	N/A	
PM:	12:00 PM-1:00 PM	PM:	N/A	

All Vehicles

Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth 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**
10:00	10:15	0	12	11	3	0	3	40	12	0	6	15	10	0	2	50	6	836	
10:15	10:30	0	14	14	1	0	0	43	14	1	12	24	17	0	7	52	12	881	Peak
10:30	10:45	0	22	23	1	0	0	41	10	1	8	23	20	0	9	49	12	855	
10:45	11:00	0	42	14	1	0	1	52	9	0	6	19	13	0	6	63	10	853	
11:00	11:15	0	30	18	2	0	0	42	6	0	11	17	10	0	2	56	21	830	
11:15	11:30	0	24	10	1	0	1	40	9	0	5	19	10	0	3	44	19		
11:30	11:45	2	33	11	2	0	1	41	4	0	13	25	8	3	6	47	21		
11:45	12:00	0	35	21	0	0	1	47	7	0	5	15	6	0	5	49	22		
12:00	12:15	0	32	20	2	0	3	48	4	0	5	20	5	0	5	40	12	732	Peak
12:15	12:30	0	23	23	3	0	0	54	8	0	7	18	10	0	3	38	11	677	
12:30	12:45	0	33	11	2	0	1	51	6	0	5	9	10	1	2	42	4	626	
12:45	13:00	1	22	15	1	0	0	48	9	1	3	8	8	3	1	36	5	582	
13:00	13:15	0	25	8	0	0	1	51	2	0	2	10	5	1	1	28	7	563	
13:15	13:30	0	27	10	2	0	3	52	5	0	2	10	3	0	1	22	10	549	
13:30	13:45	0	21	6	0	0	0	49	4	0	2	8	1	1	1	34	6	517	
13:45	14:00	0	26	11	0	0	1	48	2	0	2	3	5	0	1	35	8	502	
14:00	14:15	0	17	12	0	0	0	41	5	1	4	3	4	0	0	36	4	477	
14:15	14:30	0	27	7	1	0	0	39	5	0	3	8	4	1	1	15	4		
14:30	14:45	0	20	6	0	0	1	43	5	0	5	9	4	1	1	18	5		
14:45	15:00	1	22	7	1	2	0	36	0	1	3	9	0	1	1	27	6		

Peak Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth St				Peak total
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	
10:15	11:15	0	108	69	5	0	1	178	39	2	37	83	60	0	24	220	55	881
12:00	13:00	1	110	69	8	0	4	201	27	1	20	55	33	4	11	156	32	732

Graphic



Light Vehicles

Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	12	11	3	0	3	40	12	0	6	15	10	0	2	50	6
10:15	10:30	0	14	13	1	0	0	43	14	1	12	24	16	0	7	52	12
10:30	10:45	0	22	23	1	0	0	41	10	1	8	23	19	0	9	49	12
10:45	11:00	0	42	14	1	0	1	52	9	0	6	19	13	0	6	62	10
11:00	11:15	0	30	18	2	0	0	42	6	0	11	17	10	0	2	56	21
11:15	11:30	0	24	10	1	0	1	40	9	0	5	19	9	0	3	44	19
11:30	11:45	2	33	10	2	0	1	41	4	0	13	25	8	3	6	47	21
11:45	12:00	0	35	21	0	0	1	47	7	0	5	15	6	0	5	49	22
12:00	12:15	0	32	20	2	0	3	48	4	0	5	20	5	0	5	38	12
12:15	12:30	0	23	23	3	0	0	54	8	0	7	18	10	0	3	38	11
12:30	12:45	0	33	10	2	0	1	51	6	0	5	9	10	1	2	42	3
12:45	13:00	1	22	15	1	0	0	48	9	1	3	8	7	3	1	36	5
13:00	13:15	0	25	8	0	0	1	51	2	0	2	10	5	1	1	28	7
13:15	13:30	0	27	10	2	0	3	52	5	0	2	10	3	0	1	22	10
13:30	13:45	0	21	6	0	0	0	48	4	0	2	8	1	1	1	34	6
13:45	14:00	0	26	11	0	0	1	48	2	0	2	3	5	0	1	35	8
14:00	14:15	0	17	12	0	0	0	41	5	1	4	3	4	0	0	36	4
14:15	14:30	0	27	7	1	0	0	39	4	0	3	8	4	1	1	15	4
14:30	14:45	0	20	6	0	0	1	43	5	0	5	9	4	1	1	18	5
14:45	15:00	1	22	7	1	2	0	35	0	1	3	9	0	1	1	27	6

Heavy Vehicles

Time		North Approach The Esplanade				East Approach Forsyth St				South Approach Murray St				West Approach Forsyth St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	10:30	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
10:30	10:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
10:45	11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:00	11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	11:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
11:30	11:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
12:15	12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	12:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12:45	13:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	13:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	14:30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Docker St and Morgan St, Wagga Wagga

Date:	Tue 05/12/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	Docker St
East:	Morgan St
South:	Docker St
West:	Bolton St

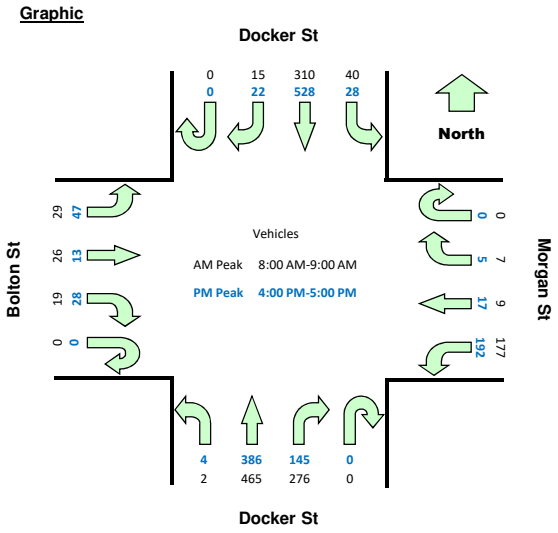
Survey Start	AM:	7:00	PM:	16:00
Vehicular Peakhour		**Pedestrians Peakhour**		
AM:	8:00 AM-9:00 AM	AM:	N/A	
PM:	4:00 PM-5:00 PM	PM:	N/A	

All Vehicles

Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton 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**
7:00	7:15	0	0	28	3	0	0	3	15	0	10	24	1	0	3	3	2	660	
7:15	7:30	0	3	35	5	0	1	1	21	0	32	40	0	0	3	4	3	841	
7:30	7:45	0	1	20	10	0	7	9	24	0	34	51	1	0	2	1	3	1024	
7:45	8:00	0	8	62	11	0	1	3	37	0	56	66	1	0	4	6	2	1238	
8:00	8:15	0	1	59	9	0	1	1	43	0	59	79	1	0	6	9	5	1375	Peak
8:15	8:30	0	5	72	12	0	0	1	34	0	67	121	0	0	5	9	5		
8:30	8:45	0	5	78	14	0	4	3	49	0	67	136	1	0	7	3	10		
8:45	9:00	0	4	101	5	0	2	4	51	0	83	129	0	0	1	5	9		
16:00	16:15	0	4	149	4	0	1	6	49	0	43	122	0	0	2	2	18	1415	Peak
16:15	16:30	0	10	120	12	0	0	5	56	0	33	107	3	0	14	8	15	1379	
16:30	16:45	0	4	131	6	0	1	4	41	0	28	79	0	0	11	1	7	1309	
16:45	17:00	0	4	128	6	0	3	2	46	0	41	78	1	0	1	2	7	1322	
17:00	17:15	0	5	160	6	0	5	2	45	0	35	88	2	0	5	5	6	1285	
17:15	17:30	1	4	129	6	0	1	3	54	0	29	72	0	0	1	6	7		
17:30	17:45	0	2	151	3	0	3	5	43	0	31	71	0	0	8	2	7		
17:45	18:00	0	4	106	5	0	2	6	39	0	22	82	0	0	4	8	4		

Peak Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:00	9:00	0	15	310	40	0	7	9	177	0	276	465	2	0	19	26	29	1375
16:00	17:00	0	22	528	28	0	5	17	192	0	145	386	4	0	28	13	47	1415

Graphic



Light Vehicles

Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	28	3	0	0	3	15	0	10	24	1	0	3	2	2
7:15	7:30	0	3	35	5	0	1	1	21	0	30	39	0	0	3	4	3
7:30	7:45	0	1	18	10	0	7	9	21	0	33	49	1	0	2	1	3
7:45	8:00	0	8	62	10	0	0	3	37	0	56	64	1	0	4	6	2
8:00	8:15	0	1	55	8	0	1	1	41	0	58	77	1	0	5	9	5
8:15	8:30	0	5	71	12	0	0	1	33	0	66	119	0	0	5	9	5
8:30	8:45	0	5	74	14	0	3	3	48	0	67	134	1	0	6	3	10
8:45	9:00	0	4	99	5	0	2	3	51	0	83	125	0	0	1	5	9
16:00	16:15	0	4	147	4	0	1	6	49	0	42	115	0	0	2	1	17
16:15	16:30	0	10	119	11	0	0	5	55	0	33	105	3	0	14	8	15
16:30	16:45	0	4	131	6	0	1	4	41	0	28	79	0	0	11	1	7
16:45	17:00	0	4	127	6	0	3	2	45	0	40	78	1	0	1	2	7
17:00	17:15	0	5	158	6	0	5	2	45	0	35	87	2	0	5	5	6
17:15	17:30	1	4	129	6	0	1	3	53	0	29	72	0	0	1	6	7
17:30	17:45	0	2	149	3	0	3	5	43	0	31	71	0	0	8	2	7
17:45	18:00	0	4	106	4	0	2	6	39	0	22	82	0	0	4	8	4

Heavy Vehicles

Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:15	7:30	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0
7:30	7:45	0	0	2	0	0	0	0	3	0	1	2	0	0	0	0	0
7:45	8:00	0	0	0	1	0	1	0	0	0	0	2	0	0	0	0	0
8:00	8:15	0	0	4	1	0	0	0	2	0	1	2	0	0	1	0	0
8:15	8:30	0	0	1	0	0	0	0	1	0	1	2	0	0	0	0	0
8:30	8:45	0	0	4	0	0	1	0	1	0	0	2	0	0	1	0	0
8:45	9:00	0	0	2	0	0	0	1	0	0	0	4	0	0	0	0	0
16:00	16:15	0	0	2	0	0	0	0	0	0	1	7	0	0	0	1	1
16:15	16:30	0	0	1	1	0	0	0	1	0	0	2	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0
17:00	17:15	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
17:30	17:45	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Docker St and Morgan St, Wagga Wagga

Date:	Thu 30/11/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	Docker St
East:	Morgan St
South:	Docker St
West:	Bolton St

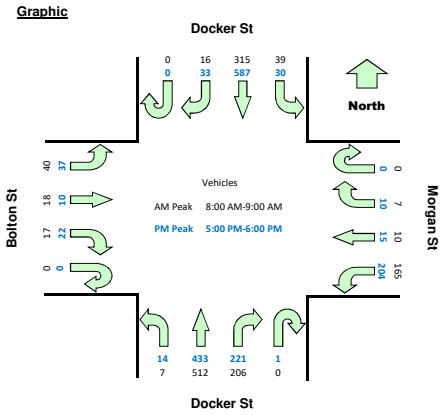
Survey Start	AM:	7:00	PM:	17:00
Vehicular Peakhour		**Pedestrians Peakhour**		
AM:	8:00 AM-9:00 AM	AM:	N/A	
PM:	5:00 PM-6:00 PM	PM:	N/A	

All Vehicles

Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton 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**
7:00	7:15	0	0	34	2	0	0	1	14	0	16	34	0	0	3	3	1	617	
7:15	7:30	0	3	38	5	0	0	0	19	0	15	49	0	0	1	5	1	779	
7:30	7:45	0	3	40	4	0	1	2	25	0	20	36	0	0	0	5	3	958	
7:45	8:00	0	2	72	6	0	2	2	32	0	27	72	2	0	5	9	3	1186	
8:00	8:15	0	2	66	6	0	0	3	39	0	44	98	1	0	1	7	3	1352	Peak
8:15	8:30	0	3	74	10	0	2	1	38	0	41	123	1	0	7	5	10		
8:30	8:45	0	7	79	14	0	3	2	36	0	57	143	3	0	4	1	18		
8:45	9:00	0	4	96	9	0	2	4	52	0	64	148	2	0	5	5	9		
17:00	17:15	0	5	159	12	0	0	7	48	0	75	124	6	0	2	2	8	1617	Peak
17:15	17:30	0	14	149	9	0	2	4	59	0	60	108	6	0	4	2	10	1460	
17:30	17:45	0	6	129	6	0	3	1	61	1	40	96	0	0	8	4	13	1289	
17:45	18:00	0	8	150	3	0	5	3	36	0	46	105	2	0	8	2	6	1146	
18:00	18:15	0	1	106	3	0	2	5	30	0	37	96	2	0	7	1	1	950	
18:15	18:30	0	4	86	1	0	1	5	33	0	24	89	0	0	4	5	4	813	
18:30	18:45	0	1	71	3	0	1	7	29	0	29	73	1	0	7	3	0	712	
18:45	19:00	0	3	70	3	0	0	2	26	0	28	36	1	0	2	6	1	613	
19:00	19:15	0	3	65	3	0	3	7	20	0	9	34	0	0	3	5	2	575	
19:15	19:30	0	2	54	1	0	2	5	25	0	26	29	3	0	2	4	2	550	
19:30	19:45	0	2	46	2	0	2	0	20	0	14	38	0	0	0	1	1	525	
19:45	20:00	0	1	51	1	0	1	0	27	0	17	37	0	0	3	1	1	504	
20:00	20:15	0	2	46	0	0	0	4	22	0	9	36	1	0	4	2	3	473	
20:15	20:30	0	0	58	1	0	4	3	20	0	10	26	0	0	4	4	0		
20:30	20:45	0	0	35	0	0	7	2	17	0	12	26	1	0	1	1	3		
20:45	21:00	0	1	43	0	0	0	3	15	0	7	31	1	0	5	2	1		

Peak Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
8:00	9:00	0	16	315	39	0	7	10	165	0	206	512	7	0	17	18	40	1352
17:00	18:00	0	33	587	30	0	10	15	204	1	221	433	14	0	22	10	37	1617

Graphic



Light Vehicles

Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	34	2	0	0	1	13	0	16	32	0	0	3	3	1
7:15	7:30	0	3	38	5	0	0	0	19	0	15	47	0	0	1	4	1
7:30	7:45	0	3	39	4	0	1	2	25	0	18	35	0	0	0	4	3
7:45	8:00	0	2	72	5	0	2	2	31	0	26	68	2	0	5	9	3
8:00	8:15	0	2	65	6	0	0	2	35	0	43	96	1	0	1	7	3
8:15	8:30	0	3	72	10	0	2	1	37	0	41	119	1	0	7	5	10
8:30	8:45	0	7	78	14	0	2	2	36	0	57	140	3	0	3	1	17
8:45	9:00	0	4	95	9	0	2	4	52	0	64	146	2	0	4	5	8
17:00	17:15	0	5	158	12	0	0	7	48	0	75	124	6	0	2	2	8
17:15	17:30	0	14	149	9	0	2	4	58	0	60	108	6	0	4	2	10
17:30	17:45	0	6	128	6	0	3	1	61	0	40	96	0	0	8	4	13
17:45	18:00	0	8	149	3	0	4	3	36	0	46	105	2	0	8	2	6
18:00	18:15	0	1	106	3	0	2	5	30	0	37	96	2	0	6	1	1
18:15	18:30	0	4	86	1	0	1	5	33	0	24	89	0	0	3	5	3
18:30	18:45	0	1	71	3	0	1	7	29	0	29	72	1	0	6	3	0
18:45	19:00	0	3	70	3	0	0	2	26	0	28	35	1	0	1	6	1
19:00	19:15	0	3	65	3	0	2	7	20	0	9	34	0	0	3	5	2
19:15	19:30	0	2	54	1	0	2	5	25	0	26	29	3	0	2	4	2
19:30	19:45	0	2	45	2	0	2	0	20	0	14	37	0	0	0	1	1
19:45	20:00	0	1	51	1	0	1	0	27	0	17	37	0	0	2	1	1
20:00	20:15	0	2	46	0	0	0	4	22	0	9	36	1	0	4	2	3
20:15	20:30	0	0	58	1	0	4	3	19	0	10	26	0	0	4	4	0
20:30	20:45	0	0	35	0	0	7	2	17	0	12	26	1	0	1	1	3
20:45	21:00	0	1	43	0	0	0	3	15	0	7	31	1	0	5	2	1

Heavy Vehicles

Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
7:00	7:15	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0
7:30	7:45	0	0	1	0	0	0	0	0	0	2	1	0	0	0	1	0
7:45	8:00	0	0	0	1	0	0	0	1	0	1	4	0	0	0	0	0
8:00	8:15	0	0	1	0	0	0	1	4	0	1	2	0	0	0	0	0
8:15	8:30	0	0	2	0	0	0	0	1	0	0	4	0	0	0	0	0
8:30	8:45	0	0	1	0	0	1	0	0	0	0	3	0	0	1	0	1
8:45	9:00	0	0	1	0	0	0	0	0	0	0	2	0	0	1	0	1
17:00	17:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
17:30	17:45	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
17:45	18:00	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
18:30	18:45	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
18:45	19:00	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
19:00	19:15	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
19:15	19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:30	19:45	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
19:45	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
20:00	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	20:30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
20:30	20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Docker St and Morgan St, Wagga Wagga

Date:	Sat 02/12/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	Docker St
East:	Morgan St
South:	Docker St
West:	Bolton St

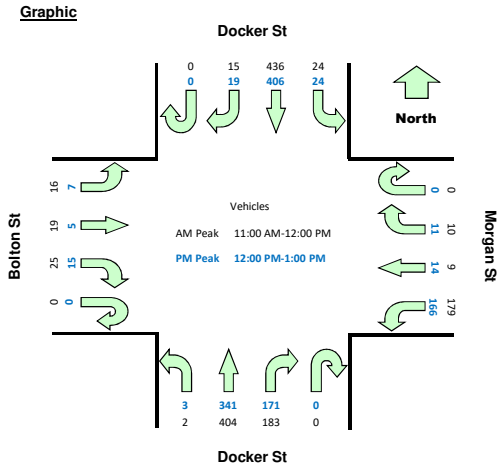
Survey Start	AM:	10:00	PM: 12:00
Vehicular Peakhour		**Pedestrians Peakhour**	
AM:	11:00 AM-12:00 PM	AM:	N/A
PM:	12:00 PM-1:00 PM	PM:	N/A

All Vehicles

Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton 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**
10:00	10:15	0	1	87	9	0	0	3	31	0	41	74	1	0	2	3	2	1199	
10:15	10:30	0	1	82	10	0	2	3	45	0	47	91	0	0	3	4	3	1278	
10:30	10:45	0	3	93	4	0	2	4	42	0	51	103	1	0	5	7	3	1287	
10:45	11:00	0	5	119	6	0	1	4	32	0	54	103	1	0	4	1	6	1302	
11:00	11:15	0	7	108	5	0	3	4	50	0	57	89	1	0	6	1	2	1322	Peak
11:15	11:30	0	3	106	6	0	3	1	41	0	35	97	0	0	2	4	2		
11:30	11:45	0	3	110	7	0	2	2	42	0	45	95	0	0	10	10	7		
11:45	12:00	0	2	112	6	0	2	2	46	0	46	123	1	0	7	4	5		
12:00	12:15	0	5	95	5	0	1	1	39	0	53	105	0	0	7	0	0	1182	Peak
12:15	12:30	0	3	104	8	0	2	1	36	0	38	77	2	0	3	3	3	1120	
12:30	12:45	0	6	105	5	0	4	5	51	0	47	83	1	0	1	2	4	1081	
12:45	13:00	0	5	102	6	0	4	7	40	0	33	76	0	0	4	0	0	1006	
13:00	13:15	0	4	100	4	0	2	2	35	0	24	66	1	0	4	4	3	964	
13:15	13:30	0	1	96	5	0	0	3	38	0	34	54	0	0	5	3	2	966	
13:30	13:45	0	2	95	2	0	2	4	33	0	28	69	0	0	1	1	2	936	
13:45	14:00	0	5	102	3	0	2	2	25	0	20	66	0	0	2	3	5	920	
14:00	14:15	0	4	82	6	0	0	5	39	0	28	86	0	0	1	0	0	912	
14:15	14:30	0	1	91	2	0	3	4	35	0	18	50	0	0	1	3	3		
14:30	14:45	0	2	101	4	0	1	2	34	0	16	53	1	0	3	3	3		
14:45	15:00	0	3	87	1	0	1	1	33	0	26	68	1	0	4	1	1		

Peak Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton St				Peak
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	**total**
11:00	12:00	0	15	436	24	0	10	9	179	0	183	404	2	0	25	19	16	1322
12:00	13:00	0	19	406	24	0	11	14	166	0	171	341	3	0	15	5	7	1182

Graphic



Light Vehicles

Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	1	86	9	0	0	3	31	0	41	74	1	0	2	3	1
10:15	10:30	0	1	81	10	0	2	3	45	0	47	91	0	0	3	4	3
10:30	10:45	0	3	88	4	0	2	4	41	0	51	103	1	0	5	7	3
10:45	11:00	0	5	119	6	0	1	4	31	0	54	103	1	0	4	1	5
11:00	11:15	0	7	108	5	0	3	4	50	0	57	89	1	0	6	1	2
11:15	11:30	0	3	104	6	0	3	1	41	0	35	97	0	0	2	4	2
11:30	11:45	0	3	110	7	0	2	2	41	0	45	95	0	0	9	10	7
11:45	12:00	0	2	110	6	0	2	2	46	0	46	123	1	0	6	4	5
12:00	12:15	0	5	95	5	0	1	1	39	0	53	103	0	0	7	0	0
12:15	12:30	0	3	103	8	0	2	1	36	0	38	77	2	0	3	3	3
12:30	12:45	0	6	104	5	0	4	5	50	0	47	82	1	0	1	2	3
12:45	13:00	0	5	100	6	0	4	7	39	0	33	76	0	0	4	0	0
13:00	13:15	0	4	99	4	0	2	2	35	0	23	66	1	0	4	4	2
13:15	13:30	0	1	96	5	0	0	3	37	0	33	54	0	0	5	3	2
13:30	13:45	0	2	94	2	0	2	4	33	0	28	67	0	0	1	1	2
13:45	14:00	0	5	101	3	0	2	2	24	0	20	66	0	0	2	3	5
14:00	14:15	0	4	82	6	0	0	5	39	0	28	86	0	0	1	0	0
14:15	14:30	0	1	90	2	0	3	4	34	0	17	50	0	0	1	3	3
14:30	14:45	0	1	100	4	0	1	2	33	0	16	53	1	0	3	3	3
14:45	15:00	0	3	86	1	0	1	1	33	0	26	67	1	0	4	1	1

Heavy Vehicles

Time		North Approach Docker St				East Approach Morgan St				South Approach Docker St				West Approach Bolton St			
Period Start	**Period End**	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
10:00	10:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10:15	10:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	10:45	0	0	5	0	0	0	0	1	0	0	0	0	0	0	0	0
10:45	11:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
11:00	11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	11:30	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
11:45	12:00	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0
12:00	12:15	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
12:15	12:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	12:45	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1
12:45	13:00	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0
13:00	13:15	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1
13:15	13:30	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
13:30	13:45	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0
13:45	14:00	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	14:30	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0
14:30	14:45	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0
14:45	15:00	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0

TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Docker St and Forsyth St, Wagga Wagga

Date:	Tue 05/12/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	Docker St
East:	Forsyth St
South:	Docker St
West:	N/A

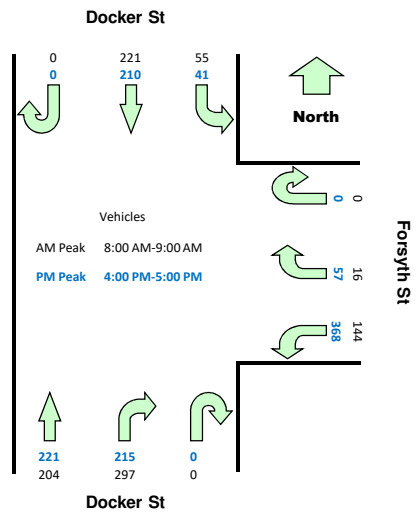
Survey Start			
AM:	7:00	PM:	16:00
Vehicular Peakhour Start			
AM:	8:00 AM-5	PM:	4:00 PM-5:00 PM

All Vehicles

Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
7:00	7:15	0	19	1	0	1	12	0	11	15	404	
7:15	7:30	0	32	3	0	2	11	0	25	20	511	
7:30	7:45	0	20	3	0	1	11	0	23	36	654	
7:45	8:00	0	49	5	0	4	31	0	36	33	832	
8:00	8:15	0	44	12	0	0	25	0	46	39	937	Peak
8:15	8:30	0	60	17	0	4	29	0	79	47		
8:30	8:45	0	56	16	0	9	41	0	89	61		
8:45	9:00	0	61	10	0	3	49	0	83	57		
16:00	16:15	0	52	11	0	16	105	0	64	75	1112	Peak
16:15	16:30	0	57	9	0	14	85	0	71	51	1084	
16:30	16:45	0	49	11	0	13	92	0	42	45	1041	
16:45	17:00	0	52	10	0	14	86	0	38	50	1045	
17:00	17:15	0	49	10	0	15	122	0	35	64	1016	
17:15	17:30	0	56	5	0	17	84	0	30	52		
17:30	17:45	0	59	10	0	9	97	0	30	51		
17:45	18:00	0	47	9	0	9	68	0	36	52		

Peak Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
8:00	9:00	0	221	55	0	16	144	0	297	204	937
16:00	17:00	0	210	41	0	57	368	0	215	221	1112

Graphic



Light Vehicles

Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
7:00	7:15	0	19	1	0	0	12	0	11	15
7:15	7:30	0	32	3	0	2	11	0	25	19
7:30	7:45	0	19	3	0	1	10	0	22	35
7:45	8:00	0	49	5	0	4	31	0	35	31
8:00	8:15	0	41	12	0	0	23	0	46	37
8:15	8:30	0	59	17	0	4	29	0	79	45
8:30	8:45	0	54	16	0	9	39	0	89	58
8:45	9:00	0	60	10	0	3	48	0	80	56
16:00	16:15	0	51	11	0	16	104	0	62	71
16:15	16:30	0	55	9	0	14	85	0	70	50
16:30	16:45	0	49	11	0	13	92	0	42	45
16:45	17:00	0	52	10	0	14	85	0	38	50
17:00	17:15	0	48	10	0	15	121	0	35	63
17:15	17:30	0	56	5	0	17	84	0	30	52
17:30	17:45	0	59	10	0	9	95	0	30	51
17:45	18:00	0	46	9	0	9	68	0	36	52

Heavy Vehicles

Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
7:00	7:15	0	0	0	0	1	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0	0	1
7:30	7:45	0	1	0	0	0	1	0	1	1
7:45	8:00	0	0	0	0	0	0	0	1	2
8:00	8:15	0	3	0	0	0	2	0	0	2
8:15	8:30	0	1	0	0	0	0	0	0	2
8:30	8:45	0	2	0	0	0	2	0	0	3
8:45	9:00	0	1	0	0	0	1	0	3	1
16:00	16:15	0	1	0	0	0	1	0	2	4
16:15	16:30	0	2	0	0	0	0	0	1	1
16:30	16:45	0	0	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	1	0	0	0
17:00	17:15	0	1	0	0	0	1	0	0	1
17:15	17:30	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	2	0	0	0
17:45	18:00	0	1	0	0	0	0	0	0	0

TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Docker St and Forsyth St, Wagga Wagga

Date:	Thu 30/11/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	Docker St
East:	Forsyth St
South:	Docker St
West:	N/A

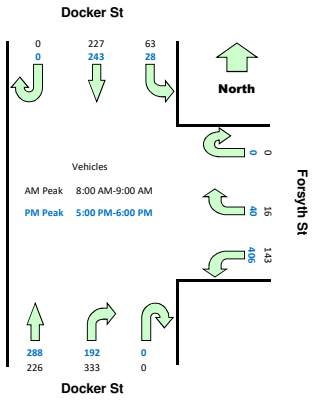
Survey Start			
AM:	7:00	PM:	17:00
Vehicular Peakhour Start			
AM:	8:00 AM-	PM:	5:00 PM-6:00 PM

All Vehicles

Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St			Hourly Total	
Period Start	**Period End**	**U**	**SB**	**L**	**U**	**R**	**L**	**U**	**R**	**NB**	**Hour**	**Peak**
7:00	7:15	0	26	1	0	3	10	0	14	21	435	
7:15	7:30	0	32	3	0	3	14	0	21	29	548	
7:30	7:45	0	28	6	0	3	16	0	24	16	683	
7:45	8:00	0	45	5	0	2	36	0	48	29	874	
8:00	8:15	0	46	10	0	3	28	0	67	34	1008	Peak
8:15	8:30	0	50	12	0	3	37	0	80	55		
8:30	8:45	0	64	15	0	4	37	0	91	73		
8:45	9:00	0	67	26	0	6	41	0	95	64		
17:00	17:15	0	53	4	0	11	123	0	55	77	1197	Peak
17:15	17:30	0	69	9	0	10	103	0	53	67	1104	
17:30	17:45	0	58	8	0	11	82	0	40	72	993	
17:45	18:00	0	63	7	0	8	98	0	44	72	884	
18:00	18:15	0	49	7	0	13	62	0	44	55	721	
18:15	18:30	0	31	8	0	8	60	0	28	65	608	
18:30	18:45	0	34	4	0	9	41	0	19	55	507	
18:45	19:00	0	32	10	0	6	44	0	9	28	441	
19:00	19:15	0	27	3	0	4	44	0	17	22	412	
19:15	19:30	0	24	3	0	6	33	0	14	19	384	
19:30	19:45	0	17	2	0	4	32	0	12	29	384	
19:45	20:00	0	20	1	0	6	34	0	15	24	362	
20:00	20:15	0	23	2	0	3	25	0	13	23	342	
20:15	20:30	0	19	5	0	5	40	0	10	20		
20:30	20:45	0	11	1	0	2	24	0	8	28		
20:45	21:00	0	22	2	0	2	22	0	8	24		

Peak Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St			Peak
Period Start	**Period End**	U	SB	L	U	R	L	U	R	NB	**total**
8:00	9:00	0	227	63	0	16	143	0	333	226	1008
17:00	18:00	0	243	28	0	40	406	0	192	288	1197

Graphic



Light Vehicles

Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St		
Period Start	**Period End**	U	SB	L	U	R	L	U	R	NB
7:00	7:15	0	26	1	0	3	10	0	13	20
7:15	7:30	0	32	3	0	2	14	0	20	28
7:30	7:45	0	28	6	0	3	16	0	24	15
7:45	8:00	0	43	5	0	2	36	0	45	28
8:00	8:15	0	45	10	0	3	28	0	65	34
8:15	8:30	0	50	12	0	3	35	0	77	54
8:30	8:45	0	62	15	0	4	37	0	90	69
8:45	9:00	0	67	26	0	5	41	0	94	62
17:00	17:15	0	53	4	0	11	122	0	55	77
17:15	17:30	0	69	9	0	10	103	0	53	67
17:30	17:45	0	58	8	0	11	82	0	40	72
17:45	18:00	0	63	7	0	8	97	0	44	71
18:00	18:15	0	49	7	0	13	61	0	44	55
18:15	18:30	0	31	8	0	8	60	0	28	65
18:30	18:45	0	34	4	0	9	41	0	19	54
18:45	19:00	0	32	10	0	6	44	0	9	27
19:00	19:15	0	27	3	0	4	44	0	17	21
19:15	19:30	0	24	3	0	6	33	0	14	19
19:30	19:45	0	17	2	0	4	32	0	11	29
19:45	20:00	0	20	1	0	6	33	0	15	24
20:00	20:15	0	23	2	0	3	25	0	13	23
20:15	20:30	0	19	5	0	5	40	0	10	20
20:30	20:45	0	11	1	0	2	24	0	8	28
20:45	21:00	0	22	2	0	2	22	0	8	24

Heavy Vehicles

Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St		
Period Start	**Period End**	U	SB	L	U	R	L	U	R	NB
7:00	7:15	0	0	0	0	0	0	0	1	1
7:15	7:30	0	0	0	0	1	0	0	1	1
7:30	7:45	0	0	0	0	0	0	0	0	1
7:45	8:00	0	2	0	0	0	0	0	3	1
8:00	8:15	0	1	0	0	0	0	0	2	0
8:15	8:30	0	0	0	0	0	2	0	3	1
8:30	8:45	0	2	0	0	0	0	0	1	4
8:45	9:00	0	0	0	0	1	0	0	1	2
17:00	17:15	0	0	0	0	0	1	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	1	0	0	1
18:00	18:15	0	0	0	0	0	1	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0
18:30	18:45	0	0	0	0	0	0	0	0	1
18:45	19:00	0	0	0	0	0	0	0	0	1
19:00	19:15	0	0	0	0	0	0	0	0	1
19:15	19:30	0	0	0	0	0	0	0	0	0
19:30	19:45	0	0	0	0	0	0	0	1	0
19:45	20:00	0	0	0	0	0	1	0	0	0
20:00	20:15	0	0	0	0	0	0	0	0	0
20:15	20:30	0	0	0	0	0	0	0	0	0
20:30	20:45	0	0	0	0	0	0	0	0	0
20:45	21:00	0	0	0	0	0	0	0	0	0

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Docker St and Forsyth St, Wagga Wagga

Date:	Sat 02/12/17
Weather:	Overcast
Suburban:	Wagga Wagga
Customer:	McLaren

North:	Docker St
East:	Forsyth St
South:	Docker St
West:	N/A

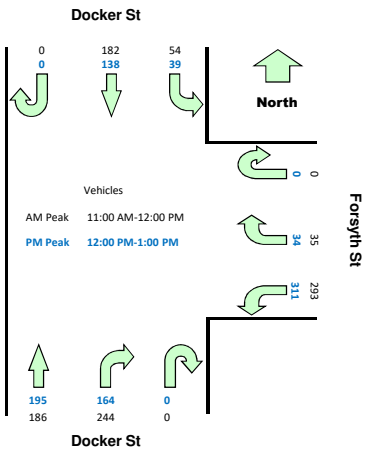
Survey Start			
AM:	10:00	PM:	12:00
Vehicular Peakhour Start			
AM:	11:00 AM	PM:	12:00 PM-1:00 PM

All Vehicles

Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St			Hourly Total	
Period Start	**Period End**	**U**	**SB**	**L**	**U**	**R**	**L**	**U**	**R**	**NB**	**Hour**	**Peak**
10:00	10:15	0	42	13	0	7	55	0	45	31	913	
10:15	10:30	0	28	8	0	9	65	0	63	33	960	
10:30	10:45	0	36	18	0	19	64	0	52	56	987	
10:45	11:00	0	35	17	0	12	95	0	62	48	991	
11:00	11:15	0	48	16	0	10	72	0	63	31	994	Peak
11:15	11:30	0	47	10	0	6	68	0	56	46		
11:30	11:45	0	45	15	0	10	75	0	62	42		
11:45	12:00	0	42	13	0	9	78	0	63	67		
12:00	12:15	0	28	10	0	8	77	0	47	59	881	Peak
12:15	12:30	0	39	12	0	10	76	0	40	43	852	
12:30	12:45	0	33	10	0	11	83	0	39	51	808	
12:45	13:00	0	38	7	0	5	75	0	38	42	768	
13:00	13:15	0	40	8	0	14	68	0	29	41	759	
13:15	13:30	0	30	8	0	10	72	0	25	31	748	
13:30	13:45	0	34	9	0	7	65	0	33	39	736	
13:45	14:00	0	35	6	0	6	75	0	38	36	724	
14:00	14:15	0	38	3	0	8	54	0	37	49	702	
14:15	14:30	0	32	5	0	9	62	0	16	40		
14:30	14:45	0	44	6	0	5	63	0	19	38		
14:45	15:00	0	37	8	0	5	54	0	27	43		

Peak Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St			Peak
Period Start	**Period End**	U	SB	L	U	R	L	U	R	NB	**total**
11:00	12:00	0	182	54	0	35	293	0	244	186	994
12:00	13:00	0	138	39	0	34	311	0	164	195	881

Graphic



Light Vehicles

Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St		
Period Start	**Period End**	U	SB	L	U	R	L	U	R	NB
10:00	10:15	0	41	13	0	7	55	0	45	30
10:15	10:30	0	28	8	0	9	64	0	63	33
10:30	10:45	0	32	18	0	19	63	0	52	56
10:45	11:00	0	35	17	0	12	95	0	61	48
11:00	11:15	0	48	16	0	10	72	0	63	31
11:15	11:30	0	45	10	0	5	68	0	56	46
11:30	11:45	0	45	15	0	10	75	0	62	42
11:45	12:00	0	40	13	0	9	78	0	63	67
12:00	12:15	0	28	10	0	8	77	0	45	59
12:15	12:30	0	38	12	0	10	76	0	40	42
12:30	12:45	0	32	10	0	11	83	0	38	51
12:45	13:00	0	36	7	0	4	75	0	38	42
13:00	13:15	0	39	8	0	14	68	0	29	41
13:15	13:30	0	30	8	0	10	72	0	25	31
13:30	13:45	0	34	9	0	7	64	0	33	38
13:45	14:00	0	34	6	0	6	75	0	38	35
14:00	14:15	0	38	3	0	8	54	0	37	49
14:15	14:30	0	31	5	0	9	62	0	16	40
14:30	14:45	0	42	6	0	5	63	0	19	38
14:45	15:00	0	37	8	0	5	53	0	27	42

Heavy Vehicles

Time		North Approach Docker St			East Approach Forsyth St			South Approach Docker St		
Period Start	**Period End**	U	SB	L	U	R	L	U	R	NB
10:00	10:15	0	1	0	0	0	0	0	0	1
10:15	10:30	0	0	0	0	0	1	0	0	0
10:30	10:45	0	4	0	0	0	1	0	0	0
10:45	11:00	0	0	0	0	0	0	0	1	0
11:00	11:15	0	0	0	0	0	0	0	0	0
11:15	11:30	0	2	0	0	1	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0	0	0
11:45	12:00	0	2	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0	2	0
12:15	12:30	0	1	0	0	0	0	0	0	1
12:30	12:45	0	1	0	0	0	0	0	1	0
12:45	13:00	0	2	0	0	1	0	0	0	0
13:00	13:15	0	1	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0	0	0
13:30	13:45	0	0	0	0	0	1	0	0	1
13:45	14:00	0	1	0	0	0	0	0	0	1
14:00	14:15	0	0	0	0	0	0	0	0	0
14:15	14:30	0	1	0	0	0	0	0	0	0
14:30	14:45	0	2	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	1	0	0	1

ANNEXURE C: SIDRA RESULTS - EXISTING

(16 SHEETS)

MOVEMENT SUMMARY

Site: 101 [AM Morgan/Docker]

Network: N101 [AM]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)														
1	L2	7	0.0	7	0.0	0.004	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
2	T1	512	2.2	512	2.2	0.477	2.3	LOS A	4.2	29.5	0.32	0.21	0.44	45.4
3	R2	206	0.5	206	0.5	0.477	9.3	LOS A	4.2	29.5	0.49	0.32	0.68	43.2
Approach		725	1.7	725	1.7	0.477	4.3	NA	4.2	29.5	0.36	0.24	0.50	44.8
East: Morgan Street (E)														
4	L2	165	3.0	165	3.0	0.133	4.8	LOS A	0.5	3.7	0.16	0.51	0.16	45.3
5	T1	10	10.0	10	10.0	0.212	42.0	LOS C	0.6	4.9	0.92	0.97	0.97	26.8
6	R2	7	14.3	7	14.3	0.212	62.7	LOS E	0.6	4.9	0.92	0.97	0.97	15.2
Approach		182	3.8	182	3.8	0.212	9.1	LOS A	0.6	4.9	0.23	0.55	0.23	42.4
North: Docker Street (N)														
7	L2	39	0.0	39	0.0	0.021	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	39.7
8	T1	315	1.6	315	1.6	0.161	0.5	LOS A	0.3	2.5	0.09	0.03	0.09	49.1
9	R2	16	0.0	16	0.0	0.161	9.3	LOS A	0.3	2.5	0.11	0.03	0.11	48.6
Approach		370	1.4	370	1.4	0.161	1.3	NA	0.3	2.5	0.08	0.08	0.08	48.7
West: Bolton Street (W)														
10	L2	40	5.0	40	5.0	0.092	5.4	LOS A	0.3	2.2	0.41	0.57	0.41	39.9
11	T1	18	0.0	18	0.0	0.459	47.8	LOS D	1.4	10.7	0.77	0.88	0.92	20.2
12	R2	17	11.8	17	11.8	0.459	95.7	LOS F	1.4	10.7	0.95	1.04	1.18	24.0
Approach		75	5.3	75	5.3	0.459	36.0	LOS C	1.4	10.7	0.62	0.75	0.71	27.8
All Vehicles		1352	2.1	1352	2.1	0.477	5.9	NA	4.2	29.5	0.28	0.27	0.36	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [AM Morgan/Docker]

Network: N101 [AM]

Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Docker Street (S)															
Lane 1	7	0.0	7	0.0	1857	0.004	100	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	184	2.2	184	2.2	1923	0.095	20[6]	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	534	1.5	534	1.5	1120	0.477	100	5.8	LOS A	4.2	29.5	Full	500	0.0	0.0
Approach	725	1.7	725	1.7		0.477		4.3	NA	4.2	29.5				
East: Morgan Street (E)															
Lane 1	165	3.0	165	3.0	1241	0.133	63[5]	4.8	LOS A	0.5	3.7	Short (P)	25	0.0	NA
Lane 2	17	11.8	17	11.8	80	0.212	100	50.5	LOS D	0.6	4.9	Full	285	0.0	0.0
Approach	182	3.8	182	3.8		0.212		9.1	LOS A	0.6	4.9				
North: Docker Street (N)															
Lane 1	39	0.0	39	0.0	1857	0.021	100	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	62	1.6	62	1.6	1930	0.032	20[6]	0.0	LOS A	0.0	0.0	Full	230	0.0	0.0
Lane 3	269	1.5	269	1.5	1671	0.161	100	1.2	LOS A	0.3	2.5	Full	230	0.0	0.0
Approach	370	1.4	370	1.4		0.161		1.3	NA	0.3	2.5				
West: Bolton Street (W)															
Lane 1	46	4.3	46	4.3	503	0.092	20[6]	9.4	LOS A	0.3	2.2	Short (P)	10	0.0	NA
Lane 2	29	6.9	29	6.9	63	0.459	100	78.5	LOS F	1.4	10.7	Full	500	0.0	0.0
Approach	75	5.3	75	5.3		0.459		36.0	LOS C	1.4	10.7				
Intersection	1352	2.1	1352	2.1		0.477		5.9	NA	4.2	29.5				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

MOVEMENT SUMMARY

Site: 101 [AM Forsyth/Docker]

Network: N101 [AM]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)														
2	T1	226	3.1	226	3.1	0.118	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	333	2.1	333	2.1	0.457	8.2	LOS A	2.8	19.6	0.52	0.78	0.66	34.3
Approach		559	2.5	559	2.5	0.457	4.9	NA	2.8	19.6	0.31	0.47	0.40	43.4
East: Forsyth Street (E)														
4	L2	143	1.4	143	1.4	0.112	4.7	LOS A	0.4	3.0	0.11	0.50	0.11	39.6
6	R2	16	6.3	16	6.3	0.062	16.6	LOS B	0.2	1.5	0.73	0.87	0.73	38.2
Approach		159	1.9	159	1.9	0.112	5.9	LOS A	0.4	3.0	0.18	0.54	0.18	39.2
North: Docker Street (N)														
7	L2	63	0.0	63	0.0	0.034	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	44.5
8	T1	227	1.3	227	1.3	0.098	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		290	1.0	290	1.0	0.098	1.0	NA	0.0	0.0	0.00	0.11	0.00	48.7
All Vehicles		1008	2.0	1008	2.0	0.457	3.9	NA	2.8	19.6	0.20	0.38	0.25	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [AM Forsyth/Docker]

Network: N101 [AM]

Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Docker Street (S)															
Lane 1	226	3.1	226	3.1	1911	0.118	26[5]	0.0	LOS A	0.0	0.0	Full	230	0.0	0.0
Lane 2	333	2.1	333	2.1	728	0.457	100	8.2	LOS A	2.8	19.6	Full	230	0.0	0.0
Approach	559	2.5	559	2.5		0.457		4.9	NA	2.8	19.6				
East: Forsyth Street (E)															
Lane 1	143	1.4	143	1.4	1280	0.112	100	4.7	LOS A	0.4	3.0	Full	250	0.0	0.0
Lane 2	16	6.3	16	6.3	257	0.062	100	16.6	LOS B	0.2	1.5	Full	250	0.0	0.0
Approach	159	1.9	159	1.9		0.112		5.9	LOS A	0.4	3.0				
North: Docker Street (N)															
Lane 1	63	0.0	63	0.0	1857	0.034	100	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	38	1.3	38	1.3	1933	0.020	20[6]	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	189	1.3	189	1.3	1933	0.098	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	290	1.0	290	1.0		0.098		1.0	NA	0.0	0.0				
Intersection	1008	2.0	1008	2.0		0.457		3.9	NA	2.8	19.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

MOVEMENT SUMMARY

Site: 101 [AM Forsyth/Murray]

Network: N101 [AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Murray Street (S)														
1	L2	27	0.0	27	0.0	0.030	3.3	LOS A	0.1	0.8	0.27	0.39	0.27	40.4
2	T1	128	2.3	128	2.3	0.131	2.5	LOS A	0.5	3.9	0.24	0.40	0.24	48.3
3	R2	50	0.0	50	0.0	0.131	7.9	LOS A	0.5	3.9	0.24	0.40	0.24	49.2
3u	U	4	0.0	4	0.0	0.131	9.9	LOS A	0.5	3.9	0.24	0.40	0.24	39.4
Approach		209	1.4	209	1.4	0.131	4.0	LOS A	0.5	3.9	0.25	0.40	0.25	48.1
East: Forsyth Street (E)														
4	L2	19	0.0	19	0.0	0.042	2.9	LOS A	0.2	1.3	0.26	0.32	0.26	45.6
5	T1	87	0.0	87	0.0	0.042	2.5	LOS A	0.2	1.3	0.27	0.33	0.27	45.4
6	R2	5	0.0	5	0.0	0.042	8.0	LOS A	0.2	1.3	0.27	0.34	0.27	49.9
6u	U	1	0.0	1	0.0	0.042	10.0	LOS A	0.2	1.3	0.27	0.34	0.27	54.4
Approach		112	0.0	112	0.0	0.042	2.9	LOS A	0.2	1.3	0.26	0.33	0.26	45.9
North: The Esplanade (N)														
7	L2	4	0.0	4	0.0	0.005	4.1	LOS A	0.0	0.1	0.40	0.44	0.40	47.6
8	T1	85	4.7	85	4.7	0.108	3.0	LOS A	0.5	3.3	0.38	0.47	0.38	43.6
9	R2	46	6.5	46	6.5	0.108	8.5	LOS A	0.5	3.3	0.38	0.47	0.38	43.6
9u	U	2	0.0	2	0.0	0.108	10.4	LOS A	0.5	3.3	0.38	0.47	0.38	53.0
Approach		137	5.1	137	5.1	0.108	5.0	LOS A	0.5	3.3	0.38	0.47	0.38	44.0
West: Forsyth Street (W)														
10	L2	111	1.8	111	1.8	0.154	3.1	LOS A	0.7	5.1	0.31	0.37	0.31	47.2
11	T1	266	1.9	266	1.9	0.154	2.7	LOS A	0.7	5.1	0.31	0.36	0.31	48.9
12	R2	19	0.0	19	0.0	0.154	8.2	LOS A	0.7	5.0	0.32	0.36	0.32	41.3
12u	U	1	0.0	1	0.0	0.154	10.2	LOS A	0.7	5.0	0.32	0.36	0.32	41.3
Approach		397	1.8	397	1.8	0.154	3.1	LOS A	0.7	5.1	0.31	0.36	0.31	48.3
All Vehicles		855	2.0	855	2.0	0.154	3.6	LOS A	0.7	5.1	0.30	0.38	0.30	47.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [AM Forsyth/Murray]

Network: N101 [AM]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Murray Street (S)															
Lane 1	27	0.0	27	0.0	904	0.030	100	3.3	LOS A	0.1	0.8	Short	30	0.0	NA
Lane 2[d]	182	1.6	182	1.6	1390	0.131	100	4.1	LOS A	0.5	3.9	Full	200	0.0	0.0
Approach	209	1.4	209	1.4		0.131		4.0	LOS A	0.5	3.9				
East: Forsyth Street (E)															
Lane 1[d]	58	0.0	58	0.0	1376	0.042	100	2.6	LOS A	0.2	1.3	Full	500	0.0	0.0
Lane 2	54	0.0	54	0.0	1275	0.042	100	3.2	LOS A	0.2	1.3	Full	500	0.0	0.0
Approach	112	0.0	112	0.0		0.042		2.9	LOS A	0.2	1.3				
North: The Esplanade (N)															
Lane 1	4	0.0	4	0.0	794	0.005	100	4.1	LOS A	0.0	0.1	Short	30	0.0	NA
Lane 2[d]	133	5.3	133	5.3	1229	0.108	100	5.0	LOS A	0.5	3.3	Full	500	0.0	0.0
Approach	137	5.1	137	5.1		0.108		5.0	LOS A	0.5	3.3				
West: Forsyth Street (W)															
Lane 1[d]	206	1.8	206	1.8	1340	0.154	100	2.9	LOS A	0.7	5.1	Full	250	0.0	0.0
Lane 2	191	1.7	191	1.7	1238	0.154	100	3.3	LOS A	0.7	5.0	Full	250	0.0	0.0
Approach	397	1.8	397	1.8		0.154		3.1	LOS A	0.7	5.1				
Intersection	855	2.0	855	2.0		0.154		3.6	LOS A	0.7	5.1				

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

d Dominant lane on roundabout approach

MOVEMENT SUMMARY

Site: 101 [AM Morgan/Murray]

Network: N101 [AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Murray Street (S)														
1	L2	22	9.1	22	9.1	0.027	3.8	LOS A	0.1	0.8	0.35	0.43	0.35	45.0
2	T1	96	1.0	96	1.0	0.097	2.7	LOS A	0.4	3.0	0.31	0.41	0.31	44.3
3	R2	32	0.0	32	0.0	0.097	8.1	LOS A	0.4	3.0	0.31	0.41	0.31	49.3
3u	U	1	0.0	1	0.0	0.097	10.2	LOS A	0.4	3.0	0.31	0.41	0.31	53.6
Approach		151	2.0	151	2.0	0.097	4.1	LOS A	0.4	3.0	0.32	0.41	0.32	46.1
East: Morgan Street (E)														
4	L2	12	0.0	12	0.0	0.013	3.1	LOS A	0.1	0.4	0.25	0.37	0.25	48.0
5	T1	106	2.8	106	2.8	0.116	2.4	LOS A	0.5	3.7	0.23	0.41	0.23	44.5
6	R2	51	3.9	51	3.9	0.116	7.9	LOS A	0.5	3.7	0.23	0.41	0.23	44.5
6u	U	5	0.0	5	0.0	0.116	9.9	LOS A	0.5	3.7	0.23	0.41	0.23	53.7
Approach		174	2.9	174	2.9	0.116	4.3	LOS A	0.5	3.7	0.24	0.41	0.24	45.2
North: The Esplanade (N)														
7	L2	27	3.7	27	3.7	0.032	3.8	LOS A	0.1	0.9	0.36	0.44	0.36	46.8
8	T1	56	1.8	56	1.8	0.078	2.8	LOS A	0.3	2.5	0.33	0.47	0.33	47.4
9	R2	44	4.6	44	4.6	0.078	8.2	LOS A	0.3	2.5	0.33	0.47	0.33	37.7
9u	U	1	0.0	1	0.0	0.078	10.2	LOS A	0.3	2.5	0.33	0.47	0.33	37.7
Approach		128	3.1	128	3.1	0.078	4.9	LOS A	0.3	2.5	0.34	0.46	0.34	45.4
West: Morgan Street (W)														
10	L2	62	0.0	62	0.0	0.065	3.4	LOS A	0.3	1.9	0.32	0.42	0.32	42.3
11	T1	186	0.0	186	0.0	0.149	2.7	LOS A	0.7	4.8	0.30	0.34	0.30	49.1
12	R2	6	16.7	6	16.7	0.149	8.4	LOS A	0.7	4.8	0.30	0.34	0.30	49.6
12u	U	10	0.0	10	0.0	0.149	10.2	LOS A	0.7	4.8	0.30	0.34	0.30	42.5
Approach		264	0.4	264	0.4	0.149	3.3	LOS A	0.7	4.8	0.30	0.36	0.30	48.2
All Vehicles		717	1.8	717	1.8	0.149	4.0	LOS A	0.7	4.8	0.30	0.40	0.30	46.6

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [AM Morgan/Murray]

Network: N101 [AM]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Murray Street (S)															
Lane 1	22	9.1	22	9.1	809	0.027	100	3.8	LOS A	0.1	0.8	Short	40	0.0	NA
Lane 2[d]	129	0.8	129	0.8	1329	0.097	100	4.1	LOS A	0.4	3.0	Full	500	0.0	0.0
Approach	151	2.0	151	2.0		0.097		4.1	LOS A	0.4	3.0				
East: Morgan Street (E)															
Lane 1	12	0.0	12	0.0	918	0.013	100	3.1	LOS A	0.1	0.4	Short	50	0.0	NA
Lane 2[d]	162	3.1	162	3.1	1395	0.116	100	4.4	LOS A	0.5	3.7	Full	500	0.0	0.0
Approach	174	2.9	174	2.9		0.116		4.3	LOS A	0.5	3.7				
North: The Esplanade (N)															
Lane 1	27	3.7	27	3.7	845	0.032	100	3.8	LOS A	0.1	0.9	Short	40	0.0	NA
Lane 2[d]	101	3.0	101	3.0	1295	0.078	100	5.2	LOS A	0.3	2.5	Full	200	0.0	0.0
Approach	128	3.1	128	3.1		0.078		4.9	LOS A	0.3	2.5				
West: Morgan Street (W)															
Lane 1	62	0.0	62	0.0	947	0.065	100	3.4	LOS A	0.3	1.9	Short	30	0.0	NA
Lane 2[d]	202	0.5	202	0.5	1354	0.149	100	3.2	LOS A	0.7	4.8	Full	285	0.0	0.0
Approach	264	0.4	264	0.4		0.149		3.3	LOS A	0.7	4.8				
Intersection	717	1.8	717	1.8		0.149		4.0	LOS A	0.7	4.8				

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

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [PM Forsyth/Murray]

Network: N101 [PM]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	Aver. Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Murray Street (S)															
Lane 1	27	0.0	27	0.0	762	0.035	100	4.4	LOS A	0.1	0.4	Short	30	0.0	NA
Lane 2[d]	182	0.0	182	0.0	1225	0.149	100	4.8	LOS A	0.3	1.8	Full	200	0.0	0.0
Approach	209	0.0	209	0.0		0.149		4.8	LOS A	0.3	1.8				
East: Forsyth Street (E)															
Lane 1[d]	142	0.4	142	0.4	1265	0.112	100	3.0	LOS A	0.2	1.5	Full	500	0.0	0.0
Lane 2	128	0.4	128	0.4	1146	0.112	100	3.4	LOS A	0.2	1.5	Full	500	0.0	0.0
Approach	270	0.4	270	0.4		0.112		3.2	LOS A	0.2	1.5				
North: The Esplanade (N)															
Lane 1	4	0.0	4	0.0	847	0.005	100	3.6	LOS A	0.0	0.0	Short	30	0.0	NA
Lane 2[d]	280	0.4	280	0.4	1331	0.210	100	5.9	LOS A	0.4	2.7	Full	500	0.0	0.0
Approach	284	0.4	284	0.4		0.210		5.9	LOS A	0.4	2.7				
West: Forsyth Street (W)															
Lane 1[d]	115	0.0	115	0.0	1343	0.086	100	2.8	LOS A	0.2	1.1	Full	250	0.0	0.0
Lane 2	106	0.0	106	0.0	1236	0.086	100	3.2	LOS A	0.2	1.1	Full	250	0.0	0.0
Approach	221	0.0	221	0.0		0.086		3.0	LOS A	0.2	1.1				
Intersection	984	0.2	984	0.2		0.210		4.3	LOS A	0.4	2.7				

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

d Dominant lane on roundabout approach

MOVEMENT SUMMARY

Site: 101 [PM Forsyth/Murray]

Network: N101 [PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Murray Street (S)														
1	L2	27	0.0	27	0.0	0.035	4.4	LOS A	0.1	0.4	0.44	0.51	0.44	38.8
2	T1	128	0.0	128	0.0	0.149	3.2	LOS A	0.3	1.8	0.42	0.47	0.42	47.5
3	R2	50	0.0	50	0.0	0.149	8.6	LOS A	0.3	1.8	0.42	0.47	0.42	48.4
3u	U	4	0.0	4	0.0	0.149	10.6	LOS A	0.3	1.8	0.42	0.47	0.42	37.9
Approach		209	0.0	209	0.0	0.149	4.8	LOS A	0.3	1.8	0.42	0.48	0.42	47.2
East: Forsyth Street (E)														
4	L2	23	0.0	23	0.0	0.112	3.4	LOS A	0.2	1.5	0.38	0.36	0.38	44.8
5	T1	240	0.4	240	0.4	0.112	3.0	LOS A	0.2	1.5	0.39	0.37	0.39	44.7
6	R2	6	0.0	6	0.0	0.112	8.5	LOS A	0.2	1.5	0.39	0.38	0.39	49.5
6u	U	1	0.0	1	0.0	0.112	10.6	LOS A	0.2	1.5	0.39	0.38	0.39	53.9
Approach		270	0.4	270	0.4	0.112	3.2	LOS A	0.2	1.5	0.39	0.37	0.39	45.0
North: The Esplanade (N)														
7	L2	4	0.0	4	0.0	0.005	3.6	LOS A	0.0	0.0	0.34	0.40	0.34	47.8
8	T1	114	0.0	114	0.0	0.210	2.7	LOS A	0.4	2.7	0.33	0.52	0.33	42.8
9	R2	165	0.6	165	0.6	0.210	8.2	LOS A	0.4	2.7	0.33	0.52	0.33	42.8
9u	U	1	0.0	1	0.0	0.210	10.2	LOS A	0.4	2.7	0.33	0.52	0.33	52.3
Approach		284	0.4	284	0.4	0.210	5.9	LOS A	0.4	2.7	0.33	0.52	0.33	43.0
West: Forsyth Street (W)														
10	L2	46	0.0	46	0.0	0.086	3.0	LOS A	0.2	1.1	0.30	0.34	0.30	47.3
11	T1	165	0.0	165	0.0	0.086	2.6	LOS A	0.2	1.1	0.31	0.34	0.31	49.0
12	R2	9	0.0	9	0.0	0.086	8.1	LOS A	0.2	1.1	0.31	0.35	0.31	41.4
12u	U	1	0.0	1	0.0	0.086	10.1	LOS A	0.2	1.1	0.31	0.35	0.31	41.4
Approach		221	0.0	221	0.0	0.086	3.0	LOS A	0.2	1.1	0.31	0.34	0.31	48.5
All Vehicles		984	0.2	984	0.2	0.210	4.3	LOS A	0.4	2.7	0.36	0.43	0.36	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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [PM Forsyth/Docker]

Network: N101 [PM]

Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	Aver. Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Docker Street (S)															
Lane 1	288	0.4	288	0.4	1946	0.148	59[5]	0.0	LOS A	0.0	0.0	Full	230	0.0	0.0
Lane 2	192	0.0	192	0.0	766	0.251	100	6.6	LOS A	0.4	2.8	Full	230	0.0	0.0
Approach	480	0.2	480	0.2		0.251		2.6	NA	0.4	2.8				
East: Forsyth Street (E)															
Lane 1	406	0.5	406	0.5	1330	0.305	100	4.6	LOS A	0.0	0.0	Full	250	0.0	0.0
Lane 2	40	0.0	40	0.0	320	0.125	100	14.1	LOS A	0.2	1.2	Full	250	0.0	0.0
Approach	446	0.4	446	0.4		0.305		5.4	LOS A	0.2	1.2				
North: Docker Street (N)															
Lane 1	28	0.0	28	0.0	1857	0.015	24[5]	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	122	0.0	122	0.0	1950	0.062	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	122	0.0	122	0.0	1950	0.062	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	271	0.0	271	0.0		0.062		0.5	NA	0.0	0.0				
Intersection	1197	0.3	1197	0.3		0.305		3.2	NA	0.4	2.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program

MOVEMENT SUMMARY

Site: 101 [PM Forsyth/Docker]

Network: N101 [PM]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)														
2	T1	288	0.4	288	0.4	0.148	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	192	0.0	192	0.0	0.251	6.6	LOS A	0.4	2.8	0.42	0.64	0.42	36.5
Approach		480	0.2	480	0.2	0.251	2.6	NA	0.4	2.8	0.17	0.26	0.17	46.8
East: Forsyth Street (E)														
4	L2	406	0.5	406	0.5	0.305	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	40.4
6	R2	40	0.0	40	0.0	0.125	14.1	LOS A	0.2	1.2	0.69	0.85	0.69	39.6
Approach		446	0.4	446	0.4	0.305	5.4	LOS A	0.2	1.2	0.06	0.56	0.06	40.2
North: Docker Street (N)														
7	L2	28	0.0	28	0.0	0.015	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	44.5
8	T1	243	0.0	243	0.0	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		271	0.0	271	0.0	0.062	0.5	NA	0.0	0.0	0.00	0.05	0.00	49.4
All Vehicles		1197	0.3	1197	0.3	0.305	3.2	NA	0.4	2.8	0.09	0.32	0.09	45.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [PM Morgan/Murray]

Network: N101 [PM]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	Aver. Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Murray Street (S)															
Lane 1	10	0.0	10	0.0	833	0.012	100	3.8	LOS A	0.0	0.1	Short	40	0.0	NA
Lane 2[d]	90	0.0	90	0.0	1309	0.069	100	4.5	LOS A	0.1	0.8	Full	500	0.0	0.0
Approach	100	0.0	100	0.0		0.069		4.4	LOS A	0.1	0.8				
East: Morgan Street (E)															
Lane 1	24	4.2	24	4.2	893	0.027	100	3.2	LOS A	0.0	0.3	Short	50	0.0	NA
Lane 2[d]	218	0.9	218	0.9	1421	0.153	100	3.2	LOS A	0.3	2.0	Full	500	0.0	0.0
Approach	242	1.2	242	1.2		0.153		3.2	LOS A	0.3	2.0				
North: The Esplanade (N)															
Lane 1	42	0.0	42	0.0	988	0.042	100	3.6	LOS A	0.1	0.5	Short	40	0.0	NA
Lane 2[d]	107	0.0	107	0.0	1313	0.081	100	4.5	LOS A	0.1	1.0	Full	200	0.0	0.0
Approach	149	0.0	149	0.0		0.081		4.2	LOS A	0.1	1.0				
West: Morgan Street (W)															
Lane 1	43	0.0	43	0.0	916	0.047	100	3.2	LOS A	0.1	0.5	Short	30	0.0	NA
Lane 2[d]	218	0.0	218	0.0	1430	0.152	100	2.9	LOS A	0.3	2.0	Full	285	0.0	0.0
Approach	261	0.0	261	0.0		0.152		2.9	LOS A	0.3	2.0				
Intersection	752	0.4	752	0.4		0.153		3.5	LOS A	0.3	2.0				

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

d Dominant lane on roundabout approach

MOVEMENT SUMMARY

Site: 101 [PM Morgan/Murray]

Network: N101 [PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Murray Street (S)														
1	L2	10	0.0	10	0.0	0.012	3.8	LOS A	0.0	0.1	0.36	0.42	0.36	45.0
2	T1	62	0.0	62	0.0	0.069	2.8	LOS A	0.1	0.8	0.33	0.43	0.33	44.0
3	R2	27	0.0	27	0.0	0.069	8.2	LOS A	0.1	0.8	0.33	0.43	0.33	49.1
3u	U	1	0.0	1	0.0	0.069	10.2	LOS A	0.1	0.8	0.33	0.43	0.33	53.4
Approach		100	0.0	100	0.0	0.069	4.4	LOS A	0.1	0.8	0.33	0.43	0.33	46.2
East: Morgan Street (E)														
4	L2	24	4.2	24	4.2	0.027	3.2	LOS A	0.0	0.3	0.27	0.38	0.27	48.0
5	T1	186	1.1	186	1.1	0.153	2.4	LOS A	0.3	2.0	0.25	0.34	0.25	45.2
6	R2	30	0.0	30	0.0	0.153	7.9	LOS A	0.3	2.0	0.25	0.34	0.25	45.2
6u	U	2	0.0	2	0.0	0.153	9.9	LOS A	0.3	2.0	0.25	0.34	0.25	54.3
Approach		242	1.2	242	1.2	0.153	3.2	LOS A	0.3	2.0	0.25	0.34	0.25	45.7
North: The Esplanade (N)														
7	L2	42	0.0	42	0.0	0.042	3.6	LOS A	0.1	0.5	0.35	0.44	0.35	46.9
8	T1	75	0.0	75	0.0	0.081	2.8	LOS A	0.1	1.0	0.33	0.43	0.33	47.9
9	R2	30	0.0	30	0.0	0.081	8.2	LOS A	0.1	1.0	0.33	0.43	0.33	38.6
9u	U	2	0.0	2	0.0	0.081	10.3	LOS A	0.1	1.0	0.33	0.43	0.33	38.6
Approach		149	0.0	149	0.0	0.081	4.2	LOS A	0.1	1.0	0.34	0.43	0.34	46.6
West: Morgan Street (W)														
10	L2	43	0.0	43	0.0	0.047	3.2	LOS A	0.1	0.5	0.26	0.39	0.26	42.7
11	T1	201	0.0	201	0.0	0.152	2.4	LOS A	0.3	2.0	0.24	0.31	0.24	49.3
12	R2	14	0.0	14	0.0	0.152	7.9	LOS A	0.3	2.0	0.24	0.31	0.24	50.1
12u	U	3	0.0	3	0.0	0.152	9.9	LOS A	0.3	2.0	0.24	0.31	0.24	43.0
Approach		261	0.0	261	0.0	0.152	2.9	LOS A	0.3	2.0	0.24	0.33	0.24	48.8
All Vehicles		752	0.4	752	0.4	0.153	3.5	LOS A	0.3	2.0	0.28	0.37	0.28	47.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [PM Morgan/Docker]

Network: N101 [PM]

Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	Aver. Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Docker Street (S)															
Lane 1	14	0.0	14	0.0	1857	0.008	100	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	225	2.2	225	2.2	1923	0.117	20[6]	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	439	1.3	439	1.3	753	0.584	100	12.5	LOS A	2.3	16.2	Full	500	0.0	0.0
Approach	678	1.6	678	1.6		0.584		8.2	NA	2.3	16.2				
East: Morgan Street (E)															
Lane 1	204	0.5	204	0.5	1196	0.171	37[5]	5.1	LOS A	0.3	1.9	Short (P)	25	0.0	NA
Lane 2	25	4.0	25	4.0	54	0.461	100	90.6	LOS F	0.6	4.1	Full	285	0.0	0.0
Approach	229	0.9	229	0.9		0.461		14.4	LOS A	0.6	4.1				
North: Docker Street (N)															
Lane 1	30	0.0	30	0.0	1857	0.016	100	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	116	0.5	116	0.5	1944	0.060	20[6]	0.0	LOS A	0.0	0.0	Full	230	0.0	0.0
Lane 3	504	0.5	504	0.5	1689	0.298	100	1.3	LOS A	0.3	2.2	Full	230	0.0	0.0
Approach	650	0.5	650	0.5		0.298		1.2	NA	0.3	2.2				
West: Bolton Street (W)															
Lane 1	45	0.0	45	0.0	302	0.149	20[6]	14.5	LOS A	0.2	1.3	Short (P)	10	0.0	NA
Lane 2	24	0.0	24	0.0	32	0.745	100	203.5	LOS F	1.0	6.7	Full	500	0.0	0.0
Approach	69	0.0	69	0.0		0.745		80.3	LOS F	1.0	6.7				
Intersection	1626	1.0	1626	1.0		0.745		9.3	NA	2.3	16.2				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

MOVEMENT SUMMARY

Site: 101 [PM Morgan/Docker]

Network: N101 [PM]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)														
1	L2	14	0.0	14	0.0	0.008	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
2	T1	443	2.2	443	2.2	0.584	4.8	LOS A	2.3	16.2	0.38	0.27	0.65	42.8
3	R2	221	0.5	221	0.5	0.584	15.2	LOS B	2.3	16.2	0.77	0.55	1.31	37.4
Approach		678	1.6	678	1.6	0.584	8.2	NA	2.3	16.2	0.50	0.37	0.85	41.1
East: Morgan Street (E)														
4	L2	204	0.5	204	0.5	0.171	5.1	LOS A	0.3	1.9	0.23	0.53	0.23	45.1
5	T1	15	0.0	15	0.0	0.461	75.8	LOS F	0.6	4.1	0.96	1.04	1.17	19.6
6	R2	10	10.0	10	10.0	0.461	112.9	LOS F	0.6	4.1	0.96	1.04	1.17	9.8
Approach		229	0.9	229	0.9	0.461	14.4	LOS A	0.6	4.1	0.31	0.58	0.33	39.2
North: Docker Street (N)														
7	L2	30	0.0	30	0.0	0.016	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	39.7
8	T1	587	0.5	587	0.5	0.298	0.6	LOS A	0.3	2.2	0.10	0.03	0.11	49.1
9	R2	33	0.0	33	0.0	0.298	9.2	LOS A	0.3	2.2	0.12	0.04	0.14	48.5
Approach		650	0.5	650	0.5	0.298	1.2	NA	0.3	2.2	0.09	0.05	0.11	48.8
West: Bolton Street (W)														
10	L2	37	0.0	37	0.0	0.149	5.5	LOS A	0.2	1.3	0.56	0.63	0.56	36.0
11	T1	10	0.0	10	0.0	0.745	75.0	LOS F	1.0	6.7	0.65	0.73	0.74	20.6
12	R2	22	0.0	22	0.0	0.745	208.7	LOS F	1.0	6.7	0.99	1.11	1.43	13.2
Approach		69	0.0	69	0.0	0.745	80.3	LOS F	1.0	6.7	0.71	0.80	0.87	18.8
All Vehicles		1626	1.0	1626	1.0	0.745	9.3	NA	2.3	16.2	0.32	0.29	0.48	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

ANNEXURE D: SIDRA RESULTS - FUTURE

(28 SHEETS)

LANE SUMMARY

Site: 101 [AM Morgan/Docker]

Network: N101 [AM]

Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Docker Street (S)															
Lane 1	7	0.0	7	0.0	1857	0.004	100	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	240	2.2	240	2.2	1923	0.125	20[6]	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	598	1.2	598	1.2	957	0.625	100	8.8	LOS A	7.2	50.9	Full	500	0.0	0.0
Approach	845	1.5	845	1.5		0.625		6.3	NA	7.2	50.9				
East: Morgan Street (E)															
Lane 1	227	3.0	227	3.0	1241	0.183	39[5]	4.9	LOS A	0.8	5.4	Short (P)	25	0.0	NA
Lane 2	29	11.0	29	11.0	62	0.468	100	81.2	LOS F	1.5	11.4	Full	285	0.0	0.0
Approach	256	3.9	256	3.9		0.468		13.5	LOS A	1.5	11.4				
North: Docker Street (N)															
Lane 1	39	0.0	39	0.0	1857	0.021	100	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	62	1.6	62	1.6	1930	0.032	20[6]	0.0	LOS A	0.0	0.0	Full	230	0.0	0.0
Lane 3	269	1.5	269	1.5	1674	0.161	100	1.2	LOS A	0.3	2.4	Full	230	0.0	0.0
Approach	370	1.4	370	1.4		0.161		1.3	NA	0.3	2.4				
West: Bolton Street (W)															
Lane 1	53	3.8	53	3.8	270	0.197	20[6]	16.1	LOS B	0.6	4.4	Short (P)	10	0.0	NA
Lane 2	46	4.4	46	4.4	47	0.984	100	291.8	LOS F	6.0	43.6	Full	500	0.0	0.0
Approach	99	4.0	99	4.0		0.984		143.8	LOS F	6.0	43.6				
Intersection	1570	2.0	1570	2.0		0.984		14.9	NA	7.2	50.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

MOVEMENT SUMMARY

Site: 101 [AM Morgan/Docker]

Network: N101 [AM]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)														
1	L2	7	0.0	7	0.0	0.004	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
2	T1	512	2.2	512	2.2	0.625	3.2	LOS A	7.2	50.9	0.35	0.30	0.57	44.4
3	R2	326	0.5	326	0.5	0.625	11.1	LOS A	7.2	50.9	0.65	0.56	1.07	40.4
Approach		845	1.5	845	1.5	0.625	6.3	NA	7.2	50.9	0.46	0.40	0.76	42.8
East: Morgan Street (E)														
4	L2	227	3.0	227	3.0	0.183	4.9	LOS A	0.8	5.4	0.17	0.51	0.17	45.3
5	T1	22	10.0	22	10.0	0.468	72.3	LOS F	1.5	11.4	0.96	1.04	1.19	20.9
6	R2	7	14.3	7	14.3	0.468	109.3	LOS F	1.5	11.4	0.96	1.04	1.19	10.7
Approach		256	3.9	256	3.9	0.468	13.5	LOS A	1.5	11.4	0.25	0.57	0.28	39.8
North: Docker Street (N)														
7	L2	39	0.0	39	0.0	0.021	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	39.7
8	T1	315	1.6	315	1.6	0.161	0.5	LOS A	0.3	2.4	0.09	0.03	0.09	49.1
9	R2	16	0.0	16	0.0	0.161	9.2	LOS A	0.3	2.4	0.11	0.03	0.11	48.6
Approach		370	1.4	370	1.4	0.161	1.3	NA	0.3	2.4	0.08	0.08	0.08	48.7
West: Bolton Street (W)														
10	L2	40	5.0	40	5.0	0.197	5.7	LOS A	0.6	4.4	0.60	0.68	0.60	34.9
11	T1	42	0.0	42	0.0	0.984	192.2	LOS F	6.0	43.6	0.87	1.27	2.25	7.7
12	R2	17	11.8	17	11.8	0.984	348.9	LOS F	6.0	43.6	1.00	1.53	3.01	10.0
Approach		99	4.0	99	4.0	0.984	143.8	LOS F	6.0	43.6	0.78	1.07	1.71	11.6
All Vehicles		1570	2.0	1570	2.0	0.984	14.9	NA	7.2	50.9	0.36	0.39	0.58	37.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [AM Forsyth/Docker]

Network: N101 [AM]

Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Docker Street (S)															
Lane 1	226	3.1	226	3.1	1911	0.118	24[5]	0.0	LOS A	0.0	0.0	Full	230	0.0	0.0
Lane 2	333	2.1	333	2.1	667	0.499	100	9.5	LOS A	3.2	22.5	Full	230	0.0	0.0
Approach	559	2.5	559	2.5		0.499		5.7	NA	3.2	22.5				
East: Forsyth Street (E)															
Lane 1	143	1.4	143	1.4	1280	0.112	100	4.7	LOS A	0.4	3.0	Full	250	0.0	0.0
Lane 2	53	6.3	53	6.3	241	0.220	100	19.3	LOS B	0.8	5.7	Full	250	0.0	0.0
Approach	196	2.7	196	2.7		0.220		8.7	LOS A	0.8	5.7				
North: Docker Street (N)															
Lane 1	135	0.0	135	0.0	1857	0.073	100	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	38	1.3	38	1.3	1933	0.020	20[6]	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	189	1.3	189	1.3	1933	0.098	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	362	0.8	362	0.8		0.098		1.7	NA	0.0	0.0				
Intersection	1117	2.0	1117	2.0		0.499		4.9	NA	3.2	22.5				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

MOVEMENT SUMMARY

Site: 101 [AM Forsyth/Docker]

Network: N101 [AM]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)														
2	T1	226	3.1	226	3.1	0.118	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	333	2.1	333	2.1	0.499	9.5	LOS A	3.2	22.5	0.58	0.89	0.82	32.6
Approach		559	2.5	559	2.5	0.499	5.7	NA	3.2	22.5	0.35	0.53	0.49	42.5
East: Forsyth Street (E)														
4	L2	143	1.4	143	1.4	0.112	4.7	LOS A	0.4	3.0	0.11	0.50	0.11	39.6
6	R2	53	6.3	53	6.3	0.220	19.3	LOS B	0.8	5.7	0.78	0.91	0.84	36.8
Approach		196	2.7	196	2.7	0.220	8.7	LOS A	0.8	5.7	0.30	0.61	0.31	38.1
North: Docker Street (N)														
7	L2	135	0.0	135	0.0	0.073	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	44.5
8	T1	227	1.3	227	1.3	0.098	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		362	0.8	362	0.8	0.098	1.7	NA	0.0	0.0	0.00	0.20	0.00	47.8
All Vehicles		1117	2.0	1117	2.0	0.499	4.9	NA	3.2	22.5	0.23	0.44	0.30	43.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [AM Forsyth/Murray]

Network: N101 [AM]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Murray Street (S)															
Lane 1	27	0.0	27	0.0	870	0.031	100	3.5	LOS A	0.1	0.8	Short	30	0.0	NA
Lane 2[d]	206	1.6	206	1.6	1346	0.153	100	4.4	LOS A	0.7	4.7	Full	200	0.0	0.0
Approach	233	1.4	233	1.4		0.153		4.3	LOS A	0.7	4.7				
East: Forsyth Street (E)															
Lane 1[d]	83	0.0	83	0.0	1329	0.063	100	2.9	LOS A	0.3	2.0	Full	500	0.0	0.0
Lane 2	77	0.0	77	0.0	1220	0.063	100	3.2	LOS A	0.3	1.9	Full	500	0.0	0.0
Approach	160	0.0	160	0.0		0.063		3.0	LOS A	0.3	2.0				
North: The Esplanade (N)															
Lane 1	4	0.0	4	0.0	778	0.005	100	4.2	LOS A	0.0	0.1	Short	30	0.0	NA
Lane 2[d]	181	5.4	181	5.4	1206	0.150	100	5.3	LOS A	0.6	4.8	Full	500	0.0	0.0
Approach	185	5.2	185	5.2		0.150		5.3	LOS A	0.6	4.8				
West: Forsyth Street (W)															
Lane 1[d]	220	1.8	220	1.8	1315	0.167	100	3.0	LOS A	0.8	5.7	Full	250	0.0	0.0
Lane 2	201	1.7	201	1.7	1207	0.167	100	3.4	LOS A	0.8	5.6	Full	250	0.0	0.0
Approach	421	1.8	421	1.8		0.167		3.2	LOS A	0.8	5.7				
Intersection	999	2.0	999	2.0		0.167		3.8	LOS A	0.8	5.7				

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

d Dominant lane on roundabout approach

MOVEMENT SUMMARY

Site: 101 [AM Forsyth/Murray]

Network: N101 [AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Murray Street (S)														
1	L2	27	0.0	27	0.0	0.031	3.5	LOS A	0.1	0.8	0.31	0.42	0.31	40.0
2	T1	140	2.3	140	2.3	0.153	2.6	LOS A	0.7	4.7	0.29	0.42	0.29	48.0
3	R2	62	0.0	62	0.0	0.153	8.0	LOS A	0.7	4.7	0.29	0.42	0.29	48.9
3u	U	4	0.0	4	0.0	0.153	10.1	LOS A	0.7	4.7	0.29	0.42	0.29	38.8
Approach		233	1.4	233	1.4	0.153	4.3	LOS A	0.7	4.7	0.30	0.42	0.30	47.8
East: Forsyth Street (E)														
4	L2	43	0.0	43	0.0	0.063	3.1	LOS A	0.3	2.0	0.31	0.36	0.31	45.3
5	T1	111	0.0	111	0.0	0.063	2.7	LOS A	0.3	2.0	0.32	0.35	0.32	45.1
6	R2	5	0.0	5	0.0	0.063	8.2	LOS A	0.3	1.9	0.32	0.35	0.32	49.8
6u	U	1	0.0	1	0.0	0.063	10.2	LOS A	0.3	1.9	0.32	0.35	0.32	54.2
Approach		160	0.0	160	0.0	0.063	3.0	LOS A	0.3	2.0	0.32	0.35	0.32	45.5
North: The Esplanade (N)														
7	L2	4	0.0	4	0.0	0.005	4.2	LOS A	0.0	0.1	0.41	0.44	0.41	47.6
8	T1	109	4.7	109	4.7	0.150	3.1	LOS A	0.6	4.8	0.40	0.50	0.40	43.3
9	R2	70	6.5	70	6.5	0.150	8.6	LOS A	0.6	4.8	0.40	0.50	0.40	43.3
9u	U	2	0.0	2	0.0	0.150	10.5	LOS A	0.6	4.8	0.40	0.50	0.40	52.8
Approach		185	5.2	185	5.2	0.150	5.3	LOS A	0.6	4.8	0.40	0.49	0.40	43.6
West: Forsyth Street (W)														
10	L2	123	1.8	123	1.8	0.167	3.2	LOS A	0.8	5.7	0.34	0.38	0.34	47.1
11	T1	278	1.9	278	1.9	0.167	2.8	LOS A	0.8	5.7	0.34	0.37	0.34	48.8
12	R2	19	0.0	19	0.0	0.167	8.3	LOS A	0.8	5.6	0.35	0.37	0.35	41.1
12u	U	1	0.0	1	0.0	0.167	10.3	LOS A	0.8	5.6	0.35	0.37	0.35	41.1
Approach		421	1.8	421	1.8	0.167	3.2	LOS A	0.8	5.7	0.34	0.37	0.34	48.1
All Vehicles		999	2.0	999	2.0	0.167	3.8	LOS A	0.8	5.7	0.34	0.40	0.34	46.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [AM Morgan/Murray]

Network: N101 [AM]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Murray Street (S)															
Lane 1	94	9.1	94	9.1	990	0.095	100	3.8	LOS A	0.4	3.1	Short	40	0.0	NA
Lane 2[d]	177	0.8	177	0.8	1276	0.139	100	4.0	LOS A	0.7	4.6	Full	500	0.0	0.0
Approach	271	3.7	271	3.7		0.139		3.9	LOS A	0.7	4.6				
East: Morgan Street (E)															
Lane 1	12	0.0	12	0.0	862	0.014	100	3.5	LOS A	0.1	0.4	Short	50	0.0	NA
Lane 2[d]	210	3.2	210	3.2	1320	0.159	100	4.8	LOS A	0.7	5.4	Full	500	0.0	0.0
Approach	222	3.0	222	3.0		0.159		4.8	LOS A	0.7	5.4				
North: The Esplanade (N)															
Lane 1	27	3.7	27	3.7	785	0.034	100	4.2	LOS A	0.1	1.0	Short	40	0.0	NA
Lane 2[d]	138	2.9	138	2.9	1248	0.111	100	5.2	LOS A	0.5	3.8	Full	200	0.0	0.0
Approach	165	3.0	165	3.0		0.111		5.1	LOS A	0.5	3.8				
West: Morgan Street (W)															
Lane 1	62	0.0	62	0.0	825	0.075	100	4.0	LOS A	0.3	2.2	Short	30	0.0	NA
Lane 2[d]	250	2.9	250	2.9	1276	0.196	100	4.3	LOS A	1.0	6.9	Full	285	0.0	0.0
Approach	312	2.3	312	2.3		0.196		4.2	LOS A	1.0	6.9				
Intersection	970	3.0	970	3.0		0.196		4.4	LOS A	1.0	6.9				

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

d Dominant lane on roundabout approach

MOVEMENT SUMMARY

Site: 101 [AM Morgan/Murray]

Network: N101 [AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Murray Street (S)														
1	L2	94	9.1	94	9.1	0.095	3.8	LOS A	0.4	3.1	0.39	0.47	0.39	44.8
2	T1	144	1.0	144	1.0	0.139	2.9	LOS A	0.7	4.6	0.37	0.41	0.37	44.2
3	R2	32	0.0	32	0.0	0.139	8.4	LOS A	0.7	4.6	0.37	0.41	0.37	49.3
3u	U	1	0.0	1	0.0	0.139	10.4	LOS A	0.7	4.6	0.37	0.41	0.37	53.6
Approach		271	3.7	271	3.7	0.139	3.9	LOS A	0.7	4.6	0.38	0.43	0.38	45.4
East: Morgan Street (E)														
4	L2	12	0.0	12	0.0	0.014	3.5	LOS A	0.1	0.4	0.33	0.41	0.33	47.8
5	T1	130	2.8	130	2.8	0.159	2.7	LOS A	0.7	5.4	0.32	0.45	0.32	43.8
6	R2	75	3.9	75	3.9	0.159	8.2	LOS A	0.7	5.4	0.32	0.45	0.32	43.8
6u	U	5	0.0	5	0.0	0.159	10.2	LOS A	0.7	5.4	0.32	0.45	0.32	53.2
Approach		222	3.0	222	3.0	0.159	4.8	LOS A	0.7	5.4	0.32	0.45	0.32	44.5
North: The Esplanade (N)														
7	L2	27	3.7	27	3.7	0.034	4.2	LOS A	0.1	1.0	0.41	0.47	0.41	46.6
8	T1	81	1.8	81	1.8	0.111	3.0	LOS A	0.5	3.8	0.38	0.48	0.38	47.3
9	R2	56	4.6	56	4.6	0.111	8.4	LOS A	0.5	3.8	0.38	0.48	0.38	37.5
9u	U	1	0.0	1	0.0	0.111	10.4	LOS A	0.5	3.8	0.38	0.48	0.38	37.5
Approach		165	3.0	165	3.0	0.111	5.1	LOS A	0.5	3.8	0.39	0.48	0.39	45.3
West: Morgan Street (W)														
10	L2	62	0.0	62	0.0	0.075	4.0	LOS A	0.3	2.2	0.39	0.48	0.39	41.8
11	T1	197	0.0	197	0.0	0.196	3.0	LOS A	1.0	6.9	0.38	0.42	0.38	48.3
12	R2	43	16.7	43	16.7	0.196	8.7	LOS A	1.0	6.9	0.38	0.42	0.38	48.9
12u	U	10	0.0	10	0.0	0.196	10.5	LOS A	1.0	6.9	0.38	0.42	0.38	41.2
Approach		312	2.3	312	2.3	0.196	4.2	LOS A	1.0	6.9	0.38	0.43	0.38	47.6
All Vehicles		970	3.0	970	3.0	0.196	4.4	LOS A	1.0	6.9	0.37	0.44	0.37	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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Forsyth/Murray]

Network: N101 [PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Murray Street (S)														
1	L2	40	0.0	40	0.0	0.051	4.5	LOS A	0.1	0.5	0.45	0.53	0.45	38.7
2	T1	94	0.0	94	0.0	0.120	3.2	LOS A	0.2	1.4	0.42	0.50	0.42	47.3
3	R2	48	0.0	48	0.0	0.120	8.6	LOS A	0.2	1.4	0.42	0.50	0.42	48.2
3u	U	4	0.0	4	0.0	0.120	10.7	LOS A	0.2	1.4	0.42	0.50	0.42	37.5
Approach		186	0.0	186	0.0	0.120	5.0	LOS A	0.2	1.4	0.43	0.50	0.43	46.7
East: Forsyth Street (E)														
4	L2	35	0.0	35	0.0	0.124	3.5	LOS A	0.2	1.7	0.41	0.38	0.41	44.7
5	T1	252	0.4	252	0.4	0.124	3.1	LOS A	0.2	1.7	0.41	0.39	0.41	44.6
6	R2	6	0.0	6	0.0	0.124	8.7	LOS A	0.2	1.7	0.42	0.39	0.42	49.5
6u	U	1	0.0	1	0.0	0.124	10.7	LOS A	0.2	1.7	0.42	0.39	0.42	53.8
Approach		294	0.4	294	0.4	0.124	3.3	LOS A	0.2	1.7	0.41	0.39	0.41	44.8
North: The Esplanade (N)														
7	L2	4	0.0	4	0.0	0.005	3.7	LOS A	0.0	0.0	0.35	0.41	0.35	47.8
8	T1	126	0.0	126	0.0	0.230	2.8	LOS A	0.4	3.0	0.35	0.53	0.35	42.7
9	R2	177	0.6	177	0.6	0.230	8.2	LOS A	0.4	3.0	0.35	0.53	0.35	42.7
9u	U	1	0.0	1	0.0	0.230	10.2	LOS A	0.4	3.0	0.35	0.53	0.35	52.3
Approach		308	0.4	308	0.4	0.230	6.0	LOS A	0.4	3.0	0.35	0.53	0.35	42.9
West: Forsyth Street (W)														
10	L2	68	0.0	68	0.0	0.100	2.9	LOS A	0.2	1.3	0.28	0.34	0.28	47.4
11	T1	187	0.0	187	0.0	0.100	2.5	LOS A	0.2	1.3	0.28	0.33	0.28	49.2
12	R2	9	0.0	9	0.0	0.100	8.0	LOS A	0.2	1.3	0.28	0.33	0.28	41.8
12u	U	1	0.0	1	0.0	0.100	10.0	LOS A	0.2	1.3	0.28	0.33	0.28	41.8
Approach		265	0.0	265	0.0	0.100	2.8	LOS A	0.2	1.3	0.28	0.33	0.28	48.6
All Vehicles		1053	0.2	1053	0.2	0.230	4.3	LOS A	0.4	3.0	0.36	0.43	0.36	45.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [PM Forsyth/Murray]

Network: N101 [PM]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	Aver. Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Murray Street (S)															
Lane 1	40	0.0	40	0.0	782	0.051	100	4.5	LOS A	0.1	0.5	Short	30	0.0	NA
Lane 2[d]	146	0.0	146	0.0	1211	0.120	100	5.2	LOS A	0.2	1.4	Full	200	0.0	0.0
Approach	186	0.0	186	0.0		0.120		5.0	LOS A	0.2	1.4				
East: Forsyth Street (E)															
Lane 1[d]	155	0.3	155	0.3	1246	0.124	100	3.2	LOS A	0.2	1.7	Full	500	0.0	0.0
Lane 2	139	0.4	139	0.4	1125	0.124	100	3.5	LOS A	0.2	1.7	Full	500	0.0	0.0
Approach	294	0.4	294	0.4		0.124		3.3	LOS A	0.2	1.7				
North: The Esplanade (N)															
Lane 1	4	0.0	4	0.0	837	0.005	100	3.7	LOS A	0.0	0.0	Short	30	0.0	NA
Lane 2[d]	304	0.4	304	0.4	1319	0.230	100	6.0	LOS A	0.4	3.0	Full	500	0.0	0.0
Approach	308	0.4	308	0.4		0.230		6.0	LOS A	0.4	3.0				
West: Forsyth Street (W)															
Lane 1[d]	138	0.0	138	0.0	1373	0.100	100	2.7	LOS A	0.2	1.3	Full	250	0.0	0.0
Lane 2	127	0.0	127	0.0	1270	0.100	100	3.0	LOS A	0.2	1.3	Full	250	0.0	0.0
Approach	265	0.0	265	0.0		0.100		2.8	LOS A	0.2	1.3				
Intersection	1053	0.2	1053	0.2		0.230		4.3	LOS A	0.4	3.0				

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

d Dominant lane on roundabout approach

MOVEMENT SUMMARY

Site: 101 [PM Morgan/Murray]

Network: N101 [PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Murray Street (S)														
1	L2	46	0.0	46	0.0	0.048	3.8	LOS A	0.1	0.6	0.40	0.46	0.40	44.8
2	T1	86	0.0	86	0.0	0.090	3.0	LOS A	0.2	1.2	0.38	0.43	0.38	44.0
3	R2	27	0.0	27	0.0	0.090	8.4	LOS A	0.2	1.2	0.38	0.43	0.38	49.1
3u	U	1	0.0	1	0.0	0.090	10.4	LOS A	0.2	1.2	0.38	0.43	0.38	53.4
Approach		160	0.0	160	0.0	0.090	4.2	LOS A	0.2	1.2	0.38	0.44	0.38	45.6
East: Morgan Street (E)														
4	L2	24	4.2	24	4.2	0.030	4.0	LOS A	0.0	0.3	0.38	0.45	0.38	47.7
5	T1	198	1.1	198	1.1	0.187	2.9	LOS A	0.4	2.6	0.37	0.40	0.37	44.2
6	R2	42	0.0	42	0.0	0.187	8.3	LOS A	0.4	2.6	0.37	0.40	0.37	44.2
6u	U	2	0.0	2	0.0	0.187	10.4	LOS A	0.4	2.6	0.37	0.40	0.37	53.6
Approach		266	1.2	266	1.2	0.187	3.9	LOS A	0.4	2.6	0.37	0.41	0.37	44.8
North: The Esplanade (N)														
7	L2	42	0.0	42	0.0	0.054	4.4	LOS A	0.1	0.6	0.43	0.50	0.43	46.6
8	T1	119	0.0	119	0.0	0.139	3.1	LOS A	0.3	1.9	0.41	0.47	0.41	47.5
9	R2	52	0.0	52	0.0	0.139	8.6	LOS A	0.3	1.9	0.41	0.47	0.41	37.8
9u	U	2	0.0	2	0.0	0.139	10.6	LOS A	0.3	1.9	0.41	0.47	0.41	37.8
Approach		215	0.0	215	0.0	0.139	4.8	LOS A	0.3	1.9	0.42	0.48	0.42	46.1
West: Morgan Street (W)														
10	L2	43	0.0	43	0.0	0.048	3.4	LOS A	0.1	0.5	0.30	0.41	0.30	42.4
11	T1	223	0.0	222	0.0	0.217	2.6	LOS A	0.4	3.0	0.30	0.40	0.30	48.4
12	R2	80	0.0	80	0.0	0.217	8.0	LOS A	0.4	3.0	0.30	0.40	0.30	49.2
12u	U	3	0.0	3	0.0	0.217	10.0	LOS A	0.4	3.0	0.30	0.40	0.30	41.3
Approach		349	0.0	347 N1	0.0	0.217	4.0	LOS A	0.4	3.0	0.30	0.40	0.30	48.2
All Vehicles		990	0.3	988 N1	0.3	0.217	4.2	LOS A	0.4	3.0	0.36	0.43	0.36	46.5

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

LANE SUMMARY

Site: 101 [PM Morgan/Murray]

Network: N101 [PM]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	Aver. Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Murray Street (S)															
Lane 1	46	0.0	46	0.0	954	0.048	100	3.8	LOS A	0.1	0.6	Short	40	0.0	NA
Lane 2[d]	114	0.0	114	0.0	1265	0.090	100	4.3	LOS A	0.2	1.2	Full	500	0.0	0.0
Approach	160	0.0	160	0.0		0.090		4.2	LOS A	0.2	1.2				
East: Morgan Street (E)															
Lane 1	24	4.2	24	4.2	805	0.030	100	4.0	LOS A	0.0	0.3	Short	50	0.0	NA
Lane 2[d]	242	0.9	242	0.9	1292	0.187	100	3.9	LOS A	0.4	2.6	Full	500	0.0	0.0
Approach	266	1.2	266	1.2		0.187		3.9	LOS A	0.4	2.6				
North: The Esplanade (N)															
Lane 1	42	0.0	42	0.0	783	0.054	100	4.4	LOS A	0.1	0.6	Short	40	0.0	NA
Lane 2[d]	173	0.0	173	0.0	1243	0.139	100	4.9	LOS A	0.3	1.9	Full	200	0.0	0.0
Approach	215	0.0	215	0.0		0.139		4.8	LOS A	0.3	1.9				
West: Morgan Street (W)															
Lane 1	43	0.0	43	0.0	887	0.048	100	3.4	LOS A	0.1	0.5	Short	30	0.0	NA
Lane 2[d]	306	0.0	304	0.0	1400	0.217	100	4.1	LOS A	0.4	3.0	Full	285	0.0	0.0
Approach	349	0.0	347[N1]	0.0		0.217		4.0	LOS A	0.4	3.0				
Intersection	990	0.3	988[N1]	0.3		0.217		4.2	LOS A	0.4	3.0				

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

d Dominant lane on roundabout approach
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

Site: 101 [PM Morgan/Docker]

Network: N101 [PM]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)														
1	L2	14	0.0	14	0.0	0.008	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
2	T1	433	2.2	433	2.2	0.687	4.8	LOS A	2.8	20.1	0.33	0.30	0.65	43.0
3	R2	281	0.5	281	0.5	0.687	17.3	LOS B	2.8	20.1	0.84	0.76	1.67	35.3
Approach		728	1.5	728	1.5	0.687	9.6	NA	2.8	20.1	0.52	0.48	1.03	39.8
East: Morgan Street (E)														
4	L2	314	0.5	314	0.5	0.262	5.1	LOS A	0.5	3.3	0.25	0.53	0.25	45.1
5	T1	37	0.0	37	0.0	0.869	153.5	LOS F	1.5	10.7	0.99	1.25	1.96	13.1
6	R2	10	10.0	10	10.0	0.869	201.1	LOS F	1.5	10.7	0.99	1.25	1.96	5.9
Approach		361	0.7	361	0.7	0.869	25.8	LOS B	1.5	10.7	0.35	0.63	0.48	34.0
North: Docker Street (N)														
7	L2	30	0.0	30	0.0	0.016	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	39.7
8	T1	587	0.5	587	0.5	0.298	0.6	LOS A	0.3	2.2	0.09	0.03	0.11	49.1
9	R2	33	0.0	33	0.0	0.298	9.2	LOS A	0.3	2.2	0.12	0.04	0.13	48.5
Approach		650	0.5	650	0.5	0.298	1.2	NA	0.3	2.2	0.09	0.05	0.10	48.9
West: Bolton Street (W)														
10	L2	37	0.0	37	0.0	0.254	6.7	LOS A	0.3	2.2	0.68	0.74	0.72	31.4
11	T1	22	0.0	22	0.0	1.272	211.6	LOS F	3.2	22.5	0.80	1.02	1.55	7.2
12	R2	22	0.0	22	0.0	1.272	548.6	LOS F	3.2	22.5	1.00	1.48	2.93	5.8
Approach		81	0.0	81	0.0	1.272	209.5	LOS F	3.2	22.5	0.80	1.02	1.54	8.8
All Vehicles		1820	0.9	1820	0.9	1.272	18.7	NA	3.2	22.5	0.35	0.38	0.61	35.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [PM Morgan/Docker]

Network: N101 [PM]

Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	Aver. Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Docker Street (S)															
Lane 1	14	0.0	14	0.0	1857	0.008	100	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	264	2.2	264	2.2	1923	0.137	20[6]	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	450	1.1	450	1.1	655	0.687	100	15.4	LOS B	2.8	20.1	Full	500	0.0	0.0
Approach	728	1.5	728	1.5		0.687		9.6	NA	2.8	20.1				
East: Morgan Street (E)															
Lane 1	314	0.5	314	0.5	1196	0.262	30[5]	5.1	LOS A	0.5	3.3	Short (P)	25	0.0	NA
Lane 2	47	2.1	47	2.1	54	0.869	100	163.6	LOS F	1.5	10.7	Full	285	0.0	0.0
Approach	361	0.7	361	0.7		0.869		25.8	LOS B	1.5	10.7				
North: Docker Street (N)															
Lane 1	30	0.0	30	0.0	1857	0.016	100	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	116	0.5	116	0.5	1944	0.060	20[6]	0.0	LOS A	0.0	0.0	Full	230	0.0	0.0
Lane 3	504	0.5	504	0.5	1692	0.298	100	1.3	LOS A	0.3	2.2	Full	230	0.0	0.0
Approach	650	0.5	650	0.5		0.298		1.2	NA	0.3	2.2				
West: Bolton Street (W)															
Lane 1	51	0.0	51	0.0	199	0.254	20[6]	22.1	LOS B	0.3	2.2	Short (P)	10	0.0	NA
Lane 2	30	0.0	30	0.0	24	1.272	100	522.9	LOS F	3.2	22.5	Full	500	0.0	0.0
Approach	81	0.0	81	0.0		1.272		209.5	LOS F	3.2	22.5				
Intersection	1820	0.9	1820	0.9		1.272		18.7	NA	3.2	22.5				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

MOVEMENT SUMMARY

Site: 101 [PM Forsyth/Docker]

Network: N101 [PM]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)														
2	T1	288	0.4	288	0.4	0.148	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3	R2	192	0.0	192	0.0	0.261	6.9	LOS A	0.4	2.9	0.44	0.67	0.44	36.0
Approach		480	0.2	480	0.2	0.261	2.8	NA	0.4	2.9	0.18	0.27	0.18	46.7
East: Forsyth Street (E)														
4	L2	406	0.5	406	0.5	0.305	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	40.4
6	R2	106	0.0	106	0.0	0.342	17.1	LOS B	0.6	4.0	0.76	0.94	0.95	38.0
Approach		512	0.4	512	0.4	0.342	7.2	LOS A	0.6	4.0	0.16	0.61	0.20	39.3
North: Docker Street (N)														
7	L2	64	0.0	64	0.0	0.034	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	44.5
8	T1	243	0.0	243	0.0	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		307	0.0	307	0.0	0.062	1.0	NA	0.0	0.0	0.00	0.11	0.00	48.7
All Vehicles		1299	0.2	1299	0.2	0.342	4.1	NA	0.6	4.0	0.13	0.37	0.14	44.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [PM Forsyth/Docker]

Network: N101 [PM]

Site Category: (None)
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	Aver. Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Docker Street (S)															
Lane 1	288	0.4	288	0.4	1946	0.148	57[5]	0.0	LOS A	0.0	0.0	Full	230	0.0	0.0
Lane 2	192	0.0	192	0.0	735	0.261	100	6.9	LOS A	0.4	2.9	Full	230	0.0	0.0
Approach	480	0.2	480	0.2		0.261		2.8	NA	0.4	2.9				
East: Forsyth Street (E)															
Lane 1	406	0.5	406	0.5	1330	0.305	100	4.6	LOS A	0.0	0.0	Full	250	0.0	0.0
Lane 2	106	0.0	106	0.0	310	0.342	100	17.1	LOS B	0.6	4.0	Full	250	0.0	0.0
Approach	512	0.4	512	0.4		0.342		7.2	LOS A	0.6	4.0				
North: Docker Street (N)															
Lane 1	64	0.0	64	0.0	1857	0.034	55[5]	4.6	LOS A	0.0	0.0	Short (P)	10	0.0	NA
Lane 2	122	0.0	122	0.0	1950	0.062	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 3	122	0.0	122	0.0	1950	0.062	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	307	0.0	307	0.0		0.062		1.0	NA	0.0	0.0				
Intersection	1299	0.2	1299	0.2		0.342		4.1	NA	0.6	4.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program

MOVEMENT SUMMARY

Site: 101v [AM Morgan/Docker - Option 1 Roundabout]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)												
1	L2	7	0.0	0.296	3.4	LOS A	1.9	13.3	0.20	0.34	0.20	47.3
2	T1	512	2.2	0.296	3.2	LOS A	1.9	13.3	0.20	0.38	0.20	47.5
3	R2	326	0.5	0.296	7.5	LOS A	1.9	13.1	0.20	0.55	0.20	45.9
Approach		845	1.5	0.296	4.9	LOS A	1.9	13.3	0.20	0.44	0.20	46.8
East: Morgan Street (E)												
4	L2	227	3.0	0.218	4.7	LOS A	1.1	8.1	0.50	0.60	0.50	45.7
5	T1	22	10.0	0.051	6.3	LOS A	0.2	1.7	0.52	0.61	0.52	45.7
6	R2	7	14.3	0.051	10.8	LOS A	0.2	1.7	0.52	0.61	0.52	43.8
Approach		256	3.9	0.218	5.0	LOS A	1.1	8.1	0.50	0.60	0.50	45.6
North: Docker Street (N)												
7	L2	39	0.0	0.182	4.9	LOS A	0.9	6.4	0.49	0.54	0.49	43.5
8	T1	315	1.6	0.182	4.8	LOS A	0.9	6.4	0.49	0.56	0.49	46.4
9	R2	16	0.0	0.182	9.1	LOS A	0.9	6.4	0.50	0.57	0.50	46.4
Approach		370	1.4	0.182	5.0	LOS A	0.9	6.4	0.49	0.55	0.49	46.2
West: Bolton Street (W)												
10	L2	40	5.0	0.060	6.8	LOS A	0.2	1.8	0.60	0.71	0.60	44.2
11	T1	42	0.0	0.071	5.7	LOS A	0.3	2.2	0.58	0.69	0.58	45.7
12	R2	17	11.8	0.071	10.4	LOS A	0.3	2.2	0.58	0.69	0.58	46.5
Approach		99	4.0	0.071	6.9	LOS A	0.3	2.2	0.59	0.69	0.59	45.3
All Vehicles		1570	2.0	0.296	5.0	LOS A	1.9	13.3	0.34	0.51	0.34	46.4

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101v [AM Morgan/Docker - Option 1 Roundabout]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Docker Street (S)													
Lane 1[d]	438	2.1	1480	0.296	100	3.2	LOS A	1.9	13.3	Full	500	0.0	0.0
Lane 2	407	0.8	1377	0.296	100	6.7	LOS A	1.9	13.1	Full	500	0.0	0.0
Approach	845	1.5		0.296		4.9	LOS A	1.9	13.3				
East: Morgan Street (E)													
Lane 1[d]	227	3.0	1040	0.218	100	4.7	LOS A	1.1	8.1	Short (P)	25	0.0	NA
Lane 2	29	11.0	565	0.051	23[5]	7.4	LOS A	0.2	1.7	Full	285	0.0	0.0
Approach	256	3.9		0.218		5.0	LOS A	1.1	8.1				
North: Docker Street (N)													
Lane 1[d]	191	1.3	1046	0.182	100	4.7	LOS A	0.9	6.4	Full	230	0.0	0.0
Lane 2	179	1.4	984	0.182	100	5.2	LOS A	0.9	6.4	Full	230	0.0	0.0
Approach	370	1.4		0.182		5.0	LOS A	0.9	6.4				
West: Bolton Street (W)													
Lane 1	40	5.0	670	0.060	84[5]	6.8	LOS A	0.2	1.8	Short (P)	10	0.0	NA
Lane 2[d]	59	3.4	832	0.071	100	7.0	LOS A	0.3	2.2	Full	500	0.0	0.0
Approach	99	4.0		0.071		6.9	LOS A	0.3	2.2				
Intersection	1570	2.0		0.296		5.0	LOS A	1.9	13.3				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

MOVEMENT SUMMARY

Site: 101v [PM Morgan/Docker - Option 1 Roundabout]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)												
1	L2	14	0.0	0.271	3.5	LOS A	1.6	11.6	0.26	0.37	0.26	47.1
2	T1	433	2.2	0.271	3.4	LOS A	1.6	11.6	0.26	0.40	0.26	47.2
3	R2	281	0.5	0.271	7.7	LOS A	1.6	11.4	0.27	0.56	0.27	45.7
Approach		728	1.5	0.271	5.0	LOS A	1.6	11.6	0.26	0.46	0.26	46.6
East: Morgan Street (E)												
4	L2	314	0.5	0.354	5.9	LOS A	1.9	13.4	0.66	0.77	0.66	45.2
5	T1	37	0.0	0.098	7.9	LOS A	0.4	2.9	0.63	0.75	0.63	44.6
6	R2	10	10.0	0.098	12.8	LOS A	0.4	2.9	0.63	0.75	0.63	42.4
Approach		361	0.7	0.354	6.3	LOS A	1.9	13.4	0.66	0.77	0.66	45.1
North: Docker Street (N)												
7	L2	30	0.0	0.307	4.8	LOS A	1.7	12.1	0.51	0.53	0.51	43.3
8	T1	587	0.5	0.307	4.7	LOS A	1.7	12.1	0.51	0.55	0.51	46.3
9	R2	33	0.0	0.307	9.0	LOS A	1.7	12.0	0.52	0.56	0.52	46.3
Approach		650	0.5	0.307	4.9	LOS A	1.7	12.1	0.51	0.55	0.51	46.2
West: Bolton Street (W)												
10	L2	37	0.0	0.048	5.9	LOS A	0.2	1.4	0.57	0.65	0.57	44.9
11	T1	22	0.0	0.050	5.3	LOS A	0.2	1.5	0.55	0.67	0.55	45.3
12	R2	22	0.0	0.050	9.6	LOS A	0.2	1.5	0.55	0.67	0.55	46.3
Approach		81	0.0	0.050	6.7	LOS A	0.2	1.5	0.56	0.66	0.56	45.5
All Vehicles		1820	0.9	0.354	5.3	LOS A	1.9	13.4	0.44	0.56	0.44	46.1

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101v [PM Morgan/Docker - Option 1 Roundabout]

Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	Demand Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	95% Back of Queue Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Docker Street (S)													
Lane 1[d]	374	2.1	1383	0.271	100	3.4	LOS A	1.6	11.6	Full	500	0.0	0.0
Lane 2	354	0.8	1307	0.271	100	6.8	LOS A	1.6	11.4	Full	500	0.0	0.0
Approach	728	1.5		0.271		5.0	LOS A	1.6	11.6				
East: Morgan Street (E)													
Lane 1[d]	314	0.5	886	0.354	100	5.9	LOS A	1.9	13.4	Short (P)	25	0.0	NA
Lane 2	47	2.1	479	0.098	28[5]	8.9	LOS A	0.4	2.9	Full	285	0.0	0.0
Approach	361	0.7		0.354		6.3	LOS A	1.9	13.4				
North: Docker Street (N)													
Lane 1[d]	333	0.5	1085	0.307	100	4.7	LOS A	1.7	12.1	Full	230	0.0	0.0
Lane 2	317	0.5	1031	0.307	100	5.2	LOS A	1.7	12.0	Full	230	0.0	0.0
Approach	650	0.5		0.307		4.9	LOS A	1.7	12.1				
West: Bolton Street (W)													
Lane 1	37	0.0	775	0.048	96[5]	5.9	LOS A	0.2	1.4	Short (P)	10	0.0	NA
Lane 2[d]	44	0.0	886	0.050	100	7.4	LOS A	0.2	1.5	Full	500	0.0	0.0
Approach	81	0.0		0.050		6.7	LOS A	0.2	1.5				
Intersection	1820	0.9		0.354		5.3	LOS A	1.9	13.4				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

MOVEMENT SUMMARY

Site: 101v [AM Morgan/Docker - Option 2 - Signals]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)												
1	L2	7	0.0	0.230	12.0	LOS A	4.2	30.1	0.51	0.44	0.51	44.9
2	T1	512	2.2	0.230	7.4	LOS A	4.2	30.1	0.51	0.44	0.51	43.9
3	R2	326	0.5	0.542	15.4	LOS B	7.2	50.9	0.68	0.77	0.68	39.0
Approach		845	1.5	0.542	10.6	LOS A	7.2	50.9	0.58	0.56	0.58	41.8
East: Morgan Street (E)												
4	L2	227	3.0	0.521	30.1	LOS C	6.9	49.7	0.91	0.80	0.91	32.6
5	T1	22	10.0	0.074	22.4	LOS B	0.8	6.0	0.80	0.62	0.80	35.6
6	R2	7	14.3	0.074	27.1	LOS B	0.8	6.0	0.80	0.62	0.80	30.6
Approach		256	3.9	0.521	29.3	LOS C	6.9	49.7	0.90	0.78	0.90	32.8
North: Docker Street (N)												
7	L2	39	0.0	0.157	11.6	LOS A	2.7	19.3	0.48	0.46	0.48	40.6
8	T1	315	1.6	0.157	7.1	LOS A	2.7	19.5	0.48	0.43	0.48	43.8
9	R2	16	0.0	0.032	13.2	LOS A	0.3	1.8	0.50	0.64	0.50	39.5
Approach		370	1.4	0.157	7.8	LOS A	2.7	19.5	0.48	0.44	0.48	43.4
West: Bolton Street (W)												
10	L2	40	5.0	0.275	30.2	LOS C	2.9	21.2	0.88	0.73	0.88	32.5
11	T1	42	0.0	0.275	25.6	LOS B	2.9	21.2	0.88	0.73	0.88	33.6
12	R2	17	11.8	0.275	30.2	LOS C	2.9	21.2	0.88	0.73	0.88	35.8
Approach		99	4.0	0.275	28.2	LOS B	2.9	21.2	0.88	0.73	0.88	33.6
All Vehicles		1570	2.0	0.542	14.1	LOS A	7.2	50.9	0.63	0.58	0.63	39.6

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	50	29.3	LOS C	0.1	0.1	0.92	0.92
P2	East Full Crossing	50	9.3	LOS A	0.1	0.1	0.52	0.52
P3	North Full Crossing	50	29.3	LOS C	0.1	0.1	0.92	0.92
P4	West Full Crossing	50	8.3	LOS A	0.0	0.0	0.49	0.49
All Pedestrians		200	19.0	LOS B			0.71	0.71

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: 101v [AM Morgan/Docker - Option 2 - Signals]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

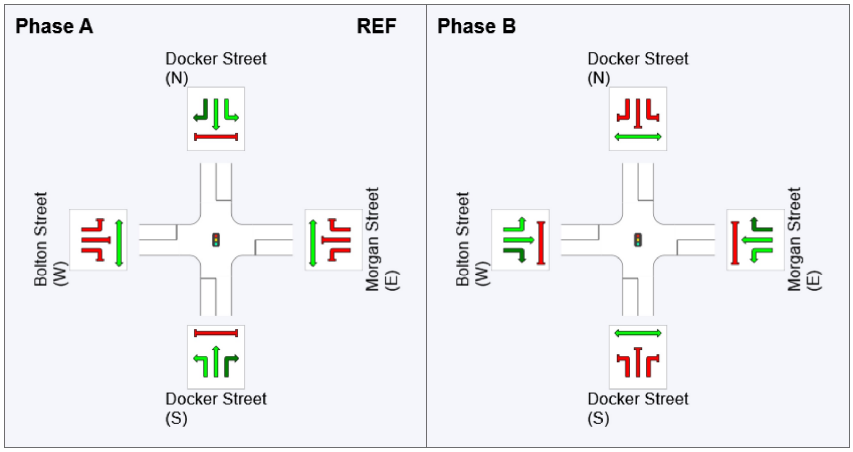
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Tom
Reference Phase: Phase A
Input Phase Sequence: A, A1*, B
Output Phase Sequence: A, B
(* Variable Phase)

Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	47
Green Time (sec)	41	17
Phase Time (sec)	47	23
Phase Split	67%	33%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

LANE SUMMARY

Site: 101v [AM Morgan/Docker - Option 2 - Signals]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Docker Street (S)													
Lane 1	259	2.1	1125	0.230	100	7.6	LOS A	4.2	30.1	Full	500	0.0	0.0
Lane 2	260	2.2	1126	0.230	100	7.4	LOS A	4.2	30.1	Full	500	0.0	0.0
Lane 3	326	0.5	601	0.542	100	15.4	LOS B	7.2	50.9	Short	60	0.0	NA
Approach	845	1.5		0.542		10.6	LOS A	7.2	50.9				
East: Morgan Street (E)													
Lane 1	227	3.0	436[1]	0.521	100	30.1	LOS C	6.9	49.7	Short (P)	25	0.0	NA
Lane 2	29	11.0	394	0.074	14[5]	23.5	LOS B	0.8	6.0	Full	285	0.0	0.0
Approach	256	3.9		0.521		29.3	LOS C	6.9	49.7				
North: Docker Street (N)													
Lane 1	176	1.2	1121	0.157	100	8.1	LOS A	2.7	19.3	Full	230	0.0	0.0
Lane 2	178	1.6	1130	0.157	100	7.1	LOS A	2.7	19.5	Full	230	0.0	0.0
Lane 3	16	0.0	501	0.032	100	13.2	LOS A	0.3	1.8	Short	60	0.0	NA
Approach	370	1.4		0.157		7.8	LOS A	2.7	19.5				
West: Bolton Street (W)													
Lane 1	99	4.0	360	0.275	100	28.2	LOS B	2.9	21.2	Full	500	0.0	0.0
Approach	99	4.0		0.275		28.2	LOS B	2.9	21.2				
Intersection	1570	2.0		0.542		14.1	LOS A	7.2	50.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program

MOVEMENT SUMMARY

Site: 101v [PM Morgan/Docker - Option 2 - Signals]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Docker Street (S)												
1	L2	14	0.0	0.209	12.9	LOS A	3.8	27.1	0.53	0.46	0.53	44.3
2	T1	433	2.2	0.209	8.3	LOS A	3.8	27.2	0.53	0.45	0.53	43.2
3	R2	281	0.5	0.663	21.1	LOS B	7.9	55.6	0.81	0.83	0.86	36.3
Approach		728	1.5	0.663	13.3	LOS A	7.9	55.6	0.64	0.60	0.66	40.1
East: Morgan Street (E)												
4	L2	314	0.5	0.659	29.7	LOS C	9.8	68.9	0.93	0.84	0.96	32.7
5	T1	37	0.0	0.098	20.8	LOS B	1.2	8.7	0.78	0.62	0.78	36.4
6	R2	10	10.0	0.098	25.5	LOS B	1.2	8.7	0.78	0.62	0.78	31.5
Approach		361	0.7	0.659	28.7	LOS C	9.8	68.9	0.91	0.81	0.93	33.0
North: Docker Street (N)												
7	L2	30	0.0	0.286	13.3	LOS A	5.5	38.8	0.56	0.50	0.56	39.7
8	T1	587	0.5	0.286	8.8	LOS A	5.5	39.0	0.56	0.49	0.56	42.8
9	R2	33	0.0	0.064	14.4	LOS A	0.6	4.1	0.54	0.66	0.54	38.8
Approach		650	0.5	0.286	9.3	LOS A	5.5	39.0	0.56	0.50	0.56	42.5
West: Bolton Street (W)												
10	L2	37	0.0	0.255	31.0	LOS C	2.4	17.0	0.88	0.73	0.88	31.9
11	T1	22	0.0	0.255	26.4	LOS B	2.4	17.0	0.88	0.73	0.88	33.0
12	R2	22	0.0	0.255	31.0	LOS C	2.4	17.0	0.88	0.73	0.88	35.3
Approach		81	0.0	0.255	29.7	LOS C	2.4	17.0	0.88	0.73	0.88	33.3
All Vehicles		1820	0.9	0.663	15.7	LOS B	9.8	68.9	0.68	0.61	0.69	38.8

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	50	29.3	LOS C	0.1	0.1	0.92	0.92
P2	East Full Crossing	50	10.3	LOS B	0.1	0.1	0.54	0.54
P3	North Full Crossing	50	29.3	LOS C	0.1	0.1	0.92	0.92
P4	West Full Crossing	50	9.3	LOS A	0.1	0.1	0.52	0.52
All Pedestrians		200	19.6	LOS B			0.72	0.72

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: 101v [PM Morgan/Docker - Option 2 - Signals]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

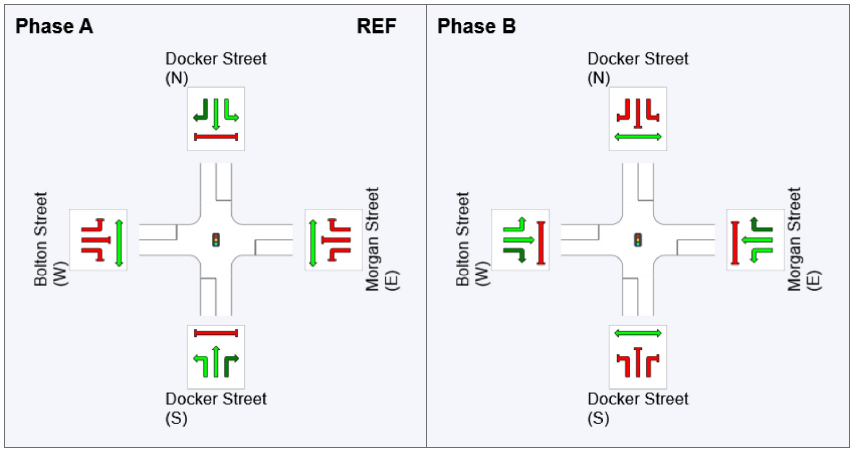
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Tom
Reference Phase: Phase A
Input Phase Sequence: A, A1*, B
Output Phase Sequence: A, B
(* Variable Phase)

Phase Timing Summary

Phase	A	B
Phase Change Time (sec)	0	45
Green Time (sec)	39	19
Phase Time (sec)	45	25
Phase Split	64%	36%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

LANE SUMMARY

Site: 101v [PM Morgan/Docker - Option 2 - Signals]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Docker Street (S)													
Lane 1	223	2.0	1069	0.209	100	8.6	LOS A	3.8	27.1	Full	500	0.0	0.0
Lane 2	224	2.2	1071	0.209	100	8.3	LOS A	3.8	27.2	Full	500	0.0	0.0
Lane 3	281	0.5	424	0.663	100	21.1	LOS B	7.9	55.6	Short	60	0.0	NA
Approach	728	1.5		0.663		13.3	LOS A	7.9	55.6				
East: Morgan Street (E)													
Lane 1	314	0.5	477[1]	0.659	100	29.7	LOS C	9.8	68.9	Short (P)	25	0.0	NA
Lane 2	47	2.1	481	0.098	15[5]	21.8	LOS B	1.2	8.7	Full	285	0.0	0.0
Approach	361	0.7		0.659		28.7	LOS C	9.8	68.9				
North: Docker Street (N)													
Lane 1	308	0.5	1078	0.286	100	9.2	LOS A	5.5	38.8	Full	230	0.0	0.0
Lane 2	309	0.5	1083	0.286	100	8.8	LOS A	5.5	39.0	Full	230	0.0	0.0
Lane 3	33	0.0	515	0.064	100	14.4	LOS A	0.6	4.1	Short	60	0.0	NA
Approach	650	0.5		0.286		9.3	LOS A	5.5	39.0				
West: Bolton Street (W)													
Lane 1	81	0.0	318	0.255	100	29.7	LOS C	2.4	17.0	Full	500	0.0	0.0
Approach	81	0.0		0.255		29.7	LOS C	2.4	17.0				
Intersection	1820	0.9		0.663		15.7	LOS B	9.8	68.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program

CIVITAS

URBAN DESIGN REPORT

1. QUALITY CONTROL

Project:	CIVITAS – Mixed use Development Renewal	
Project No:	2760	
Client:	Damasa Pty Ltd	
Applicant:	Damasa Pty Ltd	
Site Details	Address	Lot / DP Number
	205 Morgan St	Lot A DP331461
	205 Morgan St	Lot 1 DP375748
	199 Morgan St	Lot 7 DP203835
	195 Morgan St	Lot 456 DP1212902
	189 Morgan St	Lot 23 DP869492
	187 Morgan St	Lot 1 DP203835
	185 Morgan St	Lot 1 DP550746
	80-82 Murray St, 170 Forsyth St, 174-176 Forsyth St	Lot 1 DP1027240
	172 Forsyth St	Lot 1 DP617715
	180 Forsyth St	Lot 2 DP620649
	66-74 Murray Street	Lot 1-5 DP 20847
File:	C:\Users\studioaksm\Documents\studioaksm\1.Projects\1809 Morgan Street Wagga Wagga\4.Reports\WAGGA URBAN DESIGN REPORT_AS Edit 20190105.docx	

Document Control Register:		
Revision	Reasons for Issue	Date
1	Issued for Planning Proposal Application	2019-02-22

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3. EXECUTIVE SUMMARY

Morrison Design Partnership Architects (MDPA) have been appointed by Damasa Pty Ltd to undertake an urban design study for the Morgan/ Murray/ Forsyth/ Docker Streets Precinct Master Plan, from herein known as the Site.

This study analyses the current controls for the site and its immediate zone of influence in light of the strategic studies carried out by the City of Wagga Wagga. The objective is to make recommendations for appropriate intensification of the inner precinct of Wagga Wagga by varying the applicable height and zoning controls for the site. In detail, this study addresses specific urban design related considerations for built form, land-use, access, connectivity and public open space.

The report outlines measures by which this development will create cohesion, legibility and identity for the precinct, and as a result contribute to the economic and community benefits of the local area.

This is a development which will bring the strategic intent for the site to fruition, and positively contribute to the further realisation of the zone identified for infill development as an infill Housing Precinct.

Figure 1 Aerial Map of Wagga Wagga (Nearmaps 2018)

4. INTRODUCTION

4.1. BACKGROUND

This document takes incorporates both the current urban context of the precinct and a speculative projected development model, which takes into account the principles of growth for the areas considered under the strategic vision for the area. These two models allow for a consideration of the project within the current constraints, and a more holistic long-term vision for the precinct, substantiating the appropriate density within these two frameworks.

Given the demand for growth within the identified infill areas of Wagga Wagga, particularly in close proximity to the CBD, it is vitally important to consider this context in such a central precinct. Future growth is to take into account the following factors:

• Appropriate density in close proximity to the city core;

• Meeting the needs of the increasing population;

• Requirement for diversity in housing types and smaller homes.

This study identifies a considered design response for the redevelopment of the Site which is intended as a catalyst to revitalise the precinct and its immediate area while contributing to and further improving the nearby health and CBD precincts.

Figure 2 Aerial Site Location Map (Nearmaps 2018)

4.2.METHODOLOGY

The approach to the urban design and spatial planning for the proposed development carefully considers all of the following:

- Study of the Site and review of the broader surrounding areas;
- Wagga Wagga Local Environmental Plan 2010 (LEP);
- Wagga Wagga Development Control Plan 2010 (DCP);
- Community Strategic Plan 2040 - Wagga View;
- Riverina Murray Regional Plan 2036;
- Recreation Open Space and Community Strategy 2040;
- NSW Premier's Council for Active Living principles;
- Draft Medium Density Design Guide;
- Wagga Wagga Spatial Plan 2013 – 2043;
- Wagga Wagga Local Environmental Study 2008;
- Evaluation of the site from critical local influencers such as public transport, pedestrian and vehicular approaches.

Applicable planning controls and strategic directions of the abovementioned plans and studies have informed the design and development of the proposed Master Plan for the Site.

4.3. THE SITE

The subject site includes the following properties:

Legal Description	Street Address
Lot A DP331461	205 Morgan St
Lot 1 DP375748	205 Morgan St
Lot 7 DP203835	199 Morgan St
Lot 456 DP1212902	195 Morgan St
Lot 23 DP869492	189 Morgan St
Lot 1 DP203835	187 Morgan St
Lot 1 DP550746	185 Morgan St
Lot 1 DP1027240	80-82 Murray St, 170 Forsyth St, 174-176 Forsyth St
Lot 1 DP617715	172 Forsyth St
Lot 2 DP620649	180 Forsyth St
Lot 3 DP620649	Stormwater drainage
Lot 1 – DP20847*	66-74 Murray Street

Table 1- Sites Detail (Including Zone of Influence * not part of the CIVITAS Proposal)

The overall study site has an area of approx. 41,880m² (sourced from http://maps.six.nsw.gov.au/) with primary frontages along Morgan Street, Murray St and Forsyth Street.

This precinct -wide study and proposal for variations to development controls include No 66-74 Murray Street *within the immediate zone of influence. This is to establish the precinct's development potential holistically, however, it should be noted that the above properties are not part of the proposed development.

The Site encompasses a significant area of the city block which it occupies. Many of the adjoining properties, external to the Site are private residences.

The primary use of the properties within the Site is commercial and it currently accommodates:

- The Salvation Army Red Shield Family Store;
- Wattyl Solver Paint Centre.;
- Wagga Wagga Post Office;
- Murrumbidgee Medicare Local Medical Centre;
- Riverina Community College;
- Red Cross and
- Various other small retailers.

5. STRATEGIC CONTEXT

5.1. REGIONAL STRATEGIC CONTEXT

Wagga Wagga is located in the Riverina Murray region near the south border of New South Wales. 452 km from Sydney, 456 km from Melbourne and 244 km from Canberra. As the largest inland city in NSW it operates as a logistic hub for various forms of commercial freight, while its proximity to the Murrumbidgee River and historical ties to indigenous cultural heritage, make Wagga Wagga ideal for expansion and tourism.

Along with boasting the highest growth rate in the region, Wagga Wagga supports surrounding areas with a population catchment of 185,000 people. In addition to anticipated urban activities in retail, commercial, education, culture and administration, Wagga Wagga also accommodates:

- Agricultural enterprise and seasonal workers;
- Kapooka Army Recruit Training Centre;
- Royal Australian Air Force Base;
- Airport and
- Health precinct including both a private and a public hospital.

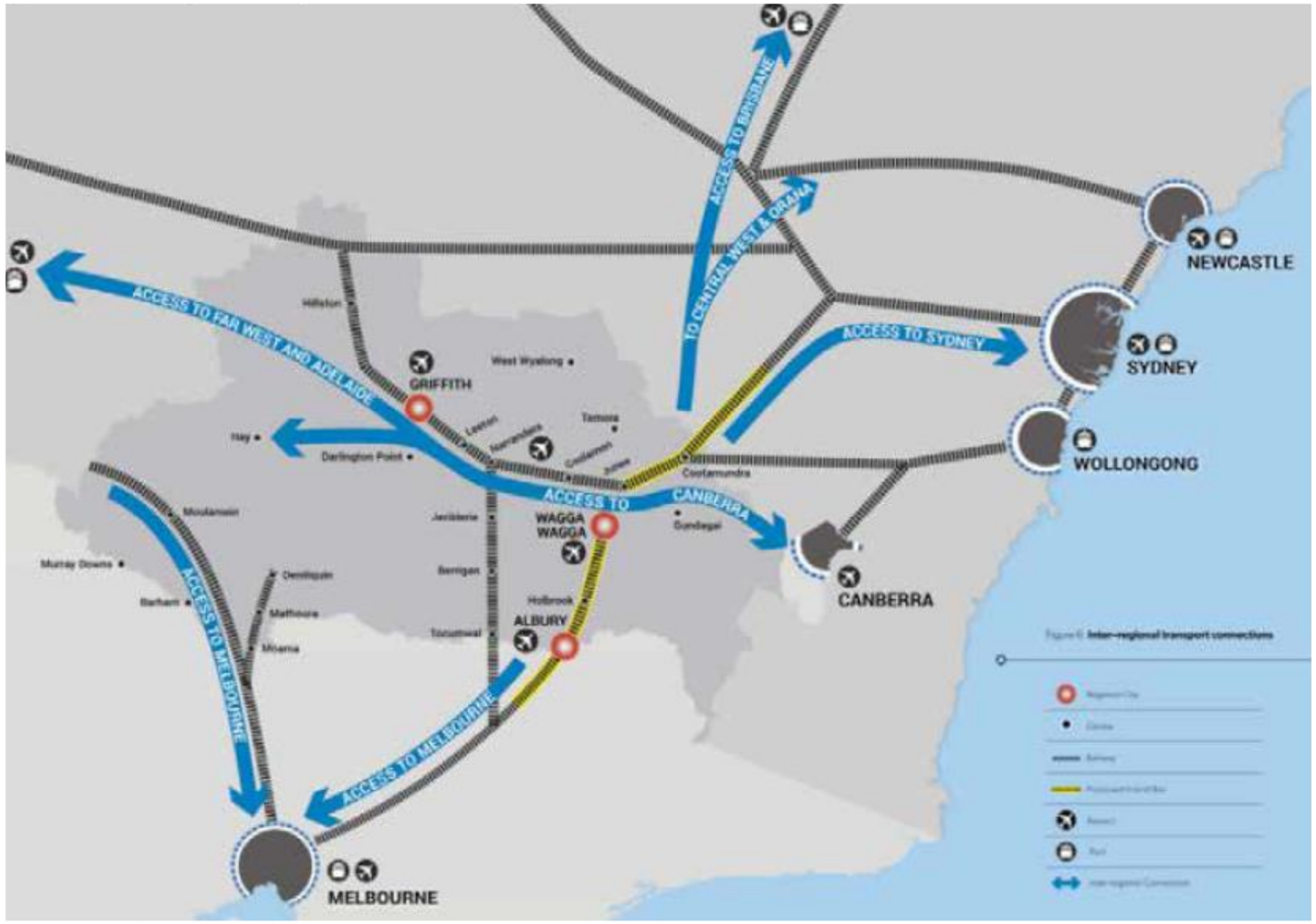


Figure 3- Regional Context Diagram (Wagga Wagga - Figure 4 - City Council 2018b

5.2. LOCAL CITY CONTEXT

Wagga Wagga City Council has a strategic focus for the growth of the city in the form of

- increase in low-density housing;
- further expansion of tourism services;
- new mixed-use developments;
- growth of retail, commercial and community focus service opportunities and
- introduction of infill residential developments

This is in keeping with the City of Wagga Wagga Strategic directions as outline in Spatial Plan 2013 – 2043. The Plan identifies:

- Investigating incentives to encourage infill development and provide high quality medium and high-density residential development through the city;
- Renewal of older sites through infill development;
- Identify sites suitable for redevelopment and investigate potential to concentrate development to infill sites to accommodate future growth
- Seven to eight-year supply of infill housing options with an indicated demand of 55 lots per year. This will equate to 15% of demand for housing.

Revitalisation of the CBD occurs through improved infrastructure to support cultural and business growth.

Adjoined by the health precinct and industrial sites and uses (as identified in section 3), the Site has been identified for infill residential development. This form of housing demand fits within a wider range of housing types catering for more diverse social and economic demographics.

The strategic approach for the CBD and inner-city area is to create a more diverse cultural hub, associated services, amenity and infrastructure. Wagga Wagga City Council's commitment to this strategic intent is demonstrated through the consideration of opportunities for redevelopment, and the rezoning of areas prohibited under current controls which may be ideal for future mixed use and residential purposes (Wagga Wagga City Council, 2018b).

6. SITE AND ITS CONTEXT

6.1. LOCAL CONTEXT

The Wagga Wagga City Council has identified the need for infill development through its strategic planning as identified by Spatial Plan 2013 – 2043. The Site, subject of this proposal, is within the central area and the proposed Master Plan is located on a site with the following attributes:

- The Site is located within an established residential area;
- Gains amenity from established street trees;
- In vicinity to established parks and playgrounds;
- Has convenient access to entertainment.

The intention of infill developments in such areas is to:

- Increase high quality residential density in the precinct;
- Utilise existing infrastructure;
- Provide a range of housing options with high amenity close to the city and its amenities through investments in housing diversity, aged care opportunities, mixed use including retail, public services, hospitality, connections to the CBD and Riverside.

(Wagga Wagga City Council, 2018b)

Figure 5 Local Context

Locally, the immediate context consists of industrial and commercial entities scattered amongst a low-density residential fabric. This proposal is for the reorganisation and consolidation of land-uses through mixed-use development. Meanwhile, the proposed masterplan consolidates living, working and playing on site, contributing to the diversification of land uses within the precinct and the greater Wagga Wagga's CBD precinct.

The proposed mixed-use nature of the development is intended to meet the everyday expectations of not only the living population on site, but also to compliment retail and services located within close walking proximity in the core of the Wagga Wagga CBD.

6.2. RECREATIONAL & CULTURAL

The Site's immediate proximity to Wollundry lagoon and lagoon walk provides residents and visitors to the site, access to passive recreational spaces as well as cultural activities and destinations.

These Cultural Precincts of the Riverside include:

- Victory Memorial Garden
- Museum of the Riverina;
- Wagga Wagga Art Gallery;

Figure 6 Local Context – Recreational and Cultural

6.3. TRANSPORT

The Site's ideal location, proximous to the CBD and other leisure and employment destinations, offers a unique opportunity to meet the strategic intents of the Wagga Wagga Integrated Transport Strategy and Implementation Plan 2040 by creating a walkable, connected and legible plan for the Site which binds seamlessly into the existing network.

While the Site has easy and convenient access to the network of Public Transport, as demonstrated in Figure 7, the mixed-use nature of the site and its convenient location reduces the need to travel to and from destinations. Furthermore, by rationalising the Site's land-uses pedestrian, cyclist and vehicular conflicts can be removed, creating a safe environment for the community.

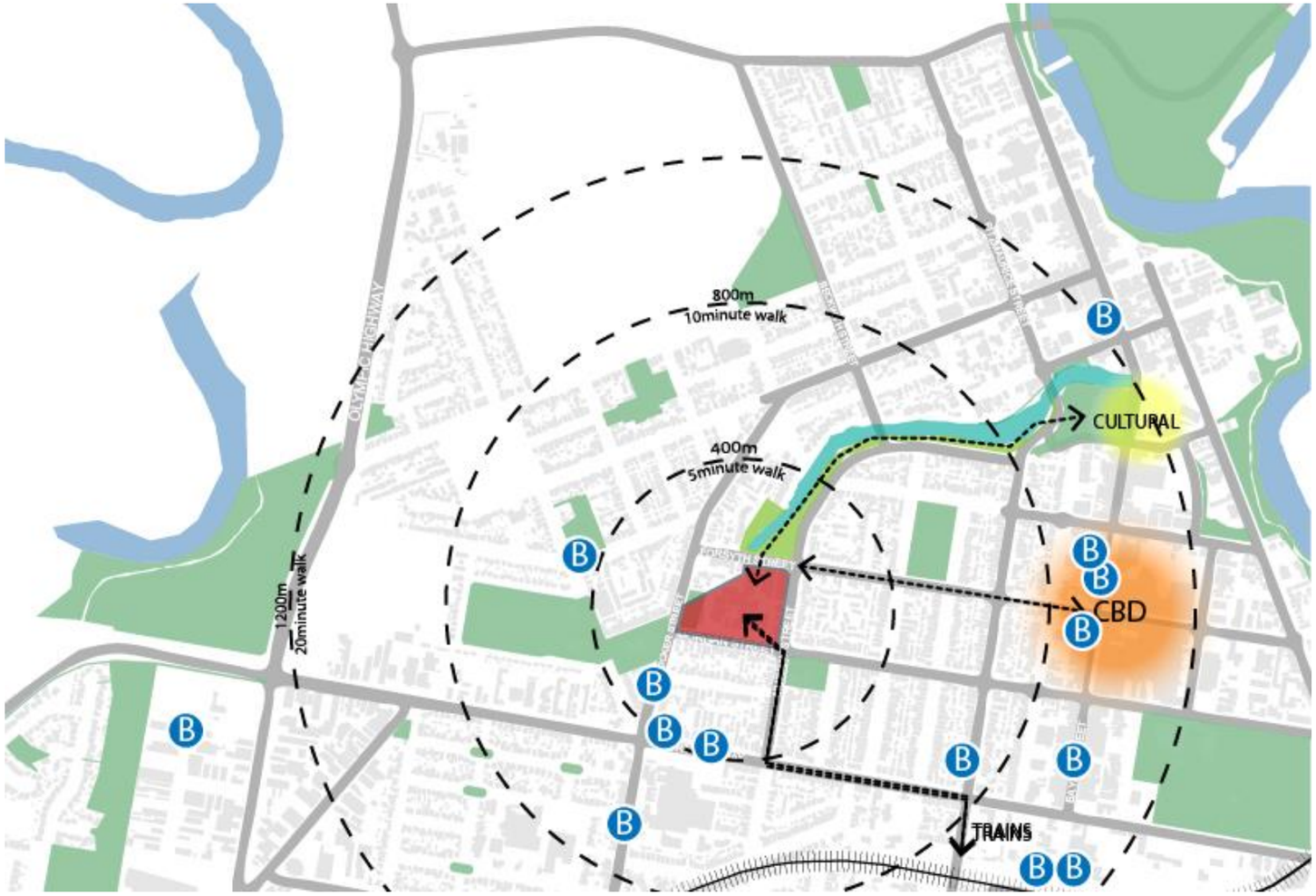


Figure 7 Local Context – Transport

6.4. EXISTING SITE

The masterplan proposes the redevelopment of approximately two thirds of the urban block as shown in *Figure 8-Existing Site*.

The subject site as an L-shaped area aligned with Murray and Morgan Street, with secondary frontages on Forsyth and Docker Streets.

Existing properties on the Site consist of:

- Medical centres
- Wagga Wagga South Post Office
- Red Cross
- Riverina Community College
- Various retailers
- Various commercial tenants
- Various hospitality tenants
- Wagga Veteran and Historic Car Club

Additionally, the south east corner currently accommodates a small number of residential properties. Notably, the Masterplan encompasses an expanded vision which includes the Enixus building at 195 Morgan St, Wagga Wagga. This new commercial premises sets the tone for further development of the site.

The sites correlation with Wollundry Lagoon offers an excellent opportunity for connectivity and access to recreational spaces with great potential. A potential which has been recognised in the Master Plan vision through the proposed enhancements such as the proposed new Wollundry Lagoon Play Park.

Figure 8 Existing Site

6.5. EXISTING STREETSCAPE AND VIEWS

The existing streetscape is predominantly residential with a strong presence of established existing street trees. Vistas along the boundary streets are indicated in Figures 9-17

A notable exception to the prevailing residential streetscape is the Wollundry Lagoon on the north side of Forsyth Street, which provides a break from the built environment with its natural landscape setting. The Australian native vegetation creates a natural watercourse appearance and this is bordered by a more curated grass verge and ornamental border planting scheme on the corner of Forsyth and Murray Streets.

Additionally, the streetscape along Morgan Street is unusual due to the existing stormwater drain along this frontage. The setback along such a primary frontage provides a transition, when approaching the Site, to the change of uses as well as the bulk and scale of the built environment.

As expected, the vistas from site consist of the suburban streetscape. Views to and from the site are well organised due to the grid arrangement of the area and the layout of urban blocks. Visual permeability, upon approach, makes for clear legibility of the site.

The Masterplan proposes to consolidate the various uses, access points, views and pathways on site into an organised cohesive network. New views will become available within the site, as well as greatly improved visual connections to Wollundry Lagoon. The scheme is legible in its vehicular and pedestrian access and egress which is emphasised through the use of strong visual axes and vistas as proposed in the Master Plan

Figure 9 *- View from Morgan Street*

Figure 10 *- View from Morgan Street*

Figure 11 *- View from Forsyth Street*

Figure 12 *- View from Docker Street*

Figure 13 *- View from Murrary Street*

Figure 14 *- View from Murray Street*

Figure 15 *- View from Forsyth Street*

Figure 16 *- View from Forsyth Street*

Figure 17 *- View from Forsyth Street*

6.6. HEIGHT AND MASSING ANALYSIS

This proposal seeks to address the need for a higher density and amenity through redevelopment and reorganisation of uses and built forms. It is crucial to consider the Site holistically when enhancing spatial qualities as a placemaking strategy in order to contribute to the quality of both living and working communities.

This intent is achieved through the re-visioning of the Site's capacity to accommodate complimentary uses, by bringing working and living communities together in a cohesive and legible manner. Accordingly, appropriate transitioning of bulk and scale, vehicular and pedestrian access, operational needs and carparking have been reconsidered to achieve a clear, comprehensive and revitalised precinct.

The Site has been re-organised through the proposed Master Plan to respond to the vision for diversification of uses, increased permeability and building typologies. The built forms have been carefully crafted to allow for the intensification of uses on site without adversely impacting the amenity of the Site or its surrounds. As part of this Master Plan, a variation of the current height controls has been proposed to enable the delivery of this vision. The proposed height variation is considered critical in providing enhanced site and city amenity through the delivery of significant through-site-links and ground level public realm, which support the proposed retail and commercial tenancies.

Currently, the subject area consists of a variety of commercial buildings, the tallest of which have a maximum height of approximately 6-7m. These buildings primarily address the streetscape and the adjacent residential context which is almost exclusively single storey dwellings.

The proposed Master Plan identifies portions of the subject area which require consideration by Wagga Wagga City Council:

- Proposed rezoning of Lot A DP331461 (Car Club site) and Lot 1 DP375748 (east boundary of car club site) from RE1 Public recreation to B4 Mixed Use
- Proposed amending Height of Buildings Map be prepared over all the subject land, including Lot A DP331461 and Lot 1 DP375748, removing the limitation of 16 metres and indicating a height of building maximum level of 35 metres;
- Proposed re-zoning of Lots 1-5 DP20847 from R1 General Residential to B4 Mixed Use.

Refer to Planning Proposal document prepared by Salvestro Planning for details.

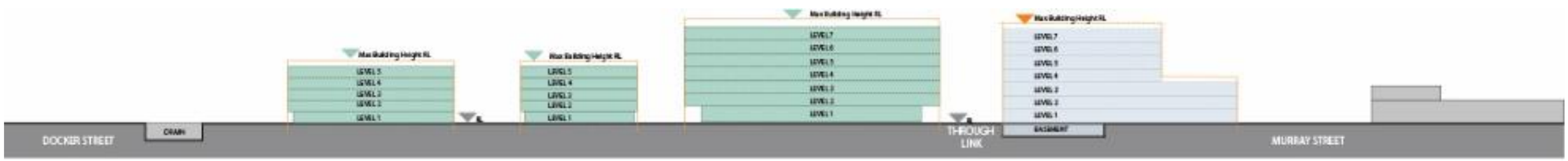


Figure 18- Proposed Height and Massing cross section diagram

To achieve this, it is proposed that the site be governed by a new site specific DCP which will include controls for:

- Establishing setbacks that appropriately respond to surrounding context, as well as the specific and unique characteristics of the site.
- Transition of height through stepping of building mass to minimise impact on adjoining properties;
- Careful analysis of the development potential and the resulting built form to ensure the intensification does not create adverse impact to the amenity of the site and its surrounds.

The construction of the new Enixus building at 195 Morgan St has successfully demonstrated the positive co-relation between careful design and positioning of taller buildings within a residential context.

The success is achieved through appropriate setbacks and consistent height of street wall. This building represents the height benchmark for the majority of the proposed new buildings within the Masterplan. An exception is the proposed building located at 185-187 Morgan St which is intended as an icon to create a sense of identity for the site. This building will add the appropriate gravitas to the scheme, and has therefore been proposed as the tallest building on site.

In recognition of the scheme's relationship to the local context, careful consideration has been given to setbacks and articulation of the bulk and the scale in the Masterplan, as indicated in Figure 18 and 19

Furthermore, the proposed master plan also recognises the significance of active frontages as part of the overall Place Making Strategy for the site, and nominates appropriate levels of interactions.

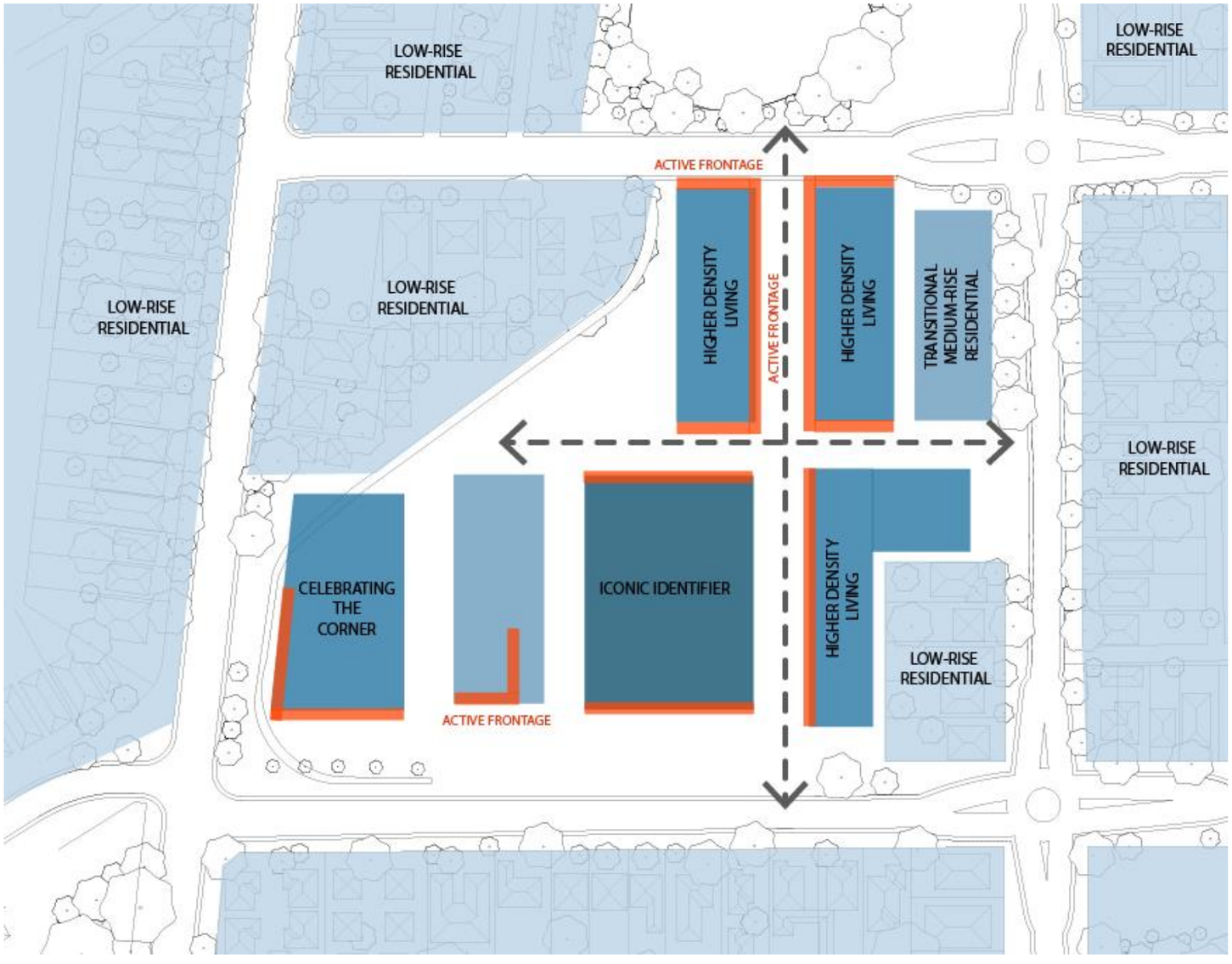


Figure 19- Proposed Height and Massing Principle Diagram

In accordance with the Wagga Wagga Development Control Plan 2010- Section 10.2 Mixed use development, the Masterplan proposes to:

- Ensure the design and layout of mixed-use developments retains a high-level amenity for all users.
- Encourage active street frontages and an opportunity for a mix of uses.
- Ensure that the form of mixed-use development in the B4 Zone is appropriate to its built context.
- Ensure that development of sites within B4 Zone is based on an urban design-based masterplan
- Minimise expanses of blank walls, use articulation and complimentary range of materials to create visually interesting street elevations.

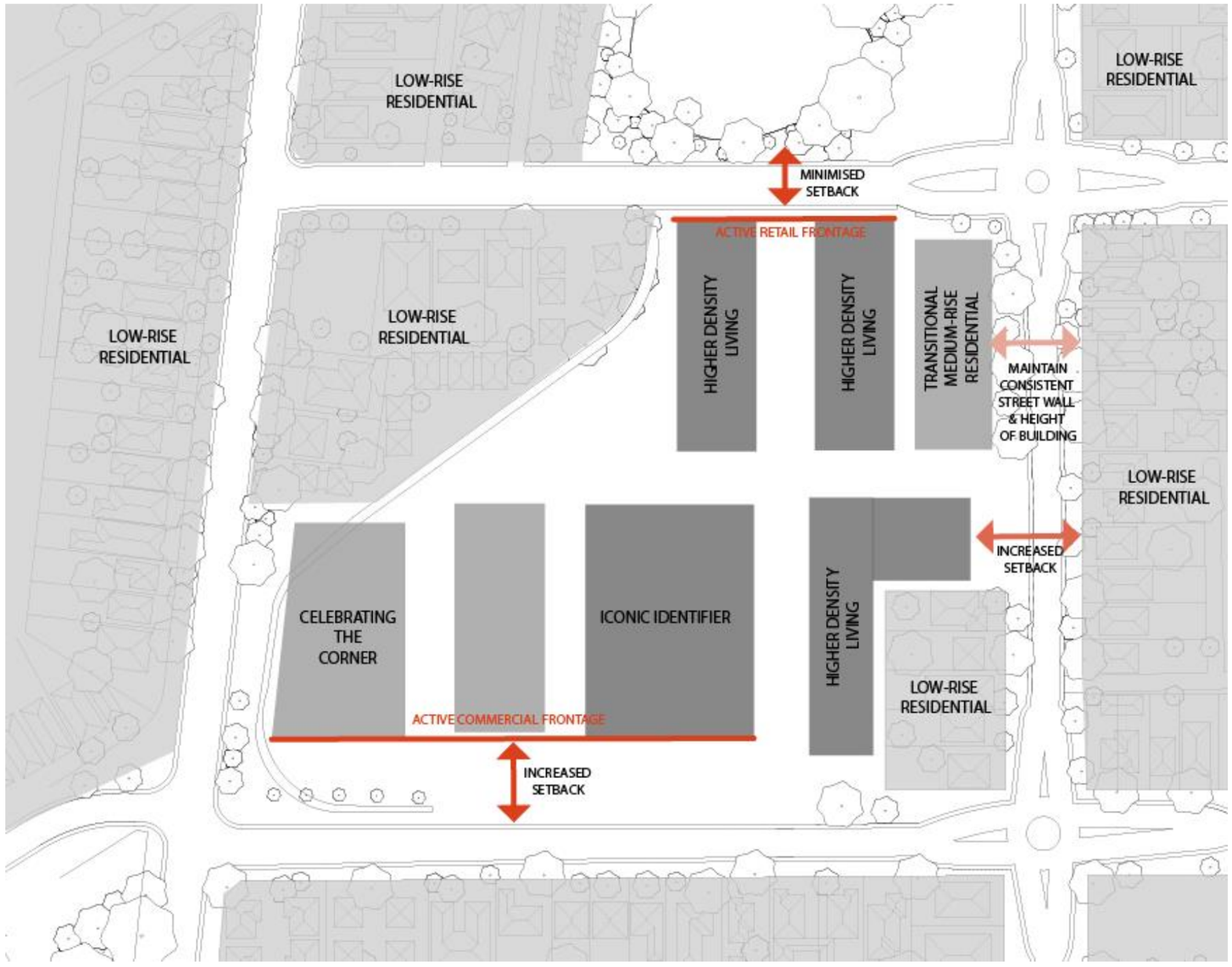


Figure 20- Proposed Setback Diagram

7. THE MASTER PLAN

7.1. THE VISION

The governing vision for the proposed development of the site has been conceived to bring together the following concepts:

- A beacon of corporate excellence to attract corporate business both NGO and government agencies at the local, state and national level;
- A modern residential community for residents, workers and retirees in a walkable community, which is less reliant on vehicles;
- A thriving retail precinct which is activated by the onsite density of workers and residents;
- Provision of a well-defined and composed public realm which supports and integrates into the wider urban fabric of Wagga Wagga;
- Activation of the Southern end of the Wollundry Lagoon to establish a family friendly and focused destination for the entire community.
- Delivering a development established with the principals of the Smart Cities Plan;
- Development of energy efficient infrastructure;

These initiatives are to be achieved by creating a hub which generates employment and housing opportunities, while ensuring that transport opportunities and connectivity are considered and incorporated into the design. With this vision in mind, this proposal seeks to redevelop the Site which currently consists of largely disconnected properties in terms of use, aesthetic and amenity.

The scheme encompasses a mixed-use development delivering

- 180 residential living units & 13 Townhouse units
- 23,000 square metres of additional commercial office space; and
- Retention of 8,000 square metres of retail floor space on what was once light industrial land housing equal to 8000 sqm of retail and other uses.

Figure 21- Aerial view of the proposed Development Master Plan

As a catalyst project the redevelopment of the Site can facilitate the gradual growth of the immediate satellite neighbourhoods. The Site can complement and support the CBD, through increased population and activation of otherwise single-used and isolated precincts. The collective neighbourhood will provide much needed support and strengthen localities by use, increased population density and diversification.

This proposal has a focus on:

- Place-making through high-quality built environment and enhancements to the natural spaces;
- Creating a vibrant and safe public realm with high natural (e.g. access to light, sun and shade) and physical amenities through high quality and durable materials and finishes;
- Locating active uses along the street and public realm to enhance the enjoyment of the place;
- Delivering a development consistent with the principles of SEPP 65 and medium density housing;
- Supporting health services e.g. community, sexual and aging health areas;
- Nurturing small commercial enterprise;
- Providing boutique retailers for the precinct.

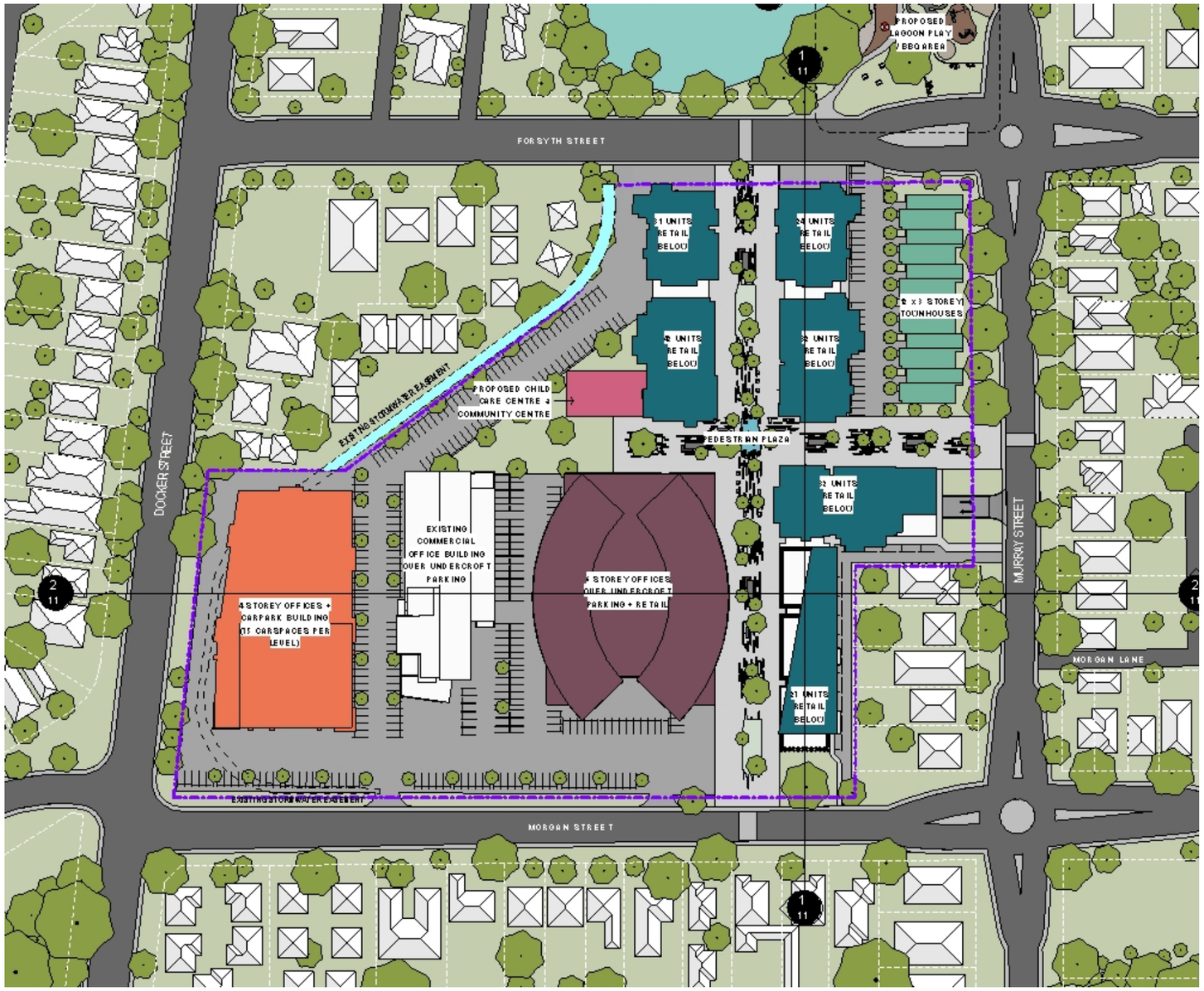


Figure 22- Proposed Masterplan

7.2. SITE CHARACTERISTICS & OPPORTUNITIES

The proposed development is crucial in creating a capstone for the southern aspect of the Wollundry Lagoon. The Lagoon itself acts as a potential conduit between the CBD and the health precinct but lacks the reach to physically unite both areas for a meaningful connectivity between the two destinations.

The lagoon is largely an under-utilised but powerfully nascent feature in the heart of the city. It represents both the unique Aboriginal cultural heritage, and the early European connection to the Murrumbidgee River as a food bowl for both cultures. The proposed development is the natural and vital link for this journey, with the central plaza providing legible public connection to the Lagoon. Further, the amenity available in linking the central arterial plaza to the Wollundry Lagoon is compelling.

It is suggested that the Lagoon, as a microcosmic representation of this, be allowed to carry the activities and energy of the CBD through to the south western portion of the city. In acting as a connection between the CBD and the health precinct, the scheme consolidates a variety of uses into a denser area for both living and working populations by creating a sense of place and bringing together residential and commercial uses to support each other.

The mixed-use nature of the proposed Master Plan, elevates the Site to a desirable place to work, live, shop and gather. It will act as an iconic place in its own right, as well as a bustling precinct, contributing to the flourishing of its contextual neighbours and further afield, the CBD.

Creating organised urban activities and diversification of offerings and uses on the site will help ensure the success of the development.

To enhance these offering, the development of the south east corner of the Wollundry Lagoon into a Play Park is proposed. The Play Park has the potential to include various activities including family friendly play areas, scooter park, climbing equipment and barbeques to cater for a wide range of community.

Figure 23- Proposed Forsyth St Lagoon Play Park

7.3. LAND USES

The fundamental approach in layout and spatial planning for the site has been to create a sense of place through a considered Master Plan.

The general arrangement has been to integrate complimentary uses and provide separation between undesirable conflicts. To achieve this intent, the general organisation of the site has been to concentrate the residential uses adjacent to similar land uses.

Along Murray Street this approach further allows for complimentary integration of the built form and enhanced co-relation of the fine grain urban detail to the streetscape through similar uses. Along Forsyth Street, the placement of residential uses allows for the views and vistas to the Wollundry Lagoon to be maximised and the proposed active mixed-use ground level will ensure activation and a meaningful interaction with the Lagoon and the proposed future Wollundry Lagoon Play Park. The retention of the commercial zone along Morgan Street maintains the characteristics of the site and street, rationalising and concentrating the currently sporadic spread of the commercial tenancies across the site.

The scale and vision for the site lends itself to further expansion of the on -site land uses to accommodate community use within the Site. Centrally located, the community zone takes advantage of the pedestrian links as well as ease of vehicular access.

Figure 24- Proposed Land-use Diagram

7.4. ACCESS AND CONNECTIVITY

The Master Plan for the Site has rationalised the overall layout to remove conflict between pedestrian and vehicular access. The introduction of major through-site pedestrian links, in the form of generous public domain, creates a safe and enjoyable environment for pedestrians. Clear and direct sightlines allow for ease of pedestrian movement and orientation through the site and beyond.

Separated vehicular pathways allow for easy manoeuvring of vehicles through the site, away from the pedestrianised areas, providing access to the more intense commercial premises use as illustrated in Figure 25.

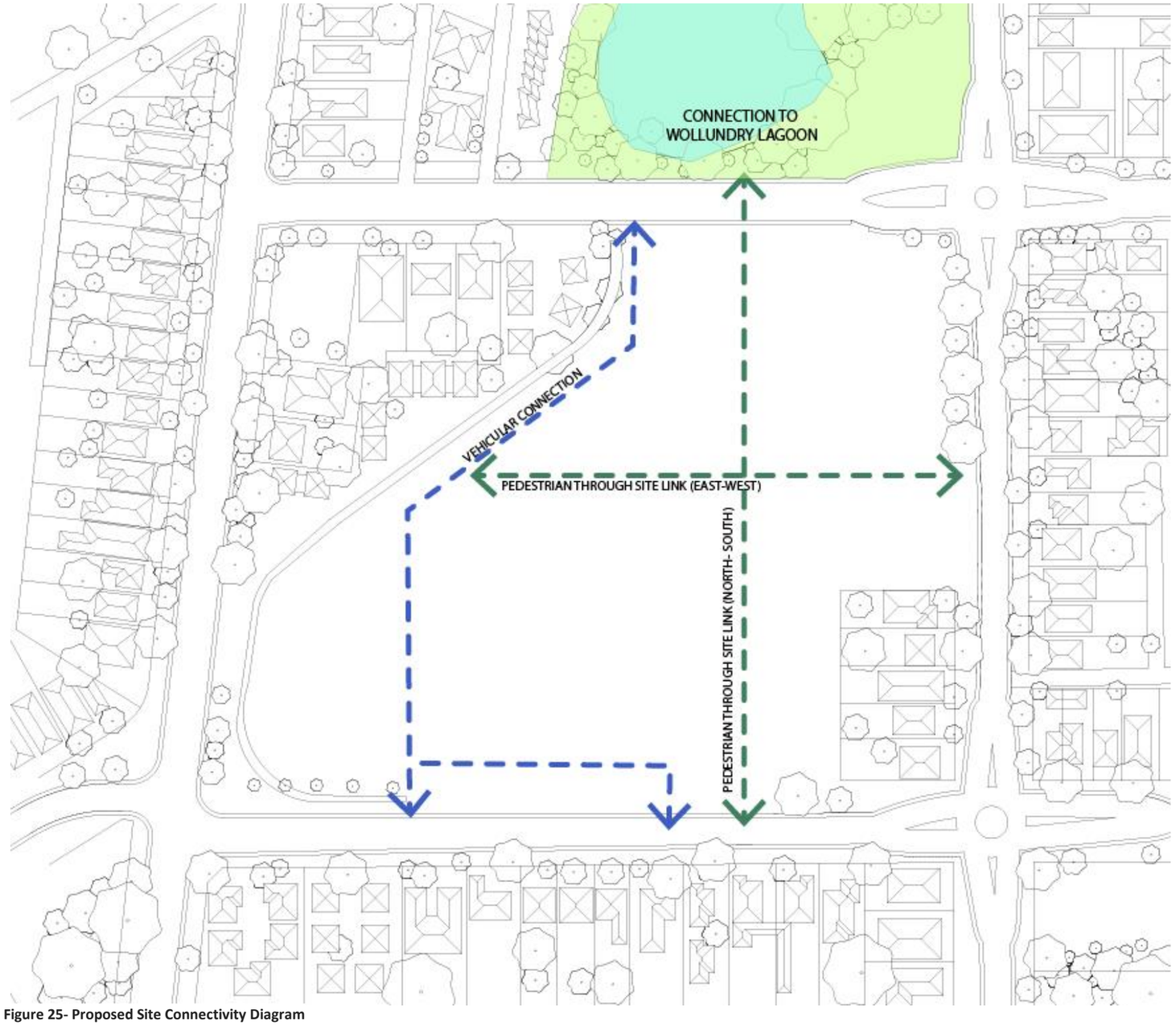


Figure 25- Proposed Site Connectivity Diagram

7.5. SMART CITIES

The masterplan will incorporate the principles of the Smart Cities Plan. An active government initiative to create developments that provide accessible, liveable spaces that attract talent, encourage innovation and create jobs and support growth. This is achieved through:

- Creating a hub which generates employment opportunities;
- Creating housing supply onsite, to the hub of employment;
- Creating employment closer to where people already live;
- Ensuring that transport opportunities and connectivity are considered and incorporated into the design;
- Creating a smart employment district that provides flexible workspaces and has access to smart technology and high-speed internet connection.

These initiatives have been considered in developing a functional plan which has been future proofed through its diversification and amenity.

Figure 26- Aerial view of the proposed Development Master Plan

7.6. COMMERCIAL & RETAIL

The retail, hospitality and health precinct are centred along a North South promenade. This is designed to be a pedestrian focused space which is enriched through significant landscape design, outdoor seating and semi-outdoor dining experiences.

- The design will be an enriching experience for all users and visitors and will enjoy the benefits of purpose-built spaces for accommodation and outdoor experiences
- The new corporate hub will contain approximately 25000 sqm of additional office space.
- Stage 1 – Enixus has already been constructed being completed in early 2017.
- Stage 2 of the corporate hub will be the building on the corner of Murray St & Docker St which will accommodate approximately 6000 sqm of corporate space, and a multistorey carpark to provide current and future parking for the development.

The final stage of the corporate hub, Stage 3, will be the 8-storey centrepiece office building. This will provide approximately, 19000 sqm of office, health & clinical space.

Figure 27- Proposed central office building

Figure 28- Proposed commercial building

7.7. RESIDENTIAL

The residential accommodation is comprised of:

- 13 Townhouse style – 3 storey units located on Murray St. The townhouses are designed to acknowledge and interpret the original Dunlop building with its distinctive saw tooth roof structure;
- 6 Residential towers of varying heights, which sit above the retail / hospitality ground floor precinct. The towers will accommodate approximately 188 units made up of 1, 2 and 3-bedroom units. The buildings will include a percentage of units that will be made available as affordable accommodation;
- All units will enjoy secure access and parking, with direct access to the retail and hospitality areas on the ground floor promenade;
- All units will be designed to comply with SEPP 65 and the Apartment design guide requirements.

Figure 29- Proposed residential buildings, Murray Street

7.8. OPEN SPACE

The central promenade is the link from the corporate hub, to the retail zone, and forms the entry zone into the residential community.

- The promenade forms the link and gateway to the proposed Wollundry Lagoon Play Park.
- The development of the park will provide the following community and family friendly waterside uses and activities, BBQ facilities, Secure Amenities, Grassed areas for families and Child focused play areas including:
    - A sand play area
    - Climbing / playground structures
    - A climbing tower
    - Scooter / riding track.

Figure 30- Proposed Wollundry Lagoon Play Park

Figure 31- Proposed Wollundry Lagoon Play Park

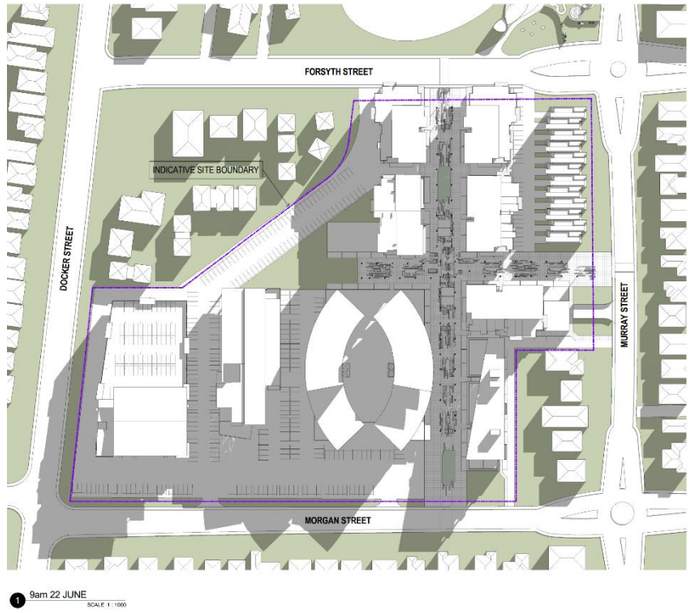
7.9. AMENITY IMPACTS & SHADOW ANALYSIS

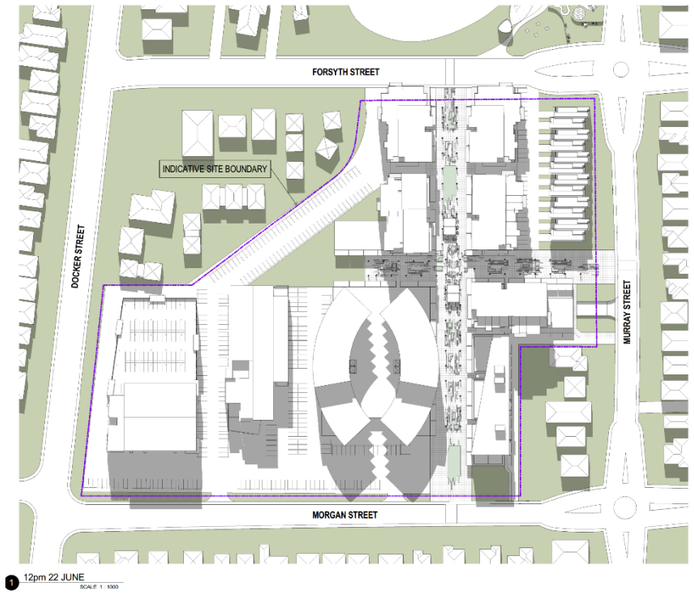
The approach to Place Making in the proposed Master Plan has informed the general arrangement, orientation and placement of the built forms across the Site.

The north-south orientation, building separation and proposed height of buildings ensure a quality environment for the Public Realm, while ensuring the amenity of the buildings in relation to views and solar gain.

As demonstrated in the opposite shadow diagrams, the central plaza benefits from full access to the sun during the winter months and throughout the hours of midday, when it is expected to be most utilised by patrons of the proposed retail.

Furthermore, the diagrams also demonstrate that the solar amenity of the adjoining, neighbouring residential properties are not adversely compromised by this proposal and the proposed height, bulk and setbacks retain the adjoining properties access to the sun during the winter months.





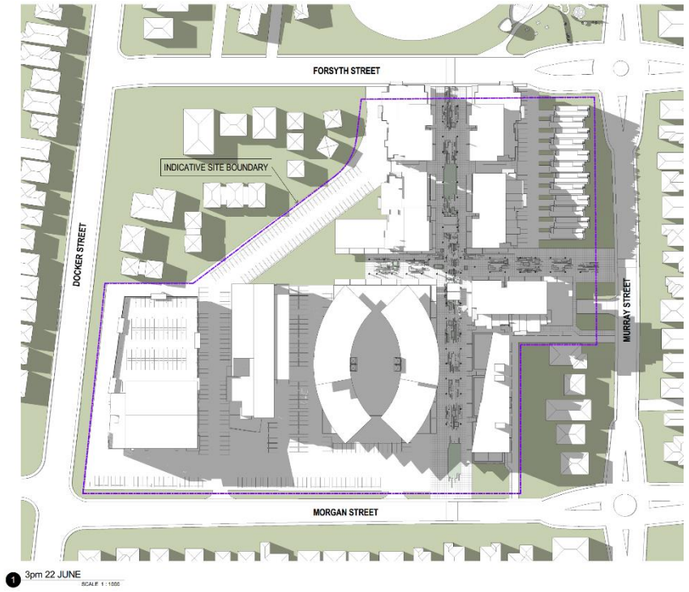


Figure 32- Shadow Diagram Winter Solstice

7.10. CARPARKING & TRAFFIC

The accompanying Traffic and Parking Impact assessment by McLaren Traffic Engineering (MTE) identifies the resulting impacts of the proposed master plan. The report concludes that the traffic and parking impacts of the mixed-use planning proposal can be fully supported.

The report carries out detail assessment of traffic and parking requirements under the proposed Master Plan For the purposes of assessment, it has been assumed that:

- an FSR of 1:1.96 can be achieved amongst a variety of land uses consisting of residential, commercial and retail uses in a combined arrangement;
- The proposal is anticipated to generate demand for some 1,083 parking spaces for tenants, staff and visitors to the site at peak times which would be weekdays during office hours;
- The estimated traffic generation for the proposal is to be in the order of 884 trips in the AM and 836 trips in the PM weekday commuter peak hours.

The site can provide parking to meet the demand for the chosen land uses and the new trips will minorly increase delays at key intersections and will retain intersection performance in general.

It is not considered that the proposal would generate sufficient traffic to warrant traffic management on the local road system beyond the driveways of the site. The site and local road network can accommodate the anticipated traffic generation impacts and the traffic impacts of the planning proposal are supported.

The surrounding intersections remain generally unaltered under the future scenario. Other than at the Morgan Street/Docker Street intersection, the east approach of which is already at capacity, all intersections will continue to operate with a high level of efficiency and short delays. Possible options for the upgrades of the Morgan Street/Docker Street intersection are discussed in detail in Section 4.7 of MTE report. This intersection upgrades are identified as a council action plan.

8. Application of Design Codes

The proposed master plan and the resulting built forms and environment has been reviewed in detail against the requirements of State Environmental Policy No.65 (SEPP 65) - Design Quality of Residential Flat Development and key amenity standards of the Apartment Design Guide (ADG).

The assessment of the development and relevant information in respect to compliance with objectives of SEPP and ADG are included in the following table:

8.1. SEPP 65 DESIGN PRINCIPLES

SEPP 65 DESIGN QUALITY PRINCIPLES	MASTERPLAN RESPONSE TO PRINCIPLES
Principle 1: Context and neighbourhood character	
Good design responds and contributes to its context. Context is the key natural and built features of an area, their relationship and the character they create when combined. It also includes social, economic, health and environmental conditions.	Masterplan is consistent with existing context as retail, commercial and residential. Masterplan is consistent with future character as indicated by WWCC Strategic planning.
Responding to context involves identifying the desirable elements of an area's existing or future character. Well-designed buildings respond to and enhance the qualities and identity of the area including the adjacent sites, streetscape and neighbourhood.	Masterplan is appropriate in scale, use and context. The scheme addresses strategic planning for connectedness to CBD and Health Precincts.
Consideration of local context is important for all sites, including sites in established areas, those undergoing change or identified for change.	As above
Principle 2: Built form and scale	
Good design achieves a scale, bulk and height appropriate to the existing or desired future character of the street and surrounding buildings.	Masterplan is appropriate in scale and form for mixed use development and infill housing. Masterplan is consistent with future character as indicated by WWCC Strategic planning. Attention to setbacks and building articulation addresses the residential scale
Good design also achieves an appropriate built form for a site and the building's purpose in terms of building alignments, proportions, building type, articulation and the manipulation of building elements.	As above
Appropriate built form defines the public domain, contributes to the character of streetscapes and parks, including their views and vistas, and provides internal amenity and outlook.	Masterplan is consistent with future character as indicated by WWCC Strategic planning. Civic open space is integrated into the Masterplan generously and is consistent with SEPP 65 and WCC Strategic Planning
Principle 3: Density	
Good design achieves a high level of amenity for residents and each apartment, resulting in a density appropriate to the site and its context.	Density is appropriate to the WWCC projections for infill housing, infrastructure, facilities and transport
Appropriate densities are consistent with the area's existing or projected population. Appropriate densities can be sustained by existing or proposed infrastructure, public transport, access to jobs, community facilities and the environment.	As above
Principle 4: Sustainability	
Good design combines positive environmental, social and economic outcomes.	Masterplan is consistent with future character as indicated by WWCC Strategic planning.
Good sustainable design includes use of natural cross ventilation and sunlight for the amenity and liveability of residents and passive thermal design for ventilation, heating and cooling reducing reliance on technology and operation costs. Other elements include recycling and reuse of materials and waste, use of sustainable materials and deep soil zones for groundwater recharge and vegetation.	High level ESD principles are addressed through good orientation and ample open space between buildings. Finer detail will be integrated during design development

Principle 5: Landscape	
Good design recognises that together landscape and buildings operate as an integrated and sustainable system, resulting in attractive developments with good amenity. A positive image and contextual fit of well designed developments is achieved by contributing to the landscape character of the streetscape and neighbourhood.	Masterplan is consistent with future character as indicated by WWCC Strategic planning. Civic open space is integrated into the Masterplan generously and is consistent with SEPP 65 and WCC Strategic Planning
Good landscape design enhances the development's environmental performance by retaining positive natural features which contribute to the local context, co-ordinating water and soil management, solar access, micro-climate, tree canopy, habitat values and preserving green networks.	Masterplan is sensitive to localised water issues relating to the onsite stormwater channel and Wollundry Lagoon. Finer detail will be integrated during design development
Good landscape design optimises useability, privacy and opportunities for social interaction, equitable access, respect for neighbours' amenity and provides for practical establishment and long term management.	Civic open space is integrated into the Masterplan generously and is consistent with SEPP 65 and WCC Strategic Planning Finer detail will be integrated during design development
Principle 6: Amenity	
Good design positively influences internal and external amenity for residents and neighbours. Achieving good amenity contributes to positive living environments and resident well being.	Masterplan is consistent with high level planning to facilitate SEPP 65 amenity, such as in the distances between buildings Finer detail will be integrated during design development.
Good amenity combines appropriate room dimensions and shapes, access to sunlight, natural ventilation, outlook, visual and acoustic privacy, storage, indoor and outdoor space, efficient layouts and service areas and ease of access for all age groups and degrees of mobility.	
Principle 7: Safety	
Good design optimises safety and security within the development and the public domain. It provides for quality public and private spaces that are clearly defined and fit for the intended purpose. Opportunities to maximise passive surveillance of public and communal areas promote safety.	Masterplan is consistent with principles for day and night passive surveillance
A positive relationship between public and private spaces is achieved through clearly defined secure access points and well lit and visible areas that are easily maintained and appropriate to the location and purpose.	Masterplan is consistent with principles for controlled access points, clear sightlines and opportunities for lighting.
Principle 8: Housing diversity and social interaction	
Good design achieves a mix of apartment sizes, providing housing choice for different demographics, living needs and household budgets.	Masterplan is consistent with high level planning to facilitate SEPP 65 variety in dwellings and WWCC strategic planning for housing growth and infill housing Finer detail will be integrated during design development.
Well designed apartment developments respond to social context by providing housing and facilities to suit the existing and future social mix.	As above
Good design involves practical and flexible features, including different types of communal spaces for a broad range of people and providing opportunities for social interaction among residents.	Masterplan provides for a wide range of social interaction and community opportunities as a mixed use development
Principle 9: Aesthetics	
Good design achieves a built form that has good proportions and a balanced composition of elements, reflecting the internal layout and structure. Good design uses a variety of materials, colours and textures.	Masterplan is consistent with high level planning to facilitate SEPP 65 and WWCC strategic planning for mixed use development Finer detail will be integrated during design development.
The visual appearance of a well designed apartment development responds to the existing or future local context, particularly desirable elements and repetitions of the streetscape.	As above

ELEMENT	GUIDELINE	COMPLIES
PART 3 – SITING THE DEVELOPMENT		
3A Site Analysis	Objective 3A-1 Site analysis illustrates that design decisions have been based on opportunities and constraints of the site conditions and their relationship to the surrounding context	Yes
3B Orientation	Objective 3B-1 Building types and layouts respond to the streetscape and site while optimising solar access within the development	Yes
	Objective 3B-2 Overshadowing of neighbouring properties is minimised during mid-winter	Yes
3C Public Domain Interface	Objective 3C-1 Transition between private and public domain is achieved without compromising safety and security	Yes
	Objective 3C-2 Amenity of the public domain is retained and enhanced	Yes
3D Communal and Public Open Space	Objective 3D-1 An adequate area of communal open space is provided to enhance residential amenity and to provide opportunities for landscaping	Yes
	Objective 3D-2 Communal open space is designed to allow for a range of activities, respond to site conditions and be attractive and inviting	Yes
	Objective 3D-3 Communal open space is designed to maximise safety	Yes
	Objective 3D-4 Public open space, where provided, is responsive to the existing pattern and uses of the neighbourhood	N/A

ELEMENT	GUIDELINE	COMPLIES
3E Deep Soil Zones	Objective 3E-1 Deep soil zones provide areas on the site that allow for and support healthy plant and tree growth. They improve residential amenity and promote management of water and air quality.	Yes
3F Visual Privacy	Objective 3F-1 Adequate building separation distances are shared equitably between neighbouring sites, to achieve reasonable levels of external and internal visual privacy.	Yes
	Objective 3F-2 Site and building design elements increase privacy without compromising access to light and air and balance outlook and views from habitable rooms and private open space.	Yes
3G Pedestrian Access & Entries	Objective 3G-1 Building entries and pedestrian access connects to and addresses the public domain.	Yes
	Objective 3G-2 Access, entries and pathways are accessible and easy to identify	Yes
	Objective 3G-3 Large sites provide pedestrian links for access to streets and connection to destinations.	N/A
3H Vehicle Access	Objective 3H-1 Vehicle access points are designed and located to achieve safety, minimise conflicts between pedestrians and vehicles and create high quality streetscapes.	Yes
3J Bicycle and Car Parking	Objective 3J-1 Car parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas.	Yes
	Objective 3J-2 Parking and facilities are provided for other modes of transport.	Yes

ELEMENT	GUIDELINE	COMPLIES
	Objective 3J-3 Car park design and access is safe and secure.	Yes
	Objective 3J-4 Visual and environmental impacts of underground car parking are minimised	Yes
	Objective 3J-5 Visual and environmental impacts of on-grade parking are minimised	Yes
	Objective 3J-6 Visual and environmental impacts of above ground enclosed car parking are minimised	N/A
ELEMENT	GUIDELINE	COMPLIES
4A Solar & Daylight Access	Objective 4A-1 To optimise the number of apartments receiving sunlight to habitable rooms, primary windows and private open space	Yes
	Objective 4A-2 Daylight access is maximised where sunlight is limited	N/A
	Objective 4A-3 Design incorporates shading and glare control, particularly for warmer months	Yes
4B Natural Ventilation	Objective 4B-1 All habitable rooms are naturally ventilated	Yes
	Objective 4B-2 The layout and design of single aspect apartments maximises natural ventilation	Yes
	Objective 4B-3 The number of apartments with natural cross ventilation is maximised to create a comfortable indoor environment for residents.	Yes

ELEMENT	GUIDELINE	COMPLIES
4C Ceiling Heights	Objective 4C-1 Ceiling height achieves sufficient natural ventilation and daylight access.	Yes
	Objective 4C-2 Ceiling height increases the sense of space in apartments and provides for well-proportioned rooms	Yes
	Objective 4C-3 Ceiling heights contribute to the flexibility of building use over the life of the building	N/A
4D Apartment Size & Layout	Objective 4D-1 The layout of rooms within an apartment is functional, well organised and provides a high standard of amenity	Yes
	Objective 4D-2 Environmental performance of the apartment is maximised	Yes
	Objective 4D-3 Apartment layouts are designed to accommodate a variety of household activities and needs	Yes
4E Private Open Space & Balconies	Objective 4E-1 Apartments provide appropriately sized private open space and balconies to enhance residential amenity	Yes
	Objective 4E-2 Primary private open space and balconies are appropriately located to enhance liveability for residents	Yes
	Objective 4E-3 Private open space and balcony design is integrated into and contributes to the overall architectural form and detail of the building	Yes
	Objective 4E-4 Private open space and balcony design maximises safety	Yes

ELEMENT	GUIDELINE	COMPLIES
4F Common Circulation and Spaces	Objective 4F-1 Common circulation spaces achieve good amenity and properly service the number of apartments	Yes
	Objective 4F-2 Common circulation spaces promote safety and provide for social interaction between residents	Yes
4G Storage	Objective 4G-1 Adequate, well designed storage is provided in each apartment	Yes
	Objective 4G-2 Additional storage is conveniently located, accessible and nominated for individual apartments	Yes
4H Acoustic Privacy	Objective 4H-1 Noise transfer is minimised through the siting of buildings and building layout	Yes
	Objective 4H-2 Noise impacts are mitigated within apartments through layout and acoustic treatments	Yes
4J Noise and Pollution	Objective 4J-1 In noisy or hostile environments the impacts of external noise and pollution are minimised through the careful siting and layout of buildings	Yes
	Objective 4J-2 Appropriate noise shielding or attenuation techniques for the building design, construction and choice of materials are used to mitigate noise transmission	Yes
4K Apartment Mix	Objective 4K-1 A range of different apartment types and sizes is provided to cater for different household types now and into the future	Yes
	Objective 4K-2 The apartment mix is distributed to suitable locations within the building	Yes

ELEMENT	GUIDELINE	COMPLIES
4L Ground Floor Apartments	Objective 4L-1 Street frontage activity is maximised where ground floor apartments are located	N/A
	Objective 4L-2 Design for ground floor apartments delivers amenity and safety for residents	Yes
4M Facades	Objective 4M-1 Building facades provide visual interest along the street while respecting the character of the local area	Yes
	Objective 4M-2 Building functions are expressed by the facade	Yes
4N Roof Design	Objective 4N-1 Roof treatments are integrated into the building design and positively respond to the street	Yes
	Objective 4N-2 Opportunities to use roof space for residential accommodation and open space are maximised	N/A
	Objective 4N-3 Roof design incorporates sustainability features	Yes
4O Landscape Design	Objective 4O-1 Landscape design is viable and sustainable	Yes
	Objective 4O-2 Landscape design contributes to the streetscape and amenity	Yes
4P Planting on Structures	Objective 4P-1 Appropriate soil profiles are provided	Yes
	Objective 4P-2 Plant growth is optimised with appropriate selection and maintenance	Yes
	Objective 4P-3 Planting on structures contributes to the quality and amenity of communal and public open spaces	Yes
4Q Universal Design	Objective 4Q-1 Universal design features are included in apartment design to promote flexible housing for all community members	Yes
	Objective 4Q-2 A variety of apartments with adaptable designs are provided	Yes
	Objective 4Q-3 Apartment layouts are flexible and accommodate a range of lifestyle needs	Yes
4R Adaptive Reuse	Objective 4R-1 New additions to existing buildings are contemporary and complementary and enhance an area's identity and sense of place	N/A
	Objective 4R-2 Adapted buildings provide residential amenity while not precluding future adaptive reuse	N/A
4S Mixed Use	Objective 4S-1 Mixed use developments are provided in appropriate locations and provide active street frontages that encourage pedestrian movement	N/A
	Objective 4S-2 Residential levels of the building are integrated within the development, and safety and amenity is maximised for residents	N/A
4T Awnings & Signage	Objective 4T-1 Awnings are well located and complement and integrate with building design	Yes
	Objective 4T-2 Signage responds to the context and desired streetscape character	Yes
4U Energy Efficiency	Objective 4U-1 Development incorporates passive environmental design	Yes
	Objective 4U-2 Development incorporates passive solar design to optimise heat storage in winter and reduce heat transfer in summer	Yes
	Objective 4U-3 Adequate natural ventilation minimises the need for mechanical ventilation	Yes
4V Water Management & Conservation	Objective 4V-1 Potable water use is minimised	Yes
	Objective 4V-2 Urban stormwater is treated on site before being discharged to receiving waters	Yes
	Objective 4V-3 Flood management systems are integrated into site design	Yes
4W Waste Management	Objective 4W-1 Waste storage facilities are designed to minimise impacts on the streetscape, building entry and amenity of residents	Yes
	Objective 4W-2 Domestic waste is minimised by providing safe and convenient source separation and recycling	Yes
4X Building Maintenance	Objective 4X-1 Building design detail provides protection from weathering	Yes
	Objective 4X-2 Systems and access enable ease of maintenance	Yes
	Objective 4X-3 Material selection reduces ongoing maintenance costs	Yes

9. Conclusion & Recommendations

This Urban Design Report has identified that the current planning controls do not recognize the development potentials of the subject site as identified in the Wagga Wagga Strategies and future expansion of the area. They do not encourage development and have the potential to encourage poor development outcomes, with limited public benefits.

This report has established that the subject Site can significantly contribute to the revitalisation of the area and requires a full review of its present controls to allow adequate future development to meet housing demands and design excellence.

The proposed Master Plan has investigated building models, density and heights across the site and the proposed plan establishes a model that will set up an urban framework for the Site and the surrounding neighbourhood.

The plan proposes a development model of increased density for the precinct along with expansion of the public realm through the reduction of building footprints and increased height of building for the site.

It demonstrates that:

- the building blocks form street walls that reinforce street patterns;
- the Public Realm is legible and is significantly increased to positively contribution to the Wollundry Lagoon;
- the stepped building mass is reduced to achieve appropriate transition to the sounding context;
- separation of forms creates view and daylight corridors through the site,
- ground level active uses provide an engaging interface via retail uses;
- to increase the working and living population in an important area of growth; while
- the built form model meets the requirements of State Environmental Policy No.65 - Design Quality of Residential Flat Development and key amenity standards of the Apartment Design Guide

The redevelopment of the subject site with high architectural merit will provide future benefit in terms of urban renewal. This will be achieved by setting the standard as a catalyst to revitalise the precinct and its immediate area while contributing to and further improving the nearby health and CBD precincts.

The recommendation is for the support of the master plan and the variation of the current development controls to enable the full realisation of the site's development potential.

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Attachment:

Additional Justification in accordance with NSW Government Planning and Environment – LEP Practice Note – Classification and reclassification of public land though a local environmental plan:

The current and proposed classification of the land:

Lot A DP 331461 and Lot 1 DP 375748, 205 Morgan Street is currently community land. The proposal intends to reclassify both lots to operational.

Whether the land is a 'public reserve' (defined in the LG Act):

The title searches for the lots do not identify the land as 'public reserve'.

The strategic and site-specific merits of the reclassification and evidence to support this:

The lots directly adjoin an existing 'mixed use' precinct that is a key infill site within the city. The precinct is undergoing revitalisation and the community land presents an opportunity to expand on opportunities for increased employment and residential opportunities within the city.

Whether the planning proposal is the result of a strategic study or report:

The planning proposal is supported by an urban design report (attached).

Whether the planning proposal is consistent with council's community plan or other local strategic plan:

The reclassification is consistent with the following action of the endorsed Wagga Wagga Spatial Plan 2013-2043:

Identify sites suitable for redevelopment and investigate the potential to concentrate development to infill sites to accommodate future growth.

The planning proposal will provide opportunities for infill development that will contribute to employment and housing provision.

A summary of council's interests in the land including:

- How and when the land was first acquired (e.g. was it dedicated, donated, provided as part of a subdivision for public open space or other purpose, or a developer contribution)

  Council purchased the lots in 1935 and 1951. The land was not dedicated to Council.

- If council does not own the land, the land owner's consent
  Council are the owners of the land.

- The nature of any trusts, dedications etc.

  There are no trusts or dedications associated with the lots.

Whether an interest in land is proposed to be discharged, and if so, an explanation of the reasons why:

There are no interests associated with the lots to be reclassified.

The effect of the reclassification (including the loss of public open space, the land ceases to be a public reserve or particular interests will be discharged):

The lots to be reclassified contain one structure that is currently leased by a community club that utilise the structure and site for their meetings. The reclassification will affect this community group if the land is disposed of.

The lots are not available for use by the broader public and do not contain community facilities or infrastructure.

Evidence of public reserve status or relevant interests, or lack thereof applying to the land (e.g. electronic title searches, notice in a Government Gazette, trust documents):

The titles for the lots are attached.

Current use(s) of the land, and whether uses are authorised or unauthorised:

The land currently contains one (1) structure that is subject to a licence agreement for use by a community group for regular meetings. The use is authorised.

Current or proposed lease or agreements applying to the land, together with their duration, terms and controls:

The use of the structure and land is subject to a licence agreement for use by a community group. If required, the licence agreement can be provided.

Current or proposed business dealings (e.g. agreement for the sale or lease of the land, the basic details of any such agreement and if relevant, when council intends to realise its asset, either immediate or after rezoning / reclassification or at a later time):

Preliminary discussions have occurred regarding future development of the site. The discussions will result in a voluntary planning agreement for any sale of the site for development purposes.

Any rezoning associated with the reclassification (if yes, need to demonstrate consistency with an endorsed plan of management or strategy):

The proposal is proposing a rezoning of the sites to be reclassified from RE1 Public Recreation to B4 Mixed Use.

The rezoning is consistent with the endorsed Wagga Wagga Spatial Plan 2013-2043 action to *Identify sites suitable for redevelopment and investigate the potential to concentrate development to infill sites to accommodate future growth.*

The rezoning will facilitate a precinct redevelopment that will increase employment and housing opportunities.

How council may or will benefit financially, and how these funds will be used:

The reclassification will enable the land to be sold. Preliminary discussions are occurring to establish a voluntary planning agreement that will determine how any financial benefit will be used.

How council will ensure funds remain available to fund proposed open space sites or improvements referred to in justifying the reclassification, if relevant to the proposal:

As part of the Council recommendation, Council has resolved that the voluntary planning agreement is to be in place prior to considering the outcomes of community consultation and forwarding to NSW Department of Planning and Environment to make the plan. The voluntary planning agreement will determine the appropriate community benefit.

A Land Reclassification (part lots) Map, in accordance with any standard technical requirements for spatial datasets and maps, if land to be reclassified does not apply to the whole lot:

The reclassification will apply to the whole of the lots. A land reclassification (part lots) map is not required.

Preliminary comments by a relevant government agency, including an agency that dedicated the land to council, if applicable.

There is no government agency involvement with the reclassification.

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/375748

SEARCH DATE	TIME	EDITION NO	DATE
23/8/2016	11:22 AM	-	-

VOL 6491 FOL 138 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LOT 1 IN DEPOSITED PLAN 375748
LOCAL GOVERNMENT AREA WAGGA WAGGA
PARISH OF SOUTH WAGGA WAGGA COUNTY OF WYNYARD
TITLE DIAGRAM DP375748

FIRST SCHEDULE

THE COUNCIL OF THE CITY OF WAGGA WAGGA (T F516627)

SECOND SCHEDULE (1 NOTIFICATION)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: A/331461

SEARCH DATE	TIME	EDITION NO	DATE
23/8/2016	11:20 AM	-	-

VOL 4709 FOL 196 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LOT A IN DEPOSITED PLAN 331461
AT SOUTH WAGGA WAGGA
LOCAL GOVERNMENT AREA WAGGA WAGGA
PARISH OF SOUTH WAGGA WAGGA COUNTY OF WYNYARD
TITLE DIAGRAM DP331461

FIRST SCHEDULE

THE COUNCIL OF THE MUNICIPALITY OF WAGGA WAGGA

SECOND SCHEDULE (1 NOTIFICATION)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***