New Maitland Hospital
State Significant Infrastructure Stage 2
Transport Impact Assessment

Client //	NSW Health Infrastructure
Office //	NSW
Reference //	N149421
Date //	17/05/19

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
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Executive Summary

GTA Consultants (GTA) was commissioned by Health Infrastructure to undertake a transport impact assessment for the New Maitland Hospital (NMH) to provide advice on traffic, access and parking impacts and mitigation measures associated with the proposed new regional hospital development at Metford Road, Metford.

This report sets out an assessment of the anticipated transport implications of the Stage 2 Main Works for the NMH. Enabling works have recently been completed to provide road improvements and access to the NMH site to support the future development. This transport assessment has considered the transport conditions on the surrounding road network at the proposed year of opening and ten-year horizon to ensure it can accommodate the operation of the proposed NMH.

Summary of Existing Assets

The NMH site is located around 25 kilometres northwest of Newcastle, located along Metford Road, Metford. The site has a western frontage of 500 metres to Metford Road. The site has been declared State Significant Infrastructure and is generally cleared and disturbed land with an existing forest in the south western corner of the site.

Intersection analysis of the existing operation of the Metford Road/ Fieldsend Street, Metford Road/ Raymond Terrace Road and Metford Road/ Chelmsford Drive was undertaken as part of the Stage 1 State Significant Infrastructure (SSI) Transport Assessment and has been updated in this report to reflect road changes implemented as part of the enabling works and also to reflect revised proposed operation of the NMH. The existing intersections of Metford Road/ Fieldsend Street and Metford Road / Raymond Terrace currently operate well with spare capacity. For the existing operation of the Metford Road / Chelmsford Road it is noted that the Chelmsford Drive south east approach queues in the AM peak. Results and observations indicate that vehicles are currently getting through the roundabout, however, under the current lane arrangements it is approaching capacity.

An outcome of consultation with Roads and Maritime during the Stage 1 process included additional analysis of some intersections on the New England Highway to incorporate traffic associated with the recent completion of the Green Hills Shopping Centre. This has been undertaken and analysis shows that the intersections of New England Highway/ Chelmsford Drive and New England Highway/ Mitchell Drive currently overall operate satisfactory in peak conditions, however the Chelmsford Drive north west approach indicates queuing in peak conditions. The intersection of New England Highway/ Chisholm Road currently operates well and with spare capacity in peak conditions.

The existing public transport in the area currently consists of bus and train services, with the nearest stops located around 650 metres and 1.4 kilometres away from the NMH site, respectively. Bus services provide local connections to the outer areas of Metford, including East Maitland and Thornton. Victoria Street Station is part of the Hunter Line, with rail services alternately running from Newcastle to Telarah, Dungong and Scone. Services at Victoria Street Station are generally provided every 30 minutes while bus services for surrounding bus stops generally operating every hour or two hours.

Stage 2 Concept Assessment

The proposed NMH would consist of 339 beds and is projected to employ around 893 FTE staff at the proposed year of opening, 1,106 FTE staff five years after opening and 1,162 FTE staff ten years after opening. The NMH will be a regional hospital providing predominantly Level 4 health services.

Three site access locations are proposed along Metford Road. These include a primary site access at the Metford Road/ Fieldsend Street intersection, a secondary site access (left in/ left out) around 60 metres north of the Metford Road/ Fieldsend Street intersection and an emergency vehicle access around 130 metres south of the Metford Road/ Fieldsend Street intersection.

The primary site access will service all vehicle movements including general traffic, staff, service vehicles and public transport, providing access to the front entrance for drop off, emergency and visitor parking. The secondary site access provides access to the northern car park (visitor and staff) and the emergency vehicle access would be restricted to emergency vehicle movements only. The internal road network for the site has been designed to discourage general vehicle movements through the emergency vehicle access.

A parking demand study for the NMH has been prepared by GTA (October 2018), which determined the parking requirements to accommodate for all staff, visitors and patients. The NMH proposes to provide a total of 682 on-site parking spaces at the year of opening, including 515 staff parking spaces and 167 public/visitor parking spaces. It is proposed that the hospital will have an at grade car park to the north of the hospital building for staff and long-term patient/visitors and an at-grade short stay car park on the western side of the hospital. The project proposes a staged infrastructure approach to address the longer term car parking demand assessment for the NMH and is committed to delivering the residual 140 car parks, beyond the early 2021 supply needs, to satisfy the incremental 10 year peak parking demand to 2031/2032.

The pedestrian connections within the NMH site will connect with Maitland City Council's (Council) recently constructed shared path along Fieldsend Street. A pedestrian refuge has been provided on Metford Road at the recently constructed roundabout as part of the enabling works to provide a crossing connection. By providing a connection to Fieldsend Street, the NMH site will be able to maximise the benefits for pedestrians and cyclists to access the Victoria Street Station.

The proposal also includes an on-site bus stop for incorporation into Hunter Valley bus routes. Bus services will access the site via the Metford Road/ Fieldsend Street roundabout and use internal roundabouts to access the bus stop located near the Hospital entry on the northern side of the building. The internal road network has been designed to accommodate bus movements.

Based on the surveys of the surrounding network, it is assumed that the peak hour for the road network will occur in the evening period. It is expected that at full operation the site will generate a total of 454 vehicle movements (318 vehicles exiting and 136 vehicles entering) during the PM peak hour.

Forecast traffic volumes for 2021 and 2031 have been provided by Roads and Maritime Services (Roads and Maritime) and the forecast growth rates used to determine background traffic growth in this assessment.

Analysis shows that the intersection of Fieldsend Street/ Metford Road/ hospital access would operate well with spare capacity in the year of opening and future 10-year horizon. The existing roundabout at Chelmsford Drive/ Metford Road would operate over capacity in both the AM and

PM peaks due to the increased movements on Metford Road providing insufficient opportunities for Chelmsford Drive (northbound) traffic to enter the roundabout. The Chelmsford Drive/ Metford Road roundabout operates at capacity with and without the impact of the proposed development. Based on this, the following improvements are recommended to be implemented at the Chelmsford Drive/ Metford Road roundabout to minimise the adverse effects of additional traffic:

- Increase the number of circulating lanes on the east and south side of the roundabout to two lanes
- Provision of an additional 50 metre lane on the Chelmsford Drive east approach and Metford Road north approach.

A concept design for the proposed upgrade to the Chelmsford Drive/ Metford Road roundabout has been developed and included in Appendix D of this report. The intersection works will be undertaken by Health Infrastructure separate to the subject Stage 2 State Significant Infrastructure (SSI) Application.

The intersection of Raymond Terrace Road and Metford Road is currently controlled by a roundabout. With the expected traffic increase from the Thornton North and Chisholm residential developments, the roundabout is expected to be at capacity by 2032.

Analysis of the New England Highway between Mitchell Road and Chisholm Road (inclusive of the Chelmsford Road intersection) indicates that by 2032 the intersection of New England Highway/ Chelmsford Drive is likely to be operating at an overall level of service D. There is likely to be several movements operating at capacity particularly in the PM peak, with and without the NMH development traffic. Common Roads and Maritime practice indicates that an overall level of service D is considered acceptable.

Construction Traffic Management

Multiplex have prepared a Construction Traffic Management Plan for the Main Works, this is provided in Appendix F.

During peak construction (concrete pours), there could be up to a total of 460 vehicles arriving and departing the site per day, with 352 within the PM peak hour.

The analysis of the road network surrounding the NMH has been assessed based on the peak expected traffic generation and background traffic growth for the NMH once it is fully operational. This indicates the proposed NMH would generate an additional 454 vehicles in the peak hour, which is greater than the expected worst-case during construction.

Therefore, analysis outlines that with the proposed NMH development traffic the intersections of Fieldsend Street/ Metford Road/ Hospital Access and Metford Road/ Raymond Terrace Road would continue to operate well and with spare capacity. The existing roundabout at Chelmsford Drive/ Metford Road would operate at capacity during the peak period due to the increased movements on Metford Road not providing sufficient opportunities for Chelmsford Drive (northbound) traffic to enter the roundabout. The intersections of New England Highway/ Chelmsford Drive and New England Highway/ Mitchell Drive would overall operate satisfactory in peak conditions however New England Highway/ Chelmsford Drive would operate near to capacity in the PM peak hour.

Generally, the majority of construction workers would finish prior to the PM road network peak and therefore it is expected that the road network would continue to operate well throughout the construction period. The expected timing of the upgrade to the Chelmsford Road/ Metford Road is yet to be determined but would assist during the peak construction periods.

Summary

The Stage 1 SSI transport assessment concluded that road improvements are required at the intersection of Chelmsford Road and Metford Road to accommodate the forecast background traffic growth in the area and the NMH development. Health Infrastructure has made a commitment to these works and with these improvements the proposed NMH would have an acceptable impact on the capacity of the surrounding road network.

While it is recognised that the site's location somewhat limits the practicality of using sustainable transport modes, there remains potential for improved utilisation of public transport and associated provision of sustainable transport infrastructure.

A Green Travel Plan has been prepared to identify opportunities to provide staff with incentives to consider alternative modes of travel to and from work.

Table of Contents

Appendices

Figures

Tables

1. Introduction

1.1 Background

A traffic and accessibility impact assessment is required to inform the development of the proposed New Maitland Hospital (NMH) development on land located at Metford Road, Metford.

GTA Consultants (GTA) was commissioned by Health Infrastructure to undertake a transport and accessibility impact assessment of the internal road operations and the surrounding road network to inform the NMH proposal of potential impact and mitigation measures associated with the proposed development.

1.2 Project description

Health Infrastructure has committed to undertaking a Staged Infrastructure Application in accordance with Section 115ZD (1) of the Environmental Planning and Assessment Act 1979 (EP&A Act) for the following works:

- Stage 1: Site clearance and preparatory works, approved under SSI9022 and works have commenced
- Stage 2: Design and construction of the hospital Main Works.

Stage 2 includes the design and construction work generally comprising:

- A new seven storey Acute Services Building, including:
  - Emergency services
  - Medical, surgical, paediatric and maternity services
  - Critical care services for adults and babies, including a special care nursery
  - Operating theatres, delivery suites and assessment rooms
  - Palliative care and rehabilitation services
  - Mental health services
  - Satellite renal dialysis
  - New chemotherapy services
  - Oral health service
  - A range of ambulatory care and outpatient clinics.
- Internal road network and car parking for staff, patients and visitors
- Signage
- Site landscaping and open space improvements
- Tree removal
- Utility and services connection and amplifications works.

1.3 Scope of this assessment

This report sets out an assessment of the anticipated transport implications of the proposed NMH and has considered the transport conditions on Raymond Terrace, Metford Road, Chelmsford Drive and the New England Highway in the proposed year of opening and future 10-year horizon to ensure the surrounding road network can accommodate the operation of the proposed NMH.

This report addresses the Department of Planning and Environment - NSW Government (DPE) requirements for transport and accessibility impacts (construction and operational) that are included in Secretary's Environmental Assessment Requirements (SEARs) – Schedule 2 of the Environmental Planning and Assessment Regulation 2000, as referenced in Table 1.1.

Table 1.1: **Secretary's Environmental Assessment Requirements**

Key traffic/ transport issue	Requirement	Relevant report Section
Policies, Guidelines and Planning Agreements		
Address the relevant planning provisions, goals and strategic planning objectives in the following:		
o	*Guide to Traffic Generating Developments (Roads and Maritime Services)*	See Section 6.1
o	*Cycling Aspects of Austroads Guides*	See Section 4.5
o	*NSW Planning Guidelines for Walking and Cycling*	See Section 5.1
o	*Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development*	
o	*Australia Standards AS2890.3 (Bicycle Parking Facilities)*	See Section 3.2.3
Transport and Accessibility Impacts (Construction and Operational)		
Include a transport and accessibility impact assessment, which details, but not limited to the following:		
o	the current daily and peak hour vehicle, public transport, pedestrian and cycle movement and existing traffic and transport facilities provided on the road network located adjacent to the proposed development;	See Section 2.1.2, 2.2.2, 2.3, 2.5, 2.6
o	the future daily and peak hour vehicle, public transport, pedestrian and cycle movement for the 10-year horizon with and without the proposed development. These traffic projections are to factor in the local area urban development growth, and road hierarchy and function based on its connectivity between two state roads (New England Highway and Raymond Terrace Road)	See Section 5.1, 5.2.3, 6.1, 6.2, 6.3, 6.4.2
o	an assessment of the operation of existing and future transport networks including the bus network and their ability to accommodate the forecast number of trips to and from the development;	See Section 2.4, 2.5, 2.6, 5.1, 5.3, 6.4
o	details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips	See Section 5.1, 5.3, 6.1
o	the adequacy of public transport, pedestrian and bicycle networks and infrastructure to meet the likely future demand of the proposed development (this includes safe connections to Victoria Street railway station and Council's pedestrian and bicycle network)	See Section 5.1, 5.3
o	the impact of the proposed development on existing and future public transport infrastructure within the vicinity of the site and identify measures to integrate the development with the transport network (this includes consultation with TfNSW on connections to Victoria Street railway station)	See Section 5.3
o	provision of bus capable infrastructure for the internal road network of the hospital site, including but not limited to swept path analysis and DDA compliant bus stop design	See Section 5.3, Appendix B
o	details of any upgrading or road improvement works required to accommodate the proposed development (including details or scope and timing of upgrades)	See Section 6.5, 10.1
o	details of travel demand management measures, including the preparation of a Green Travel Plan, to encourage sustainable travel choices and details of programs for implementation	See Section 8.3, 8.4
o	the impact of trips generated by the development on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity and for a 10-year horizon, and the need/associated funding for upgrading or road improvement works, if required	See Section 6, 10.1
o	the proposed active transport access arrangements and connections to public transport services (including the requirements for connections to be safe – i.e. shared paths, traffic controls and /or calming measures and lighting requirements)	See Section 3.2.3, 5.1, 5.3, 7
o	the proposed access arrangements, including car and bus pickup/drop-off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones	See Section 5.1, 5.3, 7
o	the number of proposed car parking spaces and compliance with appropriate parking codes, justifying the level of car parking provided on-site	See Section 4
o	measures to maintain road and personal safety in line with CPTED principles	See Section 5.4
o	proposed bicycle parking facilities in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance	See Section 4.5, 5.2.3

Key traffic/ transport issue	Requirement	Relevant report Section
o	proposed end-of-trip facilities	See Section 5.2.3
o	a Pedestrian Access and Mobility Plan	See Section 5.1
o	details of emergency vehicle access arrangements	See Section 7.2
o	an assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures.	See Section 5.1
o	service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times)	See Section 3.2.5, 7.4
o o o o o o o o o	in relation to construction traffic: assessment of cumulative impacts associated with other construction activities; an assessment of road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity; details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process; details of anticipated peak hour and daily construction vehicle movements to and from the site; details of access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle; details of temporary cycling and pedestrian access during construction; details of proposed construction vehicle access arrangements at all stages of construction; and traffic and transport impacts during construction, including cumulative impacts associated with other construction activities, and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact (which must include vehicle routes, number of trucks, hours of operation, access arrangements and traffic control measures for all demolition/construction activities)	See Section 9

1.4 References

In preparing this report, reference has been made to the following:

- An inspection of the site and its surrounds
- Maitland City Council (Council) Development Control Plan (DCP) 2011
- Roads and Maritime Services (Roads and Maritime) Schedule of Classified Roads and State and Regional Roads versions 2011/1
- Roads and Maritime, Guide to Traffic Generating Developments 2002
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- Australian Standard, Parking Facilities, Part 3: Bicycle parking AS2890.3:2015
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- Traffic and car parking surveys undertaken by Matrix Traffic and Transport Data Pty Ltd as referenced in the context of this report
- Traffic surveys undertaken by Roads and Maritime Services as referenced in the context of this report
- Mid-block traffic survey data provided by Maitland City Council as referenced in the context of this report
- Plans for the proposed development prepared by BVN, Drawing Number BVN-ARH-01A-AX0-002, Issue SD 3, dated 3 March 2019
- *New Maitland Hospital - Traffic and Transport Assessment (2020 - Year of Opening)* (AECOM, December 2015)

- *New Maitland Hospital and Health Precinct- Traffic and Transport Assessment* (AECOM, November 2014)
- *New Maitland Hospital – Strategic Workforce Plan* (NSW Health, November 2015)
- *New Maitland Hospital – State Significant Infrastructure Transport Impact Statement* (GTA Consultants, 2018)
- *New Maitland Hospital Parking Demand Study* (GTA Consultants, October 2018)
- *New Maitland Hospital Traffic Management Plan Main Works (Draft)* (Multiplex, February 2019)
- Roads and Maritime Strategic Traffic Forecast Model outputs provided November 2017
- Austroads Guide to Traffic Management – Part 3: Traffic Studies and Analysis
- Austroads Guide to Traffic Management - Part 12: Traffic Impacts of Development
- Cycling Aspects of Austroads Guides (Austroads, June 2017)
- NSW Planning Guidelines for Walking and Cycling
- EIS Guidelines – Road and Related Facilities (DoPI)
- Other documents and data as referenced in this report.

2. Existing conditions

It is proposed that the NMH will be located on Lot 7314 and Part Lot 401 within the south-western portion of the 'Metford Triangle' along Metford Road, Metford. The site has a western frontage of 500 metres to Metford Road. The site has been declared State Significant Infrastructure and is generally cleared and disturbed land with an existing forest in the south western corner of the site.

The surrounding properties include:

- Council Sports Fields opposite the site on the corner of Fieldsend Street and Metford Road
- Council's depot on Metford Road
- Redundant brickworks site to the northeast of the site
- Bushland and residential to the south of the site.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject site and its environs

Source: Fitzpatrick+Partners 16 February 2018

2.1 Road network

This section provides an understanding of the current road network surrounding the site in terms of characteristics and operational performance.

2.1.1 Road hierarchy

Roads are classified according to the functions they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies which guide the management of the road according to their intended service or qualities.

In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions within Sydney, and throughout the State. Roads and Maritime is responsible for funding, prioritising and carrying out works on State roads. State roads generally include roads classified as freeways, state highways, and main roads under the 1993 Roads Act, and the regulation to manage the road system is stated in the Australian Road Rules (1999).

Roads and Maritime defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

Arterial Roads – Controlled by Roads and Maritime, typically no limit in flow and designed to carry vehicles long distance between regional centres.

Sub-Arterial Roads – Managed by either Council or Roads and Maritime under a joint agreement. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their purpose is to carry through traffic between specific areas in a sub region or provide connectivity from arterial road routes (regional links).

Collector Roads – Provide connectivity between local sites and the sub-arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.

Local Roads – Provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.1.2 Surrounding road network

Metford Road

Metford Road functions as a sub-arterial road and is aligned in a north-east, south-west direction on the western boundary of the site. It is a two-way road with one traffic lane in each direction, configured with a nine-metre wide carriageway.

A roundabout has recently been constructed at the Metford Road/ Fieldsend Street intersection, intended to provide the primary access for the NMH.

Metford Road is shown in Figure 2.2 and carries around 13,000 vehicles per day[1].

Fieldsend Street

Fieldsend Street functions as a local road and intersects Metford Road at the northern corner of the site. It is aligned in a north-west, south-east direction and is two-way with one traffic lane in each direction. 15 angle parking spaces have recently been constructed on Fieldsend Street adjacent to the sports fields.

Fieldsend Street provides access to the Council Sports Fields on the corner of Fieldsend Street and Metford Road.

1 Based on the peak hour traffic counts undertaken by GTA in May 2017 and assuming a peak-to-daily ratio of 10 per cent for arterial roads and 10 per cent for local roads. `

Council recently constructed a shared path on Fieldsend Street between Metford Road and Brunswick Street connecting to an off-road shared path to Victoria Station. Fieldsend Street is shown in Figure 2.3 and carries around 2,000 vehicles per day[2].

Figure 2.2: Metford Road (looking north-east)

Figure 2.3: Fieldsend Street (looking north-west)

Raymond Terrace Road

Raymond Terrace Road is classified as a State road in the Roads and Maritime *Schedule of Classified Roads and State and Regional Roads* versions 2011/1. Near the site it is aligned in a north-west, south-east direction and is two-way with one traffic lane in each direction. No kerbside parking is permitted.

Chelmsford Drive

Chelmsford Drive is classified as a sub-arterial road and is aligned in the north-west, south-east direction. It is a two-way road separated by a median, with one traffic lane as well as one bicycle lane and one parking lane in each direction east of Metford Road and two traffic lanes in each direction west of Metford Road, configured in a carriageway of 20 metres wide. Unrestricted kerbside parking is permitted on both sides of the road east of Metford Road, and no kerbside parking is permitted on Chelmsford Drive west of Metford Road.

New England Highway

The New England Highway is classified as a State road in the Roads and Maritime *Schedule of Classified Roads and State and Regional Roads* versions 2011/1. Near the site it is aligned in a north-west, south-east direction and is two-way with two traffic lanes in each direction. No kerbside parking is permitted.

2.1.3 Surrounding intersections

The following intersections currently exist near the site:

- Metford Road/ Raymond Terrace Road (roundabout)
- Metford Road/ Fieldsend Street (roundabout)
- Metford Road/ Chelmsford Drive (roundabout)
- New England Highway/ Chelmsford Drive (signalised)
- New England Highway/ Mitchell Drive (signalised)
- New England Highway/ Chisholm Road (signalised).

2 Based on the peak hour traffic counts undertaken by GTA in May 2017 and assuming a peak-to-daily ratio of 10 per cent for arterial roads and 10 per cent for local roads.

2.2 Local context

This section provides an overview of current and expected population for the area, including an understanding of current modes of transport used by those working in the surrounding area.

2.2.1 Population

AECOM (December 2015) provided a summary of the expected population growth in the Maitland Local Government Area (LGA), with an overall predicted growth of around 31,000 residents by 2031. Since then, updated population growth statistics have become available and can be accessed via HealthStats NSW. These forecasts show a similar overall growth of around 30,600 residents by 2031. A comparison of these statistics is presented in Table 2.1.

Table 2.1: Current and projected population, Maitland LGA

Source	2011	2016 [1]	2021	2026	2031	Change 2011-2031	% Change 2011-2031
AECOM (December 2015)	73,506	82,415	90,297	-	104,404	30,898	42
HealthStats NSW [2]	69,924	78,199	85,758	93,509	101,554	31,630	45

[1] Based on forecasts from 2011 Census data. 2016 Census data currently not available.
[2] Source: http://www.healthstats.nsw.gov.au/Indicator/dem_pop_lgamap/dem_pop_proj_age_trend

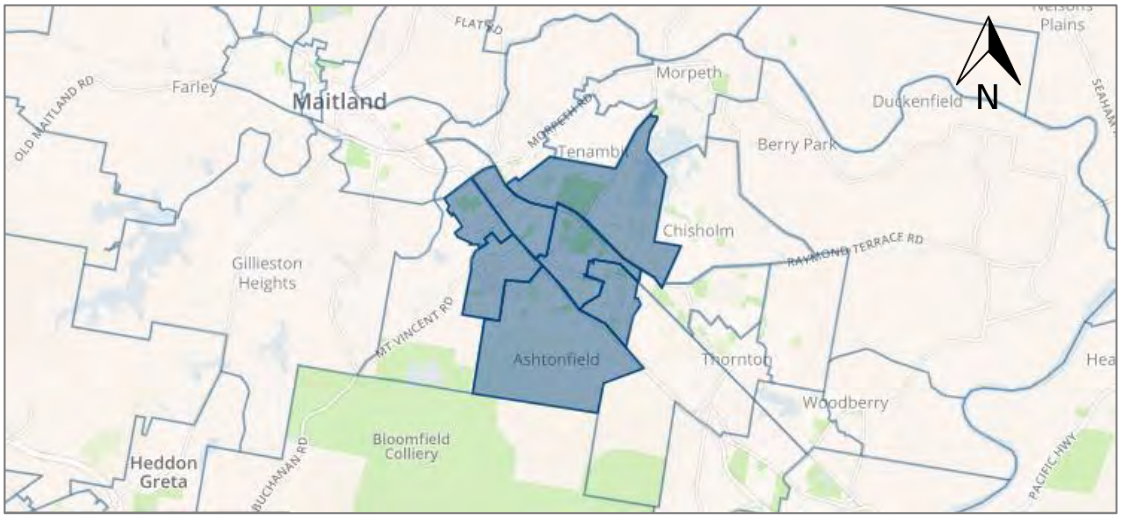
2.2.2 Journey to work data

Proposed Hospital Site

The Journey to Work (JTW) data published by the Bureau of Transport Statistics[3](BTS) from 2011 Census data provides an understanding of travel patterns to/ from the site and the surrounding area.

The smallest geographical area for which JTW data is available is a Travel Zone. The relevant Travel Zones used for the purposes of this assessment are 6609, 6610, 6611, 6612, 6613, 6614 and 6616 and are shown in Figure 2.4.

Figure 2.4: Travel Zones



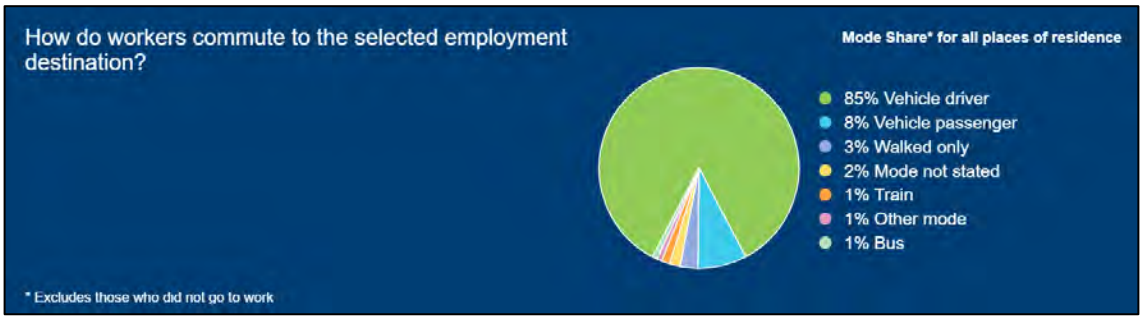
Source: Bureau of Transport Statistics, http://visual.bts.nsw.gov.au/jtwbasic/#6612,6613,6611,6610,6609,6616,6614, accessed 22 June 2017

[3] Now the "Transport Performance and Analytics" section of Transport for NSW

The JTW data indicates that a total of 6,603 people work within the selected Travel Zones.

Figure 2.5 shows the distribution of travel modes by the workers employed in the Travel Zones, which indicates that around 93 per cent of workers travel to the area by private vehicle as a driver or passenger. In addition, the JTW data indicates that six per cent of workers travelling to the area choose an alternate mode of transport such as walking, bus or train.

Figure 2.5: JTW travel modes by workers to the selected Travel Zones



Data source: Bureau of Transport Statistics, http://visual.bts.nsw.gov.au/jtwbasic/#6612,6613,6611,6610,6609,6616,6614, accessed 22 June 2017

The JTW data also indicates that around 62 per cent of workers travelling to the Travel Zone originate from the Maitland Area, while Newcastle accounts for 13 per cent, the Lower Hunter for nine per cent and the remaining areas for 16 per cent.

Existing Maitland Hospital

GTA Consultants (GTA) prepared a parking demand study in October 2018. This assessment included a review of the current mode share of staff at the existing Maitland Hospital, located at 560 High Street, Maitland. The hospital currently has 779 full time equivalent (FTE) staff and a total of 198 beds.

The site is well-serviced by public transport, with a bus stop located along the site frontage to High Street with bus services every 20 minutes. Furthermore, Telarah Railway Station is located around 600 metres west of the site.

Staff Surveys

An online staff questionnaire was distributed to all hospital staff in August 2018 to understand existing staff travel patterns, and a total of 74 responses were received. The results of the survey indicate that car travel was generally the main mode of travel to/from the hospital, with over 95 per cent of responses travelling by private vehicle (including car passengers and motorcyclists) with an average vehicle occupancy of 1.1 persons per vehicle according to those surveyed. It is noted that this value excluded people who travelled by car for a portion of the trip to/from the hospital, such as parking near a railway station or other public transport facilities as part of their commute.

The survey responses relating to current staff modes of transportation is summarised in Table 2.2.

Table 2.2: Mode of travel of staff

Mode of transport	Responses (%)
Car – As a driver	91.9
Car – As a passenger	1.35
Motorcycle / scooter	2.7
Bus	0
Bicycle	0
Walk	1.35
Train	1.35
Taxi	0
Split - Car/ Public Transport	1.35

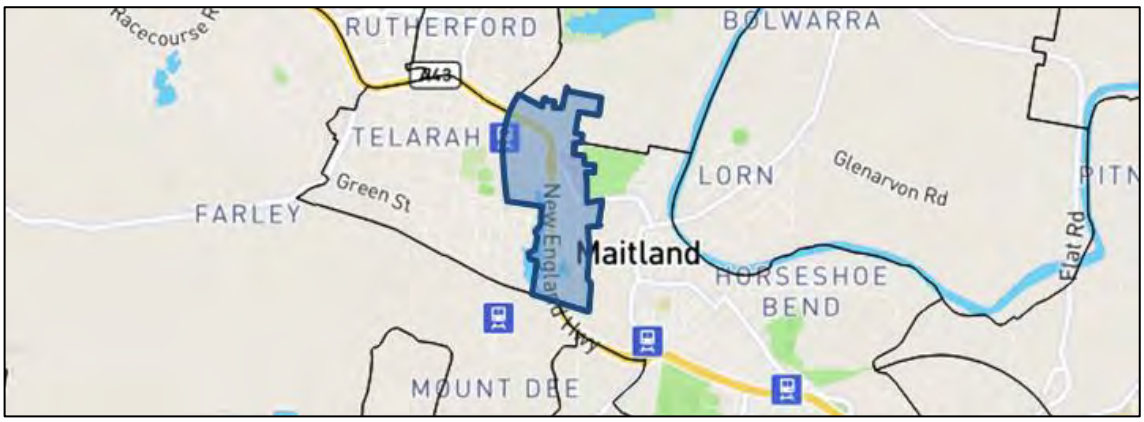
It was found that the two main reasons for staff selection of these modes of transportation to/from the hospital was due to:

- Travel distance
- Convenience.

JTW Data

The mode of travel for hospital staff was generally consistent with the 2011 JTW data for Travel Zone 6600, shown in Figure 2.6.

Figure 2.6: Travel Zone containing Maitland Hospital



Base map source: https://www.transport.nsw.gov.au/data-and-research/forecasts-and-projections/travel-zone-explorer, accessed 23 August 2018.

The JTW data indicates that a total of 1,268 persons work within the selected Travel Zone.

Table 2.3 shows the distribution of travel modes by the workers employed in the Travel Zone, which indicates that of the people that travel to work around 93 percent of workers travel to the area by private vehicle as a driver or passenger.

Table 2.3: TW travel modes by workers within the Travel Zone

Travel Mode	Mode Share Split (%) [1]	
Vehicle Driver	88	93
Vehicle Passenger	5	
Train	2	
Bus	0	
Walked	1	
Other	1	
Not Stated	2	

[1] Excludes those who did not travel to work

2.3 Traffic volumes

Traffic movement surveys were undertaken on Thursday 18 May, Thursday 25 May and Saturday 27 May 2017 during the following peak periods:

- Thursday 7am to 9am
- Thursday 3pm to 6pm
- Saturday 8:30am to 3pm.

The following intersections were included in the traffic survey:

- Metford Road/ Raymond Terrace Road (roundabout)
- Metford Road/ Fieldsend Street (give way)
- Metford Road/ Chelmsford Drive (roundabout).

Following consultation with Roads and Maritime it was concluded on 21 March 2018 that traffic surveys of New England Highway should be completed after the final stage of the Stockland Green Hills Shopping Centre development opens and traffic patterns have adjusted.

Subsequently, traffic movement surveys were undertaken by Roads and Maritime on Tuesday 26 July 2018 during the following peak periods:

- Thursday 6am to 10am
- Thursday 2pm to 6pm.

The following intersections were included in the traffic surveys:

- New England Highway/ Chisholm Road
- New England Highway/ Chelmsford Drive
- New England Highway/ Mitchell Drive.

The actual AM and PM peak hours are provided in Table 2.4.

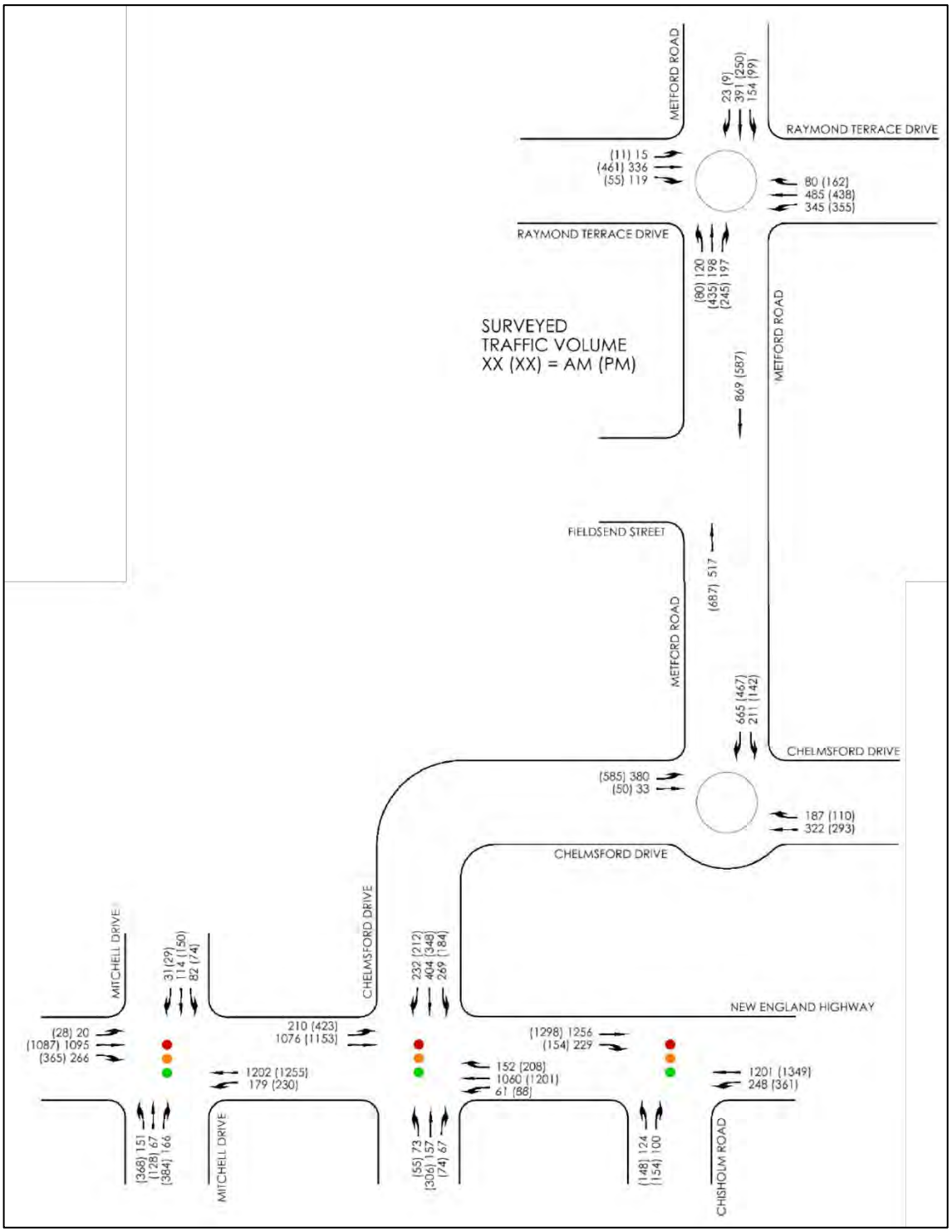
Table 2.4: Peak hours

	Metford Rd/ Chelmsford Dr	Metford Rd/ Fieldsend St	Metford Rd/ Raymond Terrace Rd	New England Hwy/ Chisholm Rd	New England Hwy/ Chelmsford Dr	New England Hwy/ Mitchell Dr
Thursday AM	8am – 9am	8am – 9am	8am – 9am	7:45am – 8:45am	8:15am – 9:15am	8:15am – 9:15am
Thursday PM	4:45pm – 5:45pm	4:30pm – 5:30pm	4:30pm – 5:30pm	3:30pm – 4:30pm	3:30pm – 4:30pm	3:30pm – 4:30pm
Saturday	10:45am – 11:45am	10:45am – 11:45am	11am – 12pm	n/a	n/a	n/a

The May 2017 Metford Road and July 2018 New England Highway traffic volumes are summarised in Figure 2.7, with full results contained in Appendix A.

It is noted that Council was undertaking road works on Fieldsend Street between Turton Street and Metford Road during the traffic surveys. This work resulted in the closure of this section of Fieldsend Street during the survey period. Due to the closure of Fieldsend Street, historical data was provided by Council to determine an appropriate estimation of traffic flows for Fieldsend Street, this was outlined in the Stage 1 SSI Transport Assessment.

Figure 2.7: Existing AM and PM peak hour traffic volumes (May 2017/ July 2018)



The intersection of Metford Road/ Fieldsend Street has recently been upgraded to a roundabout in association with the enabling works for the NMH. The updated layout is shown in Figure 2.8.

Figure 2.8: Metford Road/ Fieldsend Street upgraded intersection layout

Source: Nearmap

2.4 Intersection operation

The operation of the key intersections within the study area have been assessed using SIDRA Intersection[4], a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by Roads and Maritime, is vehicle delay. SIDRA Intersection determines the average delay that vehicles encounter and provides a measure of the level of service. A level of service of D or better is generally considered acceptable operation.

Table 2.5 shows the criteria that SIDRA Intersection adopts in assessing the level of service.

Table 2.5: SIDRA Intersection level of service criteria

Level of service	Average delay per vehicle (secs/veh)	Traffic signals, roundabouts	Give way and stop signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

[4] Program used under license from Akcelik & Associates Pty Ltd.

2.4.1 Metford Road

Table 2.6 presents a summary of the existing operation of the intersections along Metford Road, with full results presented in Appendix B of this report.

Table 2.6: Existing operating conditions – Metford Road (2017)

Intersection	Peak	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
Chelmsford Drive/ Metford Road	AM	South East	0.99	56	167	D
		North East	0.86	17	117	B
		North West	0.25	12	12	A
	PM	South East	0.59	17	39	B
		North East	0.77	19	74	B
		North West	0.39	11	22	A
Metford Road/ Fieldsend Street (roundabout)	AM	South East	0.00	5	0	A
		North East	0.57	9	34	A
		North West	0.12	11	4	A
		South West	0.40	11	16	A
	PM	North East	0	3	0	A
		North East	0.45	9	24	A
		North West	0.14	13	5	A
		South West	0.52	11	24	A
Metford Road/ Raymond Terrace Road	AM	South East	0.60	16	40	B
		North East	0.44	12	19	A
		North West	0.38	11	18	A
		South West	0.46	13	25	A
	PM	South East	0.53	13	28	A
		North East	0.30	12	12	A
		North West	0.54	14	30	B
		South West	0.67	16	52	B

Based on the results outlined in Table 2.6, the intersections of Metford Road/ Chelmsford Drive, Metford Road/ Fieldsend Street and Metford Road/ Raymond Terrace Road currently operate satisfactorily in peak conditions.

It is noted that the Chelmsford Drive south east approach to the Metford Road roundabout does queue in the AM peak and results and observations show that it is nearing capacity.

2.4.2 New England Highway

Table 2.7 presents a summary of the existing operation of the intersections along New England Highway, with full results presented in Appendix B of this report.

Table 2.7: Existing operating conditions – New England Highway (2018)

Intersection	Peak	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
Chelmsford Drive/ New England Highway	AM	South East	0.60	25	152	LOS B
		North East	0.50	39	90	LOS C
		North West	0.83	35	240	LOS C
		South West	0.41	60	34	LOS E
		Overall	0.83	35	240	LOS C
	PM	South East	0.60	20	150	LOS B
		North East	0.87	47	103	LOS D
		North West	0.87	36	265	LOS C
		South West	0.58	54	67	LOS D
		Overall	0.87	34	265	LOS C
Mitchell Drive/ New England Highway	AM	South East	0.47	14	115	LOS A
		North East	0.40	58	36	LOS E
		North West	0.63	20	117	LOS B
		South West	0.54	51	38	LOS D
		Overall	0.63	23	117	LOS B
	PM	South East	0.55	21	146	LOS B
		North East	0.33	54	31	LOS D
		North West	0.80	25	123	LOS B
		South West	0.94	56	105	LOS D
		Overall	0.94	32	146	LOS C
Chisholm Road/ New England Highway	AM	South East	0.51	12	146	LOS A
		North West	0.97	14	129	LOS A
		South West	0.71	55	48	LOS D
		Overall	0.97	16	146	LOS B
	PM	South East	0.57	11	165	LOS A
		North West	0.89	8	76	LOS A
		South West	0.80	56	73	LOS D
		Overall	0.89	14	165	LOS A

Based on the results outlined in Table 2.7, the intersections of New England Highway/ Chelmsford Drive and New England Highway/ Mitchell Drive currently overall operate satisfactory in peak conditions, however the Chelmsford Drive north west approach indicates queuing in peak conditions.

The intersection of New England Highway/ Chisholm Road currently operates well and with spare capacity in peak conditions.

2.5 Public transport

Bus services provide local connections to the outer areas of Metford, including East Maitland and Thornton.

Victoria Street Railway Station is located around 1.4 kilometres from the NMH site. It is part of the Hunter Line, with services alternately servicing Newcastle to Telarah, Dungong and Scone. Services at Victoria Street Railway Station are generally provided every 30 minutes.

A review of the public transport available near the site is summarised in Table 2.8 and illustrated in Figure 2.9.

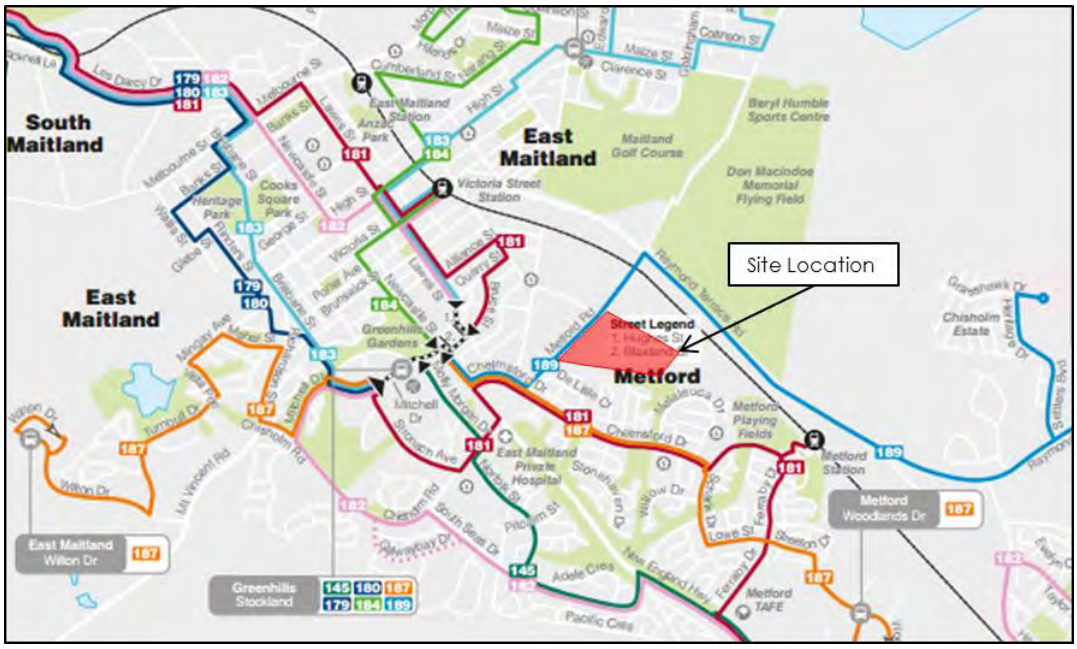
Table 2.8: Public transport routes and frequencies

Service	Route number	Route description	Location of stop	Distance to nearest stop[1]	Frequency on/ off-peak
Bus	181	Rutherford to Woodberry	Metford Road/Chelmsford	650 m	Hourly
	187	East Maitland and Metford Loop			Hourly peak / every 2 hours off peak
	189	Stockland Green Hills to Thornton			Hourly peak / every 2 hours off peak
Train	n/a	Hunter Line	Victoria Street Station	1.4 km	Every 30 min
			Metford Station	2.7 km	

[1] Distance taken from the Metford Road/Fieldsend Street intersection

Currently the only bus services using Metford Road is the 189-bus service, private operators and school bus services.

Figure 2.9: Hunter Valley train and bus network – Metford/ East Maitland



Basemap Source: http://www.cdcbus.com.au/images/files/maps/hunter-valley/Maitland_and_Raymond_Terrace_Region_Map.pdf (accessed 5 May 2017)

2.6 Pedestrian and bicycle infrastructure

Council has recently constructed a shared path on Fieldsend Street connecting Metford Road through to Victoria Street Station. This also connects to a new footpath provided on the north western side of Metford Road between Fieldsend Street and the Council Depot.

The cycling network of East Maitland, including proposed on-road and off-road cycleways is shown in Figure 2.10.

During several site visits undertaken by GTA there were no pedestrian or cyclist activity observed along Metford Road.

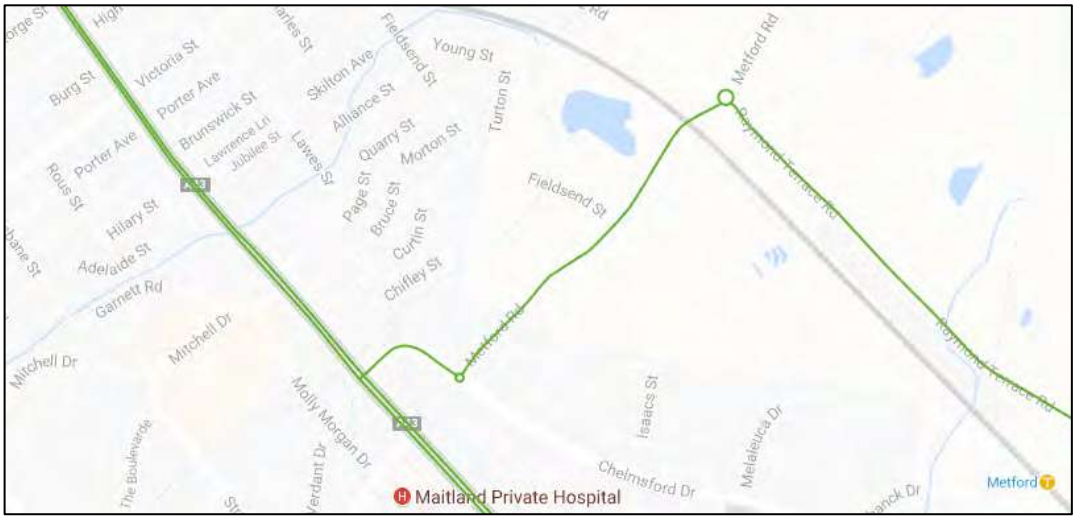
Figure 2.10: Maitland bike network

Basemap Source: https://www.maitland.nsw.gov.au (accessed 1 March 2018)

2.7 Heavy vehicle routes

It is noted that Metford Road between Chelmsford Street and Raymond Terrace Road is a Roads and Maritime approved 25-metre, B-double route. As such, any changes to road design and intersection layout proposed for the NMH must continue to accommodate 25-metre, B-double movements.

Figure 2.11: Roads and Maritime – B-double routes



Source: http://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/map/index.html (accessed 5 July 2017)

2.8 Crash analysis

Crash data for the roads near the site has been obtained from Roads and Maritime. The crash data relates to the five-year period to June 2016.

Within this period, two crashes occurred on Fieldsend Street (between Metford Road and Turton Street) and nine crashes occurred on Metford Road (between Chelmsford Drive and Raymond Terrace Road). A summary of the crash history is provided as follows:

- Of the two crashes on Fieldsend Street, one crash resulted in a moderate injury on an overcast day at the intersection of Turton Street and Fieldsend Street.
- Of the nine crashes on Metford Road, two crashes resulted in moderate injuries. The first occurred at the intersection of Metford Road and Raymond Terrace Road on a fine day and the second occurred on Metford Road with the vehicle travelling off the road and into a roadside utility pole during a rainy day.

3. Development proposal

This section provides an overview of the enabling works recently completed; the Stage 2 works as well as the NMH development to provide context in relation to this assessment.

3.1 Approved Works

3.1.1 Overview of enabling works (completed)

It is noted that the enabling works were delivered outside of the State Significant Infrastructure (SSI) project and have been assessed under Part 5 of the EP&A Act and the provisions of State Environmental Planning Policy (Infrastructure) 2007. An Assessment of Review of Environmental Factors (REF) was approved on 12 October 2017 and the works have recently been completed.

To provide access to the site and prepare the site for the potential development of the NMH an upgrade of Metford Road between the Council depot and Fieldsend Street was recently completed.

This included the following two accesses:

- Roundabout to accommodate the primary site access at the Metford Road/ Fieldsend Street intersection
- Emergency vehicle access around 130 metres south of the Metford Road/ Fieldsend Street intersection on Metford Road.

An overview of the site access locations and changes to the Metford Road corridor are shown in Figure 3.1.

Figure 3.1: Enabling Works - Metford Road upgrade (recently constructed)

Source: Nearmap

3.1.2 Overview of Stage 1 Early Works (approved and in progress)

Stage 1 includes site clearance and preparatory works generally comprising;

- bulk earthworks
- utility connections
- in-ground infrastructure works
- vegetation removal
- building foundations
- drainage infrastructure
- construction of temporary roads, temporary car parking area, temporary fencing and site office/ compound.

3.2 Proposed Works

3.2.1 Overview of the Stage 2 Main Works

Stage 2 includes the design and construction of the NMH generally comprising of:

- A new seven storey Acute Services Building, including:
  - Emergency services
  - Medical, surgical, paediatric and maternity services
  - Critical care services for adults and babies, including a special care nursery
  - Operating theatres, delivery suites and assessment rooms
  - Palliative care and rehabilitation services
  - Mental health services
  - Satellite renal dialysis
  - New chemotherapy services
  - Oral health service
  - A range of ambulatory care and outpatient clinics.
- Internal road network and car parking for staff, patients and visitors;
- Signage
- Site landscaping and open space improvements
- Tree removal
- Utility and services connection and amplifications works.

It is proposed that the NMH would consist of 339 beds and is projected to employ around 893 FTE staff at the proposed year of opening, 1,106 FTE staff five years after opening and 1,162 FTE staff ten years after opening.

An indicative layout of the proposed hospital is provided in Figure 3.2.

Figure 3.2: Proposed NMH Site Plan

Base Image Source: BVN Schematic Design BVN-ARH-01A-AX0-002- Site Plan Issue 6.

3.2.2 Car parking

A parking demand study for the NMH has been prepared by GTA (October 2018), which determined the parking requirements to accommodate for all staff, visitors and patients. The NMH proposes to provide a total of 682 on-site parking spaces at the year of opening, including 515 staff parking spaces and 167 public/visitor parking spaces.

It is proposed that the hospital will have an at grade car park to the north of the hospital building for staff and long-term patient/visitors and an at-grade short stay car park on the western side of the hospital.

The project proposes a staged infrastructure approach to address the longer-term car parking demand assessment for the NMH and is committed to delivering the residual 140 car parks, beyond the early 2021 supply needs, to satisfy the incremental 10-year peak parking demand to 2031/ 2032.

The additional 140 car parks are proposed to be constructed on-grade within the 19.57 ha. site. This staged approach will allow the opportunity to accommodate broader planning and design efficiencies to be considered ahead of the additional car parking infrastructure being constructed as needed.

The car parking provision requirement is discussed in Section 4.

3.2.3 Pedestrian and bicycle facilities

The proposed pedestrian facilities within the NMH site connect with the northern and western car parks, Metford Road and the Main Hospital Building. This includes associated pedestrian crossings on the internal access roads.

Pedestrian connections within the NMH site are being designed to connect with Council's recently constructed shared path along Fieldsend Street and footpath on Metford Road. By providing these connections, the NMH site will be maximising the opportunity for active connections to the Victoria Street Railway Station.

23 secure bicycle spaces are proposed to be located on site to the north of the western car park with access to end of trip facilities and designed in accordance with AS2890.3 (Bicycle Parking Facilities). At least 12 bicycle racks will also be provided at the same location for visitor use with easily access from Metford Road.

The suitability of the proposed pedestrian facilities is discussed in Section 5.1 of this report.

3.2.4 Bus Zone

There is one bus zone proposed on the northern side of the hospital, accessed via the Metford Road roundabout.

The suitability of the proposed bus zone is discussed in Section 5.3 of this report.

3.2.5 Loading areas

A loading area is proposed on the lower ground level at the rear of the hospital, accessed through the eastern internal access roundabout as shown in Figure 3.2. The loading area is proposed to accommodate vehicles up to and including 12.5-metre vehicles within six loading bays.

The refuse storage area will be located adjacent to the loading area within the lower ground level of the hospital site.

3.2.6 Emergency Vehicle Area

There is one emergency vehicle area with six drop off bays proposed on the ground level at the southern side of the hospital, accessed through the emergency vehicle access.

3.2.7 Helipad

A Helipad is proposed to be accessed to the east of the eastern internal roundabout.

The suitability of the helipad is discussed in Section 7.5 of this report.

4. Car parking

4.1 Car parking requirements

GTA prepared the *New Maitland Hospital Parking Demand Study* in October 2018 which provided the parking recommendations for the proposed hospital as outlined in Table 4.1 and is provided in Appendix G.

Table 4.1: Recommended car parking demand (peak)

Source	Existing Hospital	Opening Year	5-year horizon	10-year horizon	Sensitivity Scenario
	2018	2021/22	2026/27	2031/32	2031/32
Staff	222	461	554	578	578
VMOs	7	24	30	30	30
Public (hospital users)	195	164	175	184	197
LHD & Fleet vehicles	18	30	30	30	30
Total demand	442	679	789	822	835
Total incremental peak parking demand		-	110	143	156

Table 4.1 indicates that on the year of opening, the NMH requires a total of 679 parking spaces.

4.2 Adequacy of parking supply

The parking layout proposes to accommodate 682 spaces at the year of opening, comprised of 515 staff parking spaces and 167 public/ visitor parking spaces. This parking provision meets the parking demand for the year of opening as outlined in the Parking Demand Study prepared by GTA (October 2018) for the proposed NMH.

The additional 140 car parks are proposed to be constructed on-grade within the 19.57 ha. site. This staged approach will allow the opportunity to accommodate broader planning and design efficiencies to be considered ahead of the additional car parking infrastructure being constructed as needed.

The Local Health District plan to monitor the car park utilisation and will commence constructing the additional car parking spaces when required. A review of parking demand is therefore proposed to be undertaken within three years of opening to verify the parking demand estimated in the Parking Demand Study.

4.3 Disabled parking

The disabled car parking requirements for different development types are set out in the Building Code of Australia (BCA), 2014.

Table 4.2: Disabled parking requirement (BCA 2004)

Class 9a [1]	No. of car parking spaces required
(a) Hospital (non-outpatient area)	1 space for every 100 car parking spaces or part thereof
(b) Hospital (outpatient area)	
(i) up to 1000 car parking spaces; and	1 space for every 50 car parking spaces or part thereof
(ii) for each additional 100 car parking spaces or part thereof in excess of 1000 car parking spaces	1 space
(c) Nursing home	1 space for every 100 car parking spaces or part thereof
(d) Clinic of day surgery not forming part of a hospital	1 space for every 100 car parking spaces or part thereof

[1] Class 9a is defined in the BDA 2004 as a *health care building*

Based on 682 spaces, the proposal will be required to provide between 7 and 14 accessible spaces to be compliant with the BCA. The proposed development provides 14 disabled spaces, in accordance with the BCA, located in the at-grade visitor car park on the western side of the building.

4.4 Motorcycle parking

DCP 2011 does not provide specific guidance on motorcycle parking provision requirements. The proposal provides 12 motorcycle spaces, four within the visitor parking area to the west of the main entrance and eight within the northern at grade staff car park.

4.5 Bicycle parking

DCP 2011 refers to the Austroads Guide to Traffic Engineering, Part 14 for bike parking rate and facilities. A review of the bicycle parking requirements is summarised in Table 4.3.

Table 4.3: Bicycle parking requirement (Austroads)

Defined Use	Description	Size	Parking Rate	Parking Requirement	Class
General Hospital	Long Term (Staff Parking)	339 beds	1 space per 15 beds	23 spaces	1 or 2 Facilities
	Short Term (Visitor Parking)		1 space per 30 beds	12 spaces	3 Facilities

Based on the Austroads requirements, the NMH would be required to provide 35 bicycle parking spaces, including 23 staff and 12 visitor spaces.

23 secure bicycle spaces are proposed to be located on site to the north of the western car park with access to end of trip facilities, discussed in Section 5.2.3. At least 12 bicycle racks will also be provided at the same location for visitor use with easily access from Metford Road and in well-lit areas with good active and passive surveillance.

4.6 Car park layout review

Overall, the site access arrangements and car park layout have been designed in accordance with the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004 and AS/NZS2890.6:2009). Public/ visitor car parking spaces are required to be a minimum of 2.6 metres wide and 5.4 metres long and staff car parking spaces are required to be a reduced minimum of 2.4 metres wide and 5.4 metres long. Car spaces have been designed to be at least 2.6 metres wide by 5.4 metres long which would cater for both staff and visitor parking requirements. It is noted that staff car parking spaces may be reduced to 2.4 metres wide as the detailed design/ operation of the car park is finalised.

Internal aisle widths are proposed to be a minimum of 6 metres which meets the minimum requirement of 5.8 metres. A swept path assessment and design review is provided in Appendix C.

5. Sustainable transport infrastructure

5.1 Pedestrian and cycle policy

5.1.1 Better Placed – An Integrated Design Policy for the Build Environment of NSW 2007

Multiple environmental and health benefits are created through walkable access, cycling and public transport by reducing private car usage, traffic impacts and household transport costs. Better Placed has been developed by the Government Architect to deliver the strategic approach needed to ensure that as our cities and towns grow bigger they get even better.

As transport is responsible for around 14 per cent of the state's greenhouse gas emissions, there is a need to provide people with public transport options, and promote walking and cycling for short trips, in order to meet environmental objectives. This is further detailed in the Work Travel Plan in Section 8.

5.1.2 NSW Planning Guidelines for Walking and Cycling

The Planning Guidelines for Walking and Cycling provide guidance to land-use planners to ensure that walking and cycling improvements are taken into consideration in planning policy and practice. The guidelines provide a walking and cycling focus to the NSW Government's Integrating Land Use & Transport Planning Policy Package.

The guidelines suggest that "when making planning instruments, councils are encouraged to integrate relevant state and local policies related to walking and cycling". This includes development policies in the DCPs and LEPs that encourage walking and/or cycling that would be considered during the development assessment stage thereby encourage improvements to walking and cycling facilities.

The proposed bicycle parking facilities are discussed in Section 3.2.3, Section 4.5 and Section 5.2 of this report.

5.2 Proposed pedestrian and cycling network

5.2.1 External network

Council's recently constructed shared path along the northern side of Fieldsend Street, between Metford Road and Curtin Street, is shown in Figure 5.1. It is noted the path extends to Brunswick Street where it connects to the existing shared path traveling adjacent to the railway line towards Victoria Street Station.

Furthermore, as part of the enabling works, the Metford Road upgrades included the construction of a pedestrian path on the north-western side of Metford Road between Fieldsend Street and the Council depot. The upgrades also included the construction of pedestrian refuges on the western, southern and eastern leg of the upgraded Metford Road/ Fieldsend Street intersection, as illustrated in Figure 5.1.

Figure 5.1: Recently constructed pedestrian/ cycle facilities

Source: Nearmap

Based on the proposed future mode share of the NMH outlined in the Green Travel Plan (GTP), prepared by GTA Consultants in March 2019, it is likely that there would be five to 10 bicycle trips respectively in the AM and PM peak hours, and up to five walking trips in any peak hour.

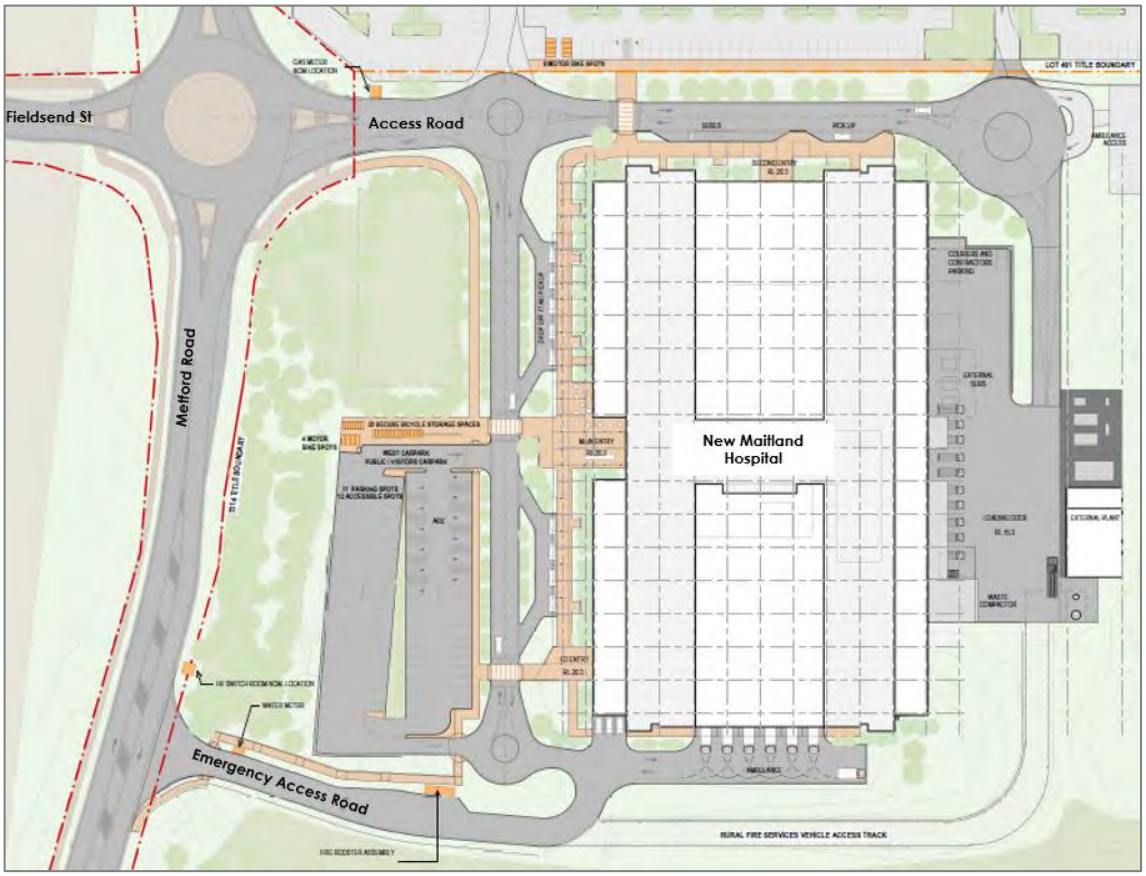
Pedestrian volumes across Metford Road are therefore expected to be relatively low. This is primarily due to the railway station being 1.4 kilometres from the NMH. Parking for staff and visitors would be provided on site and those travelling by bus or taxi would arrive and depart from within the NMH site accessing the hospital through internal pedestrian connections.

A pedestrian refuge has been constructed on Metford Road, as shown in Figure 5.1, at the new roundabout to safely accommodate these pedestrian movements. It is noted that the expected future pedestrian volumes do not warrant any form of formalised pedestrian crossing at this location, even with the potential mode shift outlined in the GTP (GTA 2019).

5.2.2 Internal network

The pedestrian connections within the NMH site are being designed to connect with Council's recently constructed shared path along Fieldsend Street. By providing a connection to Fieldsend Street, the NMH site will be maximising the opportunity for cyclists to access the Victoria Street Railway Station. The proposed pedestrian facilities within the NMH site connect with the northern and western car parks, Metford Road and the hospital building. This includes associated pedestrian crossings across the internal access roads as shown in Figure 5.2.

Figure 5.2: Proposed NMH pedestrian network



Source: BVN Schematic Design BVN-ARH-01A-AX0-002- Site Plan Issue 6

5.2.3 End of Trip Facilities

Given that DCP 2011 does not specify any requirements for end of trip facilities, it is recommended that end of trip facilities are provided in accordance with the following:

- One bathroom and change area shall be provided and shall contain at least one toilet, wash basin, mirror, clothing hooks and power points (including shaving plugs).
- One bathroom and change area(s) per 10 required bicycle parking spaces.
- Clothes lockers to be provided at the rate of one clothes locker for every required bicycle parking space.

Based on the provision of 23 bicycle spaces for staff, the development proposes to extend the back of house change facilities to accommodate a total of seven showers rather than provide a standalone facility. This approach provides greater flexibility and increased amenity and efficiencies.

5.3 Proposed public transport

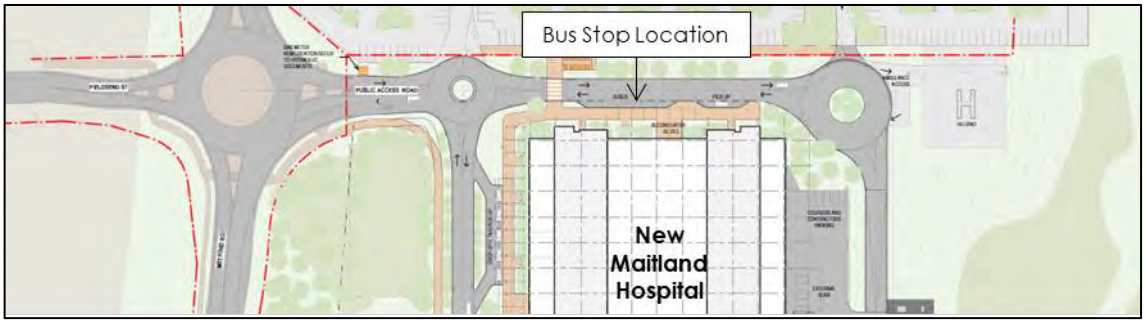
The site is accessible by public transport with a bus stop within 650 metres for local connections. The train station is around 1.4 kilometres away from the NMH for connections outside the local Maitland area. Existing services are discussed in Section 2.5.

The integration of the proposed NMH with local public transport services is discussed in the following sections.

5.3.1 Internal facilities

The proposed NMH includes an on-site bus stop for incorporation into Hunter Valley bus routes. As illustrated in Figure 5.3, bus routes will access the site via the Metford Road/ Fieldsend Street roundabout and circulate around the eastern-most internal roundabout to access the bus stop located near the Main Hospital entry on the southern edge of the internal access road.

Figure 5.3: Proposed NMH bus stop location



Source: BVN Schematic Design BVN-ARH-01A-AX0-002- Site Plan dated 3 March 2019

One bus stop bay has been proposed based on the bus stop capacity outlined in the *State Transit Bus Infrastructure Guide (BI Guide).* Section 3.10 of the BI Guide provides guidance on bus stop capacity based on the frequency of bus arrival and the dwell time at the stop. Table 5.1 is provided as a guideline to the number of spaces required.

Table 5.1: Bus Infrastructure Guide - minimum bus stop capacity

Buses Passing Stop in Busiest Hour	Number of Bus Spaces
Up to 15	1
30 – 45	2
69 – 75	3
75 – 90	4
90 – 120	5
120 - 180	6

Table 5.1 is based on a 20 – 30 second dwell time. One designated bus stop would provide sufficient capacity to accommodate the expected future bus services.

Both internal roundabouts have been designed to accommodate bus movements, as illustrated in the swept path assessment included in Appendix C. Furthermore, the raised pedestrian crossing across the internal road, illustrated in Figure 5.3, has been designed with a maximum profile of 75mm, suitable for buses to traverse.

Providing a bus stop within the development site will encourage public transport use and remove safety concerns that could occur by implementing a bus stop location within the Metford Road corridor.

5.3.2 Future Bus Services

Considering the level of activity expected from the hospital, it is reasonable to assume that the proposed NMH would generate a demand for public transport if convenient routes and schedules are proposed. To further encourage staff and visitors to use these services, it is recommended that public transport trips be arranged to align with hospital shifts.

As discussed in Section 2.5, currently only the 189 bus service travels past the NMH site, from Thornton Station to Green Hills, however, this service does not connect to Victoria Street Station. The service runs hourly on weekdays and does not operate on weekends.

Health Infrastructure met with Hunter Valley Buses, the contractor to Transport for NSW for bus services to the Lower Hunter, in October 2018. Hunter Valley buses reviewed the proposed NMH on-site bus stop access and layout and noted they were comfortable with the design.

Health Infrastructure are currently lobbying Hunter Valley Buses and Transport for NSW for the inclusion of the NMH proposed bus stop and Victoria Street Station into the 189 and/or 181bus routes, in addition to the extension of services to weekends. It is Health Infrastructures intention for these service changes to occur by the proposed year of opening for the NMH. Given the distance to Victoria St station is 1.4 kilometres, the connection of the site to the train station via bus is important.

A meeting with Transport for NSW was held on Wednesday 3 April 2019 to present the updated site layout and discuss bus stop requirements within the site. On-going consultation with Transport for NSW will be held through the detailed design process to ensure suitable bus infrastructure requirements are accommodated for the 10-year horizon. The Green Travel Plan (GTP) identifies that a potential mode shift of one per cent may be achieved for the NMH. Current arrangements would result in the NMH receiving two buses per peak hour. Even if services for the 181 were increased to half hourly to align with train services at Victoria Station and route 189 also increased to half hourly to provide increased services this would still only equate to a maximum of four buses per peak hour, therefore not requiring more than the one bus bay provided. Based on the expected GTP mode shift, this number of buses would more than service the expected patronage in the ten-year horizon.

5.4 Crime Prevention through Environmental Design (CPTED)

There are four main principles of CPTED – natural surveillance, access control, territorial reinforcement and space management. The principles of CPTED can help create a safe and secure environment and assist in minimising the incidence of crime and contribute to perceptions of increased public safety within the hospital site.

Health Infrastructure has generally considered the CPTED principles as a tool in the infrastructure design. It is proposed that the car park be designed in accordance to the NSW Car Park Guidelines for Crime Prevention. The design guidelines which incorporates the CPTED principles are provided in Table 5.2.

Table 5.2: NSW Car Park Guidelines for Crime Prevention

Category	Sub Category	Guidelines
Natural surveillance	Sightlines	○ Configure the layout so cars are parked in grid like rows to allow for good sightlines between vehicles and through the car park. Do this in a way to maximise sightlines from areas with the most pedestrian and vehicular traffic, such as a nearby business or street. ○ Trim or remove foliage that is blocking sightlines into and through the car park. Any landscaping should be above head height, below waist height and set back from pedestrian pathways. ○ Remove or block secluded areas or hidden recesses, such as areas under stairs. ○ Ensure there is minimal obstruction to lines of sight including vehicles, pillars and concrete columns.
	Surveillance	○ Provide a mixture of long term and short-term parking to enhance natural surveillance where practical. ○ Incorporate additional security for long term parking areas, such as patrols. ○ Locate long term parking areas in the most visible location in the car park. ○ Schedule maintenance at the most vulnerable times for offending, as the maintenance staff are a form of surveillance.

Category	Sub Category	Guidelines
	Lighting	○ Lighting should at least meet minimum requirements under Australian Standards (AS 1158 for external lighting and AS 1680 for interior lighting). ○ Light fixtures should be reliable, easy to maintain, able to withstand the elements and vandal resistant. ○ Incorporate lighting into a regular maintenance plan so as to ensure lights are working, maintaining lux levels and are not obstructed in any way by signs, landscaping or other objects. ○ When selecting and positioning light fixtures, be considerate of glare. Also consider the brightness of the light and effect of passing from light to dark areas. ○ White' light is best for natural surveillance as it allows for clarity of vision. Parked cars can be identified by colour and other details, which is important for crime reporting. Direct lighting to the car park so that guardians or passers-by can see inside the area. Ensure the lighting extends to the edges of the parking areas, not just vehicle and pedestrian routes. ○ Lights should be bright enough to enable the rear seat of a parked vehicle to be seen before entering and enable the face of a person to be seen 15 metres away. ○ Ensure there is sufficient lighting to complement the CCTV system (if in place) so that images are captured. ○ Consider the use of sensor lights in certain darker areas.
	Closed Circuit Television (CCTV)	○ Install a quality, vandal resistant system which staff are thoroughly trained to use. ○ Display signage identifying that CCTV is operating. ○ Ensure the cameras are installed so as to maximise surveillance opportunities. ○ Ensure the camera views are not obstructed by anything such as landscaping or signposts. ○ Ensure that cameras are constantly, actively monitored near the site. If a crime is occurring this can make it possible for a perpetrator to be apprehended or interrupted. ○ Camera feeds should be recorded and stored.
Access Control	Vehicle Access	○ Provide a dedicated singular point of entry and a dedicated singular point of exit to the car park. ○ Install boom gates, ticketed entry, one-way spikes or other access control devices to regulate vehicle movement. ○ Locate entry and exit points near guardians in the car park, such as ticket sellers / machines, businesses, or other adjoining properties. ○ Provide clear line marking or parking spaces and clearly number or colour-code the parking bays.
	Pedestrian Access	○ Provide minimal number of pedestrian access / exit points. ○ Provide clearly marked, open, visible pedestrian access ways within the car park to busy destination points. ○ Maintain landscaping along and near pedestrian access ways to ensure clear sightlines. Any landscaping should be above head height, below waist height and set back from pedestrian pathways.
	Design	○ Delineate the boundary and perimeter of the car park in some way. This could be through low shrubbery or dark coloured, see-through fencing around the perimeter of the car park. ○ Implement circular movement of traffic around the car park so that vehicles cannot simply take the shortest route to and from the entry and exit.
Space and Activity Management	-	○ Clearly number or colour-code the floor levels and parking bays. ○ Ensure a regular maintenance plan is in place including rubbish removal, graffiti removal, repair of light fixtures, maintenance of lux levels, trimming of vegetation and other necessary repairs. ○ All staff should undergo crime awareness training - what is suspicious behaviour and what are the reporting procedures for the location.

Category	Sub Category	Guidelines
		○ Crime statistics for the car park should be monitored by management and should inform crime prevention initiatives such as the timing and frequency of security patrols.
	Signage	○ Highly visible (should be able to be seen clearly at night – use reflective material). ○ Advise users of installed security measures and where to find them (such as help points or intercom systems). ○ Remind people to secure their vehicle and remove valuables. These signs should be simple to understand – use of images is best.

Furthermore, DCP 2011 outlines the following principles of crime prevention relating to residential subdivisions that are also considered appropriate for the proposed NMH:

- Clear sightlines between public and private places.
- Landscaping that makes places attractive but does not provide offenders with places to hide or entrap victims.
- Dense vegetation or structures should not be located beside bicycle routes or pedestrian walking paths. A safety convention is to have three to five metres of cleared space on either side of pathways and bicycle routes. Pedestrians feel more comfortable sharing wide paths than narrow paths.
- Natural surveillance should focus on orientation of buildings and strategic use of windows, balconies, entrances, permeable fencing and street design. Tactical location of living areas, workstations, offices and recreation areas help surveillance opportunities.
- Lighting of public places such as public streets, car parks and pedestrian areas should meet the relevant Australian Standards. Effective lighting reduces fear and can increase community activity. The types of lighting should also be considered (different lights are used in different situations).

6. Traffic impact assessment

6.1 Traffic generation

6.1.1 Design rates

Traffic generation rates have been estimated using the Roads and Maritime *Guide to Traffic Generating Developments*, 2002 (the Guide) to understand the impact of the proposed development on the surrounding traffic network. For private hospitals, the Guide sets out two separate trip generation rates as follows:

Calculated on staff and beds (recommended)

This is the preferred method where both bed numbers (B) and average staff per day shift (ASDS) are known. The trip generation rates are as follows:

- Peak Vehicle Trips (PVT) = -14.69 + 0.69B + 0.31ASDS
- Morning Vehicle Trips (MVT) = -10.21 + 0.47B + 0.06ASDS
- Evening Vehicle Trips (EVT) = -2.84 + 0.25B + 0.40ASDS.

Calculated on beds only

This method is recommended for usage only where staff numbers are unknown. The trip generation rates are as follows:

- Peak Vehicle Trips (PVT) = -22.07 +1.04*B
- Morning Vehicle Trips (MVT) = -12.41 + 0.57*B
- Evening Vehicle Trips (EVT) = -11.96 + 0.69*B.

Bed and Staffing Numbers

This assessment calculates the traffic generation based on 339 beds and 1,162 FTE (930 ASDS), where ASDS has been estimated as 80 per cent of FTE staff.

The traffic generation assessment has been based on the completed development in terms of bed and staff numbers.

Based on the surveys of the surrounding network, it is expected that the peak impact would occur in the evening period. Therefore, the EVT has been utilised as the design traffic generation rate to overlap with the network peak.

The following trip distribution has been applied:

- AM peak – 80 per cent in/ 20 per cent out
- PM peak – 30 per cent in/ 70 per cent out.

The ratio of staff trips to visitor trips for the peak hour have been calculated based on the proposed number of car parking spaces provided for staff compared to visitors, as follows:

- Staff – 76 per cent of total trips
- Visitors – 24 per cent of total trips.

Estimates of peak hour traffic volumes for the AM and PM peak periods as outlined above are set out in Table 6.1.

Table 6.1: Traffic generation estimates

Peak period	Traffic generation (vehicles per hour)				
	In		Out		Total
	Staff	Visitor	Staff	Visitor	
AM	125	39	31	10	205
PM	104	33	242	76	454

Based on Table 6.1, it is expected that the site will generate a peak hour total of 454 vehicle movements (318 vehicles exiting and 136 vehicles entering) during the PM peak hour.

6.2 Background growth

6.2.1 Roads and Maritime forecasted growth

Roads and Maritime provided GTA with outputs for the Maitland area from their Strategic Traffic Forecasting Model (STFM). These outputs included forecasted mid-block traffic volumes for 2021, 2026, and 2031, accounting for the growth in traffic volumes as result of the development of the surrounding areas. Using these volumes, the growth rates for the individual links near the site were calculated and applied to the GTA surveyed 2017 traffic volumes.

6.3 Distribution and assignment

The distribution of traffic within the surrounding network is based on the transport impact assessment prepared for Stage 1 of the State Significant Infrastructure Application for the proposed NMH in May 2018 by GTA Consultants.

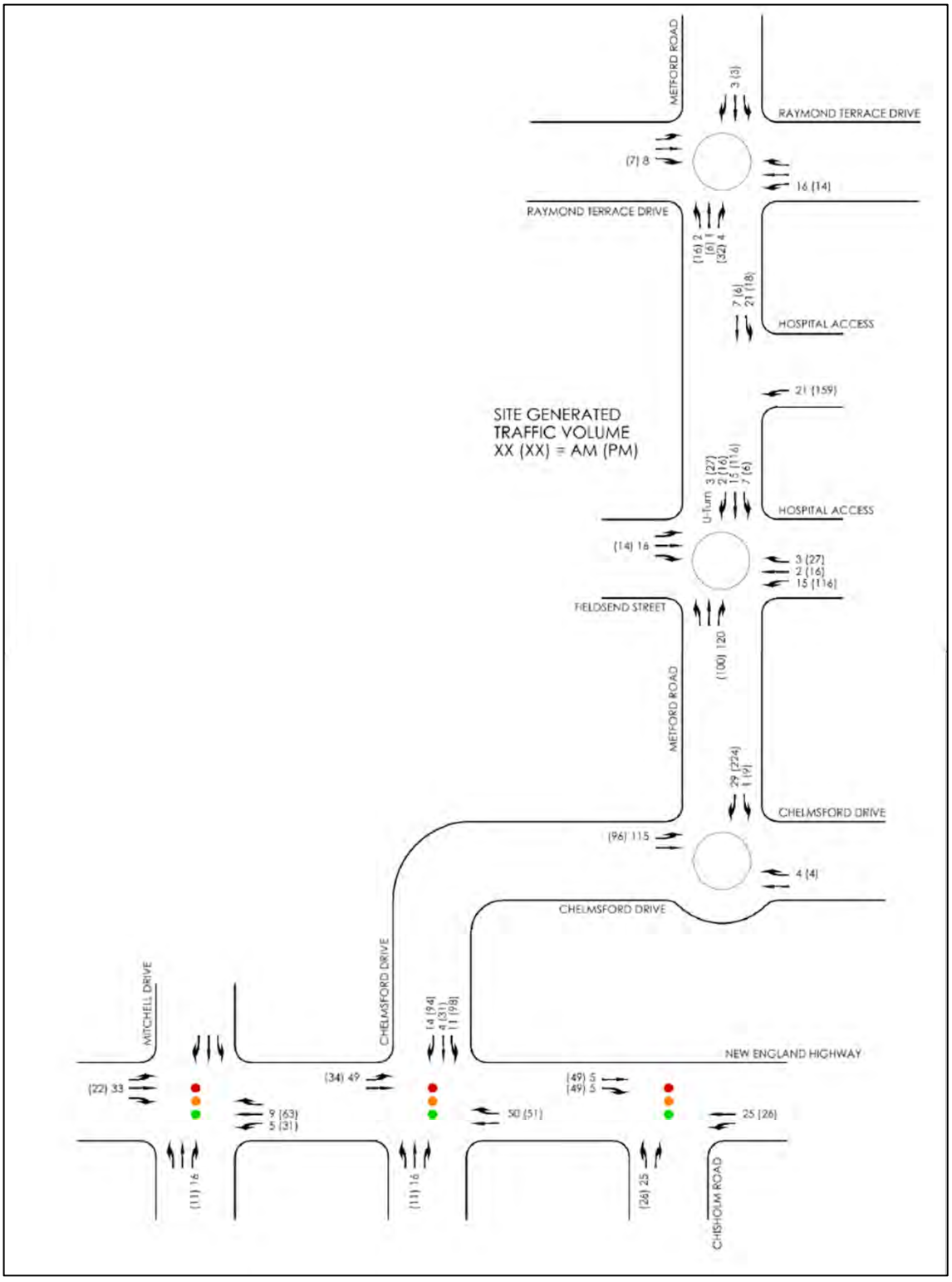
On advice from Roads and Maritime, the traffic distribution traveling to/ from Fieldsend Street has been increased from two per cent to 10 per cent, and respectively the traffic distribution traveling to/ from Metford Road (south) has been reduced from 81 per cent to 73 per cent.

Furthermore, the following traffic distribution assumptions regarding the primary and secondary site access locations have been applied:

- 100 per cent of staff traveling from the north enter through the secondary site access directly to the northern car park, all staff from Fieldsend Street or Metford Road south enter through the primary site access
- 50 per cent of staff exit from the secondary site access, 50 per cent of staff exit from the primary site access, all northbound vehicles would turn around at the Metford Road/ Fieldsend Street roundabout
- 100 per cent of visitors enter through the primary site access
- 50 per cent of visitors travel to the northern visitor car park, 50 per cent of visitors travel to the western visitor car park and drop off area
- 50 per cent of visitors (all visitors from the northern car park) exit from the secondary site access, 50 per cent of visitors exit from the primary site access (western visitor car park and drop off area).

Figure 6.1 has been prepared to show the expected traffic volumes surrounding the site following full site development.

Figure 6.1: AM and PM peak hour site generated traffic volumes



6.4 Traffic impact

6.4.1 Intersection Performance

Metford Road

The impacts on Metford Road during peak periods for the 2022 growth scenarios, without the NMH development, are detailed in Table 6.2.

Table 6.2: Metford Road 2022 operating conditions – Without development

Intersection	Peak period	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
Chelmsford Drive/ Metford Road (Roundabout)	AM	South East	1.25	150	390	F
		North East	1.00	35	260	C
		North West	0.27	11	13	A
	PM	South East	0.72	21	62	B
		North East	0.86	24	106	B
		North West	0.43	11	25	A
Metford Road/ Fieldsend Street (Roundabout)	AM	South East	0.00	8	0	A
		North East	0.66	9	48	A
		North West	0.12	11	4	A
		South West	0.43	11	18	A
	PM	South East	0.00	4	0	A
		North East	0.48	9	27	A
		North West	0.15	13	6	A
		South West	0.59	11	31	A
Metford Road/ Raymond Terrace Road (Roundabout)	AM	South East	0.74	19	66	B
		North East	0.50	13	24	A
		North West	0.41	12	20	A
		South West	0.58	15	40	B
	PM	South East	0.61	14	38	B
		North East	0.34	12	14	A
		North West	0.58	15	35	B
		South West	0.76	20	72	B

The results in Table 6.2 show that with the expected background traffic growth the intersections of Fieldsend Street/ Metford Road and Metford Road/ Raymond Terrace Road would operate well and with spare capacity. The intersection of Chelmsford Drive/ Metford Road would operate at capacity in the AM peak due to the increased movements on Metford Road.

Table 6.3 provides an understanding of the expected operating conditions of Metford Road once the NMH is operational.

Table 6.3: Metford Road 2022 operating conditions – With development

Intersection	Peak period	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
Chelmsford Drive/ Metford Road (Roundabout)	AM	South East	1.28	162	416	F
		North East	1.03	42	306	C
		North West	0.28	12	14	A
	PM	South East	0.90	37	111	C
		North East	1.14	89	420	F
		North West	0.44	11	26	A
Metford Road/ Fieldsend Road (Roundabout)	AM	South East	0.04	9	2	A
		North East	0.77	12	59	A
		North West	0.16	12	6	A
		South West	0.53	11	29	A
	PM	South East	0.20	6	11	A
		North East	0.65	12	41	A
		North West	0.23	16	11	B
		South West	0.73	12	53	A
Metford Road/ Raymond Terrace Road (Roundabout)	AM	South East	0.75	20	68	B
		North East	0.50	13	25	A
		North West	0.42	12	20	A
		South West	0.58	16	41	B
	PM	South East	0.61	14	40	B
		North East	0.36	13	15	A
		North West	0.61	16	38	B
		South West	0.81	22	88	B

The results in Table 6.3 show that with the proposed NMH development traffic the intersections of Fieldsend Street/ Metford Road/ Hospital Access and Metford Road/ Raymond Terrace Road would continue to operate well and with spare capacity.

The existing roundabout at Chelmsford Drive/ Metford Road would operate at capacity in both the AM and PM peaks due to the increased movements on Metford Road not providing sufficient opportunities for Chelmsford Drive (northbound) traffic to enter the roundabout.

The impacts on the surrounding road network during peak periods for the 2032 growth scenarios, without the NMH development, are detailed in Table 6.4.

Table 6.4: Metford Road 2032 operating conditions – Without development

Intersection	Peak period	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
Chelmsford Drive/ Metford Road (Roundabout)	AM	South East	1.52	259	694	F
		North East	1.20	108	627	F
		North West	0.31	12	16	A
	PM	South East	0.94	40	145	C
		North East	1.05	62	276	E
		North West	0.50	12	31	A
Metford Road/ Fieldsend Street (Roundabout)	AM	South East	0.01	16	0	B
		North East	0.78	9	86	A
		North West	0.16	12	7	A
		South West	0.54	11	27	A
	PM	South East	0.00	6	0	A
		North East	0.59	9	42	A
		North West	0.21	15	10	B
		South West	0.68	11	43	A
Metford Road/ Raymond Terrace Road (Roundabout)	AM	South East	0.89	27	123	B
		North East	0.55	14	30	A
		North West	0.53	14	32	A
		South West	0.87	31	107	C
	PM	South East	0.73	16	64	B
		North East	0.45	14	22	A
		North West	0.76	21	59	B
		South West	1.08	73	282	F

The results in Table 6.4 show that with the expected background traffic growth and without the NMH development, the 2032 operating conditions are similar to the 2022 operating conditions detailed in Table 6.2. However, the intersection of Raymond Terrace Road/ Metford Road will be operating at capacity in the PM peak.

Table 6.5: Metford Road 2032 operating conditions – With development

Intersection	Peak period	Leg	Degree of saturation	Average delay (sec)	95th Percentile Queue (m)	Level of service
Chelmsford Drive/ Metford Road (Roundabout)	AM	South East	1.57	282	734	F
		North East	1.16	90	574	F
		North West	0.29	12	14	A
	PM	South East	1.02	59	200	E
		North East	1.28	148	659	F
		North West	0.47	12	28	A
Metford Road/ Fieldsend Street (Roundabout)	AM	South East	0.07	18	4	B
		North East	0.91	15	138	B
		North West	0.22	14	10	A
		South West	0.65	12	46	A
	PM	South East	0.30	11	19	A
		North East	0.78	12	69	A
		North West	0.35	18	20	B
		South West	0.84	14	95	B
Metford Road/ Raymond Terrace Road (Roundabout)	AM	South East	0.95	35	163	C
		North East	0.61	15	36	B
		North West	0.55	14	34	A
		South West	0.89	33	113	C
	PM	South East	0.74	17	65	B
		North East	0.46	14	23	B
		North West	0.77	21	61	B
		South West	1.14	97	370	F

Table 6.5 shows that with the proposed NMH development traffic the intersection of Fieldsend Street/ Metford Road/ Hospital Access would operate at an acceptable level of service with spare capacity. The existing roundabout at Metford Road/ Raymond Terrace Road would operate at capacity in the PM peak period. The existing roundabout at Chelmsford Drive/ Metford Road would operate at capacity in both the AM and PM peaks due to the increased movements on Metford Road not providing sufficient opportunities for Chelmsford Drive (northbound) traffic to enter the roundabout.

New England Highway

The impacts on the New England Highway (NEH) during peak periods for the 2022 growth scenarios, without the NMH development, are detailed in Table 6.6.

Table 6.6: NEH 2022 operating conditions – Without NMH development

Intersection	Peak	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
Chelmsford Drive/ New England Highway	AM	South East	0.65	15	116	B
		North East	0.91	46	99	D
		North West	0.93	46	257	D
		South West	0.34	42	25	C
		Overall	0.93	35	257	C
	PM	South East	0.90	18	144	B
		North East	0.87	45	75	D
		North West	0.90	33	251	C
		South West	0.85	49	64	D
		Overall	0.90	31	251	C
Mitchell Drive/ New England Highway	AM	South East	0.54	19	127	B
		North East	0.55	46	30	D
		North West	0.92	21	117	B
		South West	0.49	39	28	C
		Overall	0.92	24	127	B
	PM	South East	0.67	24	148	B
		North East	0.62	46	35	D
		North West	0.90	24	114	B
		South West	0.87	42	78	C
		Overall	0.90	30	148	C
Chisholm Road/ New England Highway	AM	South East	0.63	15	146	A
		North West	0.62	6	77	A
		South West	0.96	47	49	D
		Overall	0.96	13	146	A
	PM	South East	0.69	13	172	A
		North West	0.67	5	53	A
		South West	0.89	45	68	D
		Overall	0.89	13	172	A

The results in Table 6.6 show that with the expected background traffic growth the intersections of New England Highway/ Chelmsford Drive and New England Highway/ Mitchell Drive would overall operate satisfactory in peak conditions.

The intersection of New England Highway/ Chisholm Road would operate well and with spare capacity in peak conditions.

Table 6.7 provides an understanding of the expected operating conditions of New England Highway once the NMH is operational.

Table 6.7: NEH 2022 operating conditions – With NMH development

Intersection	Peak	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
Chelmsford Drive/ New England Highway	AM	South East	0.64	16	115	B
		North East	0.98	59	118	E
		North West	0.93	45	257	D
		South West	0.40	42	28	C
		Overall	0.98	38	257	C
	PM	South East	0.95	22	165	B
		North East	0.96	61	145	E
		North West	0.97	52	346	D
		South West	0.90	56	77	D
		Overall	0.97	43	346	D
Mitchell Drive/ New England Highway	AM	South East	0.54	19	129	B
		North East	0.55	46	30	D
		North West	0.92	21	122	B
		South West	0.53	40	31	C
		Overall	0.92	24	129	B
	PM	South East	0.65	23	164	B
		North East	0.69	52	40	D
		North West	0.91	26	133	B
		South West	0.94	51	98	D
		Overall	0.94	32	164	C
Chisholm Road/ New England Highway	AM	South East	0.65	15	151	B
		North West	0.64	6	78	A
		South West	0.96	46	49	D
		Overall	0.96	13	151	A
	PM	South East	0.71	15	199	B
		North West	0.71	6	76	A
		South West	0.89	48	75	D
		Overall	0.89	14	199	B

Table 6.7 shows that with the proposed NMH development traffic in 2022, the intersections of New England Highway/ Chelmsford Drive and New England Highway/ Mitchell Drive would overall operate satisfactory in peak conditions however New England Highway/ Chelmsford Drive would operate near to capacity in the PM peak hour.

The intersection of New England Highway/ Chisholm Road overall would continue to operate well and with spare capacity in peak conditions.

The impacts on the surrounding road network during peak periods for the 2032 growth scenarios, without the NMH development, are detailed in Table 6.8.

Table 6.8: NEH 2032 operating conditions – Without NMH development

Intersection	Peak	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
Chelmsford Drive/ New England Highway	AM	South East	0.81	16	137	B
		North East	0.95	59	112	E
		North West	0.98	61	352	E
		South West	0.37	42	28	C
		Overall	0.98	44	352	D
	PM	South East	0.87	18	175	B
		North East	0.96	61	104	E
		North West	0.95	44	360	D
		South West	0.96	66	91	E
		Overall	0.96	40	360	C
Mitchell Drive/ New England Highway	AM	South East	0.63	21	149	B
		North East	0.69	47	36	D
		North West	0.87	22	166	B
		South West	0.60	39	32	C
		Overall	0.87	25	166	B
	PM	South East	0.80	31	198	C
		North East	0.62	49	43	D
		North West	0.87	28	170	B
		South West	0.92	48	113	D
		Overall	0.92	35	198	C
Chisholm Road/ New England Highway	AM	South East	0.69	15	170	B
		North West	0.70	6	80	A
		South West	0.90	43	49	D
		Overall	0.90	13	170	A
	PM	South East	0.77	15	233	B
		North West	0.74	5	59	A
		South West	0.91	51	86	D
		Overall	0.91	14	233	A

Table 6.8 shows that with the proposed background traffic growth, the intersection of New England Highway/ Chelmsford Drive would overall operate satisfactory in the PM peak, however, would operate near to capacity in the AM peak hour. It is noted that most approaches for the intersection would operate near to or at capacity in peak conditions, aside from the south east approach that would operate well and with spare capacity.

The intersection New England Highway/ Mitchell Drive would overall operate satisfactory in peak conditions.

The intersection of New England Highway/ Chisholm Road would continue to operate well overall with spare capacity in peak conditions.

The impacts on the surrounding road network during peak periods for the 2032 growth scenarios, with the NMH development, are detailed in Table 6.9.

Table 6.9: NEH 2032 operating conditions – With NMH development

Intersection	Peak	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
Chelmsford Drive/ New England Highway	AM	South East	0.95	22	156	B
		North East	0.96	69	141	E
		North West	0.93	45	348	D
		South West	0.40	49	37	D
		Overall	0.96	43	348	D
	PM	South East	0.93	30	284	C
		North East	0.97	69	176	E
		North West	1.00	68	435	E
		South West	0.92	64	96	E
		Overall	1.00	54	435	D
Mitchell Drive/ New England Highway	AM	South East	0.56	19	155	B
		North East	0.78	58	44	E
		North West	0.88	23	185	B
		South West	0.59	48	43	D
		Overall	0.88	27	185	B
	PM	South East	0.87	36	239	C
		North East	0.68	55	48	D
		North West	0.90	49	308	D
		South West	0.95	53	125	D
		Overall	0.95	45	308	D
Chisholm Road/ New England Highway	AM	South East	0.68	17	204	B
		North West	0.67	7	97	A
		South West	0.85	48	56	D
		Overall	0.85	15	204	B
	PM	South East	0.93	36	464	C
		North West	0.92	8	89	A
		South West	0.93	58	96	E
		Overall	0.93	26	464	B

Table 6.9 shows that with the proposed NMH development traffic in 2032, the intersection of New England Highway/ Chelmsford Drive would overall operate near to capacity in both the AM and PM peaks.

The intersections of New England Highway/ Mitchell Drive and New England Highway/ Chisholm Road would overall operate satisfactory in peak conditions.

It is noted that most approaches for the Chelmsford Drive intersection would operate near to or at capacity in peak conditions, aside from the south east approach that would operate well and with spare capacity.

6.4.2 Mid-block capacity

Analysing the expected through-traffic on key roads near the site provides an understanding of the performance characteristics of these roads following the development of the NMH.

An assessment of the mid-block performance of the following road corridors has therefore been completed:

- Raymond Terrace Road south-east of the intersection with Metford Road
- Metford Road between Fieldsend Street and Chelmsford Drive
- Chelmsford Drive between Metford Road and New England Highway.

The *Austroads Guide to Traffic Management – Part 3: Traffic Studies and Analysis* provides typical mid-block capacities for urban roads. This is summarised in Table 6.10.

Table 6.10: Typical mid-block capacity – Urban roads

Type of lane	One-way mid-block capacity (passenger cars per lane, per hour)
Median or Inner Lane	
Divided Road	1,000
Undivided Road	900
Middle Lane (of a 3 Lane Carriageway)	
Divided Road	900
Undivided Road	1,000
Kerb Lane	
Adjacent to Parking Lane	900
Occasional Parked Vehicles	600
Clearway Condition	900

Source: Table 5.1 of Austroads Guide to Traffic management – Part 3: Traffic Studies and Analysis

In addition, peak-period mid-block capacities may increase to 1,200 or 1,400 passenger cars per lane per hour when the following conditions exist or can be implemented:

- Adequate flaring at major upstream intersections
- Uninterrupted flow from a wider carriageway upstream of an intersection approach and flowing at capacity
- Control or absence of crossing or entering traffic at minor intersections by major road priority controls
- Control or absence of parking
- Control or absence of right turns by banning turning at difficult intersections
- High volume flows of traffic from upstream intersections during more than one phase of a signal cycle
- Good coordination of traffic signals along the route.

Therefore, the assumed traffic capacity for key roads near the NMH are summarised in Table 6.11. A capacity of 1,200 passenger cars per lane per hour has been adopted. This is considered appropriate, since each road exhibits the following:

- Absence of crossing or entering traffic at minor intersections by major road priority control
- Adequate flaring at major upstream intersections
- Control or absence of parking and control.

Table 6.11: Mid-block capacity

Road	Lanes (per direction)	Capacity (passenger cars/ lane/ hour)
Raymond Terrace Road (east of Fieldsend Street)	1	1,200
Metford Road (south of Fieldsend Street)	1	1,200
Chelmsford Road (west of Metford Road)	2	2,400

Analysis of mid-block level of service was conducted based on criteria set by Roads and Maritime and experience with comparable developments, with a summary provided in Table 6.12.

Table 6.12: Mid-block level of service criteria

Level of service	Description	Volume to capacity ratio (VCR) range
A	A condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.	0.00 – 0.34
B	In the zone of stable flow and drivers still have the reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is a little less than LoS A.	0.35 – 0.50
C	Also, in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.	0.51 – 0.74
D	Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.	0.75 – 0.89
E	Occurs when traffic volumes are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause break-down.	0.90 – 0.99
F	In the zone of forced flow. With LOS F, the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs, and queuing and delays result.	1.0 or greater

Source: Based on values as supplied in Guide to Traffic Generating Developments (RMS, 2002)

Based on Table 6.12, an assessment of the mid-block capacity for each direction (northbound (NB)/ eastbound (EB) or southbound (SB)/ westbound (WB)) of the surrounding road network during peak periods for the 2022 growth scenarios, with and without the NMH development, is outlined in Table 6.13.

Table 6.13: Summary of traffic capacity – 2022 growth scenario

Scenario	Location	Traffic volumes				Volume/ capacity			
		AM		PM		AM		PM	
		EB/NB		WB/SB		EB/NB	WB/SB	EB/NB	WB/SB
Without Development	Raymond Terrace Road	729	1066	870	1075	0.61(C)	0.89(D)	0.73(C)	0.9(D)
	Metford Road	581	1046	823	738	0.49(B)	0.88(D)	0.69(C)	0.62(C)
	Chelmsford Road	636	1107	1105	847	0.27(A)	0.47(B)	0.47(B)	0.36(B)
With Development	Raymond Terrace Road	733	1082	902	1089	0.62(C)	0.91(E)	0.76(D)	0.91(E)
	Metford Road	701	1076	923	970	0.59(C)	0.9(D)	0.77(D)	0.81(D)
	Chelmsford Road	751	1136	1201	1071	0.32(A)	0.48(B)	0.51(B)	0.45(B)

The results in Table 6.13 show that with the expected background traffic growth and proposed NMH development, the road network will operate with some spare capacity during the AM and PM peak hours.

An assessment of the mid-block capacity of the surrounding road network during peak periods for the 2032 growth scenarios, with and without the NMH development, is outlined in Table 6.14.

Table 6.14: Summary of traffic capacity – 2032 growth scenario

Scenario	Location	Traffic volumes				Volume/ capacity			
		AM		PM		AM		PM	
		EB/NB		WB/SB		EB/NB	WB/SB	EB/NB	WB/SB
Without Development	Raymond Terrace Road	844	1251	1023	1226	0.71(C)	1.05(F)	0.86(D)	1.03(F)
	Metford Road	720	1229	936	918	0.6(C)	1.03(F)	0.78(D)	0.77(D)
	Chelmsford Road	774	1316	1256	997	0.33(A)	0.55(C)	0.53(C)	0.42(B)
With Development	Raymond Terrace Road	848	1267	1055	1240	0.71(C)	1.06(F)	0.88(D)	1.04(F)
	Metford Road	840	1259	1036	1150	0.7(C)	1.05(F)	0.87(D)	0.96(E)
	Chelmsford Road	889	1345	1352	1221	0.38(B)	0.57(C)	0.57(C)	0.51(B)

Table 6.14 indicates that by 2032, Raymond Terrace Road westbound/ Metford Road southbound will be approaching or at capacity during the AM and PM peak, irrespective of the NMH development. However, Raymond Terrace Road eastbound/ Metford Road northbound will be operating with some spare capacity during the AM and PM peak.

Chelmsford Road is expected to operate well, with spare capacity during both peak hours.

6.5 Mitigating measures and intersection works

6.5.1 Chelmsford Drive/ Metford Road roundabout

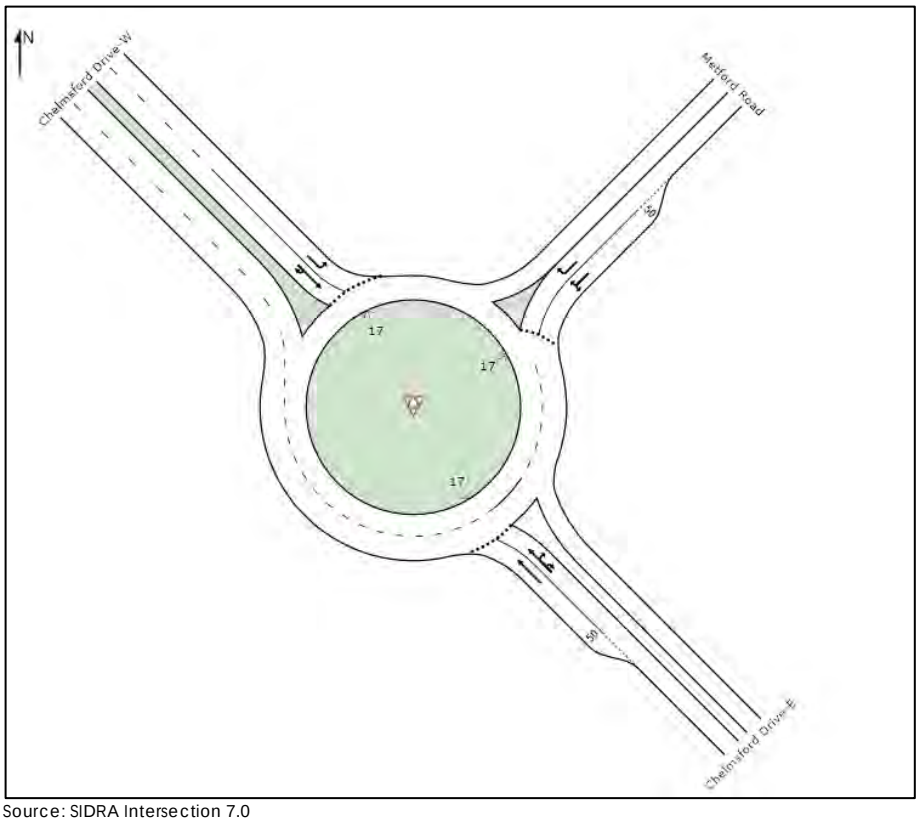
As outlined in Section 6.4.1, the Chelmsford Drive/ Metford Road roundabout operates at capacity with and without the impact of the proposed development; with the south-east and north-east approaches of the intersection operating with high degrees of saturation and delays.

The following treatments are recommended for the Chelmsford Drive/ Metford Road roundabout to minimise the adverse effects of forecast additional traffic:

- Increasing the number of circulating lanes on the east and south side of the roundabout to two lanes
- Provision of an additional 50-metre lane on the Chelmsford Drive east approach and Metford Road north approach.

The expected layout of the proposed intersections is shown in Figure 6.2.

Figure 6.2: Proposed layout of Chelmsford Drive/ Metford Road roundabout (indicative layout only)



Source: SIDRA Intersection 7.0

The performance of this proposed intersection layout without the development is outlined in Table 6.15 for both 2022 and 2032 growth scenarios and for both the AM and PM peak periods.

Table 6.15: 2022 and 2032 proposed intersection operating conditions - Without development

Year	Peak period	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
2022	AM	South East	0.41	14	15	B
		North East	0.46	10	25	A
		North West	0.27	12	13	A
	PM	South East	0.29	13	10	A
		North East	0.37	12	18	A
		North West	0.42	11	23	A
2032	AM	South East	0.57	17	26	B
		North East	0.56	11	34	A
		North West	0.34	12	17	A
	PM	South East	0.38	13	14	A
		North East	0.46	13	25	A
		North West	0.49	12	29	A

The results in Table 6.15 show that the proposed upgrades to the Chelmsford Drive/ Metford Road intersection results in good intersection operation with spare capacity in all peak periods for both 2022 and 2032 growth scenarios.

The performance of the proposed intersection layout with the development is outlined in Table 6.16 for both 2022 and 2032 growth scenarios and for both the AM and PM peak periods.

Table 6.16: 2022 and 2032 proposed intersection operating conditions - With development

Year	Peak period	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of service
2022	AM	South East	0.42	15	16	B
		North East	0.48	10	26	A
		North West	0.29	12	13	A
	PM	South East	0.35	14	12	A
		North East	0.51	13	29	A
		North West	0.44	11	24	A
2032	AM	South East	0.56	16	25	B
		North East	0.54	11	32	A
		North West	0.32	13	15	A
	PM	South East	0.44	14	17	B
		North East	0.57	14	39	A
		North West	0.47	12	27	A

Comparing the results in Table 6.15, to Table 6.16 it is evident that with the development of the NMH, the Chelmsford Road / Metford Road roundabout with the proposed upgrade would continue to provide good intersection operation with spare capacity in all peak periods for both 2022 and 2032 growth scenarios.

Therefore, it is expected that with the recommended improvements to the Chelmsford Road/ Metford Road roundabout, the proposed NMH would have an acceptable impact on the capacity of the surrounding road network.

The intersection upgrade is discussed further in Section 10.1 and a concept design has been developed and included as Appendix D of this report.

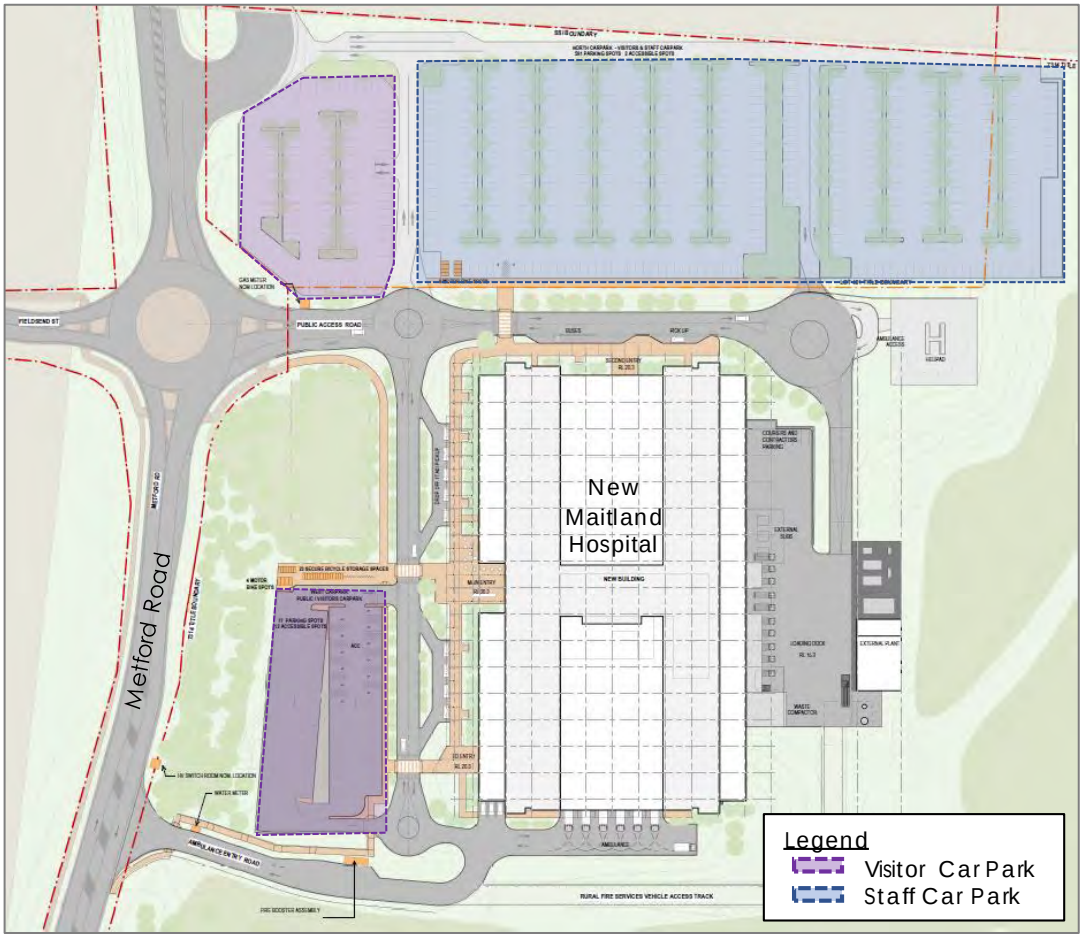
7. New Maitland Hospital – Internal transport operation

7.1 Car parking arrangements

The proposed hospital will provide an at-grade carpark to the north of the hospital building for staff and long-term patient/visitors and an at-grade carpark to west of the hospital building for short stay public/ visitors as shown in Figure 7.1.

Vehicles will access the main entrance and emergency department (ED) drop-off areas, located on the western side of the hospital building, and then progress to either the short term or long tern visitor parking areas.

Figure 7.1: Proposed staff, visitor, service and bus vehicular circulation on site



Base Image Source: BVN Schematic Design BVN-ARH-01A-AX0-002- Site Plan Issue 6.

7.2 Vehicular circulation

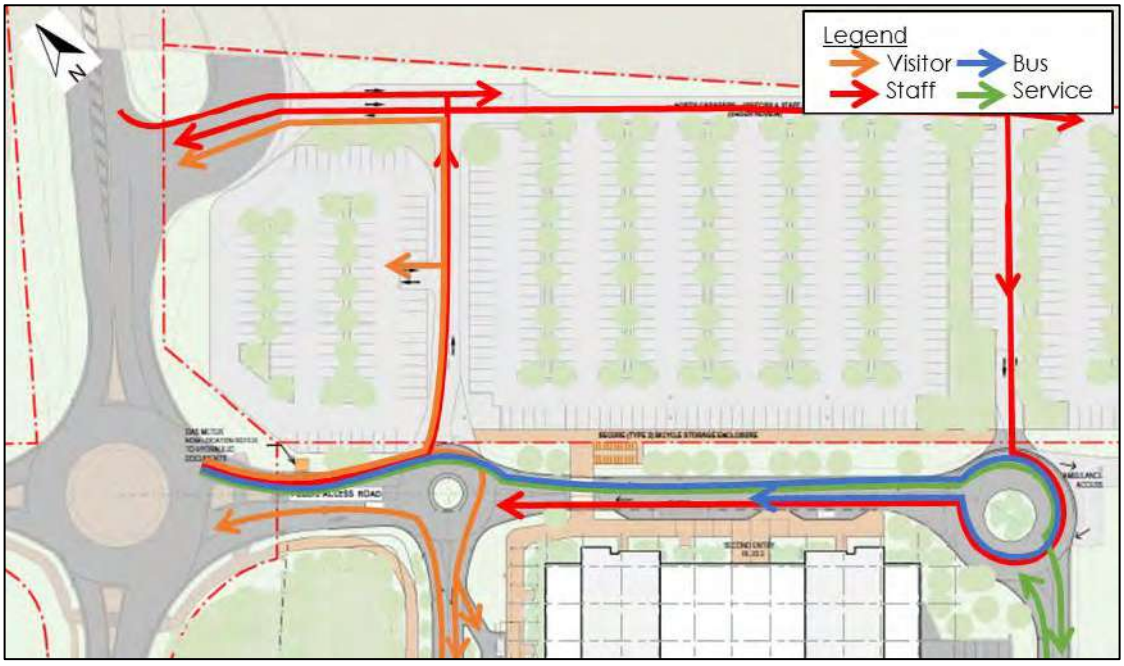
Access and circulation have been designed to minimise queuing or congestion within the site that could potentially impact the operation of the external road network. Figure 7.1 provides an overview of the proposed access arrangements with Figure 7.2 outlining the proposed vehicular circulation on the NMH site. Three vehicle accesses from Metford Road are proposed as follows:

- Metford Road/ Fieldsend Street roundabout (recently constructed) to accommodate the primary site access.
- Emergency vehicle access, from Metford Road around 130 metres south of the Metford Road/ Fieldsend Street intersection. This access accommodates authorised emergency vehicles only.
- Secondary (left in/left out) site access around 60 metres north of the Metford Road/ Fieldsend Street intersection on Metford Road.

The Metford Road roundabout (roundabout 1) provides the primary access to the hospital site. Internally two roundabouts are proposed with the first internal roundabout (roundabout 2) providing entry only access to the northern car park (visitor and staff), as well as access to the front entrance for drop off, emergency and visitor parking. The eastern roundabout (roundabout 3) provides for buses to turn around to access the bus zone on the northern side of the hospital building and provides access to the proposed loading dock and an exit point for vehicles from the northern (staff) car park.

It is important to note that the internal roundabouts operate as separated entry and exit points for the main northern car park. This is to ensure that there is no impact to the operation of the Metford Road / Fieldsend Street roundabout through any potential congestion or queuing internally on site.

Figure 7.2: Proposed staff, visitor, service and bus vehicular circulation on site



Base Image Source: BVN Schematic Design BVN-ARH-01A-AX0-002.

7.3 Bus services

The proposed NMH includes an on-site bus stop for incorporation into Hunter Valley bus routes. Bus routes will access the site via the Metford Road/ Fieldsend Street roundabout and circulate around the eastern-most internal roundabout to access the bus stop located near the a hospital entry on the northern side of the hospital building, as shown in Figure 7.1 and Figure 7.2. The Metford Road and northern internal roundabouts have been designed to accommodate bus movements, as discussed in Section 5.3.

7.4 Services vehicles and loading dock

One loading and servicing area is proposed on the lower ground level at the rear (eastern side) of the hospital, with direct access to the hospital building. The loading area can be accessed through the eastern internal access roundabout, as shown in Figure 7.1 and Figure 7.2, and is proposed to accommodate vehicles up to and including 12.5-metre vehicles with at least six loading bays.

7.5 Helipad operation

An aviation report has been prepared by AviPro for the on-grade helicopter landing site. The following measures are proposed to manage traffic within the adjacent car park to the north and roundabout to the west during helipad operations:

- A pedestrian and vehicle management strategy as high vehicles (delivery trucks, buses etc) may cause an obstruction to the flight path and therefore would need to be absent from the roundabout during helipad operations.
- A traffic management system such as a flashing light and appropriate signage to control the roundabout during helipad operations would be recommended.
- Pedestrians to be kept clear of the area during helipad operations.

8. Work Travel Plan

8.1 Purpose of a Work Travel Plan

A facility such as a hospital generates a significant level of transport demand, primarily for private vehicle trips. Travel demand management (TDM) aims to modify travel decisions rather than providing costly infrastructure and additional transport services to support the current and future transport demands. TDM has the following key objectives:

i Reduce the need to travel
i Reduce the amount of travel
ii Reduce the impact of travel.

In this regard, a Work Travel Plan (WTP) is a tool that hospitals can use to manage the transport mode choices of their staff. The plan aims to promote and encourage sustainable travel and reduce reliance on the private vehicle. The WTP comprises a list of strategies aimed at encouraging walking, cycling, public transport and car-pooling for travel to and from work and aims at a shift away from the reliance on single occupant vehicle travel.

8.2 Typical challenges for regional hospitals

Most staff activity associated with regional hospitals occurs via vehicles due to the nature of staff shift times and the limited availability of convenient public transport. Walking and cycling often proves difficult due to the distance between the home and work place as well as a lack of quality facilities. In this regard, the following factors are typically attributed to a high mode share for private vehicles at regional hospitals:

- Residential locations and hospital locations can have limited access to public transport services.
- Driving presents attractive travel time advantages for many key staff origins.
- Limited number of locations have access to direct public transport connections that do not require interchanging. This typically results in longer travel times, as well as influencing the perception of a lack of convenience and reliability.
- Time of arrival/ departure, due to shift work, potentially limits the access to frequent public transport services. Staff that work in shifts with start/ end times outside peak hours might also experience personal security issues.
- Time of arrival/ departure influences perceived comfort of traveling via alternate modes of transport, in particular outside peak hours.
- Unpredictable hospital activities may extend staff shift finish times. This can leave staff 'stranded' if public transport options are limited.
- Staff may need to drive to efficiently conduct other activities on their way to/ from the hospital such as school set-down/ pick-up activities.

Strategies can be implemented to encourage staff to reduce their reliance on private vehicles.

8.3 Travel demand strategies

Several opportunities exist to provide the NMH staff with incentives to consider alternative modes of travel to and from work. The following recommendations are high level strategies that will need to be developed in greater detail and through consultation with relevant stakeholders closer to the opening of the hospital.

- Staff accommodation
  - Provide staff accommodation near the site. This may encourage:
    - Walking and/ or cycling to work
    - Car-pooling between staff working the same shifts.
  - Provide a shuttle bus service between staff accommodation and the hospital to further reduce reliance on private vehicles.
- Shuttle bus service
  - Provide a shuttle bus service between the hospital and key public transport interchanges, such as Victoria Street Station, aligned with staff shifts. A regular, flexible service is likely to increase staff perception of convenience and reliability.
  - Develop shuttle bus routes targeting key residential areas near the hospital with low public transport connectivity.
- Public transport
  - Communicate with bus operators to amend bus routes (where possible) to connect public transport nodes with the hospital using the proposed on-site bus stop discussed in Section 5.2.3.
  - Communicate with bus operators to arrange public transport trips to be aligned with hospital shifts through consultation with public transport operators.
- Active travel
  - Provide high quality and prominent bicycle parking and change/ shower facilities.
  - Provide clear pedestrian and cyclist wayfinding.
  - Provide shelters along walkways or near bus stops and street lighting.
  - Encourage cultural change through:
    - Creating a bicycle user group (targeting staff living within five kilometres of the hospital)
    - Events such as annual 'ride to work' day
    - Providing information detailing opportunities and facilities available to staff. This may include providing maps of the available cycling routes to and within the hospital site.
- Promote car-pooling
  - Provide prioritised car pool parking spaces on-site, including consideration for incentives such as prices, location and proximity to services.

8.4 Green Travel Plan

A Green Travel Plan (GTP) for the NMH site has been developed, building upon the principles discussed in this section. The GTP intends to influence travel behaviour for both staff and visitors to the hospital and is included as Appendix E.

9. Construction Traffic Management Plan

9.1 Construction Traffic Management

The preparation of the Construction Traffic Management Plan (CTMP) for Stage 2 of the NMH has been completed by Multiplex and is provided in Appendix F.

This section refers to the CTMP and provides a summary of the works and an understanding of the impact the construction of the Stage 2 Main Works may have on the surrounding road network.

9.2 Works programme

The CTMP indicates the following main works programme:

- Main Works total programme is expected to be September 2019 to April 2021
  - Structure – September 2019 to July 2020
  - Façade – July 2021 to February 2021
  - Fit out – March 2020 to April 2021
  - Car park – October 2019 to March 2021.

The anticipated peak construction is expected between March 2020 and July 2020.

9.3 Work hours

Construction work would be undertaken in accordance to development consent conditions. The typical work hours are expected to be:

- Monday to Friday: 7am to 6pm
- Saturday: 7am to 5pm (subject to DA approval)
- Sundays and public holidays: No work.

9.4 Site access

Site access will be provided via the recently constructed Metford Road/ Fieldsend Street/ site access roundabout. The roundabout has been designed to cater for truck movements. All construction vehicles will enter and exit the site in a forward direction.

9.5 Heavy vehicle generation

The number of daily truck movements will vary depending on the works being conducted on the specific day or timeframe in the construction programme.

Concrete pour days would expect an increase in truck movements with the delivery timing to be managed to avoid peak periods. On average concrete pour days, it is expected that there would be one truck every five to 10 minutes. All trucks would be contained wholly within the site and there would not be any waiting areas on the surrounding road network. During the period of October 2019 to July 2020 there is an estimated three concrete pours per week.

On days outside of concrete pour days it is anticipated that there would be an average of one to two truck deliveries per hour between 7am to 5pm Monday to Saturday.

9.6 Light vehicle generation

Light vehicle traffic generation would be largely generated by construction worker traffic movements to and from the site.

It is expected in the worst-case scenario there could be up to 400 construction workers on any one day. Multiplex has indicated that workers will be encouraged to car pool to ensure that construction worker parking can be accommodated wholly within the site. Based on an assumption that 15 per cent car pool it is expected that 340 light vehicles per day could be expected. It is expected that all workers would arrive to the site prior to 7am and therefore before the AM peak period, however, depart around 6pm, potentially coinciding with the PM peak period.

9.7 Summary of construction traffic generation

The estimated number of construction vehicles per day is detailed in the Table 9.1.

Table 9.1: Daily construction traffic volumes (worst-case)

Vehicle type	Total number of vehicles per day (on average)	Total peak vehicle movements per day (on average)	Total peak vehicle movements per hour
Light vehicles	340	340	340
Heavy vehicles/ Trucks	20	120	12
Total	360	460	352

Table 9.1 shows that during peak construction (concrete pours), there could be up to a total of 460 vehicles arriving and departing the site per day, with 352 within the PM peak hour.

9.8 Construction traffic impact

The analysis of the road network surrounding the NMH has been assessed based on the peak expected traffic generation and background traffic growth for the NMH once it is fully operational. Table 6.1 indicates the proposed NMH would generate an additional 454 vehicles in the peak hour, which is greater than the expected worst-case during construction.

Analysis outlined in Table 6.3 outlines that with the proposed NMH development traffic in the year 2022 the intersections of Fieldsend Street/ Metford Road/ Hospital Access and Metford Road/ Raymond Terrace Road would continue to operate well and with spare capacity. The existing roundabout at Chelmsford Drive/ Metford Road would operate at capacity during the peak period due to the increased movements on Metford Road not providing sufficient opportunities for Chelmsford Drive (northbound) traffic to enter the roundabout. Table 6.7 shows that the intersections of New England Highway/ Chelmsford Drive and New England Highway/ Mitchell Drive would overall operate satisfactory in peak conditions however New England Highway/ Chelmsford Drive would operate near to capacity in the PM peak hour. The intersection of New England Highway/ Chisholm Road overall would continue to operate well and with spare capacity in peak conditions.

Generally, the majority of construction workers finish prior to the PM road network peak and therefore it is expected that the road network would continue to operate well throughout the construction period.

10. Health Infrastructure project commitments

10.1 Metford Road/ Chelmsford Drive intersection upgrade

To improve access to the site, the Chelmsford Drive/ Metford Road intersection will be upgraded as part of the NMH works. The proposed upgrade includes increasing the number of circulating lanes on the east and south side of the roundabout to two lanes and the provision of an additional 50-metre lane on the Chelmsford Drive east approach and Metford Road north approach.

The Chelmsford Drive/ Metford Road intersection upgrades will be undertaken by Health Infrastructure separate to the subject Stage 2 SSI Application.

A concept design has been developed and included in Appendix D of this report.

The final design of the roundabout and associated footpath connection on Metford Road will be developed between Council and Health Infrastructure.

11. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

i The proposed NMH includes:
   - A total of 339 beds/ chairs/ rooms.
   - A total of 893 full time equivalent (FTE) staff at the proposed year of opening with up to 1,162 FTE ten years after opening.

ii The site will include a total of 682 onsite parking spaces, accommodating 515 staff parking spaces and 167 public/ visitor parking spaces. An additional 140 car parking spaces are committed to be provided on site to meet the expected 2021/ 2031 parking demand. The parking provision has been determined through a separate Parking Demand Study.

iii The NMH site when completely developed is expected to generate around 454 vehicle movements in the peak hour.

iv There is adequate capacity in the recently constructed roundabout at Metford Road/ Fieldsend Street/ NMH access to cater for the traffic generated by the proposed NMH development at the year of opening and the ten-year horizon.

v Mitigating works are recommended at the existing roundabout of Metford Road/ Chelmsford Drive to accommodate forecast background traffic growth and the proposed NMH development traffic.

vi The majority of construction workers are likely to finish prior to the PM road network peak and therefore it is expected that the road network would continue to operate well throughout the construction period.

vii A Green Travel Plan for the NMH has been developed.

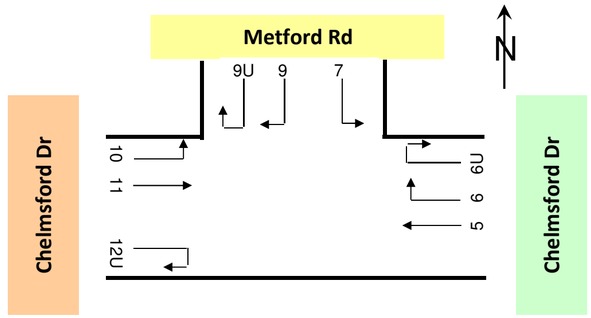
viii This traffic assessment concludes that road improvements are required at the intersection of Chelmsford Road and Metford Road to accommodate the forecast background traffic growth in the area and the NMH development. With the recommended improvements to the Chelmsford Road/ Metford Road roundabout the proposed NMH would have an acceptable impact on the capacity of the surrounding road network.

Appendix A

Survey results

Job No. : N3242
Client : GTA
Suburb : Metford Road
Location : 1. Metford Road / Chelmsford Drive

Day/Date : Thu, 25th May 2017
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



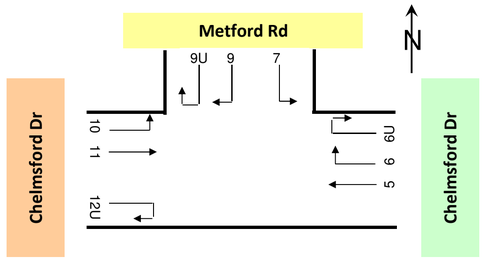
MATRIX Traffic and Transport Data

	Approach			Chelmsford Dr			Metford Rd			Chelmsford Dr			Grand Total
	Time Period			Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	8:00	to	9:00	490	19	**509**	851	27	**878**	574	37	**611**	**1,998**
PM	16:45	to	17:45	398	6	**404**	599	10	**609**	1,030	14	**1,044**	**2,057**

Approach			Chelmsford Dr			Metford Rd			Chelmsford Dr			Grand Total
Time Period			Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
7:00	to	8:00	222	4	**226**	505	27	**532**	319	21	**340**	**1,098**
7:15	to	8:15	278	5	**283**	569	28	**597**	371	27	**398**	**1,278**
7:30	to	8:30	358	11	**369**	665	25	**690**	464	35	**499**	**1,558**
7:45	to	8:45	455	15	**470**	768	23	**791**	548	37	**585**	**1,846**
8:00	to	9:00	490	19	**509**	851	27	**878**	574	37	**611**	**1,998**
AM Totals			**712**	**23**	**735**	**1,356**	**54**	**1,410**	**893**	**58**	**951**	**3,096**
15:00	to	16:00	393	21	**414**	646	16	**662**	900	43	**943**	**2,019**
15:15	to	16:15	362	10	**372**	609	12	**621**	932	45	**977**	**1,970**
15:30	to	16:30	362	7	**369**	604	11	**615**	954	24	**978**	**1,962**
15:45	to	16:45	367	5	**372**	605	11	**616**	943	15	**958**	**1,946**
16:00	to	17:00	380	4	**384**	562	9	**571**	1,004	14	**1,018**	**1,973**
16:15	to	17:15	380	4	**384**	560	6	**566**	1,004	8	**1,012**	**1,962**
16:30	to	17:30	375	5	**380**	579	10	**589**	1,037	10	**1,047**	**2,016**
16:45	to	17:45	398	6	**404**	599	10	**609**	1,030	14	**1,044**	**2,057**
17:00	to	18:00	414	4	**418**	597	10	**607**	989	11	**1,000**	**2,025**
PM Totals			**1,187**	**29**	**1,216**	**1,805**	**35**	**1,840**	**2,893**	**68**	**2,961**	**6,017**

Job No. : N3242
Client : GTA
Suburb : Metford Road
Location : 1. Metford Road / Chelmsford Drive

Day/Date : Sat, 27th May 2017
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



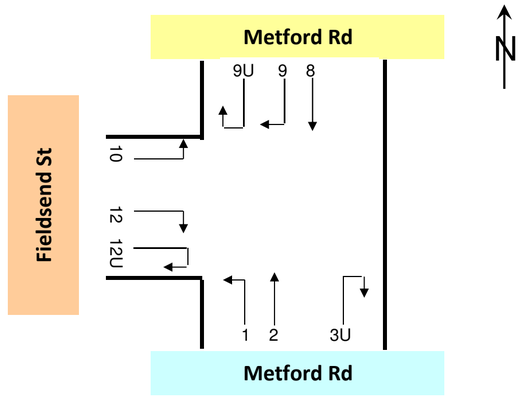
MATRIX Traffic and Transport Data

Approach		Chelmsford Dr			Metford Rd			Chelmsford Dr			Grand Total
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
10:45 to 11:45		386	2	**388**	637	6	**643**	840	9	**849**	1,880

Approach		Chelmsford Dr			Metford Rd			Chelmsford Dr			Grand Total
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
8:30 to 9:30		295	3	**298**	566	11	**577**	606	10	**616**	1,491
8:45 to 9:45		319	3	**322**	648	11	**659**	632	12	**644**	1,625
9:00 to 10:00		317	3	**320**	675	11	**686**	636	10	**646**	1,652
9:15 to 10:15		321	2	**323**	727	8	**735**	651	8	**659**	1,717
9:30 to 10:30		337	4	**341**	682	9	**691**	711	8	**719**	1,751
9:45 to 10:45		335	6	**341**	646	9	**655**	772	6	**778**	1,774
10:00 to 11:00		359	5	**364**	624	10	**634**	839	5	**844**	1,842
10:15 to 11:15		391	6	**397**	621	12	**633**	841	5	**846**	1,876
10:30 to 11:30		404	4	**408**	595	9	**604**	854	6	**860**	1,872
10:45 to 11:45		386	2	**388**	637	6	**643**	840	9	**849**	1,880
11:00 to 12:00		372	2	**374**	667	2	**669**	825	10	**835**	1,878
11:15 to 12:15		325	1	**326**	635	2	**637**	840	11	**851**	1,814
11:30 to 12:30		306	2	**308**	658	2	**660**	888	11	**899**	1,867
11:45 to 12:45		313	2	**315**	619	3	**622**	917	8	**925**	1,862
12:00 to 13:00		289	2	**291**	610	3	**613**	889	11	**900**	1,804
12:15 to 13:15		313	2	**315**	639	5	**644**	889	10	**899**	1,858
12:30 to 13:30		308	1	**309**	596	6	**602**	857	9	**866**	1,777
12:45 to 13:45		293	1	**294**	553	6	**559**	825	8	**833**	1,686
13:00 to 14:00		309	1	**310**	525	6	**531**	814	7	**821**	1,662
13:15 to 14:15		296	2	**298**	521	2	**523**	842	11	**853**	1,674
13:30 to 14:30		291	4	**295**	529	3	**532**	792	13	**805**	1,632
13:45 to 14:45		288	6	**294**	544	3	**547**	771	15	**786**	1,627
14:00 to 15:00		289	6	**295**	545	4	**549**	787	13	**800**	1,644
Totals		**2,081**	**20**	**2,101**	**3,889**	**42**	**3,931**	**5,089**	**61**	**5,150**	**11,182**

Job No. : N3242
Client : GTA
Suburb : Metford Road
Location : 2. Metford Road / Fieldsend Street

Day/Date : Thu, 25th May 2017
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



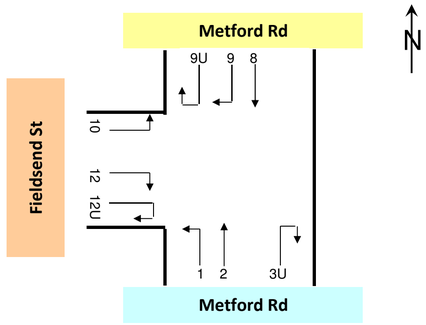
MATRIX Traffic and Transport Data

	Approach	Metford Rd				Metford Rd			Fieldsend St			Grand Total
	Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	
AM	8:00 to 9:00	532	29	**561**		850	26	**876**	22	5	**27**	**1,464**
PM	16:30 to 17:30	710	8	**718**		653	12	**665**	77	0	**77**	**1,460**

Approach	Metford Rd				Metford Rd			Fieldsend St			Grand Total
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	
7:00 to 8:00	254	28	**282**		509	21	**530**	8	5	**13**	**825**
7:15 to 8:15	309	20	**329**		576	24	**600**	9	4	**13**	**942**
7:30 to 8:30	374	24	**398**		688	20	**708**	14	5	**19**	**1,125**
7:45 to 8:45	483	32	**515**		764	19	**783**	19	5	**24**	**1,322**
8:00 to 9:00	532	29	**561**		850	26	**876**	22	5	**27**	**1,464**
AM Totals	**786**	**57**	**843**		**1,359**	**47**	**1,406**	**30**	**10**	**40**	**2,289**
15:00 to 16:00	700	18	**718**		608	27	**635**	58	7	**65**	**1,418**
15:15 to 16:15	697	14	**711**		582	21	**603**	64	5	**69**	**1,383**
15:30 to 16:30	692	14	**706**		596	16	**612**	72	3	**75**	**1,393**
15:45 to 16:45	692	12	**704**		609	12	**621**	84	0	**84**	**1,409**
16:00 to 17:00	692	9	**701**		601	10	**611**	84	0	**84**	**1,396**
16:15 to 17:15	680	7	**687**		628	8	**636**	85	0	**85**	**1,408**
16:30 to 17:30	710	8	**718**		653	12	**665**	77	0	**77**	**1,460**
16:45 to 17:45	698	13	**711**		648	13	**661**	64	0	**64**	**1,436**
17:00 to 18:00	697	11	**708**		652	11	**663**	59	0	**59**	**1,430**
PM Totals	**2,089**	**38**	**2,127**		**1,861**	**48**	**1,909**	**201**	**7**	**208**	**4,244**

Job No. : N3242
Client : GTA
Suburb : Metford Road
Location : 2. Metford Road / Fieldsend Street

Day/Date : Sat, 27th May 2017
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



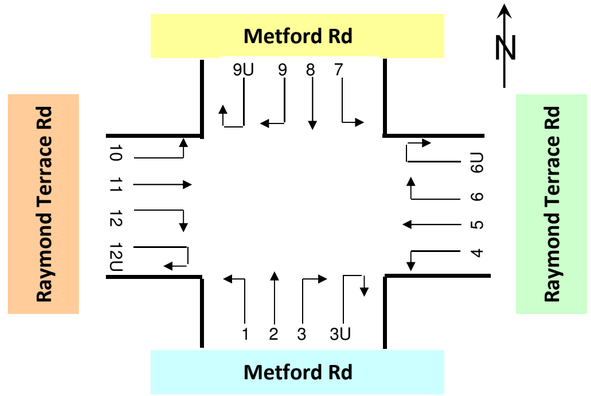
MATRIX Traffic and Transport Data

Approach	Metford Rd				Metford Rd			Fieldsend St			Grand Total
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	
10:45 to 11:45	656	7	**663**		622	5	**627**	112	0	**112**	**1,402**

Approach	Metford Rd				Metford Rd			Fieldsend St			Grand Total
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	
8:30 to 9:30	479	12	**491**		538	10	**548**	173	1	**174**	**1,213**
8:45 to 9:45	507	15	**522**		601	13	**614**	185	3	**188**	**1,324**
9:00 to 10:00	526	15	**541**		624	10	**634**	164	4	**168**	**1,343**
9:15 to 10:15	547	9	**556**		658	8	**666**	133	4	**137**	**1,359**
9:30 to 10:30	567	8	**575**		638	11	**649**	88	4	**92**	**1,316**
9:45 to 10:45	599	6	**605**		619	10	**629**	59	3	**62**	**1,296**
10:00 to 11:00	650	7	**657**		599	12	**611**	79	2	**81**	**1,349**
10:15 to 11:15	665	8	**673**		593	12	**605**	90	2	**92**	**1,370**
10:30 to 11:30	650	7	**657**		593	8	**601**	79	2	**81**	**1,339**
10:45 to 11:45	656	7	**663**		622	5	**627**	112	0	**112**	**1,402**
11:00 to 12:00	623	6	**629**		626	2	**628**	105	1	**106**	**1,363**
11:15 to 12:15	607	4	**611**		596	3	**599**	91	1	**92**	**1,302**
11:30 to 12:30	659	6	**665**		608	4	**612**	94	1	**95**	**1,372**
11:45 to 12:45	659	5	**664**		597	3	**600**	62	2	**64**	**1,328**
12:00 to 13:00	647	7	**654**		575	3	**578**	65	1	**66**	**1,298**
12:15 to 13:15	653	8	**661**		607	4	**611**	67	1	**68**	**1,340**
12:30 to 13:30	619	7	**626**		566	5	**571**	67	1	**68**	**1,265**
12:45 to 13:45	576	7	**583**		520	10	**530**	67	0	**67**	**1,180**
13:00 to 14:00	559	4	**563**		530	10	**540**	77	0	**77**	**1,180**
13:15 to 14:15	582	4	**586**		492	7	**499**	102	0	**102**	**1,187**
13:30 to 14:30	555	7	**562**		506	7	**513**	91	0	**91**	**1,166**
13:45 to 14:45	535	8	**543**		521	3	**524**	84	0	**84**	**1,151**
14:00 to 15:00	558	7	**565**		505	4	**509**	66	2	**68**	**1,142**
Totals	**3,788**	**49**	**3,837**		**3,699**	**47**	**3,746**	**616**	**11**	**627**	**8,210**

Job No. : N3242
Client : GTA
Suburb : Metford Road
Location : 3. Metford Road / Raymond Terrace Road

Day/Date : Thu, 25th May 2017
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



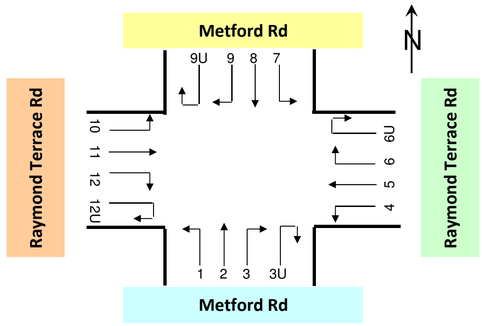
MATRIX Traffic and Transport Data

	Approach	Metford Rd			Raymond Terrace Rd			Metford Rd			Raymond Terrace Rd			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	8:00 to 9:00	489	27	**516**	890	20	**910**	550	18	**568**	446	24	**470**	**2,464**
PM	16:30 to 17:30	752	8	**760**	933	23	**956**	354	4	**358**	520	7	**527**	**2,601**

Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Grand Total
7:00 to 8:00	247	26	**273**	523	28	**551**	442	11	**453**	281	19	**300**	**1,577**
7:15 to 8:15	290	23	**313**	656	22	**678**	467	11	**478**	310	21	**331**	**1,800**
7:30 to 8:30	346	26	**372**	755	18	**773**	518	12	**530**	375	19	**394**	**2,069**
7:45 to 8:45	449	32	**481**	833	14	**847**	540	14	**554**	405	17	**422**	**2,304**
8:00 to 9:00	489	27	**516**	890	20	**910**	550	18	**568**	446	24	**470**	**2,464**
AM Totals	**736**	**53**	**789**	**1,413**	**48**	**1,461**	**992**	**29**	**1,021**	**727**	**43**	**770**	**4,041**
15:00 to 16:00	704	19	**723**	746	40	**786**	401	19	**420**	495	17	**512**	**2,441**
15:15 to 16:15	693	14	**707**	737	37	**774**	404	14	**418**	551	18	**569**	**2,468**
15:30 to 16:30	701	14	**715**	775	31	**806**	399	8	**407**	547	19	**566**	**2,494**
15:45 to 16:45	730	11	**741**	828	26	**854**	382	7	**389**	539	18	**557**	**2,541**
16:00 to 17:00	747	9	**756**	827	22	**849**	361	5	**366**	532	12	**544**	**2,515**
16:15 to 17:15	746	7	**753**	884	19	**903**	345	4	**349**	511	9	**520**	**2,525**
16:30 to 17:30	752	8	**760**	933	23	**956**	354	4	**358**	520	7	**527**	**2,601**
16:45 to 17:45	728	11	**739**	916	17	**933**	382	3	**385**	522	4	**526**	**2,583**
17:00 to 18:00	719	10	**729**	881	15	**896**	402	3	**405**	498	4	**502**	**2,532**
PM Totals	**2,170**	**38**	**2,208**	**2,454**	**77**	**2,531**	**1,164**	**27**	**1,191**	**1,525**	**33**	**1,558**	**7,488**

Job No. : N3242
Client : GTA
Suburb : Metford Road
Location : 3. Metford Road / Raymond Terrace Road

Day/Date : Sat, 27th May 2017
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



MATRIX Traffic and Transport Data

Approach	Metford Rd			Raymond Terrace Rd			Metford Rd			Raymond Terrace Rd			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
11:00 to 12:00	624	7	**631**	739	7	**746**	432	1	**433**	381	4	**385**	2,195

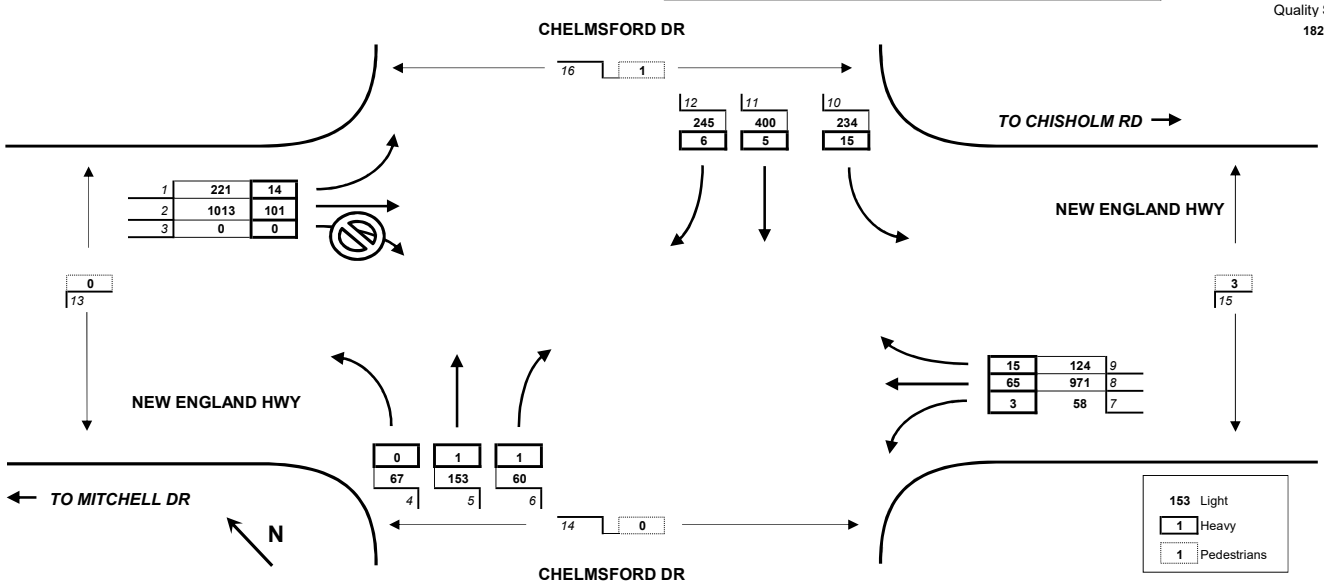
Approach	Metford Rd			Raymond Terrace Rd			Metford Rd			Raymond Terrace Rd			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
8:30 to 9:30	426	11	**437**	642	5	**647**	375	8	**383**	269	7	**276**	1,743
8:45 to 9:45	503	14	**517**	660	9	**669**	376	8	**384**	268	9	**277**	1,847
9:00 to 10:00	539	15	**554**	669	7	**676**	419	7	**426**	279	9	**288**	1,944
9:15 to 10:15	565	10	**575**	698	9	**707**	437	6	**443**	315	8	**323**	2,048
9:30 to 10:30	567	9	**576**	678	11	**689**	432	6	**438**	340	5	**345**	2,048
9:45 to 10:45	550	7	**557**	672	9	**681**	445	4	**449**	363	2	**365**	2,052
10:00 to 11:00	577	9	**586**	685	11	**696**	415	4	**419**	372	4	**376**	2,077
10:15 to 11:15	609	9	**618**	679	12	**691**	429	3	**432**	356	4	**360**	2,101
10:30 to 11:30	592	8	**600**	703	11	**714**	454	3	**457**	379	4	**383**	2,154
10:45 to 11:45	619	8	**627**	726	9	**735**	447	2	**449**	375	4	**379**	2,190
11:00 to 12:00	624	7	**631**	739	7	**746**	432	1	**433**	381	4	**385**	2,195
11:15 to 12:15	612	5	**617**	706	5	**711**	429	3	**432**	385	4	**389**	2,149
11:30 to 12:30	647	6	**653**	707	8	**715**	406	3	**409**	382	4	**386**	2,163
11:45 to 12:45	643	5	**648**	696	11	**707**	410	4	**414**	381	4	**385**	2,154
12:00 to 13:00	627	6	**633**	638	9	**647**	407	4	**411**	403	1	**404**	2,095
12:15 to 13:15	627	7	**634**	641	12	**653**	432	3	**435**	417	2	**419**	2,141
12:30 to 13:30	608	6	**614**	611	9	**620**	418	4	**422**	407	5	**412**	2,068
12:45 to 13:45	550	7	**557**	596	6	**602**	396	3	**399**	394	6	**400**	1,958
13:00 to 14:00	545	4	**549**	619	7	**626**	390	3	**393**	395	7	**402**	1,970
13:15 to 14:15	570	5	**575**	608	3	**611**	354	2	**356**	399	6	**405**	1,947
13:30 to 14:30	536	8	**544**	589	2	**591**	380	0	**380**	395	4	**399**	1,914
13:45 to 14:45	536	8	**544**	590	1	**591**	407	0	**407**	415	2	**417**	1,959
14:00 to 15:00	537	8	**545**	558	1	**559**	412	1	**413**	396	1	**397**	1,914
Totals	**3,624**	**51**	**3,675**	**4,207**	**47**	**4,254**	**2,666**	**25**	**2,691**	**2,364**	**29**	**2,393**	**13,013**

26/7/2018 - CHELMSFORD DR / NEW ENGLAND HWY, GREENHILLS

9:15 <<< HOUR ENDING **Thursday**

Summary:	CHELMSFORD DR / NEW ENGLAND HWY
3546	Total Light Vehicles
226	Total Heavy Vehicles
4	Total Pedestrians

Quality Surveys
182825



26/7/2018 - CHELMSFORD DR / NEW ENGLAND HWY, GREENHILLS

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
06:15	31	205	0	3	2	7	6	83	23	32	5	18	415		0	0	0	0
06:30	25	265	0	3	22	11	3	96	26	46	23	21	541		0	0	0	0
06:45	16	263	0	5	16	9	8	159	27	64	26	27	620		0	0	1	0
07:00	24	260	0	8	17	10	4	128	29	37	34	27	578	2154	0	0	1	0
07:15	21	287	0	6	17	18	5	111	18	48	29	28	588	2327	0	0	0	1 <
07:30	24	364	0	8	13	19	5	154	25	61	29	30	732	2518	0	0	0	0 <
07:45	37	287 <	0	7	26	11	10	231	25	58	46	46	784	2682	0	0	1	0 <
08:00	35	259	0	13	21	13	11	258	27	69	69	38	813	2917	0	0	1	0 <
08:15	38	217	0	17	40	10	9	217	34	59	86	50	777	3106	0	0	0	0
08:30	38	313	0	20	35	18	18	279	33	79 <	104	51	988	3362	0	0	2 <	0
08:45	53	251	0	17	47	18	19	262 <	34	57	91	73	922	3500	0	0	1 <	0
09:00	66	212	0	19 <	34 <	19 <	13	246	33 <	57	118	50	867	3554 <	0	0	0	1 <
09:15	64	237	0	11	37	5	8	184	24	41	87 <	71	769	3546	0	0	0	0 <
09:30	52 <	212	0	23	34	10	20	196	34	34	69	53 <	737	3295	1	1 <	0	0 <
09:45	48	215	0	10	21	15	20	184	32	38	75	51	709	3082	3 <	0 <	2	0 <
10:00	58	137	0	7	48	18	15 <	167	30	26	71	50	627	2842	0 <	0 <	0	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
06:15	1	9	0	1	0	0	0	14	1	2	0	1	29	
06:30	0	9	0	0	0	1	1	9	6	5	0	1	32	
06:45	0	18	0	0	0	0	2	32	3	6	2	4	67	
07:00	2	20	0	0 <	1 <	1 <	2	21	2	4	2	12	67	195
07:15	2	19	0	0	0 <	0 <	1 <	22	3	4 <	2 <	3	56	222
07:30	2	21	0	0	0 <	0	0	22 <	4	4	0 <	5 <	58	248 <
07:45	3	27	0	1 <	0 <	0	0	20	2	7 <	1	1	62	243
08:00	4	16	0	0 <	0	0	0	23	4	1	0	4	52	228
08:15	2	10	0	0 <	0	1	0	11	4	5	0	3	36	208
08:30	7 <	34	0	0 <	0	0	1	20	5	4	2	0	73	223
08:45	3 <	14	0	0	0	1 <	1	10	7 <	3	1	2	42	203
09:00	3	25	0	0	1 <	0 <	0	15	2	5	2	3	56	207
09:15	1	28 <	0	0	0 <	0	1	20	1	3	0	1	55	226
09:30	6	23	0	0	0 <	0	0	17	3	2	2	1	54	207
09:45	4	14	0	1 <	0 <	0	1	13	5	2	2 <	5	47	212
10:00	5 <	15	0	0 <	0	1	0	10	4	6	1	4	46	202

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
06:15	32	214	0	4	2	7	6	97	24	34	5	19	444	
06:30	25	274	0	3	22	12	4	105	32	51	23	22	573	
06:45	16	281	0	5	16	9	10	191	30	70	28	31	687	
07:00	26	280	0	8	18	11	6	149	31	41	36	39	645	2349
07:15	23	306	0	6	17	18	6	133	21	52	31	31	644	2549
07:30	26	385	0	8	13	19	5	176	29	65	29	35	790	2766
07:45	40	314 <	0	8	26	11	10	251	27	65	47	47	846	2925
08:00	39	275	0	13	21	13	11	281	31	70	69	42	865	3145
08:15	40	227	0	17	40	11	9	228	38	64	86	53	813	3314
08:30	45	347	0	20	35	18	19	299	38	83 <	106	51	1061	3585
08:45	56	265	0	17	47	19	20	272 <	41	60	92	75	964	3703
09:00	69	237	0	19 <	35 <	19 <	13	261	35 <	62	120	53	923	3761
09:15	65	265	0	11	37	5	9	204	25	44	87 <	72	824	3772 <
09:30	58 <	235	0	23	34	10	20	213	37	36	71	54 <	791	3502
09:45	52	229	0	11	21	15	21	197	37	40	77	56	756	3294
10:00	63	152	0	7	48	19	15 <	177	34	32	72	54	673	3044

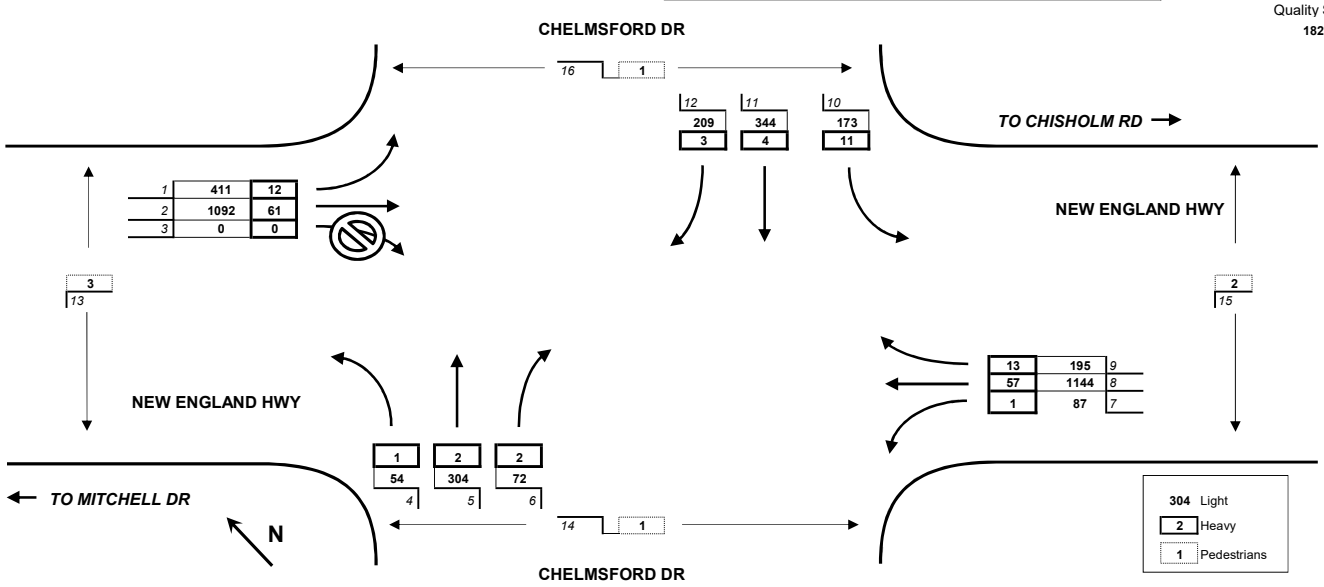
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

26/7/2018 - CHELMSFORD DR / NEW ENGLAND HWY, GREENHILLS

16:30 <<< HOUR ENDING **Thursday**

Summary:	CHELMSFORD DR / NEW ENGLAND HWY
4085	Total Light Vehicles
167	Total Heavy Vehicles
7	Total Pedestrians

Quality Surveys
182825



26/7/2018 - CHELMSFORD DR / NEW ENGLAND HWY, GREENHILLS

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
14:15	50	243	0	19	62	28	11	171	52	49	62	40	787		1	1	0	0
14:30	86	223	0	5	47	31	13	225	55	41	75	46	847		2	0	0	0
14:45	66	267	0	17	64	18	23	221	68	36	46	48	874		1	0	0	0
15:00	77	170	0	14	52	30	14	269	36	50	71	59	842	3350	3	0 <	0	0
15:15	54	213	0	11	61	27	23	273	76	44	93	48	923	3486	2	0	1	0
15:30	68	258	0	15	77	31	21	228	60	44	92	19	913	3552	0	0	3	0
15:45	132	292	0	22 <	81	25 <	25	298	10	42	98	44	1069	3747	0	0	2 <	0
16:00	94	262	0	10	71	17	18	261	54	51 <	89	46	973	3878	0	0	0 <	0
16:15	111	264	0	11	68	19	18	274	59	39	96	69	1028	3983	3	0	0	1
16:30	74	274 <	0	11	84 <	11	26	311 <	72	41	61	50	1015	4085 <	0	1 <	0	0
16:45	85	255	0	17	59	24	8	256	83	32	116	62	997	4013	2	0 <	0	1 <
17:00	100	227	0	10	68	25	19	241	62	34	102	60 <	948	3988	4 <	0 <	3	0 <
17:15	127	239	0	10	59	30	36	250	73 <	28	125	40	1017	3977	2	0 <	0	0
17:30	138	318	0	12	67	26	21	269	61	36	101 <	45	1094	4056	0	0	0	0
17:45	117	206	0	13	48	20	16	263	42	39	115	59	938	3997	1	0	1	0
18:00	109 <	157	0	7	54	23	29 <	228	88	30	95	65	885	3934	2	0	1	0

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
14:15	2	17	0	0	1	1	0	16	1	2	0	4	44	
14:30	0	25	0	0	0	0	0	18	6	1	0	3	53	
14:45	11	19	0	1	0	0	2	27	1	2	1	0	64	
15:00	5	10	0	0	1	1	0	31 <	3	4	0	3 <	58	219
15:15	2	21	0	1 <	2	0	1	12	1	7	2	3	52	227
15:30	6 <	23	0	0 <	1 <	1	2 <	15	5	5	0	0	58	232 <
15:45	7	26 <	0	0	0 <	1 <	0	21	2	4 <	1	2	64	232 <
16:00	1	9	0	1 <	0	0	0	18	4	4 <	3 <	0	40	214
16:15	0	12	0	0	0	0	0	11	3	1	0	1	28	190
16:30	4	14	0	0	2	1	1	7	4	2	0	0	35	167
16:45	5	22	0	0	0	1	0	5	4	1	0	0	38	141
17:00	0	14	0	0	0	0	0	7	6 <	2	0	3	32	133
17:15	2	13	0	0	0	0	0	5	1	2	0	0	23	128
17:30	3	8	0	0	0	0	0	7	3	1	0	0	22	115
17:45	2	1	0	0	0	0	0	8	1	2	1	2	17	94
18:00	-1	3	0	0	0	0	0	2	2	1	0	1	8	70

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
14:15	52	260	0	19	63	29	11	187	53	51	62	44	831	
14:30	86	248	0	5	47	31	13	243	61	42	75	49	900	
14:45	77	286	0	18	64	18	25	248	69	38	47	48	938	
15:00	82	180	0	14	53	31	14	300	39	54	71	62	900	3569
15:15	56	234	0	12	63	27	24	285	77	51	95	51	975	3713
15:30	74	281	0	15	78	32	23	243	65	49	92	19	971	3784
15:45	139	318	0	22 <	81	26 <	25	319	12	46	99	46	1133	3979
16:00	95	271	0	11	71	17	18	279	58	55 <	92	46	1013	4092
16:15	111	276	0	11	68	19	18	285	62	40	96	70	1056	4173
16:30	78	288 <	0	11	86 <	12	27	318 <	76	43	61	50	1050	4252 <
16:45	90	277	0	17	59	25	8	261	87	33	116	62	1035	4154
17:00	100	241	0	10	68	25	19	248	68	36	102	63 <	980	4121
17:15	129	252	0	10	59	30	36	255	74 <	30	125	40	1040	4105
17:30	141	326	0	12	67	26	21	276	64	37	101 <	45	1116	4171
17:45	119	207	0	13	48	20	16	271	43	41	116 <	61	955	4091
18:00	108 <	160	0	7	54	23	29 <	230	90	31	95	66	893	4004

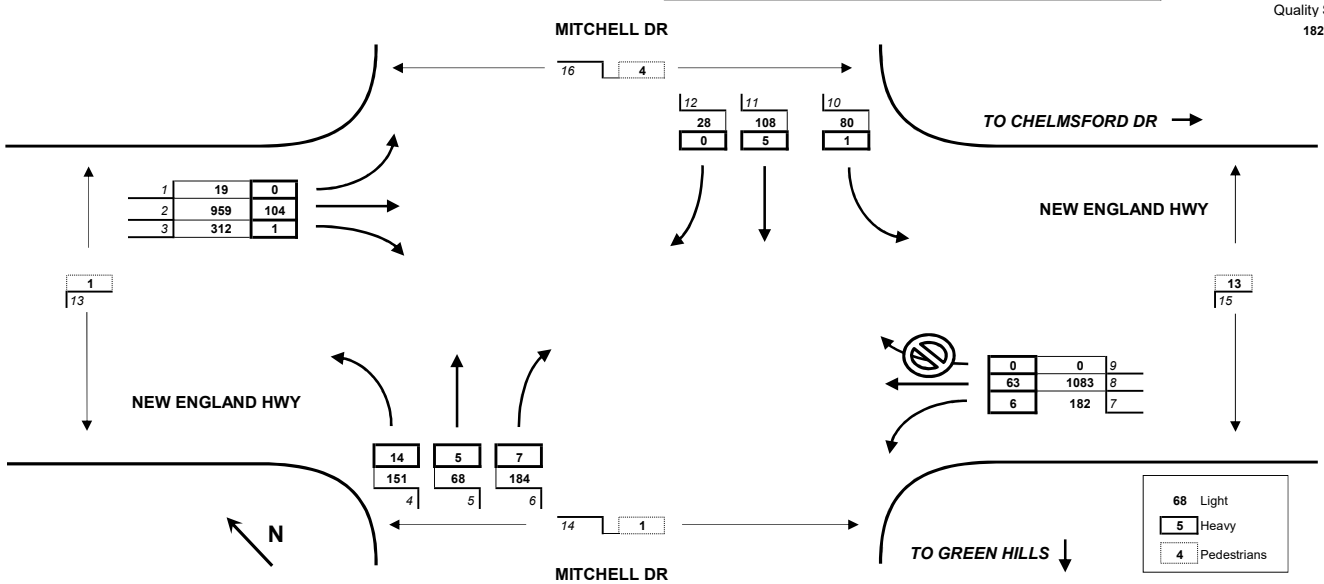
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

26/7/2018 - MITCHELL DR / NEW ENGLAND HWY, GREENHILLS

9:15 <<< HOUR ENDING **Thursday**

Summary:	MITCHELL DR / NEW ENGLAND HWY
3174	Total Light Vehicles
206	Total Heavy Vehicles
19	Total Pedestrians

Quality Surveys
182825



26/7/2018 - MITCHELL DR / NEW ENGLAND HWY, GREENHILLS

Light Vehicles — **Total Vehicles** — **Pedestrians**

	1	2	3	4	5	6	7	8	9	10	11	12	15 MIN HOUR		13	14	15	16
06:15	0	196	19	13	0	34	10	105	0	19	4	3	403		0	0	0	0
06:30	1	279	9	11	3	15	8	104	0	6	8	2	446		0	1	0	0
06:45	1	247	13	12	7	19	6	183	0	11	11	4	514		1	0	0	0
07:00	0	250	16	11	10	30	17	144	0	18	7	3	506	1869	1 <	0	0	0
07:15	3	278	18	16	7	39	11	141	0	15	5	2	535	2001	0 <	0	0	0
07:30	2	311	16	11	7	38	15	177	0	31	16	4	628	2183	0 <	0	1	0
07:45	1	256	27	22	7	40	19	247	0	23	9	5	656	2325	0	0	2	0
08:00	0	277	46	27	3	38	34	295	0	17	22	3	762	2581	0	0	2	0
08:15	4	281 <	40	30	11	29	38	296	0	21 <	33	8	791	2837	0	0	1	1
08:30	5	246	61	32	17	45	40	294	0	16	29	5	790	2999	0	0	1	0
08:45	6	239	77	47	12	47	42	295 <	0	23	18	13	819	3162	1	1	8	4
09:00	4 <	238	87	27	22	39	52	258	0	20	30	5 <	782	3182 <	0	0	3	0
09:15	4 <	236	87	45	17 <	53	48	236	0	21	31	5	783	3174	0	0	1	0
09:30	5 <	174	84	57	14	53	51 <	217	0	16	29	5	705	3089	0	0	5 <	3
09:45	3	197	87	43	15 <	61	31	211	0	12	24 <	6	690	2960	1	1	4	5
10:00	6	147	95 <	60 <	17	47 <	42	177	0	11	29	9	640	2818	0	1 <	5	3 <

Heavy Vehicles — **Total Vehicles**

	1	2	3	4	5	6	7	8	9	10	11	12	15 MIN HOUR	
06:15	0	11	0	1	1	0	1	15	0	0	0	0	29	
06:30	0	7	0	0	1	0	0	10	0	0	2	1	21	
06:45	0	17	1	0	1	2	2	23	0	0	1	1	48	
07:00	0	17	0	0	1	1	4	31	0	1	1	0 <	56	154
07:15	1 <	15	0	3	0	2	3	21	0	1 <	0	0 <	46	171
07:30	0 <	19	2	0	1	0	5 <	20 <	0	0 <	0	0	47	197
07:45	0 <	19	1	1	2	2	2 <	17	0	0 <	2	0	46	195
08:00	0 <	16	3 <	2	1	4	3	19	0	0	2	1	51	190
08:15	1 <	16	0 <	3	0	0	2	16	0	1	1 <	0	40	184
08:30	0 <	32	1	5	3 <	4	0	18	0	0	0 <	0	63	200
08:45	0 <	14	0	3	0	1	2	10	0	1 <	1	0	32	186
09:00	0 <	29	0	4 <	2	1	3	15	0	0 <	2	0	56	191
09:15	0	29 <	0	2	0	1	1	20	0	0	2 <	0	55	206 <
09:30	0	25	0	1	1	5	0	14	0	0	0 <	0	46	189
09:45	0	15	1	3	0	2	4	13	0	0	1 <	2 <	41	198
10:00	0	19	2	1	2	3 <	1	16	0	0	1	0 <	45	187

All Vehicles — **Total Vehicles**

	1	2	3	4	5	6	7	8	9	10	11	12	15 MIN HOUR	
06:15	0	207	19	14	1	34	11	120	0	19	4	3	432	
06:30	1	286	9	11	4	15	8	114	0	6	10	3	467	
06:45	1	264	14	12	8	21	8	206	0	11	12	5	562	
07:00	0	267	16	11	11	31	21	175	0	19	8	3	562	2023
07:15	4	293	18	19	7	41	14	162	0	16	5	2	581	2172
07:30	2	330	18	11	8	38	20	197	0	31	16	4	675	2380
07:45	1	275	28	23	9	42	21	264	0	23	11	5	702	2520
08:00	0	293	49	29	4	42	37	314	0	17	24	4	813	2771
08:15	5	297 <	40	33	11	29	40	312	0	22 <	34	8	831	3021
08:30	5	278	62	37	20	49	40	312	0	16	29	5	853	3199
08:45	6	253	77	50	12	48	44	305 <	0	24	19	13	851	3348
09:00	4 <	267	87	31	24	40	55	273	0	20	32	5 <	838	3373
09:15	4	265	87	47	17 <	54	49	256	0	21	33	5	838	3380 <
09:30	5	199	84	58	15	58	51 <	231	0	16	29	5	751	3278
09:45	3	212	88	46	15	63	35	224	0	12	25 <	8	731	3158
10:00	6	166	97 <	61 <	19	50 <	43	193	0	11	30	9	685	3005

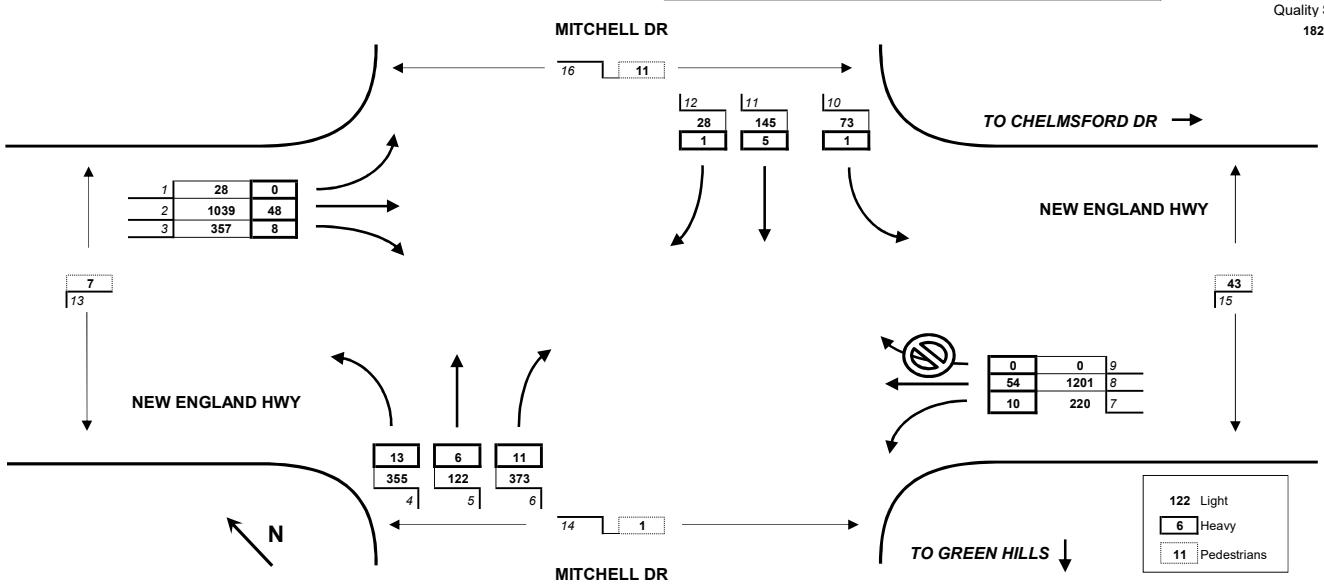
Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

26/7/2018 - MITCHELL DR / NEW ENGLAND HWY, GREENHILLS

16:30 <<< HOUR ENDING **Thursday**

Summary:	MITCHELL DR / NEW ENGLAND HWY
3941	Total Light Vehicles
157	Total Heavy Vehicles
62	Total Pedestrians

Quality Surveys
182825



26/7/2018 - MITCHELL DR / NEW ENGLAND HWY, GREENHILLS

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
14:15	3	235	73	106	26	95	21	212	0	14	39	4	828		5	3	7	3
14:30	2	219	80	67	16	81	28	266	0	9	23	3	794		1	0	4	0
14:45	3	208	50	104	27	95	37	248	0	16	33	10	831		7	4	6	2
15:00	2	227	67	100	20	66	43	294	0	18	39	3	879	3332	0	0	5	0
15:15	10	205	82	87	23	72	51	302	0	13	31	8	884	3388	3	2	6	3
15:30	7	281	84	78	20	81	54	225	0	19	35	10	894	3488	9 <	12 <	10	2
15:45	7	279	68	72	30	86	51	312	0	18	46	7	976	3633	6	0	11	5
16:00	13 <	266	84	89	30	85	56	290	0	23	27	8 <	971	3725	1 <	1	10	3 <
16:15	4	238 <	103	97	27	100	62	276	0	14 <	34	7	962	3803	0	0	13 <	3 <
16:30	4	256	102	97	35 <	102	51	323 <	0	18	38	6	1032	3941 <	0	0	9	0
16:45	6	261	82	90	25	84	50	288	0	12	37	8	943	3908	2	3	4	1
17:00	4	255	107	118	22	80	44	253	0	19	38	2	942	3879	2	3	6	0
17:15	7	232	121	107 <	23	127	55	255	0	18	47	8	1000	3917	1	1	12	5
17:30	5	294	84	85	25	96	58	301	0	12	39 <	2	1001	3886	4	2	5	3
17:45	9	216	90	101	29	101	57	252	0	8	30	2	895	3838	2	3	3	0
18:00	3	179	135 <	94	27	100 <	67 <	253	0	9	28	3	898	3794	0	0	4	1

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
14:15	0	14	0	1	0	5	2	16	0	0	1	0	39	
14:30	0	22	2	2	0	1	3	16	0	0	1	0	47	
14:45	1	16	3	0	3	4	3	22	0	0	1	0	53	
15:00	0 <	14	1	2	1	4 <	2 <	29	0	0	1	0	54	193
15:15	0 <	19	1	2	0	3	2 <	18 <	0	1	2	1	49	203 <
15:30	0 <	20	1	3	1	3 <	0	13	0	1	2	1 <	45	201
15:45	0	20 <	4	4	2	2	2	20	0	0	0	0 <	54	202
16:00	0	6	3 <	3	2	4	6 <	16	0	1 <	3 <	0 <	44	192
16:15	0	13	1 <	2	0	0	2 <	12	0	0	0	0	30	173
16:30	0	9	0	4 <	2 <	5	0 <	6	0	0	2	1	29	157
16:45	0	21	0	0	0	3	1	5	0	0	0	0	30	133
17:00	0	14	2	0	1	2	1	8	0	0	1	0	29	118
17:15	0	14	0	0	2	1	2	4	0	0	0	0	23	111
17:30	0	6	0	2	1	0	0	6	0	1	3	0	19	101
17:45	0	0	0	1	0	2	1	7	0	0	0	0	11	82
18:00	0	1	0	1	1	1	0	3	0	0	2	0	9	62

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
14:15	3	249	73	107	26	100	23	228	0	14	40	4	867	
14:30	2	241	82	69	16	82	31	282	0	9	24	3	841	
14:45	4	224	53	104	30	99	40	270	0	16	34	10	884	
15:00	2	241	68	102	21	70	45	323	0	18	40	3	933	3525
15:15	10	224	83	89	23	75	53	320	0	14	33	9	933	3591
15:30	7	301	85	81	21	84	54	238	0	20	37	11	939	3689
15:45	7	299	72	76	32	88	53	332	0	18	46	7	1030	3835
16:00	13 <	272	87	92	32	89	62	306	0	24 <	30	8 <	1015	3917
16:15	4	251 <	104	99	27	100	64	288	0	14 <	34	7	992	3976
16:30	4	265	102	101	37 <	107	51	329 <	0	18	40	7	1061	4098 <
16:45	6	282	82	90	25	87	51	293	0	12	37	8	973	4041
17:00	4	269	109	118	23	82	45	261	0	19	39	2	971	3997
17:15	7	246	121	107 <	25	128	57	259	0	18	47	8	1023	4028
17:30	5	300	84	87	26	96	58	307	0	13	42 <	2	1020	3987
17:45	9	216	90	102	29	103	58	259	0	8	30	2	906	3920
18:00	3	180	135 <	95	28	101 <	67 <	256	0	9	30	3	907	3856

Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

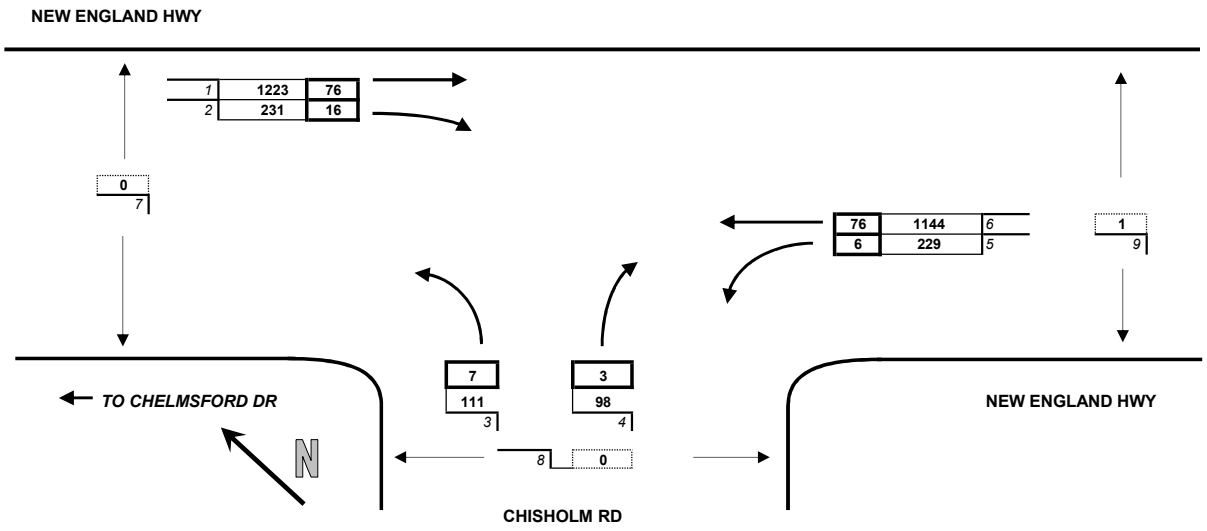
26/7/2018 - NEW ENGLAND HWY / CHISHOLM RD, GREENHILLS

8:45 <<< HOUR ENDING **Thursday**

Summary: NEW ENGLAND HWY / CHISHOLM RD	
3036	Total Light Vehicles
184	Total Heavy Vehicles
1	Total Pedestrians

Quality Surveys
182825

1223	Light Vehicles
76	Heavy Vehicles
0	Pedestrians



26/7/2018 - NEW ENGLAND HWY / CHISHOLM RD, GREENHILLS

Light Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN HOUR		Pedestrians 7	8	9
06:15	235	3	8	4	11	107	368		0	0	0
06:30	329	3	5	9	14	124	484		0	0	0
06:45	331	19	4	6	10	189	559		0	0	0
07:00	300	16	4	10	28	165	523	1934	0	0	0
07:15	368	15	5	20	18	144	570	2136	0	0	0
07:30	409	16	10	12	32	179	658	2310	0	0	0
07:45	342	27	21	14	32	243	679	2430	0	0	0
08:00	334 <	55	19	19	49	285	761	2668	0	0	1 <
08:15	277	62	26	25	63	294	747	2845	0	0	0 <
08:30	320	78	34	27	62	285	806	2993	0	0	0 <
08:45	292	36 <	32	27 <	55	280 <	722	3036 <	0	0	0 <
09:00	277	38	25 <	17	62 <	272	691	2966	0	0	0
09:15	269	24	21	14	46	214	588	2807	1 <	0	0
09:30	219	28	15	11	47	226	546	2547	0 <	0	0
09:45	233	23	18	19	57	209	559	2384	0 <	0	0
10:00	195	20	22	15	46	197	495	2188	0 <	0	0

Heavy Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN HOUR	
06:15	14	1	1	0	0	16	32	
06:30	21	0	1	0	1	17	40	
06:45	26	0	0	1	1	31	59	
07:00	22	0	0	0	3	24	49	180
07:15	16	1	0	0	0	26	43	191
07:30	20	3	0	1	0	22 <	46	197
07:45	23	1	1	0	2	19	46	184
08:00	17	1	1	0	0	22	41	176
08:15	17	2	0	0	1	17	37	170
08:30	26	11	1	0	2	25	65	189
08:45	16	2 <	5	3	3	12	41	184
09:00	31	0	1	1 <	0	16	49	192
09:15	30	2	1 <	0 <	2	24	59	214 <
09:30	26	1	1 <	0 <	3	18	49	198
09:45	17 <	0	0	0	2	18	37	194
10:00	15	2	0	1	3 <	16	37	182

All Vehicles

	1	2	3	4	5	6	Total Vehicles 15 MIN HOUR	
06:15	249	4	9	4	11	123	400	
06:30	350	3	6	9	15	141	524	
06:45	357	19	4	7	11	220	618	
07:00	322	16	4	10	31	189	572	2114
07:15	384	16	5	20	18	170	613	2327
07:30	429	19	10	13	32	201	704	2507
07:45	365	28	22	14	34	262	725	2614
08:00	351 <	56	20	19	49	307	802	2844
08:15	294	64	26	25	64	311	784	3015
08:30	346	89	35	27	64	310	871	3182
08:45	308	38 <	37	30 <	58	292 <	763	3220 <
09:00	308	38	26 <	18	62 <	288	740	3158
09:15	299	26	22	14	48	238	647	3021
09:30	245	29	16	11	50	244	595	2745
09:45	250	23	18	19	59	227	596	2578
10:00	210	22	22	16	49	213	532	2370

Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

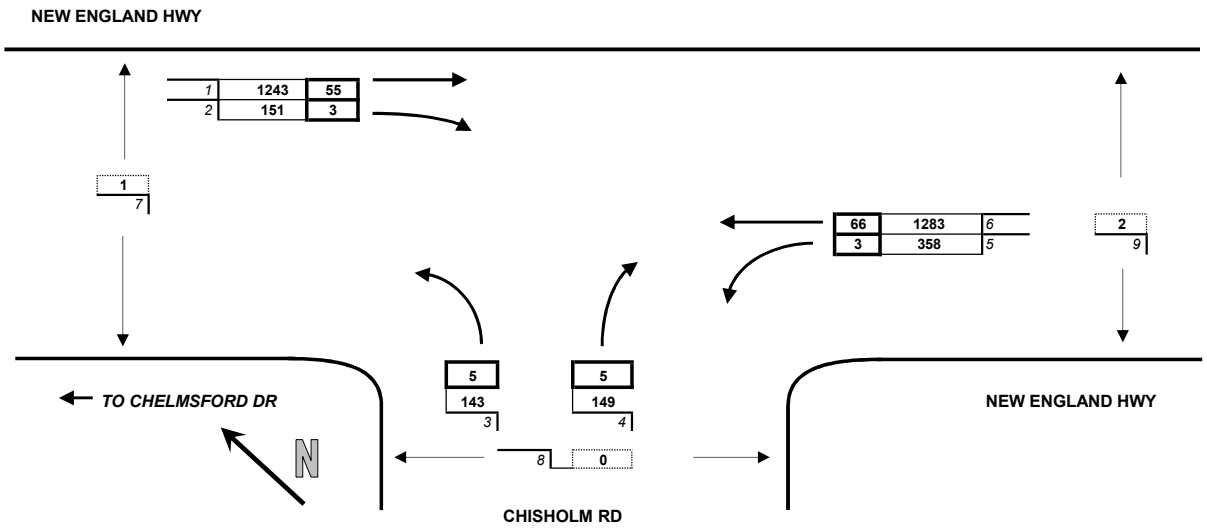
26/7/2018 - NEW ENGLAND HWY / CHISHOLM RD, GREENHILLS

16:30 <<< HOUR ENDING **Thursday**

Summary: NEW ENGLAND HWY / CHISHOLM RD	
3327	Total Light Vehicles
137	Total Heavy Vehicles
3	Total Pedestrians

Quality Surveys
182825

1243	Light Vehicles
55	Heavy Vehicles
1	Pedestrians



26/7/2018 - NEW ENGLAND HWY / CHISHOLM RD, GREENHILLS

	Light Vehicles 1	2	3	4	5	6	Total Vehicles 15 MIN HOUR		Pedestrians 7	8	9
14:15	301	25	32	47	44	202	651		0	0	0
14:30	278	30	22	36	63	271	700		0	0	0
14:45	248	42	41	39	61	271	702		0	0	0
15:00	245	47	29	35 <	63	290	709	2762	0	0	0
15:15	253	42 <	54	43	71	318	781	2892	0	0	0
15:30	320	27	44 <	37	82	265	775	2967	0	0	0
15:45	330	33	26	39	88	307	823	3088	0	0	1
16:00	291	49	31	30	93	302	796	3175	1 <	0	1 <
16:15	313 <	34	40	39	84	311	821	3215	0 <	0	0 <
16:30	309	35	46	41	93 <	363	887	3327 <	0 <	0	0 <
16:45	292	35	47	39	86	300	799	3303	0 <	0	0
17:00	279	25	22	25	84	300	735	3242	0	0	0
17:15	280	28	28	20	84	331 <	771	3192	0	0	0
17:30	314	33	25	30	90	326	818	3123	0	0	0
17:45	280	33	26	25	62	295	721	3045	0	0	0
18:00	185	35	30	20	82	315	667	2977	0	0	0

	Heavy Vehicles 1	2	3	4	5	6	Total Vehicles 15 MIN HOUR	
14:15	16	0	0	1	1	15	33	
14:30	18	1	1	2	1	25	48	
14:45	17	2	0	2	3	27	51	
15:00	18	1	0	0 <	2	34 <	55	187
15:15	21	9	6	1 <	2 <	8	47	201
15:30	25	2 <	4	2 <	0	18	51	204 <
15:45	19 <	2 <	1	0	2	22	46	199
16:00	10	0	2 <	1	0	20	33	177
16:15	12	0	0	2 <	1	14	29	159
16:30	14	1	2	2 <	0	10	29	137
16:45	20	1	1	0 <	1	8	31	122
17:00	14	1	0	0	0	13	28	117
17:15	14	1	0	0	0	4	19	107
17:30	8	0	1	1	1	9	20	98
17:45	4	0	0	0	1	9	14	81
18:00	4	1	0	0	0	4	9	62

	All Vehicles 1	2	3	4	5	6	Total Vehicles 15 MIN HOUR	
14:15	317	25	32	48	45	217	684	
14:30	296	31	23	38	64	296	748	
14:45	265	44	41	41	64	298	753	
15:00	263	48	29	35 <	65	324	764	2949
15:15	274	51 <	60	44	73	326	828	3093
15:30	345	29	48 <	39	82	283	826	3171
15:45	349	35	27	39	90	329	869	3287
16:00	301	49	33	31	93	322	829	3352
16:15	325 <	34	40	41	85	325	850	3374
16:30	323	36	48	43	93 <	373 <	916	3464 <
16:45	312	36	48	39	87	308	830	3425
17:00	293	26	22	25	84	313	763	3359
17:15	294	29	28	20	84	335	790	3299
17:30	322	33	26	31	91	335	838	3221
17:45	284	33	26	25	63	304	735	3126
18:00	189	36	30	20	82	319	676	3039

Note : Arrows "<" indicate the end time for the peak hour for each turning movement.

Appendix B

SIDRA Intersection results

MOVEMENT SUMMARY

Site: [Site 2: Fieldsend Street_Metford_AM - 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
SouthEast: Hospital Access												
21	L2	1	0.0	0.003	3.2	LOS A	0.0	0.1	0.63	0.33	0.63	42.2
22	T1	1	0.0	0.003	2.9	LOS A	0.0	0.1	0.63	0.34	0.63	42.9
23	R2	1	0.0	0.003	2.9	LOS A	0.0	0.1	0.63	0.34	0.63	44.0
Approach		3	0.0	0.003	3.0	LOS A	0.0	0.1	0.63	0.34	0.63	43.1
NorthEast: Metford Road												
24	L2	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.12	0.53	0.12	44.3
2	T1	705	1.5	0.449	4.0	LOS A	3.3	23.6	0.16	0.41	0.16	56.1
3	R2	83	5.1	0.449	9.0	LOS A	3.3	23.6	0.16	0.41	0.16	56.0
Approach		789	1.9	0.449	4.5	LOS A	3.3	23.6	0.16	0.41	0.16	56.1
NorthWest: Fieldsend Street												
4	L2	83	5.1	0.135	7.3	LOS A	0.7	5.4	0.65	0.73	0.65	52.0
28	T1	1	0.0	0.135	11.5	LOS A	0.7	5.4	0.65	0.73	0.65	42.2
6	R2	28	7.4	0.135	12.5	LOS A	0.7	5.4	0.65	0.73	0.65	53.3
Approach		113	5.6	0.135	8.7	LOS A	0.7	5.4	0.65	0.73	0.65	52.3
SouthWest: Metford Road												
7	L2	29	10.7	0.522	4.3	LOS A	3.4	24.4	0.28	0.42	0.28	54.1
8	T1	740	1.1	0.522	4.3	LOS A	3.4	24.4	0.28	0.42	0.28	55.9
32	R2	1	0.0	0.522	11.0	LOS A	3.4	24.4	0.28	0.42	0.28	45.1
Approach		771	1.5	0.522	4.3	LOS A	3.4	24.4	0.28	0.42	0.28	55.8
All Vehicles		1676	1.9	0.522	4.7	LOS A	3.4	24.4	0.25	0.44	0.25	55.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: [Site 2: Fieldsend Street_Metford_AM - 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
SouthEast: Hospital Access												
21	L2	1	0.0	0.003	5.4	LOS A	0.0	0.1	0.76	0.42	0.76	40.4
22	T1	1	0.0	0.003	5.0	LOS A	0.0	0.1	0.77	0.44	0.77	41.1
23	R2	1	0.0	0.003	5.0	LOS A	0.0	0.1	0.77	0.44	0.77	42.2
Approach		3	0.0	0.003	5.2	LOS A	0.0	0.1	0.77	0.43	0.77	41.2
NorthEast: Metford Road												
24	L2	1	0.0	0.001	5.6	LOS A	0.0	0.0	0.12	0.53	0.12	44.3
2	T1	925	1.1	0.570	4.0	LOS A	4.8	34.3	0.19	0.40	0.19	56.1
3	R2	83	5.1	0.570	9.1	LOS A	4.8	34.3	0.19	0.40	0.19	56.0
Approach		1009	1.5	0.570	4.5	LOS A	4.8	34.3	0.19	0.40	0.19	56.1
NorthWest: Fieldsend Street												
4	L2	83	5.1	0.116	6.0	LOS A	0.6	4.1	0.53	0.66	0.53	52.9
28	T1	1	0.0	0.116	10.2	LOS A	0.6	4.1	0.53	0.66	0.53	43.3
6	R2	28	7.4	0.116	11.2	LOS A	0.6	4.1	0.53	0.66	0.53	54.2
Approach		113	5.6	0.116	7.4	LOS A	0.6	4.1	0.53	0.66	0.53	53.2
SouthWest: Metford Road												
7	L2	29	10.7	0.402	4.3	LOS A	2.3	16.0	0.24	0.41	0.24	54.3
8	T1	553	1.5	0.402	4.3	LOS A	2.3	16.0	0.24	0.41	0.24	56.1
32	R2	1	0.0	0.402	11.0	LOS A	2.3	16.0	0.24	0.41	0.24	45.3
Approach		583	2.0	0.402	4.3	LOS A	2.3	16.0	0.24	0.41	0.24	56.0
All Vehicles		1708	1.9	0.570	4.6	LOS A	4.8	34.3	0.23	0.42	0.23	55.8

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.
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: 5 [Site 4: NEH & Mitchell Drive 2018_AM]

Network: N101 [AM Network - Existing - User Phasing]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 124 seconds (Network Site User-Given Phase Times)

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
SouthEast: New England Highway														
1	L2	188	3.9	188	3.9	0.171	8.8	LOS A	1.4	9.9	0.22	0.61	0.22	42.0
2	T1	1265	4.9	1265	4.9	0.468	14.2	LOS A	15.7	114.6	0.46	0.40	0.46	47.1
Approach		1454	4.8	1454	4.8	0.468	13.5	LOS A	15.7	114.6	0.43	0.43	0.43	46.7
NorthEast: Mitchell Drive														
4	L2	86	2.4	86	2.4	0.400	59.5	LOS E	5.0	35.7	0.97	0.77	0.97	2.5
5	T1	120	3.5	120	3.5	0.276	55.6	LOS D	3.4	24.6	0.95	0.73	0.95	7.4
6	R2	33	0.0	33	0.0	0.196	61.2	LOS E	1.9	13.2	0.96	0.72	0.96	20.7
Approach		239	2.6	239	2.6	0.400	57.8	LOS E	5.0	35.7	0.96	0.74	0.96	8.3
NorthWest: New England Highway														
7	L2	21	5.0	21	5.0	0.019	11.0	LOS A	0.3	2.1	0.41	0.64	0.41	43.3
8	T1	1153	8.3	1153	8.3	0.454	9.4	LOS A	15.6	116.9	0.49	0.45	0.49	46.4
9	R2	280	0.4	280	0.4	0.632	63.6	LOS E	8.4	59.0	1.00	0.81	1.02	21.6
Approach		1454	6.7	1454	6.7	0.632	19.8	LOS B	15.6	116.9	0.59	0.52	0.59	37.2
SouthWest: Mitchell Drive														
10	L2	159	9.9	159	9.9	0.140	31.8	LOS C	2.2	16.7	0.82	0.72	0.82	31.3
11	T1	71	7.5	71	7.5	0.332	56.1	LOS D	4.0	30.1	0.96	0.74	0.96	7.3
12	R2	175	3.6	175	3.6	0.538	66.0	LOS E	5.3	38.1	1.00	0.78	1.00	5.1
Approach		404	6.8	404	6.8	0.538	50.8	LOS D	5.3	38.1	0.92	0.75	0.92	15.7
All Vehicles		3551	5.7	3551	5.7	0.632	23.3	LOS B	15.7	116.9	0.59	0.52	0.59	36.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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
P11	SouthEast Stage 1	14	27.1	LOS C	0.0	0.0	0.66	0.66
P12	SouthEast Stage 2	14	52.4	LOS E	0.0	0.0	0.92	0.92
P1S	SouthEast Slip/Bypass Lane Crossing	14	25.0	LOS C	0.0	0.0	0.80	0.80
P2	NorthEast Full Crossing	5	10.9	LOS B	0.0	0.0	0.42	0.42
P2S	NorthEast Slip/Bypass Lane Crossing	5	2.3	LOS A	0.0	0.0	0.19	0.19
P3	NorthWest Full Crossing	14	56.2	LOS E	0.0	0.0	0.95	0.95
P4	SouthWest Full Crossing	1	23.3	LOS C	0.0	0.0	0.61	0.61
P4S	SouthWest Slip/Bypass Lane Crossing	1	8.0	LOS A	0.0	0.0	0.51	0.51

All Pedestrians	67	34.2	LOS D	0.74	0.74

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.

MOVEMENT SUMMARY

Site: 5 [Site 4: NEH & Mitchell Drive 2018_PM]

Network: N101 [PM Network - Existing - User Phasing]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

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
SouthEast: New England Highway														
1	L2	242	4.4	242	4.4	0.231	12.4	LOS A	3.4	25.0	0.45	0.68	0.45	38.2
2	T1	1321	4.3	1321	4.3	0.548	22.8	LOS B	20.1	145.6	0.68	0.60	0.68	41.6
Approach		1563	4.3	1563	4.3	0.548	21.2	LOS B	20.1	145.6	0.65	0.62	0.65	41.3
NorthEast: Mitchell Drive														
4	L2	78	1.4	78	1.4	0.324	55.7	LOS D	4.3	30.2	0.95	0.76	0.95	2.7
5	T1	158	3.3	158	3.3	0.327	52.8	LOS D	4.3	31.1	0.95	0.74	0.95	7.7
6	R2	31	3.4	31	3.4	0.143	55.3	LOS D	1.6	11.8	0.93	0.72	0.93	22.0
Approach		266	2.8	266	2.8	0.327	53.9	LOS D	4.3	31.1	0.95	0.74	0.95	8.7
NorthWest: New England Highway														
7	L2	29	0.0	29	0.0	0.028	11.5	LOS A	0.4	2.9	0.45	0.65	0.45	42.7
8	T1	1144	4.4	1144	4.4	0.470	11.6	LOS A	16.9	122.5	0.55	0.50	0.55	44.0
9	R2	384	2.2	384	2.2	0.796	65.5	LOS E	11.9	84.8	1.00	0.91	1.18	21.2
Approach		1558	3.8	1558	3.8	0.796	24.9	LOS B	16.9	122.5	0.66	0.60	0.71	34.0
SouthWest: Mitchell Drive														
10	L2	387	3.5	387	3.5	0.295	28.6	LOS C	4.9	35.6	0.84	0.76	0.84	33.0
11	T1	135	4.7	135	4.7	0.564	54.8	LOS D	7.6	55.7	0.99	0.79	0.99	7.5
12	R2	404	2.9	404	2.9	0.942	83.6	LOS F	14.6	104.8	1.00	1.06	1.53	4.1
Approach		926	3.4	926	3.4	0.942	56.4	LOS D	14.6	104.8	0.93	0.90	1.16	15.0
All Vehicles		4314	3.8	4314	3.8	0.942	32.1	LOS C	20.1	145.6	0.73	0.68	0.80	30.6

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.
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
P11	SouthEast Stage 1	14	22.2	LOS C	0.0	0.0	0.61	0.61
P12	SouthEast Stage 2	14	49.5	LOS E	0.0	0.0	0.91	0.91
P1S	SouthEast Slip/Bypass Lane Crossing	14	21.2	LOS C	0.0	0.0	0.78	0.78
P2	NorthEast Full Crossing	5	13.1	LOS B	0.0	0.0	0.47	0.47
P2S	NorthEast Slip/Bypass Lane Crossing	5	2.6	LOS A	0.0	0.0	0.21	0.21
P3	NorthWest Full Crossing	14	54.2	LOS E	0.0	0.0	0.95	0.95
P4	SouthWest Full Crossing	1	27.3	LOS C	0.0	0.0	0.68	0.68
P4S	SouthWest Slip/Bypass Lane Crossing	1	9.7	LOS A	0.0	0.0	0.57	0.57

All Pedestrians	67	31.7	LOS D	0.73	0.73

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.

MOVEMENT SUMMARY

Site: [Site 5: NEH & Chelmsford Drive 2018_AM]

Network: N101 [AM Network - Existing - User Phasing]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 124 seconds (Network Site User-Given Phase Times)

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
SouthEast: New England Highway														
21	L2	64	3.3	64	3.3	0.054	12.7	LOS A	1.0	7.4	0.29	0.62	0.29	34.3
2	T1	1116	5.3	1116	5.3	0.603	19.1	LOS B	20.7	151.7	0.62	0.55	0.62	25.5
3	R2	160	11.8	160	11.8	0.584	68.4	LOS E	5.0	38.2	1.00	0.79	1.03	19.5
Approach		1340	6.0	1340	6.0	0.603	24.6	LOS B	20.7	151.7	0.65	0.58	0.65	24.0
NorthEast: Chelmsford Drive														
4	L2	283	6.3	283	6.3	0.451	26.8	LOS B	9.8	72.6	0.83	0.79	0.83	26.4
25	T1	425	1.2	425	1.2	0.440	42.3	LOS C	10.9	76.8	0.89	0.74	0.89	23.4
6	R2	244	3.4	244	3.4	0.496	46.4	LOS D	12.5	89.7	0.89	0.81	0.89	18.5
Approach		953	3.3	953	3.3	0.496	38.7	LOS C	12.5	89.7	0.87	0.78	0.87	22.7
NorthWest: New England Highway														
7	L2	221	7.1	221	7.1	0.192	10.3	LOS A	2.3	17.1	0.36	0.65	0.36	46.8
8	T1	1133	7.7	1133	7.7	0.833	40.3	LOS C	32.1	239.7	0.93	0.88	0.99	20.5
Approach		1354	7.6	1354	7.6	0.833	35.4	LOS C	32.1	239.7	0.84	0.84	0.89	24.2
SouthWest: Chelmsford Drive Extension														
30	L2	77	0.0	77	0.0	0.371	62.9	LOS E	4.5	31.2	0.97	0.76	0.97	6.3
31	T1	165	0.6	165	0.6	0.406	57.6	LOS E	4.8	33.9	0.98	0.76	0.98	19.2
32	R2	71	3.0	71	3.0	0.347	62.0	LOS E	4.1	29.2	0.96	0.76	0.96	6.5
Approach		313	1.0	313	1.0	0.406	59.9	LOS E	4.8	33.9	0.97	0.76	0.97	13.8
All Vehicles		3959	5.5	3959	5.5	0.833	34.5	LOS C	32.1	239.7	0.79	0.73	0.81	22.6

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.
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	SouthEast Full Crossing	3	47.9	LOS E	0.0	0.0	0.88	0.88
P1S	SouthEast Slip/Bypass Lane Crossing	3	36.4	LOS D	0.0	0.0	0.77	0.77
P2	NorthEast Full Crossing	1	35.6	LOS D	0.0	0.0	0.76	0.76
P2S	NorthEast Slip/Bypass Lane Crossing	1	10.5	LOS B	0.0	0.0	0.56	0.56
P3	NorthWest Full Crossing	1	56.1	LOS E	0.0	0.0	0.95	0.95
P3S	NorthWest Slip/Bypass Lane Crossing	1	51.5	LOS E	0.0	0.0	0.91	0.91
P8	SouthWest Full Crossing	1	24.5	LOS C	0.0	0.0	0.63	0.63
P8S	SouthWest Slip/Bypass Lane	1	2.5	LOS A	0.0	0.0	0.20	0.20

Crossing					
All Pedestrians	13	36.1	LOS D	0.75	0.75

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.

MOVEMENT SUMMARY

Site: [Site 5: NEH & Chelmsford Drive 2018_PM]

Network: N101 [PM Network - Existing - User Phasing]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

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
SouthEast: New England Highway														
21	L2	93	1.1	93	1.1	0.074	11.5	LOS A	1.4	9.6	0.27	0.62	0.27	35.6
2	T1	1264	4.7	1264	4.7	0.600	14.0	LOS A	20.6	150.3	0.54	0.49	0.54	30.1
3	R2	219	6.3	219	6.3	0.466	58.9	LOS E	6.1	45.1	0.97	0.79	0.97	21.5
Approach		1576	4.7	1576	4.7	0.600	20.1	LOS B	20.6	150.3	0.58	0.54	0.58	27.4
NorthEast: Chelmsford Drive														
4	L2	194	6.0	194	6.0	0.291	24.6	LOS B	6.2	45.5	0.76	0.76	0.76	27.6
25	T1	366	1.1	366	1.1	0.437	44.1	LOS D	9.3	66.1	0.91	0.75	0.91	22.8
6	R2	223	1.4	223	1.4	0.866	69.8	LOS E	14.5	102.7	1.00	0.95	1.29	13.7
Approach		783	2.4	783	2.4	0.866	46.6	LOS D	14.5	102.7	0.90	0.81	0.98	20.3
NorthWest: New England Highway														
7	L2	445	2.8	445	2.8	0.464	15.7	LOS B	8.0	57.7	0.64	0.76	0.64	42.5
8	T1	1214	5.3	1214	5.3	0.867	42.9	LOS D	36.2	265.0	0.96	0.94	1.06	19.7
Approach		1659	4.6	1659	4.6	0.867	35.6	LOS C	36.2	265.0	0.87	0.89	0.94	25.3
SouthWest: Chelmsford Drive Extension														
30	L2	58	1.8	58	1.8	0.188	53.3	LOS D	3.0	21.1	0.91	0.74	0.91	7.3
31	T1	322	0.7	322	0.7	0.560	50.9	LOS D	9.5	66.9	0.97	0.78	0.97	20.9
32	R2	78	2.7	78	2.7	0.576	66.8	LOS E	4.7	33.5	1.00	0.78	1.03	6.0
Approach		458	1.2	458	1.2	0.576	53.9	LOS D	9.5	66.9	0.97	0.78	0.97	17.0
All Vehicles		4476	3.9	4476	3.9	0.867	33.9	LOS C	36.2	265.0	0.79	0.74	0.83	23.6

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.
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	SouthEast Full Crossing	3	50.4	LOS E	0.0	0.0	0.92	0.92
P1S	SouthEast Slip/Bypass Lane Crossing	3	38.4	LOS D	0.0	0.0	0.80	0.80
P2	NorthEast Full Crossing	1	33.8	LOS D	0.0	0.0	0.75	0.75
P2S	NorthEast Slip/Bypass Lane Crossing	1	10.4	LOS B	0.0	0.0	0.58	0.58
P3	NorthWest Full Crossing	1	54.2	LOS E	0.0	0.0	0.95	0.95
P3S	NorthWest Slip/Bypass Lane Crossing	1	44.2	LOS E	0.0	0.0	0.86	0.86
P8	SouthWest Full Crossing	1	19.3	LOS B	0.0	0.0	0.57	0.57
P8S	SouthWest Slip/Bypass Lane	1	4.3	LOS A	0.0	0.0	0.27	0.27

Crossing					
All Pedestrians	13	36.0	LOS D	0.76	0.76

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.

MOVEMENT SUMMARY

Site: 7 [Site 6: NEH & Chisholm Rd 2018_AM]

Network: N101 [AM Network - Existing - User Phasing]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 124 seconds (Network Site User-Given Phase Times)

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
SouthEast: New England Highway														
21	L2	261	2.4	261	2.4	0.182	8.2	LOS A	3.3	23.4	0.27	0.63	0.27	48.7
2	T1	1264	5.8	1264	5.8	0.511	12.3	LOS A	19.8	145.8	0.57	0.52	0.57	42.9
Approach		1525	5.2	1525	5.2	0.511	11.6	LOS A	19.8	145.8	0.52	0.54	0.52	44.3
NorthWest: New England Highway														
8	T1	1322	7.2	1322	7.2	0.348	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
29	R2	241	6.6	241	6.6	0.968	88.7	LOS F	17.5	129.2	1.00	1.01	1.37	17.2
Approach		1563	7.1	1563	7.1	0.968	13.7	LOS A	17.5	129.2	0.15	0.16	0.21	44.8
SouthWest: Chisholm Road														
30	L2	131	5.6	131	5.6	0.276	44.1	LOS D	6.3	46.3	0.84	0.76	0.84	20.5
32	R2	105	4.0	105	4.0	0.705	68.8	LOS E	6.6	48.1	1.00	0.84	1.12	25.3
Approach		236	4.9	236	4.9	0.705	55.1	LOS D	6.6	48.1	0.91	0.80	0.97	23.3
All Vehicles		3324	6.1	3324	6.1	0.968	15.7	LOS B	19.8	145.8	0.38	0.38	0.41	41.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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: 7 [Site 6: NEH & Chisholm Rd 2018_PM]

Network: N101 [PM Network - Existing - User Phasing]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

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
SouthEast: New England Highway														
21	L2	380	0.8	380	0.8	0.251	7.2	LOS A	3.7	26.3	0.24	0.62	0.24	49.4
2	T1	1420	4.9	1420	4.9	0.566	12.3	LOS A	22.6	164.8	0.60	0.55	0.60	42.9
Approach		1800	4.0	1800	4.0	0.566	11.2	LOS A	22.6	164.8	0.52	0.56	0.52	44.8
NorthWest: New England Highway														
8	T1	1366	4.2	1366	4.2	0.353	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
29	R2	162	1.9	162	1.9	0.887	73.8	LOS F	10.7	76.4	1.00	0.99	1.39	19.5
Approach		1528	4.0	1528	4.0	0.887	7.8	LOS A	10.7	76.4	0.11	0.11	0.15	50.2
SouthWest: Chisholm Road														
30	L2	156	3.4	156	3.4	0.335	44.3	LOS D	7.5	53.9	0.86	0.78	0.86	20.4
32	R2	162	3.2	162	3.2	0.803	67.0	LOS E	10.1	72.8	1.00	0.91	1.21	25.7
Approach		318	3.3	318	3.3	0.803	55.9	LOS D	10.1	72.8	0.93	0.84	1.04	23.8
All Vehicles		3646	3.9	3646	3.9	0.887	13.7	LOS A	22.6	164.8	0.38	0.40	0.41	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.
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 SUMMARY

Site: [Site 1: Raymond Terrace_Metford_AM - 2022 Without Development]

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
SouthEast: Raymond Terrace Road												
21	L2	425	2.2	0.554	9.3	LOS A	4.5	32.2	0.82	0.92	0.96	51.9
22	T1	598	1.4	0.738	11.3	LOS A	9.2	65.8	0.93	1.05	1.28	51.6
23	R2	99	6.4	0.738	17.2	LOS B	9.2	65.8	0.93	1.05	1.28	51.7
23u	U	1	0.0	0.738	19.3	LOS B	9.2	65.8	0.93	1.05	1.28	53.2
Approach		1123	2.2	0.738	11.1	LOS A	9.2	65.8	0.89	1.00	1.16	51.7
NorthEast: Metford Road												
24	L2	181	11.5	0.281	7.6	LOS A	1.3	10.4	0.66	0.81	0.66	52.9
25	T1	458	0.2	0.495	7.0	LOS A	3.4	24.0	0.73	0.74	0.82	54.2
26	R2	27	0.0	0.495	12.6	LOS A	3.4	24.0	0.73	0.74	0.82	54.6
Approach		666	3.3	0.495	7.4	LOS A	3.4	24.0	0.71	0.75	0.77	53.9
NorthWest: Raymond Terrace Road												
27	L2	17	0.0	0.167	7.0	LOS A	0.8	6.0	0.63	0.69	0.63	53.3
28	T1	363	1.7	0.409	6.2	LOS A	2.8	19.7	0.70	0.67	0.70	54.0
29	R2	128	0.8	0.409	11.6	LOS A	2.8	19.7	0.72	0.67	0.72	54.0
Approach		508	1.4	0.409	7.6	LOS A	2.8	19.7	0.70	0.67	0.70	54.0
SouthWest: Metford Road												
30	L2	136	0.0	0.261	8.5	LOS A	1.6	11.1	0.79	0.85	0.79	52.5
31	T1	224	1.4	0.575	9.6	LOS A	5.6	39.6	0.94	0.99	1.11	51.4
32	R2	223	2.4	0.575	15.3	LOS B	5.6	39.6	0.94	0.99	1.11	51.7
Approach		583	1.4	0.575	11.6	LOS A	5.6	39.6	0.91	0.96	1.04	51.7
All Vehicles		2881	2.2	0.738	9.7	LOS A	9.2	65.8	0.82	0.88	0.96	52.6

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.
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 [Site 1: Raymond Terrace_Metford_PM - 2022 Without Development]

New Site
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
SouthEast: Raymond Terrace Road												
21	L2	420	2.5	0.442	5.8	LOS A	2.8	20.1	0.61	0.67	0.61	54.0
22	T1	519	1.8	0.609	6.0	LOS A	5.4	38.4	0.70	0.67	0.75	53.9
23	R2	193	3.7	0.609	11.8	LOS A	5.4	38.4	0.70	0.67	0.75	54.1
23u	U	1	0.0	0.609	14.0	LOS A	5.4	38.4	0.70	0.67	0.75	55.6
Approach		1133	2.4	0.609	6.9	LOS A	5.4	38.4	0.67	0.67	0.70	53.9
NorthEast: Metford Road												
24	L2	115	3.0	0.188	7.8	LOS A	0.9	6.6	0.69	0.81	0.69	53.0
25	T1	287	0.4	0.341	6.6	LOS A	2.0	14.3	0.74	0.67	0.74	54.3
26	R2	11	0.0	0.341	12.3	LOS A	2.0	14.3	0.74	0.67	0.74	54.6
Approach		413	1.1	0.341	7.1	LOS A	2.0	14.3	0.73	0.71	0.73	53.9
NorthWest: Raymond Terrace Road												
27	L2	13	0.0	0.237	8.7	LOS A	1.2	8.5	0.75	0.84	0.75	52.5
28	T1	501	1.3	0.579	9.3	LOS A	4.9	34.6	0.86	0.98	1.02	53.2
29	R2	60	1.8	0.579	15.1	LOS B	4.9	34.6	0.89	1.01	1.09	53.3
Approach		574	1.3	0.579	9.9	LOS A	4.9	34.6	0.86	0.98	1.02	53.2
SouthWest: Metford Road												
30	L2	98	0.0	0.345	8.8	LOS A	2.1	14.5	0.79	0.86	0.79	52.3
31	T1	422	0.7	0.758	12.9	LOS A	10.1	71.5	0.95	1.09	1.31	49.7
32	R2	300	2.0	0.758	19.9	LOS B	10.1	71.5	1.00	1.16	1.47	48.8
Approach		820	1.1	0.758	15.0	LOS B	10.1	71.5	0.95	1.09	1.31	49.6
All Vehicles		2939	1.7	0.758	9.8	LOS A	10.1	71.5	0.79	0.85	0.94	52.5

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.

MOVEMENT SUMMARY

Site: [Site 3: Chelmsford Drive_Metford Road_AM - 2022 Without Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	374	1.0	1.252	143.5	LOS F	55.0	390.2	1.00	2.66	5.38	15.7
23	R2	217	2.7	1.252	147.9	LOS F	55.0	390.2	1.00	2.66	5.38	17.8
23u	U	1	0.0	1.252	149.6	LOS F	55.0	390.2	1.00	2.66	5.38	17.9
Approach		592	1.6	1.252	145.1	LOS F	55.0	390.2	1.00	2.66	5.38	16.5
NorthEast: Metford Road												
24	L2	252	0.0	0.996	30.1	LOS C	36.7	260.3	1.00	1.31	2.12	38.4
26	R2	792	2.1	0.996	34.7	LOS C	36.7	260.3	1.00	1.31	2.12	36.4
Approach		1043	1.6	0.996	33.6	LOS C	36.7	260.3	1.00	1.31	2.12	36.9
NorthWest: Chelmsford Drive-W												
27	L2	429	1.5	0.333	5.2	LOS A	2.5	17.9	0.48	0.57	0.48	52.0
28	T1	240	0.7	0.266	5.2	LOS A	1.8	12.9	0.47	0.56	0.47	52.5
29u	U	53	4.0	0.266	11.4	LOS A	1.8	12.9	0.47	0.56	0.47	51.0
Approach		722	1.5	0.333	5.7	LOS A	2.5	17.9	0.48	0.56	0.48	52.1
All Vehicles		2357	1.6	1.252	53.0	LOS D	55.0	390.2	0.84	1.42	2.44	29.8

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.
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 [Site 3: Chelmsford Drive_Metford Road_PM - 2022 Without Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	362	1.0	0.722	14.7	LOS B	8.7	61.8	1.00	1.13	1.37	46.0
23	R2	136	2.7	0.722	19.1	LOS B	8.7	61.8	1.00	1.13	1.37	47.6
23u	U	1	0.0	0.722	20.8	LOS B	8.7	61.8	1.00	1.13	1.37	48.3
Approach		499	1.5	0.722	15.9	LOS B	8.7	61.8	1.00	1.13	1.37	46.5
NorthEast: Metford Road												
24	L2	161	0.0	0.855	19.3	LOS B	14.9	106.1	1.00	1.26	1.71	43.2
26	R2	529	2.1	0.855	23.8	LOS B	14.9	106.1	1.00	1.26	1.71	41.6
Approach		691	1.6	0.855	22.8	LOS B	14.9	106.1	1.00	1.26	1.71	42.1
NorthWest: Chelmsford Drive-W												
27	L2	704	1.5	0.507	5.2	LOS A	4.8	34.4	0.52	0.55	0.52	51.9
28	T1	459	0.7	0.428	5.1	LOS A	3.6	25.3	0.49	0.53	0.49	52.7
29u	U	53	4.0	0.428	11.3	LOS A	3.6	25.3	0.49	0.53	0.49	51.3
Approach		1216	1.3	0.507	5.4	LOS A	4.8	34.4	0.51	0.55	0.51	52.2
All Vehicles		2405	1.5	0.855	12.6	LOS A	14.9	106.1	0.75	0.87	1.03	47.5

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.

MOVEMENT SUMMARY

Site: [Site 3: (Proposed Layout) Chelmsford Drive_Metford Road_AM - 2022 Without Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	374	1.0	0.406	7.8	LOS A	2.2	15.5	0.71	0.85	0.77	51.6
23	R2	217	2.7	0.406	12.4	LOS A	2.2	15.4	0.71	0.92	0.78	50.5
23u	U	1	0.0	0.406	14.2	LOS A	2.2	15.4	0.71	0.92	0.78	51.3
Approach		592	1.6	0.406	9.5	LOS A	2.2	15.5	0.71	0.87	0.77	51.1
NorthEast: Metford Road												
24	L2	252	0.0	0.461	6.1	LOS A	3.5	24.8	0.61	0.69	0.61	51.4
26	R2	792	2.1	0.461	10.4	LOS A	3.5	24.8	0.62	0.71	0.62	50.0
Approach		1043	1.6	0.461	9.4	LOS A	3.5	24.8	0.62	0.70	0.62	50.4
NorthWest: Chelmsford Drive-W												
27	L2	429	1.5	0.341	5.5	LOS A	2.4	17.4	0.50	0.59	0.50	52.0
28	T1	240	0.7	0.274	5.5	LOS A	1.8	12.6	0.49	0.59	0.49	52.4
29u	U	53	4.0	0.274	11.7	LOS A	1.8	12.6	0.49	0.59	0.49	50.9
Approach		722	1.5	0.341	5.9	LOS A	2.4	17.4	0.50	0.59	0.50	52.0
All Vehicles		2357	1.6	0.461	8.3	LOS A	3.5	24.8	0.60	0.71	0.62	51.1

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.

MOVEMENT SUMMARY

Site: [Site 3: (Proposed Layout) Chelmsford Drive_Metford Road_PM - 2022 Without Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	362	1.0	0.291	6.3	LOS A	1.4	10.0	0.60	0.70	0.60	52.1
23	R2	136	2.7	0.291	10.8	LOS A	1.4	10.0	0.60	0.77	0.60	52.0
23u	U	1	0.0	0.291	12.6	LOS A	1.4	10.0	0.60	0.77	0.60	52.9
Approach		499	1.5	0.291	7.6	LOS A	1.4	10.0	0.60	0.72	0.60	52.1
NorthEast: Metford Road												
24	L2	161	0.0	0.370	7.2	LOS A	2.6	18.4	0.71	0.77	0.71	50.8
26	R2	529	2.1	0.370	11.7	LOS A	2.6	18.4	0.71	0.80	0.71	49.4
Approach		691	1.6	0.370	10.7	LOS A	2.6	18.4	0.71	0.79	0.71	49.8
NorthWest: Chelmsford Drive-W												
27	L2	704	1.5	0.499	5.2	LOS A	4.3	30.7	0.47	0.55	0.47	52.1
28	T1	459	0.7	0.421	5.1	LOS A	3.2	22.8	0.45	0.53	0.45	52.9
29u	U	53	4.0	0.421	11.3	LOS A	3.2	22.8	0.45	0.53	0.45	51.5
Approach		1216	1.3	0.499	5.4	LOS A	4.3	30.7	0.46	0.54	0.46	52.4
All Vehicles		2405	1.5	0.499	7.4	LOS A	4.3	30.7	0.56	0.65	0.56	51.5

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.

MOVEMENT SUMMARY

Site: 5 [Site 4: NEH & Mitchell Drive 2022_AM]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
1	L2	202	3.9	202	3.9	0.199	11.3	LOS A	2.6	18.6	0.57	0.71	0.57	39.2
2	T1	1286	4.9	1286	4.9	0.539	20.1	LOS B	17.4	126.7	0.80	0.71	0.80	43.1
Approach		1488	4.8	1488	4.8	0.539	18.9	LOS B	17.4	126.7	0.77	0.71	0.77	42.8
NorthEast: Mitchell Drive														
4	L2	93	2.4	93	2.4	0.545	47.9	LOS D	4.1	29.6	1.00	0.78	1.01	3.1
5	T1	128	3.5	128	3.5	0.375	44.0	LOS D	2.8	20.3	0.98	0.74	0.98	9.0
6	R2	34	0.0	34	0.0	0.180	44.7	LOS D	1.4	9.9	0.95	0.72	0.95	25.1
Approach		255	2.6	255	2.6	0.545	45.5	LOS D	4.1	29.6	0.98	0.75	0.99	10.1
NorthWest: New England Highway														
7	L2	23	5.0	23	5.0	0.023	10.5	LOS A	0.2	1.7	0.47	0.65	0.47	43.7
8	T1	1232	8.3	1232	8.3	0.545	10.9	LOS A	15.6	117.2	0.63	0.57	0.63	44.8
9	R2	299	0.4	299	0.4	0.918	64.1	LOS E	8.0	56.5	1.00	1.06	1.63	21.5
Approach		1554	6.7	1554	6.7	0.918	21.1	LOS B	15.6	117.2	0.70	0.66	0.82	36.3
SouthWest: Mitchell Drive														
10	L2	162	9.9	162	9.9	0.188	26.4	LOS B	1.7	12.8	0.88	0.73	0.88	34.0
11	T1	73	7.5	73	7.5	0.435	44.4	LOS D	3.2	23.9	0.99	0.75	0.99	9.0
12	R2	178	3.6	178	3.6	0.486	48.8	LOS D	3.9	28.2	0.99	0.77	0.99	6.7
Approach		413	6.8	413	6.8	0.486	39.2	LOS C	3.9	28.2	0.95	0.75	0.95	18.9
All Vehicles		3709	5.7	3709	5.7	0.918	23.9	LOS B	17.4	126.7	0.78	0.70	0.83	35.7

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.
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
P11	SouthEast Stage 1	14	20.0	LOS C	0.0	0.0	0.67	0.67
P12	SouthEast Stage 2	14	39.2	LOS D	0.0	0.0	0.93	0.93
P1S	SouthEast Slip/Bypass Lane Crossing	14	19.8	LOS B	0.0	0.0	0.87	0.87
P2	NorthEast Full Crossing	5	12.8	LOS B	0.0	0.0	0.53	0.53
P2S	NorthEast Slip/Bypass Lane Crossing	5	2.7	LOS A	0.0	0.0	0.24	0.24
P3	NorthWest Full Crossing	14	39.2	LOS D	0.0	0.0	0.93	0.93
P4	SouthWest Full Crossing	1	23.5	LOS C	0.0	0.0	0.72	0.72
P4S	SouthWest Slip/Bypass Lane Crossing	1	7.6	LOS A	0.0	0.0	0.58	0.58

All Pedestrians	67	25.7	LOS C	0.77	0.77

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.

MOVEMENT SUMMARY

Site: 5 [Site 4: NEH & Mitchell Drive 2022_PM]

Network: N101 [PM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
1	L2	328	4.3	328	4.3	0.346	12.7	LOS A	4.7	34.5	0.62	0.74	0.62	37.9
2	T1	1368	4.3	1368	4.3	0.670	27.2	LOS B	20.4	148.0	0.93	0.81	0.93	39.3
Approach		1697	4.3	1697	4.3	0.670	24.4	LOS B	20.4	148.0	0.87	0.80	0.87	39.1
NorthEast: Mitchell Drive														
4	L2	81	1.4	81	1.4	0.474	47.4	LOS D	3.6	25.4	0.99	0.76	0.99	3.1
5	T1	214	3.3	214	3.3	0.623	45.7	LOS D	4.9	35.0	1.00	0.81	1.07	8.7
6	R2	33	3.4	33	3.4	0.134	41.1	LOS C	1.3	9.4	0.92	0.71	0.92	26.2
Approach		327	2.8	327	2.8	0.623	45.7	LOS D	4.9	35.0	0.99	0.79	1.04	9.8
NorthWest: New England Highway														
7	L2	31	0.0	31	0.0	0.031	11.2	LOS A	0.4	2.5	0.50	0.66	0.50	43.0
8	T1	1179	4.4	1179	4.4	0.538	12.4	LOS A	15.7	114.3	0.66	0.59	0.66	43.2
9	R2	396	2.2	396	2.2	0.895	59.9	LOS E	10.4	73.9	1.00	1.05	1.49	22.4
Approach		1605	3.8	1605	3.8	0.895	24.1	LOS B	15.7	114.3	0.74	0.71	0.86	34.4
SouthWest: Mitchell Drive														
10	L2	411	3.5	411	3.5	0.383	24.1	LOS B	3.9	28.4	0.89	0.77	0.89	35.4
11	T1	143	4.7	143	4.7	0.842	51.3	LOS D	7.1	51.5	1.00	0.96	1.39	7.9
12	R2	428	2.9	428	2.9	0.874	56.5	LOS E	10.9	77.8	1.00	1.00	1.40	5.9
Approach		982	3.4	982	3.4	0.874	42.2	LOS C	10.9	77.8	0.96	0.90	1.19	18.5
All Vehicles		4612	3.8	4612	3.8	0.895	29.6	LOS C	20.4	148.0	0.85	0.79	0.95	31.6

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.
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
P11	SouthEast Stage 1	14	16.2	LOS B	0.0	0.0	0.60	0.60
P12	SouthEast Stage 2	14	39.2	LOS D	0.0	0.0	0.93	0.93
P1S	SouthEast Slip/Bypass Lane Crossing	14	17.1	LOS B	0.0	0.0	0.83	0.83
P2	NorthEast Full Crossing	5	14.5	LOS B	0.0	0.0	0.57	0.57
P2S	NorthEast Slip/Bypass Lane Crossing	5	2.7	LOS A	0.0	0.0	0.24	0.24
P3	NorthWest Full Crossing	14	39.2	LOS D	0.0	0.0	0.93	0.93
P4	SouthWest Full Crossing	1	28.0	LOS C	0.0	0.0	0.79	0.79
P4S	SouthWest Slip/Bypass Lane Crossing	1	9.3	LOS A	0.0	0.0	0.64	0.64

All Pedestrians	67	24.6	LOS C	0.76	0.76

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.

MOVEMENT SUMMARY

Site: [Site 5: NEH & Chelmsford Drive 2022_AM]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	65	3.3	65	3.3	0.049	8.2	LOS A	0.5	3.6	0.19	0.59	0.19	39.4
2	T1	1247	5.3	1247	5.3	0.649	10.4	LOS A	15.8	115.6	0.55	0.49	0.55	34.5
3	R2	179	3.0	179	3.0	0.496	49.3	LOS D	3.9	27.8	0.97	0.77	0.97	24.0
Approach		1492	4.9	1492	4.9	0.649	15.0	LOS B	15.8	115.6	0.58	0.53	0.58	31.4
NorthEast: Chelmsford Drive														
4	L2	297	3.0	297	3.0	0.655	24.7	LOS B	7.9	56.6	0.96	0.82	0.96	27.5
25	T1	457	1.2	457	1.2	0.885	52.2	LOS D	11.7	82.6	1.00	1.04	1.42	20.5
6	R2	255	3.4	255	3.4	0.913	61.3	LOS E	13.7	98.8	1.00	1.05	1.50	15.1
Approach		1008	2.3	1008	2.3	0.913	46.4	LOS D	13.7	98.8	0.99	0.98	1.30	20.3
NorthWest: New England Highway														
7	L2	237	3.0	237	3.0	0.255	12.8	LOS A	3.4	24.5	0.65	0.73	0.65	44.8
8	T1	1209	7.7	1209	7.7	0.931	51.9	LOS D	34.4	257.0	1.00	1.17	1.38	17.3
Approach		1446	6.9	1446	6.9	0.931	45.5	LOS D	34.4	257.0	0.94	1.10	1.26	20.8
SouthWest: Chelmsford Drive Extension														
30	L2	78	0.0	78	0.0	0.296	44.8	LOS D	3.2	22.3	0.94	0.76	0.94	8.5
31	T1	174	0.6	174	0.6	0.335	39.5	LOS C	3.6	25.2	0.95	0.74	0.95	24.4
32	R2	72	3.0	72	3.0	0.256	42.7	LOS D	2.8	20.5	0.92	0.75	0.92	8.9
Approach		323	1.0	323	1.0	0.335	41.5	LOS C	3.6	25.2	0.94	0.74	0.94	18.2
All Vehicles		4269	4.7	4269	4.7	0.931	34.7	LOS C	34.4	257.0	0.83	0.85	1.01	22.5

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.
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	SouthEast Full Crossing	3	39.2	LOS D	0.0	0.0	0.93	0.93
P1S	SouthEast Slip/Bypass Lane Crossing	3	35.6	LOS D	0.0	0.0	0.89	0.89
P2	NorthEast Full Crossing	1	30.4	LOS D	0.0	0.0	0.82	0.82
P2S	NorthEast Slip/Bypass Lane Crossing	1	6.7	LOS A	0.0	0.0	0.54	0.54
P3	NorthWest Full Crossing	1	39.2	LOS D	0.0	0.0	0.93	0.93
P3S	NorthWest Slip/Bypass Lane Crossing	1	35.6	LOS D	0.0	0.0	0.89	0.89
P8	SouthWest Full Crossing	1	19.3	LOS B	0.0	0.0	0.66	0.66
P8S	SouthWest Slip/Bypass Lane Crossing	1	3.8	LOS A	0.0	0.0	0.29	0.29

All Pedestrians	13	29.9	LOS C	0.80	0.80

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.

MOVEMENT SUMMARY

Site: [Site 5: NEH & Chelmsford Drive 2022_PM]

Network: N101 [PM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	94	1.1	94	1.1	0.067	8.1	LOS A	0.7	5.2	0.19	0.60	0.19	39.6
2	T1	1425	4.7	1425	4.7	0.708	11.7	LOS A	19.8	143.9	0.61	0.55	0.61	32.7
3	R2	247	6.3	247	6.3	0.902	60.7	LOS E	6.4	46.9	1.00	0.98	1.49	21.1
Approach		1766	4.7	1766	4.7	0.902	18.4	LOS B	19.8	143.9	0.64	0.62	0.71	28.7
NorthEast: Chelmsford Drive														
4	L2	214	6.0	214	6.0	0.595	26.6	LOS B	6.0	44.1	0.96	0.80	0.96	26.4
25	T1	375	1.1	375	1.1	0.871	51.9	LOS D	9.4	66.7	1.00	1.00	1.41	20.6
6	R2	226	1.4	226	1.4	0.800	50.6	LOS D	10.6	75.4	1.00	0.92	1.22	17.4
Approach		815	2.5	815	2.5	0.871	44.9	LOS D	10.6	75.4	0.99	0.93	1.24	20.7
NorthWest: New England Highway														
7	L2	496	2.8	496	2.8	0.490	12.8	LOS A	7.7	55.3	0.70	0.78	0.70	44.8
8	T1	1336	5.3	1336	5.3	0.897	40.5	LOS C	34.3	250.7	1.00	1.09	1.24	20.5
Approach		1832	4.6	1832	4.6	0.897	33.0	LOS C	34.3	250.7	0.92	1.00	1.10	26.5
SouthWest: Chelmsford Drive Extension														
30	L2	59	1.8	59	1.8	0.272	46.7	LOS D	2.5	17.6	0.95	0.75	0.95	8.2
31	T1	348	0.7	348	0.7	0.849	50.1	LOS D	9.0	63.5	1.00	0.97	1.37	21.1
32	R2	81	2.7	81	2.7	0.289	42.9	LOS D	3.2	23.3	0.92	0.76	0.92	8.9
Approach		488	1.2	488	1.2	0.849	48.5	LOS D	9.0	63.5	0.98	0.91	1.24	18.4
All Vehicles		4901	4.0	4901	4.0	0.902	31.2	LOS C	34.3	250.7	0.84	0.84	1.00	24.7

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.
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	SouthEast Full Crossing	3	39.2	LOS D	0.0	0.0	0.93	0.93
P1S	SouthEast Slip/Bypass Lane Crossing	3	37.4	LOS D	0.0	0.0	0.91	0.91
P2	NorthEast Full Crossing	1	27.2	LOS C	0.0	0.0	0.78	0.78
P2S	NorthEast Slip/Bypass Lane Crossing	1	5.7	LOS A	0.0	0.0	0.50	0.50
P3	NorthWest Full Crossing	1	39.2	LOS D	0.0	0.0	0.93	0.93
P3S	NorthWest Slip/Bypass Lane Crossing	1	37.4	LOS D	0.0	0.0	0.91	0.91
P8	SouthWest Full Crossing	1	18.1	LOS B	0.0	0.0	0.63	0.63
P8S	SouthWest Slip/Bypass Lane Crossing	1	3.2	LOS A	0.0	0.0	0.27	0.27

All Pedestrians	13	30.0	LOS D	0.80	0.80

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.

MOVEMENT SUMMARY

Site: 7 [Site 6: NEH & Chisholm Rd 2022_AM]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	261	2.4	261	2.4	0.195	7.8	LOS A	2.5	18.1	0.31	0.64	0.31	48.9
2	T1	1294	5.8	1294	5.8	0.632	15.8	LOS B	19.9	146.2	0.76	0.68	0.76	39.6
Approach		1555	5.2	1555	5.2	0.632	14.5	LOS A	19.9	146.2	0.68	0.68	0.68	41.8
NorthWest: New England Highway														
8	T1	1385	7.2	1385	7.2	0.364	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
29	R2	241	6.6	241	6.6	0.624	42.0	LOS C	10.4	76.6	1.00	0.83	1.00	26.8
Approach		1626	7.1	1626	7.1	0.624	6.2	LOS A	10.4	76.6	0.15	0.12	0.15	51.6
SouthWest: Chisholm Road														
30	L2	146	5.6	146	5.6	0.240	28.0	LOS B	4.7	34.3	0.76	0.74	0.76	26.1
32	R2	118	4.0	118	4.0	0.955	70.5	LOS E	6.7	48.5	1.00	1.14	1.84	25.0
Approach		264	4.9	264	4.9	0.955	47.0	LOS D	6.7	48.5	0.87	0.92	1.24	25.4
All Vehicles		3445	6.1	3445	6.1	0.955	13.1	LOS A	19.9	146.2	0.45	0.43	0.47	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.
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 SUMMARY

Site: 7 [Site 6: NEH & Chisholm Rd 2022_PM]

Network: N101 [PM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	380	0.8	380	0.8	0.264	7.2	LOS A	3.2	22.7	0.29	0.64	0.29	49.3
2	T1	1514	4.9	1514	4.9	0.692	14.9	LOS B	23.6	171.8	0.77	0.70	0.77	40.5
Approach		1894	4.1	1894	4.1	0.692	13.3	LOS A	23.6	171.8	0.67	0.69	0.67	42.9
NorthWest: New England Highway														
8	T1	1504	4.2	1504	4.2	0.388	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
29	R2	162	1.9	162	1.9	0.665	52.0	LOS D	7.4	52.9	1.00	0.82	1.04	24.0
Approach		1666	4.0	1666	4.0	0.665	5.1	LOS A	7.4	52.9	0.10	0.08	0.10	53.1
SouthWest: Chisholm Road														
30	L2	176	3.4	176	3.4	0.315	30.9	LOS C	6.0	43.3	0.82	0.76	0.82	24.8
32	R2	183	3.2	183	3.2	0.885	58.0	LOS E	9.4	67.6	1.00	1.04	1.47	27.6
Approach		359	3.3	359	3.3	0.885	44.8	LOS D	9.4	67.6	0.91	0.90	1.15	26.7
All Vehicles		3919	4.0	3919	4.0	0.885	12.7	LOS A	23.6	171.8	0.45	0.45	0.47	44.3

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.
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: [Site 1: Raymond Terrace_Metford_AM - 2022 With Development]

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
SouthEast: Raymond Terrace Road												
21	L2	443	2.2	0.579	9.8	LOS A	4.9	35.2	0.83	0.95	1.01	51.5
22	T1	598	1.4	0.745	11.7	LOS A	9.5	67.8	0.94	1.07	1.31	51.3
23	R2	99	6.4	0.745	17.6	LOS B	9.5	67.8	0.94	1.07	1.31	51.5
23u	U	1	0.0	0.745	19.7	LOS B	9.5	67.8	0.94	1.07	1.31	52.9
Approach		1141	2.2	0.745	11.5	LOS A	9.5	67.8	0.90	1.02	1.20	51.4
NorthEast: Metford Road												
24	L2	181	11.5	0.284	7.7	LOS A	1.4	10.5	0.67	0.81	0.67	52.9
25	T1	461	0.2	0.502	7.1	LOS A	3.5	24.7	0.74	0.75	0.84	54.2
26	R2	27	0.0	0.502	12.8	LOS A	3.5	24.7	0.74	0.75	0.84	54.5
Approach		669	3.3	0.502	7.5	LOS A	3.5	24.7	0.72	0.77	0.79	53.8
NorthWest: Raymond Terrace Road												
27	L2	17	0.0	0.171	7.0	LOS A	0.9	6.1	0.64	0.69	0.64	53.3
28	T1	363	1.7	0.418	6.2	LOS A	2.9	20.4	0.70	0.68	0.70	53.9
29	R2	137	0.8	0.418	11.7	LOS A	2.9	20.4	0.73	0.67	0.73	53.9
Approach		517	1.4	0.418	7.7	LOS A	2.9	20.4	0.71	0.68	0.71	53.9
SouthWest: Metford Road												
30	L2	138	0.0	0.265	8.5	LOS A	1.6	11.3	0.80	0.85	0.80	52.4
31	T1	225	1.4	0.584	9.8	LOS A	5.7	40.8	0.94	1.00	1.12	51.3
32	R2	227	2.4	0.584	15.5	LOS B	5.7	40.8	0.95	1.00	1.13	51.6
Approach		591	1.4	0.584	11.7	LOS A	5.7	40.8	0.91	0.96	1.05	51.7
All Vehicles		2918	2.1	0.745	9.9	LOS A	9.5	67.8	0.83	0.89	0.99	52.4

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.

MOVEMENT SUMMARY

Site: 101 [Site 1: Raymond Terrace_Metford_PM - 2022 With Development]

New Site
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
SouthEast: Raymond Terrace Road												
21	L2	435	2.5	0.458	5.9	LOS A	3.0	21.2	0.63	0.69	0.63	53.9
22	T1	519	1.8	0.614	6.2	LOS A	5.5	39.5	0.71	0.69	0.77	53.8
23	R2	193	3.7	0.614	11.9	LOS A	5.5	39.5	0.71	0.69	0.77	54.0
23u	U	1	0.0	0.614	14.2	LOS A	5.5	39.5	0.71	0.69	0.77	55.5
Approach		1147	2.4	0.614	7.0	LOS A	5.5	39.5	0.68	0.69	0.72	53.9
NorthEast: Metford Road												
24	L2	115	3.0	0.195	8.0	LOS A	1.0	6.9	0.71	0.83	0.71	52.8
25	T1	291	0.4	0.356	6.9	LOS A	2.2	15.2	0.76	0.69	0.76	54.2
26	R2	11	0.0	0.356	12.6	LOS A	2.2	15.2	0.76	0.69	0.76	54.5
Approach		416	1.1	0.356	7.4	LOS A	2.2	15.2	0.75	0.73	0.75	53.8
NorthWest: Raymond Terrace Road												
27	L2	13	0.0	0.249	9.1	LOS A	1.3	9.2	0.77	0.85	0.77	52.3
28	T1	501	1.3	0.611	10.1	LOS A	5.4	38.4	0.89	1.01	1.09	52.6
29	R2	67	1.8	0.611	16.1	LOS B	5.4	38.4	0.92	1.05	1.17	52.5
Approach		581	1.3	0.611	10.8	LOS A	5.4	38.4	0.89	1.01	1.09	52.6
SouthWest: Metford Road												
30	L2	115	0.0	0.370	9.1	LOS A	2.3	16.1	0.80	0.88	0.82	52.2
31	T1	428	0.7	0.814	14.9	LOS B	12.4	87.9	0.96	1.16	1.45	48.3
32	R2	334	2.0	0.814	22.3	LOS B	12.4	87.9	1.00	1.23	1.62	47.2
Approach		877	1.1	0.814	17.0	LOS B	12.4	87.9	0.95	1.15	1.43	48.4
All Vehicles		3021	1.6	0.814	10.7	LOS A	12.4	87.9	0.81	0.89	1.00	51.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: [Site 2: Fieldsend Street_Metford_PM - 2022 With Dev]

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
SouthEast: Hospital Access												
21	L2	122	5.0	0.201	6.3	LOS A	1.5	11.1	0.88	0.75	0.88	40.0
22	T1	17	5.0	0.201	6.2	LOS A	1.5	11.1	0.89	0.77	0.89	41.0
23	R2	28	5.0	0.201	6.2	LOS A	1.5	11.1	0.89	0.77	0.89	42.1
Approach		167	5.0	0.201	6.3	LOS A	1.5	11.1	0.88	0.76	0.88	40.4
NorthEast: Metford Road												
24	L2	6	5.0	0.006	6.2	LOS A	0.0	0.2	0.27	0.54	0.27	43.7
2	T1	871	5.0	0.646	4.7	LOS A	5.6	40.8	0.47	0.50	0.47	54.5
3	R2	102	5.0	0.646	9.7	LOS A	5.6	40.8	0.47	0.50	0.47	54.5
3u	U	28	0.0	0.646	11.8	LOS A	5.6	40.8	0.47	0.50	0.47	55.8
Approach		1007	4.9	0.646	5.4	LOS A	5.6	40.8	0.47	0.50	0.47	54.5
NorthWest: Fieldsend Street												
4	L2	85	5.0	0.230	10.6	LOS A	1.6	11.4	0.88	0.89	0.88	49.5
28	T1	15	5.0	0.230	14.9	LOS B	1.6	11.4	0.88	0.89	0.88	39.4
6	R2	28	5.0	0.230	15.7	LOS B	1.6	11.4	0.88	0.89	0.88	50.8
Approach		128	5.0	0.230	12.2	LOS A	1.6	11.4	0.88	0.89	0.88	49.0
SouthWest: Metford Road												
7	L2	31	5.0	0.734	5.3	LOS A	7.2	52.9	0.61	0.57	0.62	52.4
8	T1	836	5.0	0.734	5.4	LOS A	7.2	52.9	0.61	0.57	0.62	53.8
32	R2	105	5.0	0.734	12.2	LOS A	7.2	52.9	0.61	0.57	0.62	42.9
Approach		972	5.0	0.734	6.2	LOS A	7.2	52.9	0.61	0.57	0.62	52.9
All Vehicles		2275	4.9	0.734	6.2	LOS A	7.2	52.9	0.58	0.57	0.58	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: [Site 3: Chelmsford Drive_Metford Road_AM - 2022 With Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	374	1.0	1.282	156.0	LOS F	58.5	415.6	1.00	2.75	5.62	14.7
23	R2	221	2.7	1.282	160.4	LOS F	58.5	415.6	1.00	2.75	5.62	16.7
23u	U	1	0.0	1.282	162.1	LOS F	58.5	415.6	1.00	2.75	5.62	16.8
Approach		596	1.7	1.282	157.6	LOS F	58.5	415.6	1.00	2.75	5.62	15.5
NorthEast: Metford Road												
24	L2	253	0.0	1.025	37.6	LOS C	43.1	305.6	1.00	1.45	2.44	35.6
26	R2	822	2.1	1.025	42.1	LOS C	43.1	305.6	1.00	1.45	2.44	33.4
Approach		1075	1.6	1.025	41.1	LOS C	43.1	305.6	1.00	1.45	2.44	34.0
NorthWest: Chelmsford Drive-W												
27	L2	551	1.5	0.423	5.3	LOS A	3.5	24.9	0.52	0.58	0.52	51.9
28	T1	240	0.7	0.281	5.3	LOS A	1.9	13.6	0.48	0.57	0.48	52.5
29u	U	53	4.0	0.281	11.5	LOS A	1.9	13.6	0.48	0.57	0.48	51.0
Approach		843	1.5	0.423	5.7	LOS A	3.5	24.9	0.51	0.57	0.51	52.0
All Vehicles		2514	1.6	1.282	56.8	LOS E	58.5	415.6	0.83	1.46	2.54	28.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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 [Site 3: Chelmsford Drive_Metford Road_PM - 2022 With Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	362	1.0	0.895	31.2	LOS C	15.6	110.5	1.00	1.41	2.07	36.9
23	R2	140	2.7	0.895	35.6	LOS C	15.6	110.5	1.00	1.41	2.07	39.2
23u	U	1	0.0	0.895	37.4	LOS C	15.6	110.5	1.00	1.41	2.07	39.7
Approach		503	1.5	0.895	32.5	LOS C	15.6	110.5	1.00	1.41	2.07	37.6
NorthEast: Metford Road												
24	L2	171	0.0	1.137	84.6	LOS F	59.2	420.3	1.00	2.57	4.72	24.4
26	R2	765	2.1	1.137	89.2	LOS F	59.2	420.3	1.00	2.57	4.72	22.1
Approach		936	1.8	1.137	88.3	LOS F	59.2	420.3	1.00	2.57	4.72	22.6
NorthWest: Chelmsford Drive-W												
27	L2	805	1.5	0.580	5.3	LOS A	6.1	43.2	0.57	0.56	0.57	51.7
28	T1	459	0.7	0.440	5.2	LOS A	3.7	26.2	0.51	0.54	0.51	52.7
29u	U	53	4.0	0.440	11.4	LOS A	3.7	26.2	0.51	0.54	0.51	51.2
Approach		1317	1.4	0.580	5.5	LOS A	6.1	43.2	0.55	0.55	0.55	52.0
All Vehicles		2756	1.5	1.137	38.6	LOS C	59.2	420.3	0.78	1.39	2.24	34.1

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.

MOVEMENT SUMMARY

Site: [Site 2: Fieldsend Street_Metford_AM - 2022 With Dev]

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
SouthEast: Hospital Access												
21	L2	16	5.0	0.035	9.4	LOS A	0.3	2.1	0.97	0.71	0.97	37.8
22	T1	2	5.0	0.035	9.1	LOS A	0.3	2.1	0.98	0.73	0.98	38.8
23	R2	3	5.0	0.035	9.1	LOS A	0.3	2.1	0.98	0.73	0.98	39.7
Approach		21	5.0	0.035	9.3	LOS A	0.3	2.1	0.97	0.71	0.97	38.2
NorthEast: Metford Road												
24	L2	7	5.0	0.007	6.3	LOS A	0.0	0.2	0.28	0.54	0.28	43.7
2	T1	1088	5.0	0.771	5.2	LOS A	8.1	59.3	0.59	0.53	0.59	54.1
3	R2	95	5.0	0.771	10.2	LOS A	8.1	59.3	0.59	0.53	0.59	54.1
3u	U	3	0.0	0.771	12.2	LOS A	8.1	59.3	0.59	0.53	0.59	55.4
Approach		1194	5.0	0.771	5.6	LOS A	8.1	59.3	0.59	0.53	0.59	54.0
NorthWest: Fieldsend Street												
4	L2	85	5.0	0.158	7.3	LOS A	0.9	6.4	0.66	0.75	0.66	51.8
28	T1	17	5.0	0.158	11.6	LOS A	0.9	6.4	0.66	0.75	0.66	42.0
6	R2	28	5.0	0.158	12.4	LOS A	0.9	6.4	0.66	0.75	0.66	53.1
Approach		131	5.0	0.158	8.9	LOS A	0.9	6.4	0.66	0.75	0.66	51.2
SouthWest: Metford Road												
7	L2	28	5.0	0.527	4.4	LOS A	4.0	29.0	0.36	0.50	0.36	53.3
8	T1	583	5.0	0.527	4.5	LOS A	4.0	29.0	0.36	0.50	0.36	54.7
32	R2	126	5.0	0.527	11.2	LOS A	4.0	29.0	0.36	0.50	0.36	43.9
Approach		738	5.0	0.527	5.6	LOS A	4.0	29.0	0.36	0.50	0.36	53.3
All Vehicles		2083	5.0	0.771	5.9	LOS A	8.1	59.3	0.52	0.53	0.52	53.5

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.

MOVEMENT SUMMARY

Site: 5 [Site 4: NEH & Mitchell Drive 2022_AM With Development]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network User-Given Cycle Time)

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
SouthEast: New England Highway														
1	L2	207	3.9	207	3.9	0.204	11.2	LOS A	2.6	18.7	0.56	0.70	0.56	39.3
2	T1	1296	4.9	1296	4.9	0.543	20.3	LOS B	17.7	128.8	0.81	0.71	0.81	43.0
Approach		1503	4.8	1503	4.8	0.543	19.0	LOS B	17.7	128.8	0.77	0.71	0.77	42.7
NorthEast: Mitchell Drive														
4	L2	93	2.4	93	2.4	0.545	47.9	LOS D	4.1	29.6	1.00	0.78	1.01	3.1
5	T1	128	3.5	128	3.5	0.375	44.0	LOS D	2.8	20.3	0.98	0.74	0.98	9.0
6	R2	34	0.0	34	0.0	0.180	44.7	LOS D	1.4	9.9	0.95	0.72	0.95	25.1
Approach		255	2.6	255	2.6	0.545	45.5	LOS D	4.1	29.6	0.98	0.75	0.99	10.1
NorthWest: New England Highway														
7	L2	23	5.0	23	5.0	0.023	10.5	LOS A	0.2	1.7	0.47	0.65	0.47	43.7
8	T1	1266	8.3	1266	8.3	0.560	11.0	LOS A	16.3	122.3	0.64	0.58	0.64	44.6
9	R2	299	0.4	299	0.4	0.918	64.1	LOS E	8.0	56.5	1.00	1.06	1.63	21.5
Approach		1588	6.8	1588	6.8	0.918	21.0	LOS B	16.3	122.3	0.70	0.67	0.82	36.3
SouthWest: Mitchell Drive														
10	L2	162	9.9	162	9.9	0.188	26.4	LOS B	1.7	12.8	0.88	0.73	0.88	34.0
11	T1	73	7.5	73	7.5	0.435	44.4	LOS D	3.2	23.9	0.99	0.75	0.99	9.0
12	R2	195	3.6	195	3.6	0.532	49.0	LOS D	4.3	31.1	0.99	0.78	0.99	6.7
Approach		429	6.6	429	6.6	0.532	39.7	LOS C	4.3	31.1	0.95	0.75	0.95	18.4
All Vehicles		3776	5.7	3776	5.7	0.918	24.0	LOS B	17.7	128.8	0.78	0.70	0.83	35.6

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.
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
P11	SouthEast Stage 1	14	20.0	LOS C	0.0	0.0	0.67	0.67
P12	SouthEast Stage 2	14	39.2	LOS D	0.0	0.0	0.93	0.93
P1S	SouthEast Slip/Bypass Lane Crossing	14	19.8	LOS B	0.0	0.0	0.87	0.87
P2	NorthEast Full Crossing	5	12.8	LOS B	0.0	0.0	0.53	0.53
P2S	NorthEast Slip/Bypass Lane Crossing	5	2.7	LOS A	0.0	0.0	0.24	0.24
P3	NorthWest Full Crossing	14	39.2	LOS D	0.0	0.0	0.93	0.93
P4	SouthWest Full Crossing	1	23.5	LOS C	0.0	0.0	0.72	0.72
P4S	SouthWest Slip/Bypass Lane Crossing	1	7.6	LOS A	0.0	0.0	0.58	0.58

All Pedestrians	67	25.7	LOS C	0.77	0.77

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.

MOVEMENT SUMMARY

Site: 5 [Site 4: NEH & Mitchell Drive 2022_PM With Development]

Network: N101 [PM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
1	L2	361	4.4	361	4.4	0.354	12.4	LOS A	5.5	40.1	0.58	0.73	0.58	38.2
2	T1	1435	4.3	1435	4.3	0.650	25.7	LOS B	22.6	163.7	0.87	0.77	0.87	40.0
Approach		1796	4.3	1796	4.3	0.650	23.0	LOS B	22.6	163.7	0.81	0.76	0.81	39.8
NorthEast: Mitchell Drive														
4	L2	81	1.4	81	1.4	0.549	53.7	LOS D	4.1	28.7	1.00	0.77	1.01	2.8
5	T1	214	3.3	214	3.3	0.692	52.4	LOS D	5.5	39.5	1.00	0.84	1.13	7.8
6	R2	33	3.4	33	3.4	0.127	44.4	LOS D	1.4	10.3	0.91	0.71	0.91	25.1
Approach		327	2.8	327	2.8	0.692	51.9	LOS D	5.5	39.5	0.99	0.81	1.08	8.8
NorthWest: New England Highway														
7	L2	31	0.0	31	0.0	0.029	10.9	LOS A	0.4	2.6	0.47	0.65	0.47	43.3
8	T1	1202	4.4	1202	4.4	0.571	13.0	LOS A	18.3	132.6	0.66	0.59	0.66	42.7
9	R2	396	2.2	396	2.2	0.911	67.4	LOS E	11.6	83.1	1.00	1.07	1.50	20.8
Approach		1628	3.8	1628	3.8	0.911	26.2	LOS B	18.3	132.6	0.74	0.71	0.86	33.2
SouthWest: Mitchell Drive														
10	L2	411	3.5	411	3.5	0.404	27.1	LOS B	4.5	32.5	0.91	0.77	0.91	33.8
11	T1	143	4.7	143	4.7	0.936	67.0	LOS E	8.6	62.7	1.00	1.07	1.65	6.2
12	R2	440	2.9	440	2.9	0.923	68.8	LOS E	13.7	98.2	1.00	1.07	1.52	4.9
Approach		994	3.4	994	3.4	0.936	51.3	LOS D	13.7	98.2	0.96	0.95	1.29	16.0
All Vehicles		4745	3.8	4745	3.8	0.936	32.0	LOS C	22.6	163.7	0.83	0.78	0.95	30.5

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.
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
P11	SouthEast Stage 1	14	18.6	LOS B	0.0	0.0	0.61	0.61
P12	SouthEast Stage 2	14	44.2	LOS E	0.0	0.0	0.94	0.94
P1S	SouthEast Slip/Bypass Lane Crossing	14	19.6	LOS B	0.0	0.0	0.84	0.84
P2	NorthEast Full Crossing	5	14.0	LOS B	0.0	0.0	0.53	0.53
P2S	NorthEast Slip/Bypass Lane Crossing	5	2.4	LOS A	0.0	0.0	0.22	0.22
P3	NorthWest Full Crossing	14	44.2	LOS E	0.0	0.0	0.94	0.94
P4	SouthWest Full Crossing	1	27.4	LOS C	0.0	0.0	0.74	0.74
P4S	SouthWest Slip/Bypass Lane Crossing	1	9.3	LOS A	0.0	0.0	0.61	0.61

All Pedestrians	67	27.6	LOS C	0.76	0.76

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.

MOVEMENT SUMMARY

Site: [Site 5: NEH & Chelmsford Drive 2022_AM With Development]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network User-Given Cycle Time)

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
SouthEast: New England Highway														
21	L2	65	3.3	65	3.3	0.048	8.4	LOS A	0.6	4.0	0.21	0.60	0.21	39.2
2	T1	1247	5.3	1247	5.3	0.635	10.2	LOS A	15.7	115.1	0.54	0.48	0.54	34.7
3	R2	232	3.0	232	3.0	0.578	48.9	LOS D	5.0	36.0	0.97	0.79	0.99	24.1
Approach		1544	4.9	1544	4.9	0.635	16.0	LOS B	15.7	115.1	0.59	0.53	0.59	30.9
NorthEast: Chelmsford Drive														
4	L2	308	3.0	308	3.0	0.681	25.1	LOS B	8.3	59.6	0.96	0.83	0.99	27.3
25	T1	461	1.2	461	1.2	0.975	72.0	LOS F	14.1	99.8	1.00	1.21	1.78	16.4
6	R2	269	3.4	269	3.4	0.965	74.8	LOS F	16.4	118.2	1.00	1.15	1.71	13.0
Approach		1039	2.3	1039	2.3	0.975	58.8	LOS E	16.4	118.2	0.99	1.08	1.53	17.2
NorthWest: New England Highway														
7	L2	288	3.0	288	3.0	0.311	13.2	LOS A	4.2	30.0	0.68	0.75	0.68	44.5
8	T1	1209	7.7	1209	7.7	0.931	52.0	LOS D	34.5	257.1	1.00	1.17	1.38	17.2
Approach		1498	6.8	1498	6.8	0.931	44.6	LOS D	34.5	257.1	0.94	1.09	1.24	21.3
SouthWest: Chelmsford Drive Extension														
30	L2	78	0.0	78	0.0	0.323	46.0	LOS D	3.2	22.7	0.95	0.76	0.95	8.3
31	T1	191	0.6	191	0.6	0.401	40.9	LOS C	4.0	28.3	0.97	0.75	0.97	23.9
32	R2	72	3.0	72	3.0	0.256	42.7	LOS D	2.8	20.5	0.92	0.75	0.92	8.9
Approach		340	1.0	340	1.0	0.401	42.4	LOS C	4.0	28.3	0.95	0.75	0.95	18.2
All Vehicles		4421	4.6	4421	4.6	0.975	37.8	LOS C	34.5	257.1	0.83	0.87	1.06	21.6

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.
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	SouthEast Full Crossing	3	39.2	LOS D	0.0	0.0	0.93	0.93
P1S	SouthEast Slip/Bypass Lane Crossing	3	36.5	LOS D	0.0	0.0	0.90	0.90
P2	NorthEast Full Crossing	1	30.4	LOS D	0.0	0.0	0.82	0.82
P2S	NorthEast Slip/Bypass Lane Crossing	1	6.7	LOS A	0.0	0.0	0.54	0.54
P3	NorthWest Full Crossing	1	39.2	LOS D	0.0	0.0	0.93	0.93
P3S	NorthWest Slip/Bypass Lane Crossing	1	36.5	LOS D	0.0	0.0	0.90	0.90
P8	SouthWest Full Crossing	1	18.7	LOS B	0.0	0.0	0.64	0.64
P8S	SouthWest Slip/Bypass Lane Crossing	1	3.5	LOS A	0.0	0.0	0.28	0.28

All Pedestrians	13	30.2	LOS D	0.80	0.80

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.

MOVEMENT SUMMARY

Site: [Site 5: NEH & Chelmsford Drive 2022_PM With Development]

Network: N101 [PM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	94	1.1	94	1.1	0.066	8.0	LOS A	0.8	5.5	0.18	0.60	0.18	39.6
2	T1	1425	4.7	1425	4.7	0.726	13.5	LOS A	22.7	165.3	0.63	0.57	0.63	30.6
3	R2	301	6.3	301	6.3	0.948	65.2	LOS E	8.7	64.2	1.00	1.00	1.45	20.1
Approach		1820	4.8	1820	4.8	0.948	21.8	LOS B	22.7	165.3	0.67	0.65	0.74	26.6
NorthEast: Chelmsford Drive														
4	L2	317	6.0	317	6.0	0.833	36.2	LOS C	11.0	80.8	1.00	0.95	1.24	22.0
25	T1	407	1.1	407	1.1	0.956	71.3	LOS F	12.9	91.0	1.00	1.14	1.66	16.5
6	R2	325	1.4	325	1.4	0.941	71.0	LOS F	20.4	144.5	1.00	1.07	1.51	13.5
Approach		1049	2.7	1049	2.7	0.956	60.6	LOS E	20.4	144.5	1.00	1.06	1.49	16.6
NorthWest: New England Highway														
7	L2	532	2.8	532	2.8	0.511	13.1	LOS A	8.8	63.1	0.69	0.78	0.69	44.5
8	T1	1336	5.3	1336	5.3	0.969	66.8	LOS E	47.3	346.1	1.00	1.27	1.47	14.3
Approach		1867	4.6	1867	4.6	0.969	51.5	LOS D	47.3	346.1	0.91	1.13	1.25	20.3
SouthWest: Chelmsford Drive Extension														
30	L2	59	1.8	59	1.8	0.275	51.2	LOS D	2.7	19.4	0.96	0.75	0.96	7.6
31	T1	360	0.7	360	0.7	0.896	59.5	LOS E	10.9	76.7	1.00	1.03	1.47	18.8
32	R2	81	2.7	81	2.7	0.237	43.2	LOS D	3.4	24.4	0.89	0.76	0.89	8.8
Approach		500	1.2	500	1.2	0.896	55.9	LOS D	10.9	76.7	0.98	0.95	1.31	16.7
All Vehicles		5237	3.9	5237	3.9	0.969	43.4	LOS D	47.3	346.1	0.85	0.93	1.13	20.3

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.
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	SouthEast Full Crossing	3	44.2	LOS E	0.0	0.0	0.94	0.94
P1S	SouthEast Slip/Bypass Lane Crossing	3	41.4	LOS E	0.0	0.0	0.91	0.91
P2	NorthEast Full Crossing	1	30.4	LOS D	0.0	0.0	0.78	0.78
P2S	NorthEast Slip/Bypass Lane Crossing	1	5.8	LOS A	0.0	0.0	0.48	0.48
P3	NorthWest Full Crossing	1	44.2	LOS E	0.0	0.0	0.94	0.94
P3S	NorthWest Slip/Bypass Lane Crossing	1	41.4	LOS E	0.0	0.0	0.91	0.91
P8	SouthWest Full Crossing	1	19.8	LOS B	0.0	0.0	0.63	0.63
P8S	SouthWest Slip/Bypass Lane Crossing	1	3.1	LOS A	0.0	0.0	0.25	0.25

All Pedestrians	13	33.5	LOS D	0.80	0.80

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.

MOVEMENT SUMMARY

Site: 7 [Site 6: NEH & Chisholm Rd 2022_AM With Development]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network User-Given Cycle Time)

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
SouthEast: New England Highway														
21	L2	261	2.4	261	2.4	0.195	7.8	LOS A	2.5	18.1	0.31	0.64	0.31	48.9
2	T1	1320	5.8	1320	5.8	0.645	16.0	LOS B	20.5	150.8	0.77	0.69	0.77	39.5
Approach		1581	5.2	1581	5.2	0.645	14.6	LOS B	20.5	150.8	0.69	0.68	0.69	41.6
NorthWest: New England Highway														
8	T1	1391	7.2	1391	7.2	0.366	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
29	R2	246	6.6	246	6.6	0.638	42.0	LOS C	10.6	78.4	1.00	0.83	1.00	26.8
Approach		1637	7.1	1637	7.1	0.638	6.3	LOS A	10.6	78.4	0.15	0.13	0.15	51.5
SouthWest: Chisholm Road														
30	L2	173	5.6	173	5.6	0.283	28.4	LOS B	5.6	41.1	0.78	0.75	0.78	25.9
32	R2	118	4.0	118	4.0	0.955	70.5	LOS E	6.7	48.5	1.00	1.14	1.84	25.0
Approach		291	5.0	291	5.0	0.955	45.5	LOS D	6.7	48.5	0.87	0.91	1.21	25.4
All Vehicles		3508	6.1	3508	6.1	0.955	13.3	LOS A	20.5	150.8	0.45	0.44	0.48	43.7

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.
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: 7 [Site 6: NEH & Chisholm Rd 2022_PM With Development]

Network: N101 [PM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	380	0.8	380	0.8	0.269	7.7	LOS A	4.0	28.1	0.30	0.64	0.30	49.0
2	T1	1541	4.9	1541	4.9	0.713	17.2	LOS B	27.3	199.1	0.79	0.72	0.79	38.5
Approach		1921	4.1	1921	4.1	0.713	15.3	LOS B	27.3	199.1	0.70	0.71	0.70	41.2
NorthWest: New England Highway														
8	T1	1556	4.2	1556	4.2	0.401	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
29	R2	214	1.9	214	1.9	0.714	50.5	LOS D	10.6	75.5	1.00	0.85	1.06	24.4
Approach		1769	3.9	1769	3.9	0.714	6.1	LOS A	10.6	75.5	0.12	0.10	0.13	51.9
SouthWest: Chisholm Road														
30	L2	203	3.4	203	3.4	0.341	32.5	LOS C	7.6	54.6	0.81	0.77	0.81	24.2
32	R2	183	3.2	183	3.2	0.894	64.1	LOS E	10.4	75.1	1.00	1.04	1.46	26.3
Approach		386	3.3	386	3.3	0.894	47.5	LOS D	10.4	75.1	0.90	0.89	1.12	25.5
All Vehicles		4077	3.9	4077	3.9	0.894	14.4	LOS A	27.3	199.1	0.47	0.46	0.49	42.9

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.
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: [Site 1: Raymond Terrace_Metford_AM - 2032 Without Development]

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
SouthEast: Raymond Terrace Road												
21	L2	499	2.2	0.668	11.6	LOS A	6.7	47.5	0.90	1.04	1.18	50.2
22	T1	701	1.4	0.888	18.8	LOS B	17.2	122.6	1.00	1.31	1.83	46.8
23	R2	117	6.4	0.888	24.7	LOS B	17.2	122.6	1.00	1.31	1.83	46.9
23u	U	1	0.0	0.888	26.8	LOS B	17.2	122.6	1.00	1.31	1.83	48.1
Approach		1318	2.2	0.888	16.6	LOS B	17.2	122.6	0.96	1.21	1.59	48.0
NorthEast: Metford Road												
24	L2	181	11.5	0.312	8.4	LOS A	1.6	12.1	0.72	0.84	0.72	52.3
25	T1	458	0.2	0.546	8.3	LOS A	4.2	29.8	0.82	0.89	0.97	53.8
26	R2	27	0.0	0.546	13.9	LOS A	4.2	29.8	0.82	0.89	0.97	54.1
Approach		666	3.3	0.546	8.5	LOS A	4.2	29.8	0.79	0.88	0.91	53.4
NorthWest: Raymond Terrace Road												
27	L2	20	0.0	0.217	8.0	LOS A	1.2	8.4	0.72	0.79	0.72	52.8
28	T1	413	1.7	0.532	7.9	LOS A	4.6	32.4	0.83	0.85	0.91	53.1
29	R2	146	0.8	0.532	13.6	LOS A	4.6	32.4	0.86	0.87	0.97	53.1
Approach		579	1.4	0.532	9.4	LOS A	4.6	32.4	0.83	0.85	0.92	53.1
SouthWest: Metford Road												
30	L2	171	0.0	0.397	10.9	LOS A	2.7	19.2	0.90	0.97	0.96	50.7
31	T1	281	1.4	0.873	25.4	LOS B	15.0	106.6	1.00	1.36	1.89	42.4
32	R2	279	2.4	0.873	31.3	LOS C	15.0	106.6	1.00	1.36	1.91	42.5
Approach		731	1.4	0.873	24.3	LOS B	15.0	106.6	0.98	1.27	1.68	44.1
All Vehicles		3294	2.1	0.888	15.4	LOS B	17.2	122.6	0.91	1.09	1.35	48.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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 [Site 1: Raymond Terrace_Metford_PM - 2032 Without Development]

New Site
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
SouthEast: Raymond Terrace Road												
21	L2	479	2.5	0.535	7.0	LOS A	4.1	29.2	0.72	0.78	0.77	53.6
22	T1	592	1.8	0.734	8.3	LOS A	8.9	63.7	0.86	0.88	1.04	52.8
23	R2	220	3.7	0.734	14.1	LOS A	8.9	63.7	0.86	0.88	1.04	53.0
23u	U	1	0.0	0.734	16.3	LOS B	8.9	63.7	0.86	0.88	1.04	54.5
Approach		1292	2.4	0.734	8.8	LOS A	8.9	63.7	0.80	0.84	0.94	53.1
NorthEast: Metford Road												
24	L2	135	3.0	0.250	8.7	LOS A	1.3	9.3	0.76	0.87	0.76	52.3
25	T1	336	0.4	0.451	8.2	LOS A	3.2	22.3	0.84	0.86	0.93	53.7
26	R2	13	0.0	0.451	13.9	LOS A	3.2	22.3	0.84	0.86	0.93	54.1
Approach		483	1.1	0.451	8.5	LOS A	3.2	22.3	0.82	0.86	0.89	53.4
NorthWest: Raymond Terrace Road												
27	L2	16	0.0	0.310	9.7	LOS A	1.6	11.6	0.81	0.88	0.81	51.8
28	T1	585	1.3	0.759	13.8	LOS A	8.4	59.2	0.95	1.13	1.37	50.0
29	R2	71	1.8	0.759	20.7	LOS B	8.4	59.2	0.99	1.19	1.52	49.4
Approach		672	1.3	0.759	14.4	LOS A	8.4	59.2	0.95	1.13	1.37	50.0
SouthWest: Metford Road												
30	L2	117	0.0	0.488	12.3	LOS A	3.6	25.6	0.91	1.00	1.06	49.9
31	T1	502	0.7	1.075	54.6	LOS D	39.8	281.6	0.98	1.90	3.25	32.0
32	R2	357	2.0	1.075	72.9	LOS F	39.8	281.6	1.00	2.16	3.89	29.0
Approach		976	1.1	1.075	56.2	LOS D	39.8	281.6	0.98	1.89	3.22	32.1
All Vehicles		3422	1.6	1.075	23.4	LOS B	39.8	281.6	0.88	1.20	1.67	44.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: [Site 3: Chelmsford Drive_Metford Road_AM - 2032 Without Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	472	1.0	1.516	253.2	LOS F	97.8	694.3	1.00	3.59	7.80	10.1
23	R2	274	2.7	1.516	257.6	LOS F	97.8	694.3	1.00	3.59	7.80	11.6
23u	U	1	0.0	1.516	259.3	LOS F	97.8	694.3	1.00	3.59	7.80	11.6
Approach		746	1.6	1.516	254.8	LOS F	97.8	694.3	1.00	3.59	7.80	10.6
NorthEast: Metford Road												
24	L2	294	0.0	1.196	103.8	LOS F	88.4	627.4	1.00	2.62	4.99	21.7
26	R2	914	2.1	1.196	108.3	LOS F	88.4	627.4	1.00	2.62	4.99	19.5
Approach		1207	1.6	1.196	107.2	LOS F	88.4	627.4	1.00	2.62	4.99	20.1
NorthWest: Chelmsford Drive-W												
27	L2	533	1.5	0.413	5.3	LOS A	3.4	24.0	0.53	0.58	0.53	51.9
28	T1	282	0.7	0.312	5.3	LOS A	2.2	15.5	0.50	0.57	0.50	52.5
29u	U	53	4.0	0.312	11.6	LOS A	2.2	15.5	0.50	0.57	0.50	51.0
Approach		867	1.4	0.413	5.7	LOS A	3.4	24.0	0.52	0.58	0.52	52.0
All Vehicles		2821	1.6	1.516	115.0	LOS F	97.8	694.3	0.85	2.25	4.36	18.8

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.
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 [Site 3: Chelmsford Drive_Metford Road_PM - 2032 Without Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	440	1.0	0.943	34.2	LOS C	20.5	145.4	1.00	1.53	2.32	35.7
23	R2	165	2.7	0.943	38.6	LOS C	20.5	145.4	1.00	1.53	2.32	38.1
23u	U	1	0.0	0.943	40.3	LOS C	20.5	145.4	1.00	1.53	2.32	38.5
Approach		606	1.5	0.943	35.4	LOS C	20.5	145.4	1.00	1.53	2.32	36.4
NorthEast: Metford Road												
24	L2	185	0.0	1.054	57.8	LOS E	38.9	276.1	1.00	2.06	3.58	29.8
26	R2	609	2.1	1.054	62.3	LOS E	38.9	276.1	1.00	2.06	3.58	27.4
Approach		795	1.6	1.054	61.3	LOS E	38.9	276.1	1.00	2.06	3.58	28.0
NorthWest: Chelmsford Drive-W												
27	L2	801	1.5	0.595	5.5	LOS A	6.2	44.1	0.62	0.59	0.62	51.6
28	T1	521	0.7	0.497	5.4	LOS A	4.4	31.2	0.58	0.57	0.58	52.4
29u	U	53	4.0	0.497	11.7	LOS A	4.4	31.2	0.58	0.57	0.58	50.9
Approach		1375	1.3	0.595	5.7	LOS A	6.2	44.1	0.60	0.58	0.60	51.9
All Vehicles		2776	1.5	1.054	28.1	LOS B	38.9	276.1	0.80	1.21	1.83	38.5

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.

MOVEMENT SUMMARY

Site: [Site 2: Fieldsend Street_Metford_AM - 2032 Without Development]

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
SouthEast: Hospital Access												
21	L2	1	0.0	0.006	15.6	LOS B	0.1	0.4	0.99	0.59	0.99	33.8
22	T1	1	0.0	0.006	14.9	LOS B	0.1	0.4	1.00	0.62	1.00	34.5
23	R2	1	0.0	0.006	14.9	LOS B	0.1	0.4	1.00	0.62	1.00	35.2
Approach		3	0.0	0.006	15.1	LOS B	0.1	0.4	1.00	0.61	1.00	34.5
NorthEast: Metford Road												
24	L2	1	0.0	0.001	5.7	LOS A	0.0	0.0	0.13	0.53	0.13	44.3
2	T1	1260	1.1	0.776	4.2	LOS A	12.1	85.5	0.32	0.40	0.32	55.4
3	R2	109	5.1	0.776	9.2	LOS A	12.1	85.5	0.32	0.40	0.32	55.3
Approach		1371	1.5	0.776	4.6	LOS A	12.1	85.5	0.32	0.40	0.32	55.4
NorthWest: Fieldsend Street												
4	L2	100	5.1	0.162	7.3	LOS A	0.9	6.6	0.66	0.74	0.66	52.1
28	T1	1	0.0	0.162	11.4	LOS A	0.9	6.6	0.66	0.74	0.66	42.3
6	R2	34	7.4	0.162	12.4	LOS A	0.9	6.6	0.66	0.74	0.66	53.3
Approach		135	5.6	0.162	8.6	LOS A	0.9	6.6	0.66	0.74	0.66	52.3
SouthWest: Metford Road												
7	L2	36	10.7	0.535	4.5	LOS A	3.8	26.7	0.35	0.45	0.35	53.8
8	T1	722	1.5	0.535	4.5	LOS A	3.8	26.7	0.35	0.45	0.35	55.5
32	R2	1	0.0	0.535	11.2	LOS A	3.8	26.7	0.35	0.45	0.35	44.7
Approach		759	2.0	0.535	4.5	LOS A	3.8	26.7	0.35	0.45	0.35	55.4
All Vehicles		2267	1.9	0.776	4.8	LOS A	12.1	85.5	0.35	0.43	0.35	55.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: [Site 2: Fieldsend Street_Metford_PM - 2032 Without Development]

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
SouthEast: Hospital Access												
21	L2	1	0.0	0.003	6.0	LOS A	0.0	0.2	0.79	0.44	0.79	40.0
22	T1	1	0.0	0.003	5.5	LOS A	0.0	0.2	0.81	0.46	0.81	40.7
23	R2	1	0.0	0.003	5.5	LOS A	0.0	0.2	0.81	0.46	0.81	41.7
Approach		3	0.0	0.003	5.7	LOS A	0.0	0.2	0.80	0.46	0.80	40.8
NorthEast: Metford Road												
24	L2	1	0.0	0.001	5.7	LOS A	0.0	0.0	0.14	0.53	0.14	44.2
2	T1	933	1.5	0.594	4.1	LOS A	5.8	41.5	0.24	0.41	0.24	55.8
3	R2	106	5.1	0.594	9.1	LOS A	5.8	41.5	0.24	0.41	0.24	55.7
Approach		1040	1.9	0.594	4.6	LOS A	5.8	41.5	0.23	0.41	0.23	55.8
NorthWest: Fieldsend Street												
4	L2	100	5.1	0.209	9.7	LOS A	1.3	9.8	0.81	0.84	0.81	50.4
28	T1	1	0.0	0.209	13.8	LOS A	1.3	9.8	0.81	0.84	0.81	40.3
6	R2	34	7.4	0.209	14.8	LOS B	1.3	9.8	0.81	0.84	0.81	51.5
Approach		135	5.6	0.209	11.0	LOS A	1.3	9.8	0.81	0.84	0.81	50.6
SouthWest: Metford Road												
7	L2	35	10.7	0.680	4.7	LOS A	6.0	42.7	0.43	0.46	0.43	53.5
8	T1	951	1.1	0.680	4.7	LOS A	6.0	42.7	0.43	0.46	0.43	55.2
32	R2	1	0.0	0.680	11.4	LOS A	6.0	42.7	0.43	0.46	0.43	44.3
Approach		986	1.5	0.680	4.7	LOS A	6.0	42.7	0.43	0.46	0.43	55.1
All Vehicles		2164	1.9	0.680	5.0	LOS A	6.0	42.7	0.36	0.46	0.36	55.1

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.

MOVEMENT SUMMARY

Site: 5 [Site 4: NEH & Mitchell Drive 2032_AM Without Development]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
1	L2	239	3.9	239	3.9	0.245	12.0	LOS A	3.4	24.3	0.60	0.72	0.60	38.6
2	T1	1428	4.9	1428	4.9	0.630	22.7	LOS B	20.4	149.0	0.87	0.77	0.87	41.6
Approach		1667	4.8	1667	4.8	0.630	21.2	LOS B	20.4	149.0	0.84	0.76	0.84	41.4
NorthEast: Mitchell Drive														
4	L2	106	2.4	106	2.4	0.693	50.1	LOS D	5.0	35.5	1.00	0.85	1.15	3.0
5	T1	162	3.5	162	3.5	0.473	44.5	LOS D	3.6	25.9	0.99	0.76	0.99	8.9
6	R2	38	0.0	38	0.0	0.202	44.8	LOS D	1.6	11.2	0.95	0.72	0.95	25.0
Approach		306	2.7	306	2.7	0.693	46.5	LOS D	5.0	35.5	0.99	0.79	1.04	9.8
NorthWest: New England Highway														
7	L2	27	5.0	27	5.0	0.029	11.1	LOS A	0.3	2.3	0.49	0.65	0.49	43.2
8	T1	1453	8.3	1453	8.3	0.726	13.1	LOS A	22.2	166.4	0.75	0.69	0.75	42.6
9	R2	353	0.4	353	0.4	0.866	57.4	LOS E	8.9	62.7	1.00	1.00	1.42	23.0
Approach		1833	6.7	1833	6.7	0.866	21.6	LOS B	22.2	166.4	0.80	0.75	0.88	36.0
SouthWest: Mitchell Drive														
10	L2	178	9.9	178	9.9	0.183	24.9	LOS B	1.8	13.4	0.86	0.73	0.86	34.8
11	T1	80	7.5	80	7.5	0.479	44.6	LOS D	3.5	26.4	0.99	0.76	0.99	8.9
12	R2	196	3.6	196	3.6	0.601	50.1	LOS D	4.5	32.4	1.00	0.81	1.06	6.6
Approach		454	6.8	454	6.8	0.601	39.3	LOS C	4.5	32.4	0.94	0.77	0.97	18.8
All Vehicles		4260	5.7	4260	5.7	0.866	25.1	LOS B	22.2	166.4	0.84	0.76	0.88	34.9

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.
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
P11	SouthEast Stage 1	14	18.7	LOS B	0.0	0.0	0.64	0.64
P12	SouthEast Stage 2	14	39.2	LOS D	0.0	0.0	0.93	0.93
P1S	SouthEast Slip/Bypass Lane Crossing	14	18.6	LOS B	0.0	0.0	0.84	0.84
P2	NorthEast Full Crossing	5	12.8	LOS B	0.0	0.0	0.53	0.53
P2S	NorthEast Slip/Bypass Lane Crossing	5	2.7	LOS A	0.0	0.0	0.24	0.24
P3	NorthWest Full Crossing	14	39.2	LOS D	0.0	0.0	0.93	0.93
P4	SouthWest Full Crossing	1	24.9	LOS C	0.0	0.0	0.74	0.74
P4S	SouthWest Slip/Bypass Lane Crossing	1	8.1	LOS A	0.0	0.0	0.60	0.60

All Pedestrians	67	25.2	LOS C	0.76	0.76

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.

MOVEMENT SUMMARY

Site: 5 [Site 4: NEH & Mitchell Drive 2032_PM Without Development]

Network: N101 [PM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
1	L2	366	4.4	366	4.4	0.387	13.5	LOS A	6.0	43.5	0.63	0.74	0.63	37.1
2	T1	1520	4.3	1520	4.3	0.803	35.6	LOS C	27.2	197.5	0.97	0.89	1.01	35.5
Approach		1886	4.3	1886	4.3	0.803	31.3	LOS C	27.2	197.5	0.91	0.86	0.94	35.7
NorthEast: Mitchell Drive														
4	L2	92	1.4	92	1.4	0.495	51.1	LOS D	4.4	31.5	0.99	0.77	0.99	2.9
5	T1	240	3.3	240	3.3	0.622	49.2	LOS D	5.9	42.8	1.00	0.81	1.05	8.2
6	R2	37	3.4	37	3.4	0.126	42.4	LOS C	1.6	11.3	0.89	0.72	0.89	25.8
Approach		368	2.8	368	2.8	0.622	49.0	LOS D	5.9	42.8	0.99	0.79	1.02	9.3
NorthWest: New England Highway														
7	L2	35	0.0	35	0.0	0.036	11.9	LOS A	0.5	3.2	0.51	0.66	0.51	42.3
8	T1	1312	4.4	1312	4.4	0.687	16.7	LOS B	23.5	170.3	0.77	0.70	0.77	39.4
9	R2	441	2.2	441	2.2	0.871	61.2	LOS E	12.3	87.7	1.00	1.01	1.35	22.1
Approach		1787	3.8	1787	3.8	0.871	27.6	LOS B	23.5	170.3	0.82	0.77	0.91	32.5
SouthWest: Mitchell Drive														
10	L2	474	3.5	474	3.5	0.389	24.1	LOS B	4.6	33.5	0.87	0.77	0.87	35.4
11	T1	165	4.7	165	4.7	0.864	57.1	LOS E	9.1	66.4	1.00	0.99	1.39	7.2
12	R2	494	2.9	494	2.9	0.923	68.3	LOS E	15.7	112.8	1.00	1.07	1.50	5.0
Approach		1133	3.4	1133	3.4	0.923	48.2	LOS D	15.7	112.8	0.95	0.93	1.22	16.8
All Vehicles		5175	3.8	5175	3.8	0.923	35.0	LOS C	27.2	197.5	0.89	0.84	1.00	29.0

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.
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
P11	SouthEast Stage 1	14	15.1	LOS B	0.0	0.0	0.55	0.55
P12	SouthEast Stage 2	14	44.2	LOS E	0.0	0.0	0.94	0.94
P1S	SouthEast Slip/Bypass Lane Crossing	14	17.0	LOS B	0.0	0.0	0.80	0.80
P2	NorthEast Full Crossing	5	16.2	LOS B	0.0	0.0	0.57	0.57
P2S	NorthEast Slip/Bypass Lane Crossing	5	2.9	LOS A	0.0	0.0	0.24	0.24
P3	NorthWest Full Crossing	14	44.2	LOS E	0.0	0.0	0.94	0.94
P4	SouthWest Full Crossing	1	32.0	LOS D	0.0	0.0	0.80	0.80
P4S	SouthWest Slip/Bypass Lane Crossing	1	10.9	LOS B	0.0	0.0	0.66	0.66

All Pedestrians	67	26.7	LOS C	0.74	0.74

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.

MOVEMENT SUMMARY

Site: [Site 5: NEH & Chelmsford Drive 2032_AM Without Development]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	66	3.3	66	3.3	0.050	8.1	LOS A	0.5	3.5	0.18	0.59	0.18	39.5
2	T1	1363	5.3	1363	5.3	0.709	11.0	LOS A	18.7	136.9	0.60	0.54	0.60	33.6
3	R2	196	3.0	196	3.0	0.814	56.8	LOS E	4.8	34.2	1.00	0.88	1.30	22.0
Approach		1625	4.9	1625	4.9	0.814	16.4	LOS B	18.7	136.9	0.63	0.59	0.67	30.0
NorthEast: Chelmsford Drive														
4	L2	342	3.0	342	3.0	0.881	44.4	LOS D	11.9	85.3	1.00	1.06	1.53	19.2
25	T1	488	1.2	488	1.2	0.947	62.8	LOS E	13.9	98.5	1.00	1.15	1.64	18.1
6	R2	265	3.4	265	3.4	0.950	69.9	LOS E	15.5	111.7	1.00	1.12	1.64	13.7
Approach		1096	2.3	1096	2.3	0.950	58.8	LOS E	15.5	111.7	1.00	1.11	1.61	17.2
NorthWest: New England Highway														
7	L2	272	3.0	272	3.0	0.274	12.2	LOS A	4.0	28.9	0.63	0.73	0.63	45.3
8	T1	1385	7.7	1385	7.7	0.983	70.9	LOS F	47.2	352.1	1.00	1.36	1.58	13.7
Approach		1657	6.9	1657	6.9	0.983	61.3	LOS E	47.2	352.1	0.94	1.25	1.42	16.9
SouthWest: Chelmsford Drive Extension														
30	L2	79	0.0	79	0.0	0.300	44.8	LOS D	3.2	22.7	0.94	0.76	0.94	8.5
31	T1	193	0.6	193	0.6	0.372	39.7	LOS C	4.0	28.1	0.95	0.74	0.95	24.3
32	R2	75	3.0	75	3.0	0.267	42.8	LOS D	3.0	21.4	0.92	0.76	0.92	8.9
Approach		346	1.0	346	1.0	0.372	41.5	LOS C	4.0	28.1	0.94	0.75	0.94	18.4
All Vehicles		4724	4.7	4724	4.7	0.983	43.8	LOS D	47.2	352.1	0.85	0.95	1.17	19.4

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.
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	SouthEast Full Crossing	3	39.2	LOS D	0.0	0.0	0.93	0.93
P1S	SouthEast Slip/Bypass Lane Crossing	3	35.6	LOS D	0.0	0.0	0.89	0.89
P2	NorthEast Full Crossing	1	28.0	LOS C	0.0	0.0	0.79	0.79
P2S	NorthEast Slip/Bypass Lane Crossing	1	6.0	LOS A	0.0	0.0	0.51	0.51
P3	NorthWest Full Crossing	1	39.2	LOS D	0.0	0.0	0.93	0.93
P3S	NorthWest Slip/Bypass Lane Crossing	1	35.6	LOS D	0.0	0.0	0.89	0.89
P8	SouthWest Full Crossing	1	19.3	LOS B	0.0	0.0	0.66	0.66
P8S	SouthWest Slip/Bypass Lane Crossing	1	3.8	LOS A	0.0	0.0	0.29	0.29

All Pedestrians	13	29.7	LOS C	0.79	0.79

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.

MOVEMENT SUMMARY

Site: [Site 5: NEH & Chelmsford Drive 2032_PM Without Development]

Network: N101 [PM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	97	1.1	97	1.1	0.068	8.1	LOS A	0.8	5.8	0.19	0.60	0.19	39.6
2	T1	1586	4.7	1586	4.7	0.737	11.2	LOS A	24.0	174.6	0.59	0.54	0.59	33.4
3	R2	276	6.3	276	6.3	0.869	57.9	LOS E	7.4	54.3	1.00	0.90	1.24	21.7
Approach		1959	4.7	1959	4.7	0.869	17.6	LOS B	24.0	174.6	0.63	0.59	0.66	29.3
NorthEast: Chelmsford Drive														
4	L2	246	6.0	246	6.0	0.648	29.4	LOS C	8.0	58.7	0.97	0.82	0.97	25.0
25	T1	409	1.1	409	1.1	0.961	72.9	LOS F	13.1	92.6	1.00	1.15	1.68	16.3
6	R2	239	1.4	239	1.4	0.938	71.9	LOS F	14.7	104.4	1.00	1.07	1.56	13.4
Approach		895	2.5	895	2.5	0.961	60.7	LOS E	14.7	104.4	0.99	1.04	1.46	16.9
NorthWest: New England Highway														
7	L2	564	2.8	564	2.8	0.542	13.9	LOS A	10.0	71.5	0.74	0.80	0.74	43.9
8	T1	1461	5.3	1461	5.3	0.948	56.2	LOS D	49.2	359.8	1.00	1.19	1.36	16.3
Approach		2025	4.6	2025	4.6	0.948	44.4	LOS D	49.2	359.8	0.93	1.08	1.19	22.3
SouthWest: Chelmsford Drive Extension														
30	L2	60	1.8	60	1.8	0.280	51.2	LOS D	2.8	19.8	0.96	0.75	0.96	7.6
31	T1	383	0.7	383	0.7	0.957	71.6	LOS F	12.9	91.1	1.00	1.14	1.68	16.5
32	R2	86	2.7	86	2.7	0.342	48.8	LOS D	3.9	28.1	0.95	0.77	0.95	8.0
Approach		529	1.2	529	1.2	0.957	65.6	LOS E	12.9	91.1	0.99	1.03	1.48	14.9
All Vehicles		5408	4.0	5408	4.0	0.961	39.5	LOS C	49.2	359.8	0.84	0.89	1.07	21.5

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.
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	SouthEast Full Crossing	3	44.2	LOS E	0.0	0.0	0.94	0.94
P1S	SouthEast Slip/Bypass Lane Crossing	3	41.4	LOS E	0.0	0.0	0.91	0.91
P2	NorthEast Full Crossing	1	26.6	LOS C	0.0	0.0	0.73	0.73
P2S	NorthEast Slip/Bypass Lane Crossing	1	5.8	LOS A	0.0	0.0	0.48	0.48
P3	NorthWest Full Crossing	1	44.2	LOS E	0.0	0.0	0.94	0.94
P3S	NorthWest Slip/Bypass Lane Crossing	1	41.4	LOS E	0.0	0.0	0.91	0.91
P8	SouthWest Full Crossing	1	16.8	LOS B	0.0	0.0	0.58	0.58
P8S	SouthWest Slip/Bypass Lane Crossing	1	3.1	LOS A	0.0	0.0	0.25	0.25

All Pedestrians	13	32.9	LOS D	0.79	0.79

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.

MOVEMENT SUMMARY

Site: 7 [Site 6: NEH & Chisholm Rd 2032_AM Without Development]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	261	2.4	261	2.4	0.194	7.8	LOS A	2.5	18.1	0.31	0.64	0.31	48.9
2	T1	1449	5.8	1449	5.8	0.694	16.1	LOS B	23.2	170.4	0.79	0.72	0.79	39.4
Approach		1711	5.3	1711	5.3	0.694	14.8	LOS B	23.2	170.4	0.72	0.70	0.72	41.4
NorthWest: New England Highway														
8	T1	1593	7.2	1593	7.2	0.419	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
29	R2	241	6.6	241	6.6	0.702	44.8	LOS D	10.8	79.6	1.00	0.85	1.05	26.0
Approach		1834	7.1	1834	7.1	0.702	5.9	LOS A	10.8	79.6	0.13	0.11	0.14	52.0
SouthWest: Chisholm Road														
30	L2	160	5.6	160	5.6	0.271	29.0	LOS C	5.2	38.5	0.78	0.75	0.78	25.6
32	R2	129	4.0	129	4.0	0.899	61.0	LOS E	6.8	48.9	1.00	1.06	1.58	26.9
Approach		289	4.9	289	4.9	0.899	43.3	LOS D	6.8	48.9	0.88	0.89	1.14	26.4
All Vehicles		3834	6.1	3834	6.1	0.899	12.7	LOS A	23.2	170.4	0.45	0.44	0.47	44.3

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.
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: 7 [Site 6: NEH & Chisholm Rd 2032_PM Without Development]

Network: N101 [PM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	380	0.8	380	0.8	0.259	7.3	LOS A	3.5	24.4	0.27	0.63	0.27	49.3
2	T1	1755	4.9	1755	4.9	0.771	16.4	LOS B	31.9	232.5	0.82	0.75	0.82	39.2
Approach		2135	4.2	2135	4.2	0.771	14.8	LOS B	31.9	232.5	0.72	0.73	0.72	41.6
NorthWest: New England Highway														
8	T1	1645	4.2	1645	4.2	0.425	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
29	R2	162	1.9	162	1.9	0.739	58.9	LOS E	8.3	59.4	1.00	0.84	1.07	22.4
Approach		1807	4.0	1807	4.0	0.739	5.3	LOS A	8.3	59.4	0.09	0.08	0.10	52.9
SouthWest: Chisholm Road														
30	L2	196	3.4	196	3.4	0.363	35.0	LOS C	7.6	54.9	0.84	0.78	0.84	23.3
32	R2	204	3.2	204	3.2	0.913	66.4	LOS E	12.0	86.1	1.00	1.06	1.50	25.8
Approach		400	3.3	400	3.3	0.913	51.1	LOS D	12.0	86.1	0.92	0.92	1.18	25.0
All Vehicles		4342	4.0	4342	4.0	0.913	14.2	LOS A	31.9	232.5	0.48	0.47	0.50	43.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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: [Site 1: Raymond Terrace_Metford_AM - 2032 With Development]

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
SouthEast: Raymond Terrace Road												
21	L2	516	2.2	0.735	14.3	LOS A	8.3	59.5	0.96	1.15	1.39	48.4
22	T1	701	1.4	0.946	27.4	LOS B	22.9	163.0	1.00	1.53	2.32	42.3
23	R2	117	6.4	0.946	33.4	LOS C	22.9	163.0	1.00	1.53	2.32	42.4
23u	U	1	0.0	0.946	35.4	LOS C	22.9	163.0	1.00	1.53	2.32	43.4
Approach		1335	2.2	0.946	22.9	LOS B	22.9	163.0	0.98	1.38	1.96	44.4
NorthEast: Metford Road												
24	L2	197	11.5	0.345	8.7	LOS A	1.8	13.8	0.74	0.86	0.76	52.1
25	T1	501	0.2	0.606	9.1	LOS A	5.2	36.2	0.85	0.99	1.07	53.6
26	R2	31	0.0	0.606	14.8	LOS B	5.2	36.2	0.85	0.99	1.07	53.9
Approach		728	3.3	0.606	9.3	LOS A	5.2	36.2	0.82	0.96	0.99	53.2
NorthWest: Raymond Terrace Road												
27	L2	20	0.0	0.224	8.1	LOS A	1.2	8.6	0.73	0.80	0.73	52.8
28	T1	413	1.7	0.547	8.2	LOS A	4.8	34.2	0.84	0.87	0.93	53.0
29	R2	155	0.8	0.547	13.9	LOS A	4.8	34.2	0.87	0.90	1.00	52.9
Approach		587	1.4	0.547	9.7	LOS A	4.8	34.2	0.84	0.88	0.94	53.0
SouthWest: Metford Road												
30	L2	173	0.0	0.404	11.1	LOS A	2.8	19.5	0.90	0.97	0.97	50.6
31	T1	282	1.4	0.888	27.3	LOS B	15.9	113.1	1.00	1.39	1.98	41.5
32	R2	283	2.4	0.888	33.2	LOS C	15.9	113.1	1.00	1.40	1.99	41.6
Approach		738	1.4	0.888	25.8	LOS B	15.9	113.1	0.98	1.30	1.75	43.3
All Vehicles		3388	2.1	0.946	18.3	LOS B	22.9	163.0	0.92	1.18	1.53	47.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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 [Site 1: Raymond Terrace_Metford_PM - 2032 With Development]

New Site
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
SouthEast: Raymond Terrace Road												
21	L2	494	2.5	0.553	7.2	LOS A	4.4	31.3	0.73	0.80	0.81	53.4
22	T1	592	1.8	0.741	8.6	LOS A	9.2	65.4	0.87	0.90	1.07	52.7
23	R2	220	3.7	0.741	14.4	LOS A	9.2	65.4	0.87	0.90	1.07	53.0
23u	U	1	0.0	0.741	16.6	LOS B	9.2	65.4	0.87	0.90	1.07	54.4
Approach		1306	2.4	0.741	9.1	LOS A	9.2	65.4	0.82	0.86	0.97	53.0
NorthEast: Metford Road												
24	L2	135	3.0	0.255	8.8	LOS A	1.3	9.5	0.77	0.87	0.77	52.2
25	T1	339	0.4	0.462	8.5	LOS A	3.3	23.2	0.85	0.89	0.96	53.7
26	R2	13	0.0	0.462	14.2	LOS A	3.3	23.2	0.85	0.89	0.96	54.0
Approach		486	1.1	0.462	8.7	LOS A	3.3	23.2	0.83	0.88	0.90	53.3
NorthWest: Raymond Terrace Road												
27	L2	16	0.0	0.314	9.7	LOS A	1.7	11.7	0.80	0.88	0.81	51.8
28	T1	585	1.3	0.767	14.0	LOS A	8.6	60.7	0.95	1.13	1.39	49.9
29	R2	78	1.8	0.767	21.0	LOS B	8.6	60.7	0.99	1.20	1.55	49.2
Approach		679	1.3	0.767	14.7	LOS B	8.6	60.7	0.95	1.14	1.39	49.8
SouthWest: Metford Road												
30	L2	134	0.0	0.519	12.9	LOS A	4.0	28.2	0.92	1.02	1.11	49.5
31	T1	508	0.7	1.143	74.1	LOS F	52.2	369.7	0.98	2.20	4.00	27.4
32	R2	391	2.0	1.143	97.0	LOS F	52.2	369.7	1.00	2.53	4.81	24.4
Approach		1033	1.1	1.143	74.9	LOS F	52.2	369.7	0.98	2.17	3.93	27.7
All Vehicles		3504	1.6	1.143	29.5	LOS C	52.2	369.7	0.89	1.30	1.92	41.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: [Site 3: Chelmsford Drive_Metford Road_AM - 2032 With Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	472	1.0	1.567	275.5	LOS F	103.4	734.4	1.00	3.67	8.00	9.4
23	R2	278	2.7	1.567	279.9	LOS F	103.4	734.4	1.00	3.67	8.00	10.8
23u	U	1	0.0	1.567	281.7	LOS F	103.4	734.4	1.00	3.67	8.00	10.9
Approach		751	1.7	1.567	277.2	LOS F	103.4	734.4	1.00	3.67	8.00	9.9
NorthEast: Metford Road												
24	L2	292	0.0	1.156	85.4	LOS F	80.9	574.0	1.00	2.19	4.12	24.3
26	R2	944	2.1	1.156	89.9	LOS F	80.9	574.0	1.00	2.19	4.12	22.0
Approach		1236	1.6	1.156	88.9	LOS F	80.9	574.0	1.00	2.19	4.12	22.6
NorthWest: Chelmsford Drive-W												
27	L2	654	1.5	0.500	5.4	LOS A	4.5	32.2	0.57	0.59	0.57	51.7
28	T1	282	0.7	0.288	5.4	LOS A	1.9	13.7	0.50	0.54	0.50	53.1
29u	U	1	4.0	0.288	11.7	LOS A	1.9	13.7	0.50	0.54	0.50	51.7
Approach		937	1.3	0.500	5.4	LOS A	4.5	32.2	0.55	0.57	0.55	52.1
All Vehicles		2923	1.5	1.567	110.5	LOS F	103.4	734.4	0.86	2.05	3.97	19.4

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.

MOVEMENT SUMMARY

Site: 101 [Site 3: Chelmsford Drive_Metford Road_PM - 2032 With Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	440	1.0	1.020	52.6	LOS D	28.2	200.2	1.00	1.80	3.03	29.4
23	R2	169	2.7	1.020	57.0	LOS E	28.2	200.2	1.00	1.80	3.03	32.0
23u	U	1	0.0	1.020	58.7	LOS E	28.2	200.2	1.00	1.80	3.03	32.3
Approach		611	1.5	1.020	53.8	LOS D	28.2	200.2	1.00	1.80	3.03	30.2
NorthEast: Metford Road												
24	L2	195	0.0	1.279	143.0	LOS F	92.8	659.4	1.00	3.43	6.74	17.6
26	R2	845	2.1	1.279	147.5	LOS F	92.8	659.4	1.00	3.43	6.74	15.6
Approach		1040	1.7	1.279	146.7	LOS F	92.8	659.4	1.00	3.43	6.74	16.0
NorthWest: Chelmsford Drive-W												
27	L2	902	1.5	0.667	5.7	LOS A	7.7	55.0	0.69	0.60	0.69	51.4
28	T1	521	0.7	0.472	5.5	LOS A	4.0	28.3	0.57	0.56	0.57	52.8
29u	U	1	4.0	0.472	11.7	LOS A	4.0	28.3	0.57	0.56	0.57	51.3
Approach		1424	1.2	0.667	5.6	LOS A	7.7	55.0	0.64	0.58	0.64	51.9
All Vehicles		3075	1.5	1.279	62.9	LOS E	92.8	659.4	0.83	1.79	3.18	27.0

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.

MOVEMENT SUMMARY

Site: [Site 3: (Proposed Layout) Chelmsford Drive_Metford Road_AM - 2032 With Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	472	1.0	0.558	9.4	LOS A	3.6	25.7	0.80	0.96	0.99	50.3
23	R2	278	2.7	0.558	14.3	LOS A	3.5	25.2	0.80	1.00	1.00	49.2
23u	U	1	0.0	0.558	16.1	LOS B	3.5	25.2	0.80	1.00	1.00	50.0
Approach		751	1.7	0.558	11.3	LOS A	3.6	25.7	0.80	0.97	0.99	49.9
NorthEast: Metford Road												
24	L2	292	0.0	0.542	6.2	LOS A	4.6	32.3	0.66	0.69	0.66	51.2
26	R2	944	2.1	0.542	10.5	LOS A	4.6	32.3	0.67	0.72	0.67	49.9
Approach		1236	1.6	0.542	9.5	LOS A	4.6	32.3	0.67	0.71	0.67	50.2
NorthWest: Chelmsford Drive-W												
27	L2	654	1.5	0.546	6.2	LOS A	4.8	34.1	0.69	0.67	0.69	51.4
28	T1	282	0.7	0.317	6.2	LOS A	2.1	14.6	0.59	0.62	0.59	52.6
29u	U	1	4.0	0.317	12.5	LOS A	2.1	14.6	0.59	0.62	0.59	51.2
Approach		937	1.3	0.546	6.2	LOS A	4.8	34.1	0.66	0.66	0.66	51.7
All Vehicles		2923	1.5	0.558	8.9	LOS A	4.8	34.1	0.70	0.76	0.75	50.6

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.
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: [Site 3: (Proposed Layout) Chelmsford Drive_Metford Road_PM - 2032 With Development]

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
SouthEast: Chelmsford Drive-E												
22	T1	440	1.0	0.439	7.8	LOS A	2.5	17.7	0.74	0.87	0.82	51.3
23	R2	169	2.7	0.439	12.5	LOS A	2.4	17.4	0.74	0.93	0.83	51.0
23u	U	1	0.0	0.439	14.3	LOS A	2.4	17.4	0.74	0.93	0.83	51.8
Approach		611	1.5	0.439	9.1	LOS A	2.5	17.7	0.74	0.88	0.83	51.2
NorthEast: Metford Road												
24	L2	195	0.0	0.572	9.0	LOS A	5.4	38.5	0.83	0.88	0.94	49.4
26	R2	845	2.1	0.572	13.7	LOS A	5.4	38.5	0.83	0.91	0.97	47.9
Approach		1040	1.7	0.572	12.8	LOS A	5.4	38.5	0.83	0.90	0.96	48.2
NorthWest: Chelmsford Drive-W												
27	L2	902	1.5	0.663	5.7	LOS A	7.3	51.4	0.66	0.60	0.66	51.5
28	T1	521	0.7	0.469	5.5	LOS A	3.8	26.7	0.54	0.55	0.54	52.9
29u	U	1	4.0	0.469	11.8	LOS A	3.8	26.7	0.54	0.55	0.54	51.4
Approach		1424	1.2	0.663	5.6	LOS A	7.3	51.4	0.62	0.58	0.62	52.0
All Vehicles		3075	1.5	0.663	8.8	LOS A	7.3	51.4	0.71	0.75	0.77	50.5

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.

MOVEMENT SUMMARY

Site: 5 [Site 4: NEH & Mitchell Drive 2032_AM With Development]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
1	L2	244	3.9	244	3.9	0.223	11.2	LOS A	3.4	24.5	0.48	0.69	0.48	39.4
2	T1	1438	4.9	1438	4.9	0.559	20.8	LOS B	21.3	155.2	0.71	0.63	0.71	42.7
Approach		1682	4.8	1682	4.8	0.559	19.4	LOS B	21.3	155.2	0.68	0.64	0.68	42.5
NorthEast: Mitchell Drive														
4	L2	106	2.4	106	2.4	0.778	63.0	LOS E	6.2	44.1	1.00	0.88	1.25	2.4
5	T1	162	3.5	162	3.5	0.579	56.5	LOS E	4.5	32.3	1.00	0.78	1.03	7.3
6	R2	38	0.0	38	0.0	0.185	52.3	LOS D	1.9	13.3	0.94	0.73	0.94	22.8
Approach		306	2.7	306	2.7	0.778	58.3	LOS E	6.2	44.1	0.99	0.81	1.09	8.1
NorthWest: New England Highway														
7	L2	27	5.0	27	5.0	0.025	10.5	LOS A	0.3	2.4	0.42	0.64	0.42	43.8
8	T1	1487	8.3	1487	8.3	0.662	12.2	LOS A	24.7	185.4	0.66	0.60	0.66	43.4
9	R2	353	0.4	353	0.4	0.882	69.0	LOS E	10.9	76.3	1.00	1.01	1.40	20.5
Approach		1867	6.8	1867	6.8	0.882	22.9	LOS B	24.7	185.4	0.72	0.68	0.79	35.1
SouthWest: Mitchell Drive														
10	L2	178	9.9	178	9.9	0.201	31.1	LOS C	2.3	17.2	0.88	0.73	0.88	31.6
11	T1	80	7.5	80	7.5	0.586	56.7	LOS E	4.4	33.0	1.00	0.78	1.04	7.2
12	R2	213	3.6	213	3.6	0.570	57.6	LOS E	5.9	42.9	1.00	0.79	1.00	5.8
Approach		471	6.6	471	6.6	0.586	47.5	LOS D	5.9	42.9	0.95	0.77	0.96	16.2
All Vehicles		4326	5.7	4326	5.7	0.882	26.7	LOS B	24.7	185.4	0.75	0.68	0.79	34.0

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.
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
P11	SouthEast Stage 1	14	24.2	LOS C	0.0	0.0	0.66	0.66
P12	SouthEast Stage 2	14	49.2	LOS E	0.0	0.0	0.95	0.95
P1S	SouthEast Slip/Bypass Lane Crossing	14	24.1	LOS C	0.0	0.0	0.86	0.86
P2	NorthEast Full Crossing	5	11.8	LOS B	0.0	0.0	0.46	0.46
P2S	NorthEast Slip/Bypass Lane Crossing	5	2.2	LOS A	0.0	0.0	0.20	0.20
P3	NorthWest Full Crossing	14	49.2	LOS E	0.0	0.0	0.95	0.95
P4	SouthWest Full Crossing	1	23.6	LOS C	0.0	0.0	0.65	0.65
P4S	SouthWest Slip/Bypass Lane Crossing	1	7.9	LOS A	0.0	0.0	0.54	0.54

All Pedestrians	67	31.4	LOS D	0.76	0.76

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.

MOVEMENT SUMMARY

Site: 5 [Site 4: NEH & Mitchell Drive 2032_PM With Development]

Network: N101 [PM Network Calibrate Chisholm]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

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
SouthEast: New England Highway														
1	L2	399	4.4	398	4.4	0.394	13.4	LOS A	6.9	49.8	0.61	0.74	0.61	37.3
2	T1	1586	4.3	1581	4.3	0.871	41.4	LOS C	32.9	238.8	0.98	0.94	1.07	33.2
Approach		1985	4.3	1978 N1	4.3	0.871	35.8	LOS C	32.9	238.8	0.90	0.90	0.97	33.6
NorthEast: Mitchell Drive														
4	L2	92	1.4	92	1.4	0.667	59.5	LOS E	5.2	36.5	1.00	0.83	1.11	2.5
5	T1	240	3.3	240	3.3	0.684	55.8	LOS D	6.7	47.9	1.00	0.83	1.10	7.3
6	R2	37	3.4	37	3.4	0.096	40.8	LOS C	1.6	11.5	0.84	0.71	0.84	26.3
Approach		368	2.8	368	2.8	0.684	55.2	LOS D	6.7	47.9	0.98	0.82	1.08	8.4
NorthWest: New England Highway														
7	L2	35	0.0	35	0.0	0.034	11.6	LOS A	0.5	3.3	0.47	0.66	0.47	42.7
8	T1	1335	4.4	1335	4.4	0.904	42.7	LOS D	42.4	308.0	0.96	1.06	1.18	25.7
9	R2	441	2.2	441	2.2	0.894	68.9	LOS E	13.8	98.3	1.00	1.03	1.39	20.5
Approach		1811	3.8	1811	3.8	0.904	48.5	LOS D	42.4	308.0	0.96	1.04	1.22	24.2
SouthWest: Mitchell Drive														
10	L2	474	3.5	474	3.5	0.410	25.9	LOS B	4.8	34.8	0.89	0.78	0.89	34.4
11	T1	165	4.7	165	4.7	0.951	75.7	LOS F	11.1	81.1	1.00	1.10	1.63	5.6
12	R2	505	2.9	505	2.9	0.911	70.7	LOS F	17.3	124.5	1.00	1.05	1.43	4.8
Approach		1144	3.4	1144	3.4	0.951	52.9	LOS D	17.3	124.5	0.95	0.94	1.24	15.7
All Vehicles		5308	3.8	5301 N1	3.8	0.951	45.2	LOS D	42.4	308.0	0.94	0.95	1.12	25.3

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.
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.

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
P11	SouthEast Stage 1	14	14.8	LOS B	0.0	0.0	0.52	0.52
P12	SouthEast Stage 2	14	49.2	LOS E	0.0	0.0	0.95	0.95
P1S	SouthEast Slip/Bypass Lane Crossing	14	18.5	LOS B	0.0	0.0	0.81	0.81
P2	NorthEast Full Crossing	5	18.6	LOS B	0.0	0.0	0.58	0.58
P2S	NorthEast Slip/Bypass Lane Crossing	5	2.6	LOS A	0.0	0.0	0.22	0.22
P3	NorthWest Full Crossing	14	49.2	LOS E	0.0	0.0	0.95	0.95
P4	SouthWest Full Crossing	1	35.2	LOS D	0.0	0.0	0.80	0.80
P4S	SouthWest Slip/Bypass Lane Crossing	1	10.3	LOS B	0.0	0.0	0.61	0.61

All Pedestrians	67	29.1	LOS C	0.74	0.74

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.

MOVEMENT SUMMARY

Site: [Site 5: NEH & Chelmsford Drive 2032_AM With Development]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	66	3.3	66	3.3	0.048	8.3	LOS A	0.6	4.1	0.17	0.59	0.17	39.2
2	T1	1363	5.3	1363	5.3	0.676	11.9	LOS A	21.3	156.0	0.55	0.50	0.55	32.5
3	R2	248	3.0	248	3.0	0.947	81.2	LOS F	8.3	59.8	1.00	1.07	1.68	17.4
Approach		1678	4.9	1678	4.9	0.947	22.0	LOS B	21.3	156.0	0.60	0.59	0.70	26.1
NorthEast: Chelmsford Drive														
4	L2	354	3.0	354	3.0	0.871	49.0	LOS D	14.4	103.6	1.00	1.04	1.43	18.0
25	T1	493	1.2	493	1.2	0.958	76.8	LOS F	17.6	124.2	1.00	1.15	1.59	15.7
6	R2	280	3.4	280	3.4	0.954	80.9	LOS F	19.5	140.6	1.00	1.08	1.55	12.2
Approach		1126	2.3	1126	2.3	0.958	69.1	LOS E	19.5	140.6	1.00	1.10	1.53	15.3
NorthWest: New England Highway														
7	L2	323	3.0	323	3.0	0.304	12.1	LOS A	5.0	35.6	0.53	0.71	0.53	45.3
8	T1	1385	7.7	1385	7.7	0.929	53.1	LOS D	46.7	348.3	0.98	1.10	1.26	17.0
Approach		1708	6.8	1708	6.8	0.929	45.3	LOS D	46.7	348.3	0.90	1.03	1.12	21.1
SouthWest: Chelmsford Drive Extension														
30	L2	79	0.0	79	0.0	0.293	52.7	LOS D	3.9	27.3	0.94	0.76	0.94	7.4
31	T1	209	0.6	209	0.6	0.398	47.9	LOS D	5.3	37.4	0.96	0.75	0.96	21.7
32	R2	75	3.0	75	3.0	0.254	49.7	LOS D	3.6	25.6	0.91	0.76	0.91	7.9
Approach		363	1.0	363	1.0	0.398	49.3	LOS D	5.3	37.4	0.94	0.76	0.94	16.6
All Vehicles		4876	4.7	4876	4.7	0.958	43.1	LOS D	46.7	348.3	0.82	0.87	1.06	19.9

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.
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	SouthEast Full Crossing	3	49.2	LOS E	0.0	0.0	0.95	0.95
P1S	SouthEast Slip/Bypass Lane Crossing	3	42.8	LOS E	0.0	0.0	0.88	0.88
P2	NorthEast Full Crossing	1	29.1	LOS C	0.0	0.0	0.73	0.73
P2S	NorthEast Slip/Bypass Lane Crossing	1	6.0	LOS A	0.0	0.0	0.46	0.46
P3	NorthWest Full Crossing	1	49.2	LOS E	0.0	0.0	0.95	0.95
P3S	NorthWest Slip/Bypass Lane Crossing	1	42.8	LOS E	0.0	0.0	0.88	0.88
P8	SouthWest Full Crossing	1	19.8	LOS B	0.0	0.0	0.60	0.60
P8S	SouthWest Slip/Bypass Lane Crossing	1	3.8	LOS A	0.0	0.0	0.26	0.26

All Pedestrians	13	35.5	LOS D	0.78	0.78

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.

MOVEMENT SUMMARY

Site: [Site 5: NEH & Chelmsford Drive 2032_PM With Development]

Network: N101 [PM Network Calibrate Chisholm]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

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
SouthEast: New England Highway														
21	L2	97	1.1	97	1.1	0.068	8.4	LOS A	1.1	7.6	0.23	0.61	0.23	39.2
2	T1	1586	4.7	1586	4.7	0.861	24.3	LOS B	39.0	284.2	0.78	0.76	0.84	22.0
3	R2	329	6.3	329	6.3	0.934	66.2	LOS E	10.1	74.8	1.00	0.97	1.36	19.9
Approach		2013	4.8	2013	4.8	0.934	30.4	LOS C	39.0	284.2	0.79	0.79	0.90	21.8
NorthEast: Chelmsford Drive														
4	L2	349	6.0	349	6.0	0.842	38.4	LOS C	13.3	97.7	1.00	0.95	1.22	21.2
25	T1	442	1.1	442	1.1	0.966	79.8	LOS F	15.5	109.8	1.00	1.16	1.64	15.2
6	R2	338	1.4	338	1.4	0.973	86.9	LOS F	24.9	176.2	1.00	1.11	1.59	11.5
Approach		1129	2.7	1129	2.7	0.973	69.1	LOS E	24.9	176.2	1.00	1.08	1.49	15.1
NorthWest: New England Highway														
7	L2	600	2.8	553	2.9	0.528	13.7	LOS A	9.5	68.3	0.66	0.77	0.66	44.1
8	T1	1461	5.3	1347	5.5	1.004	90.6	LOS F	59.3	434.6	1.00	1.36	1.59	11.3
Approach		2061	4.6	1900 N1	4.7	1.004	68.2	LOS E	59.3	434.6	0.90	1.19	1.32	16.8
SouthWest: Chelmsford Drive Extension														
30	L2	60	1.8	60	1.8	0.261	54.4	LOS D	3.0	21.4	0.95	0.75	0.95	7.2
31	T1	395	0.7	395	0.7	0.924	68.5	LOS E	13.7	96.2	1.00	1.07	1.50	17.0
32	R2	86	2.7	86	2.7	0.251	46.9	LOS D	4.0	28.6	0.89	0.76	0.89	8.3
Approach		541	1.1	541	1.1	0.924	63.5	LOS E	13.7	96.2	0.98	0.99	1.34	15.3
All Vehicles		5744	4.0	5583 N1	4.1	1.004	54.3	LOS D	59.3	434.6	0.89	1.00	1.20	17.4

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.
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.

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

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	SouthEast Full Crossing	3	49.2	LOS E	0.0	0.0	0.95	0.95
P1S	SouthEast Slip/Bypass Lane Crossing	3	44.6	LOS E	0.0	0.0	0.90	0.90
P2	NorthEast Full Crossing	1	32.1	LOS D	0.0	0.0	0.76	0.76
P2S	NorthEast Slip/Bypass Lane Crossing	1	6.2	LOS A	0.0	0.0	0.47	0.47
P3	NorthWest Full Crossing	1	49.2	LOS E	0.0	0.0	0.95	0.95
P3S	NorthWest Slip/Bypass Lane Crossing	1	44.6	LOS E	0.0	0.0	0.90	0.90
P8	SouthWest Full Crossing	1	20.4	LOS C	0.0	0.0	0.61	0.61
P8S	SouthWest Slip/Bypass Lane	1	3.3	LOS A	0.0	0.0	0.25	0.25

Crossing					
All Pedestrians	13	36.4	LOS D	0.79	0.79

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.

MOVEMENT SUMMARY

Site: 7 [Site 6: NEH & Chisholm Rd 2032_AM With Development]

Network: N101 [AM Network]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network Optimum Cycle Time - Minimum Delay)

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
SouthEast: New England Highway														
21	L2	261	2.4	261	2.4	0.190	8.0	LOS A	3.0	21.3	0.29	0.63	0.29	48.8
2	T1	1476	5.8	1476	5.8	0.682	18.1	LOS B	27.7	203.9	0.77	0.70	0.77	37.8
Approach		1737	5.3	1737	5.3	0.682	16.6	LOS B	27.7	203.9	0.70	0.69	0.70	40.0
NorthWest: New England Highway														
8	T1	1598	7.2	1598	7.2	0.420	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
29	R2	246	6.6	246	6.6	0.668	51.8	LOS D	13.1	96.6	1.00	0.84	1.01	24.0
Approach		1844	7.1	1844	7.1	0.668	6.9	LOS A	13.1	96.6	0.13	0.11	0.13	50.9
SouthWest: Chisholm Road														
30	L2	186	5.6	186	5.6	0.311	34.3	LOS C	7.5	54.8	0.79	0.76	0.79	23.5
32	R2	129	4.0	129	4.0	0.854	67.4	LOS E	7.8	56.4	1.00	0.98	1.38	25.6
Approach		316	4.9	316	4.9	0.854	47.9	LOS D	7.8	56.4	0.88	0.85	1.03	24.7
All Vehicles		3897	6.1	3897	6.1	0.854	14.6	LOS B	27.7	203.9	0.44	0.43	0.46	42.7

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.
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: 7 [Site 6: NEH & Chisholm Rd 2032_PM With Development]

Network: N101 [PM Network Calibrate Chisholm]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network Site User-Given Phase Times)

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
SouthEast: New England Highway														
21	L2	380	0.8	380	0.8	0.260	7.5	LOS A	4.0	28.2	0.28	0.63	0.28	49.1
2	T1	1782	4.9	1782	4.9	0.927	41.4	LOS C	63.5	463.5	0.98	1.08	1.19	25.6
Approach		2162	4.2	2162	4.2	0.927	35.5	LOS C	63.5	463.5	0.85	1.00	1.03	29.5
NorthWest: New England Highway														
8	T1	1697	4.2	1593	4.3	0.411	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
29	R2	214	1.9	200	1.9	0.922	69.7	LOS E	12.5	89.0	1.00	1.01	1.40	20.2
Approach		1911	3.9	1793[N1]	4.0	0.922	7.8	LOS A	12.5	89.0	0.11	0.11	0.16	50.2
SouthWest: Chisholm Road														
30	L2	223	3.4	223	3.4	0.631	42.6	LOS D	10.7	77.2	0.93	0.83	0.93	20.9
32	R2	204	3.2	204	3.2	0.928	74.2	LOS F	13.3	95.7	1.00	1.07	1.51	24.3
Approach		427	3.3	427	3.3	0.928	57.7	LOS E	13.3	95.7	0.96	0.94	1.21	23.0
All Vehicles		4500	4.0	4382[N1]	4.1	0.928	26.3	LOS B	63.5	463.5	0.56	0.63	0.69	35.1

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.
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.

Appendix C

Swept Path Assessment

IT IS UNDERSTOOD TO BE EXIT ONLY.
RECOMMEND NARROWING LANE WIDTH TO
3.5m WIDE TO PREVENT VEHICLE ENTERING

2x2.4mx1.2m ROCK
FILLED MATTRESS

KERB MODIFICATIONS WOULD BE REQUIRED
TO ACCOMMODATE VEHICLE PASSING.
RECOMMEND CAR PARK CIRCULATION TO
BE ONE-WAY CLOCKWISE.

OSD TANK VOLUME
300 m3

POTENTIAL SIGHTLINE ISSUE
TO VEHICLES EXITING THE
DROP-OFF AREA

5.5mX5.5m AREA AT REAR OF
AMBULANCE REQUIRED FOR
PATIENT TRANSFERS

BUILDING DRAINAGE
CONNECTION

BUILDING DRAINAGE
CONNECTION

IT IS UNDERSTOOD TO BE ENTRY ONLY.
RECOMMEND NARROWING LANE WIDTH TO
3.5m WIDE TO PREVENT VEHICLE EXITING

2x2.4mx1.2m ROCK
FILLED MATTRESS

ROAD WIDENING REQUIRED TO
ACCOMMODATE AMBULANCE PASSING

METFORD ROAD

AMBULANCE ROAD

MORTUARY

WKSTATIONS /
CLIN TECH

BOH CLEAN

BOH CLEAN

BOH CLEAN

FIRE ISOLATED CORRIDOR

PROVIDE GUARDRAIL

ACCESS CONTROL GATE

DD

DR

FALL

PLOTTED BY : chenlong.you
ON 21/01/2019 AT 12:40:34 PM

GTA consultants
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Melbourne	03 9851 9600
Sydney	02 8448 1800
Brisbane	07 3113 5000
Adelaide	08 8334 3600
Perth	08 6169 1000

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

DESIGNED C.YOU	DESIGN CHECK H.OBERMAIER
APPROVED BY K.MCNATTY	DATE ISSUED 21 JANUARY 2019

SCALE A3 0 5 10 1:500
CAD FILE NO. N149421-02-P1.dgn

SHCPIP - NEW MAITLAND HOSPITAL

SWEPT PATH ASSESSMENT

DRAWING NO. N149421-02-01 SHEET 01 OF 06 ISSUE P1

2x2.4mx1.2m ROCK FILLED MATTRESS

OSD TANK VOLUME 300 m3

GUARD RAIL + HANDRAIL ON TOP OF RETAINING WALL

PROVIDE GUARDRAIL

PROVIDE 1200 HIGH HANDRAIL

HANDRAIL

ACCESS CONTROL GATE

BUILDING DRAINAGE CONNECTION

BUILDING DRAINAGE CONNECTION

2x2.4mx1.2m ROCK FILLED MATTRESS

WESTFORD ROAD

AMBULANCE ROAD

FIRE ISOLATED CORRIDOR

MORTUARY

WKSTATIONS / CLIN TECH

BOH CLEAN

BOH CLEAN

BOH CLEAN

ANSW Bariatric GTA-NSW

FALL

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Adelaide	08 8334 3600
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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

DESIGNED C.YOU	DESIGN CHECK H.OBERMAIER
APPROVED BY K.MCNATTY	DATE ISSUED 21 JANUARY 2019

SCALE A3 0 5 10 1:500

CAD FILE NO. N149421-02-P1.dgn

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SWEPT PATH ASSESSMENT

DRAWING NO. N149421-02-02 SHEET 02 OF 06 ISSUE P1

ACCESS CONTROL LOCATION TO BE CONFIRMED DURING DETAILED DESIGN STAGE

MINIMUM 2.6m WIDE PARKING SPACES REQUIRED FOR CLASS 3 CAR PARKING FACILITIES IN ACCORDANCE WITH AS2890.1 TABLE 1.1

LONG RIGID BUS
AUSTROADS 2013 (AU)

BUILDING DRAINAGE CONNECTION

GROUND LEVEL FFL20.30

PHARMACY

BASEMENT FFL15.30

POTENTIAL SIGHTLINE ISSUE TO VEHICLES EXITING THE DROP-OFF AREA

PROVIDE 1200 HIGH HANDRAIL

PROVIDE GUARDRAIL

K&G

FP

ON 21/01/2019 AT 12:40:36 PM

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Melbourne	03 9851 9600
Sydney	02 8448 1800
Brisbane	07 3113 5000
Adelaide	08 8334 3600
Perth	08 6169 1000

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

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APPROVED BY K.MCNATTY	DATE ISSUED 21 JANUARY 2019

SCALE A3 — 0 5 10 — 1:500

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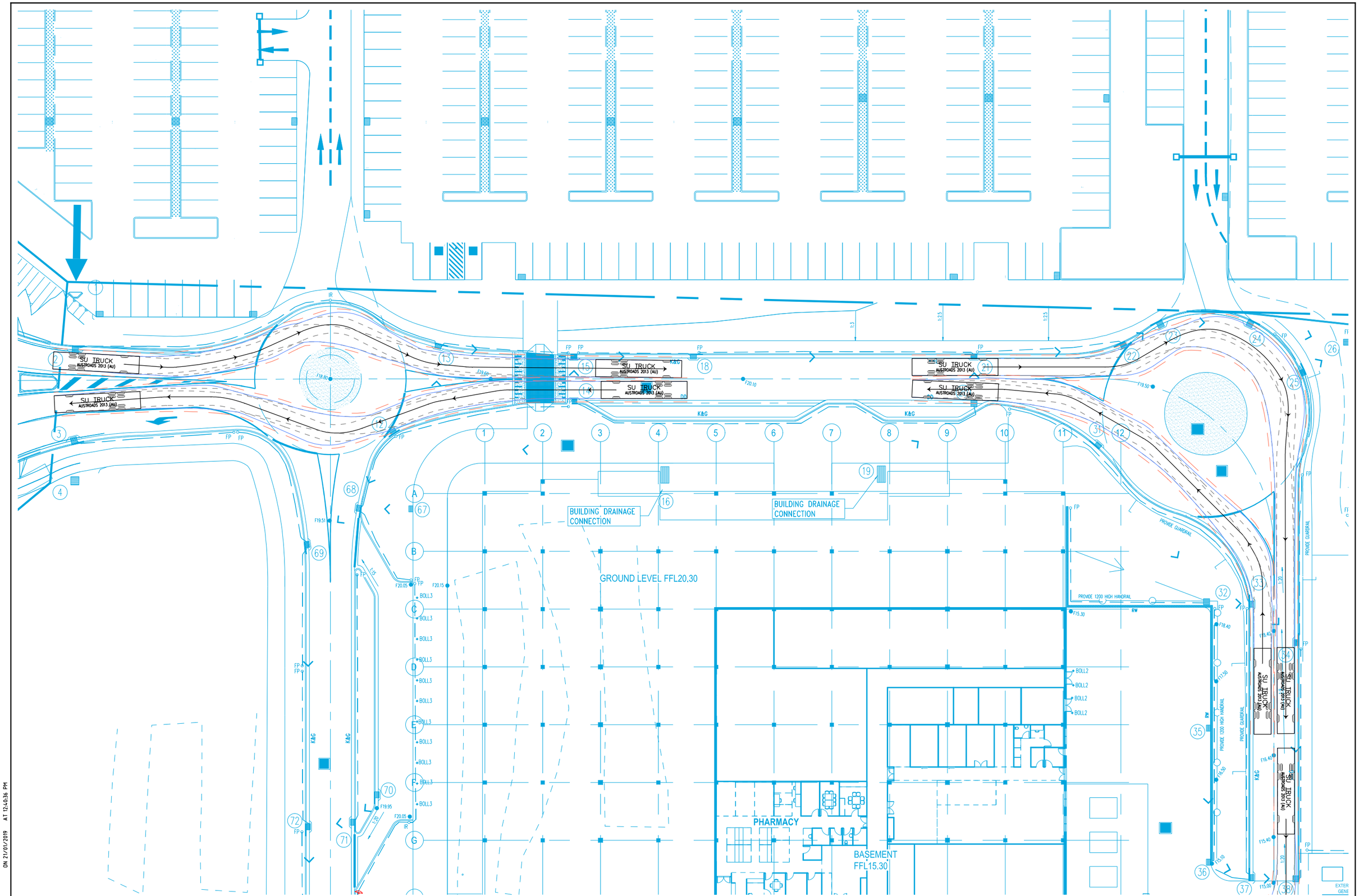
SWEPT PATH ASSESSMENT

DRAWING NO. N149421-02-03 SHEET 03 OF 06 ISSUE P1



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Melbourne	03 9851 9600
Sydney	02 8448 1800
Brisbane	07 3113 5000
Adelaide	08 8334 3600
Perth	08 6169 1000

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

DESIGNED C.YOU	DESIGN CHECK H.OBERMAIER
APPROVED BY K.MCNATTY	DATE ISSUED 21 JANUARY 2019

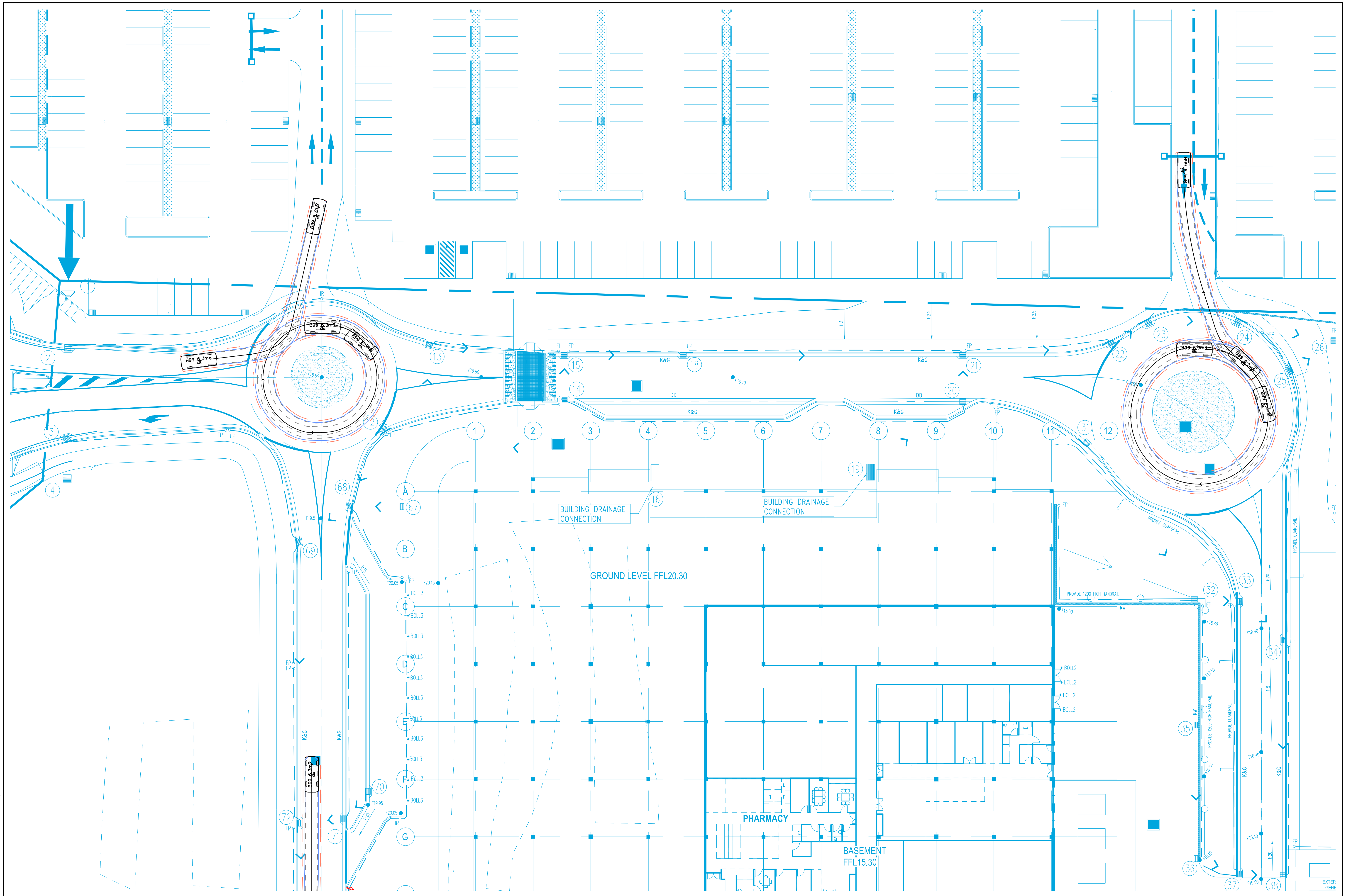
SCALE A3 — 0 5 10 — 1:500

CAD FILE NO. N149421-02-P1.dgn

SHCPIP - NEW MAITLAND HOSPITAL

SWEPT PATH ASSESSMENT

DRAWING NO. N149421-02-04 SHEET 04 OF 06 ISSUE P1



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PRELIMINARY PLAN
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APPROVED BY K.MCNATTY	DATE ISSUED 21 JANUARY 2019	CAD FILE NO. N149421-02-P1.dgn	

SHCPIP - NEW MAITLAND HOSPITAL

SWEPT PATH ASSESSMENT

DRAWING NO. N149421-02-05 SHEET 05 OF 06 ISSUE P1

PLOTTED BY : chenlong.you ON 21/01/2019 AT 12:40:36 PM

PHARMACY

BASEMENT
FFL15.30

MORTUARY

WKSTATIONS / CLIN TECH

BOH CLEAN

BOH CLEAN

BOH CLEAN

FIRE ISOLATED CORRIDOR OVER RL 17.9

17900

15300

BUILDING DRAINAGE CONNECTION

WASTE MANAGEMENT

PROVIDE HOB AND TRADE WASTE PIT TO WASTE COMPACTOR AREA. REFER TO HYDRAULIC DRAWINGS FOR DETAILS OF TRADE WASTE

LOADING DOCK
FFL15.30

SU TRUCK
AUSTROADS 2013 (AU)

FALL

RW

PROVIDE 1200 HIGH HANDRAIL

PROVIDE GUARDRAIL

K&G

1:20

EXTERNAL ELCTRICAL GENERATORS+MSB

FIRE SERVICES EXTERNAL WATER TANK

FFL15.20

OXYGEN VIE

ACCESS CONTROL GATE

IR

FP

BOLL1

BOLL2

F20.15

F20.30

F20.20

F15.30

F16.40

F17.50

F16.50

F15.40

F15.10

F15.00

F17.10

34

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44

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SWEPT PATH ASSESSMENT

DRAWING NO. N149421-02-06 SHEET 06 OF 06 ISSUE P1

Appendix D

Chelmsford Drive/ Metford Road Intersection Concept Design

LEGEND

EXISTING FEATURES

PROPOSED DESIGNS

PROPOERTY BOUNDARY

CHELMSFORD DRIVE

METFORD ROAD

MODIFY KERB AND PROVIDE ADDITIONAL LANE AS SHOWN

REMOVE EXISTING KERB RAMP

PROVIDE NEW KERB RAMP FOR PEDESTRIANS AND TIE TO EXISTING FOOTPATH.

MODIFY EXISTING MEDIAN ISLAND AS SHOWN

REALIGN THE FOOTPATH AS SHOWN

MODIFY KERB AND PROVIDE KERB RAMPS FOR PEDESTRIANS AND CYCLISTS AS SHOWN

REALIGN CYCLE LANE AS SHOWN

3.0 (E)
3.1 (E)
3.0 (E)
3.4 (E)
15.0 TAPER
50.0 STORAGE
4.0
5.5
3.2
3.5
4.5
4.5
6.0
2.0
5.2
2.7
2.7
3.5
3.5
2.0
35.0 STORAGE
15.0 TAPER

N

PLOTTED BY : Chenlong.You ON 4/04/2018 AT 3:28:48 PM

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DESIGNED C.YOU	DESIGN CHECK W.ZHENG
APPROVED BY B.MAYNARD	DATE ISSUED 4 APRIL 2018
SCALE A3	0 5 10 1:500
CAD FILE NO. N124970-04-P2.dgn	

MAITLAND HOSPITAL DEVELOPMENT
METFORD ROAD & CHELMSFORD DRIVE ROUNDABOUT

CONCEPT LAYOUT

DRAWING NO. N124970-04-01 SHEET 01 OF 01 ISSUE P2

Appendix E

Green Travel Plan

New Maitland Hospital

Metford Road, Metford
Green Travel Plan

Prepared by: GTA Consultants (NSW) Pty Ltd for Health Infrastructure
on 12/04/19
Reference: N149421
Issue #: A

GTAconsultants

New Maitland Hospital

Metford Road, Metford
Green Travel Plan

Client: Health Infrastructure

on 12/04/19

Reference: N149421

Issue #: A

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	12/04/19	Final	O. Maw	Volker Buhl	Volker Buhl	

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CONTENTS

Figures

Tables

1. INTRODUCTION

1.1. Background

As part of the Hunter New England (NHE) Health 2015/2016 Asset Strategic Plan (ASP), the construction of the New Maitland Hospital (NMH) has been identified as one of a top five priorities. Located along Metford Road in Metford, the NMH will replace the existing Maitland Hospital located in Maitland with new and increased health facilities to service the area.

The following Green Travel Plan (GTP) has been prepared for the NMH development. The GTP is being prepared to satisfy Condition 5 IX of State Significant Infrastructure 9775 SEARs:

"details of travel demand management measures, including the preparation of a Green Travel Plan, to encourage sustainable travel choices and details of programs for implementation"

A GTP is a way in which the NMH will be able to manage the transport needs of staff and visitors. The aim of the plan is to reduce the environmental impact of travel to/from and in association with the operation of the NMH. In essence, the plan encourages more efficient use of motor vehicles as well as alternatives to the single occupant motor car.

The plan comprises a list of strategies aimed at encouraging walking, cycling, public transport and car-pooling for travel to and from work and a shift away from the reliance on single occupant vehicle travel.

GTA Consultants (GTA) was commissioned by Health Infrastructure to prepare a GTP for the NMH.

1.2. Site Location

The NMH will be located on Lot 7314 and Part Lot 401 within the south-western portion of the 'Metford Triangle' along Metford Road, Metford. The site has a western frontage of 500 metres to Metford Road. The site has been declared State Significant Infrastructure and is generally cleared and disturbed land with an existing forest in the south western corner of the site.

The surrounding properties include:

- Council Sports Fields opposite the site on the corner of Fieldsend Street and Metford Road
- Council's depot on Metford Road
- Redundant brickworks site to the northeast of the site
- Bushland and residential to the south of the site.

The location of the subject site and its surrounding environs is shown in Figure 1.1.

Figure 1.1: Subject site and surrounds

Source: Fitzpatrick+Partners 16 February 2018

1.2.1. Development Proposal

It is proposed that the NMH would consist of 339 beds with a projected employment of 893 full-time equivalent (FTE) staff at the proposed year of opening. It is then expected that 1,106 FTE staff would be employed five years after opening and 1,162 FTE staff ten years after opening. An indicative layout of the NMH is shown in Figure 1.2.

Figure 1.2: Proposed NMH Site Plan

Source: BVN Schematic Design BVN-ARH-01A-AX0-002- Site Plan Issue 6

The NMH proposes to provide a total of 682 on-site parking spaces at the year of opening, including 515 staff parking spaces and 167 public/visitor parking spaces. It is estimated that an additional 140 car spaces will be required by 2031/ 2032 to support the full operation of the hospital. These will be provided in a staged manner on the site.

Bicycle parking is proposed within the NMH and includes 23 spaces for staff and 12 spaces for visitors. Staff bicycle parking will be located on the lower ground floor in a secure location with access to end of trip facilities whereas the 12 visitor spaces are to be located on the ground floor in the public domain. The NMH proposes to incorporate a minimum of three showers and 23 clothes lockers with associated change/ wash basin facilities.

The proposed NMH includes an on-site bus stop for incorporation into the Hunter Valley bus routes. As illustrated in Figure 1.3, bus routes will access the site via the Metford Road/ Fieldsend Street roundabout and circulate around the eastern-most internal roundabout to access the bus stop located near the hospital entry on the southern edge of the internal access road.

Figure 1.3: Proposed NMH bus stop location

Source: BVN Schematic Design BVN-ARH-01A-AX0-002- Site Plan Issue 6

2. GREEN TRAVEL PLAN

2.1. Introduction

Transport is a necessary part of life which has effects that can be managed. The transport sector is one of the fastest growing emissions sectors in Australia and therefore a travel plan provides an opportunity for reducing greenhouse gases, and for managing traffic congestion (which has adverse economic, health and social outcomes). As well as delivering better environmental outcomes, providing a range of travel choices with a focus on walking, cycling and public transport will have major public health benefits and will ensure strong and prosperous communities.

The overall aim of the plan is to minimise the reliance on single occupancy car journeys to and from the site given its location and accessibility to alternative travel modes.

2.2. What is a Green Travel Plan?

A GTP is a package of measures aimed at promoting and encouraging sustainable travel and reducing reliance on the private car. The GTP for the NMH will aim to mitigate (as far as possible) private car use, understanding that the regional location of the NMH precludes high use of public transport compared to more metropolitan locations. The purpose of the GTP is not to be "anti-car" but to make apparent, encourage and support people's aspirations for carrying out their daily business in a more sustainable way. GTPs then provide:

- measures which encourage reduced car use (disincentives or 'sticks')
- measures which encourage or support sustainable travel (such as active transport, public transport and multi-occupant vehicle use)
- reduce the need to travel or make travelling more efficient (incentives or 'carrots').

Active transport relates to physical activity undertaken as a means of transport. It includes travel by foot, bicycle and other non-motorised vehicles. Use of public transport is also included in the definition as it often involves some walking or cycling to/ from pick-up and drop-off points.

The GTP would promote the use of transport, other than the private car, for choice of travel to and from the NMH site, which is more sustainable and environmentally friendly. Where private car is used, multi-occupancy trips (such as carpooling) should be encouraged. Ultimately however, end users will determine their most suitable means of transport. As such, a strong communications strategy is required to promote active and public transport thereby reducing incentive to the use private car.

3. BACKGROUND

3.1. Existing Transport Provision

3.1.1. Surrounding Road Network

Metford Road

Metford Road functions as a sub-arterial road and is aligned in a north-east, south-west direction on the western boundary of the site. It is a two-way road with one traffic lane in each direction, configured with a nine-metre wide carriageway. Unrestricted kerbside parking is generally permitted south of Fieldsend Street however, no kerbside parking is permitted north of Fieldsend Street.

As part of early works for the NMH, a roundabout has recently been constructed at the Metford Road/ Fieldsend Street intersection, intended to provide the primary access for the NMH. Metford Road carries around 13,000 vehicles per day.

Fieldsend Street

Fieldsend Street functions as a local road and intersects Metford Road at the northern corner of the site. It is aligned in a north-west, south-east direction and is two-way with one traffic lane in each direction. 15 angle parking spaces have recently been constructed on Fieldsend Street adjacent to the sports fields.

Fieldsend Street provides access to the Council Sports Fields on the corner of Fieldsend Street and Metford Road.

Council recently constructed a shared path on Fieldsend Street between Metford Road and Brunswick Street connecting to an off-road shared path to Victoria Station. Fieldsend Street carries around 2,000 vehicles per day.

New England Highway

New England Highway is classified as a State road in the Roads and Maritime *Schedule of Classified Roads and State and Regional Roads* versions 2011/1. Near the site it is aligned in a north-west, south-east direction and is two-way with two traffic lanes in each direction. No kerbside parking is permitted.

Raymond Terrace Road

Raymond Terrace Road is classified as a State road in the Roads and Maritime *Schedule of Classified Roads and State and Regional Roads* versions 2011/1. Near the site it is aligned in a north-west, south-east direction and is two-way with one traffic lane in each direction. No kerbside parking is permitted.

Chelmsford Drive

Chelmsford Drive is classified as a sub-arterial road and is aligned in the north-west, south-east direction. It is a two-way road separated by a median, with one traffic lane as well as one bicycle lane and one parking lane in each direction east of Metford Road and two traffic lanes in each direction west of Metford Road, configured in a carriageway of 20 metres wide. Unrestricted kerbside parking is permitted on both sides of the road east of Metford Road, and no kerbside parking is permitted on Chelmsford Drive west of Metford Road.

Surrounding Intersections

The following intersections currently exist near the site:

- Metford Road/ Raymond Terrace Road (roundabout)
- Metford Road/ Fieldsend Street (roundabout)
- Metford Road/ Chelmsford Drive (roundabout).

3.1.2. Public Transport Infrastructure

Bus services provide local connections to the outer areas of Metford, including East Maitland and Thornton.

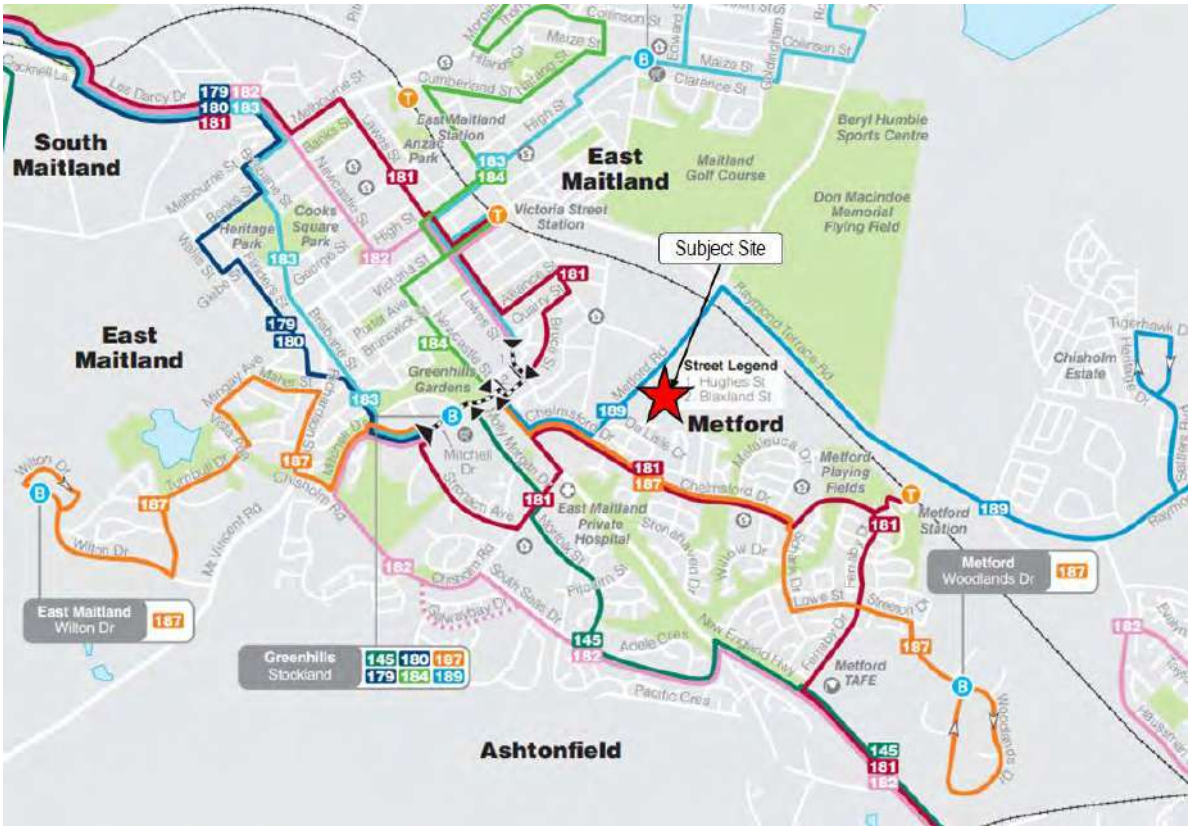
Victoria Street Railway Station is located 1.4 kilometres north-west of the NMH site and is part of the Hunter Line, with services alternately running from Newcastle to Telarah, Dungong and Scone. Services depart from Victoria Street Railway Station at general frequencies of 30 minutes. A summary of public transport within the surrounds of the NMH can be seen in Table 3.1.

Table 3.1: Public transport routes and frequencies within the NMH area

Service	Route number	Route description	Location of stop	Distance to nearest stop1	Frequency on/ off-peak
Bus	181	Rutherford to Woodberry	Metford Road/ Chelmsford	650m	Hourly
	187	East Maitland and Metford Loop			Hourly peak / every 2 hours off peak
	189	Stockland Green Hills to Thornton			Hourly peak / every 2 hours off peak
Train	Hunter Line	Telarah/Dungog	Victoria Street Station/ Metford Station	1.4km	Every 30 minutes
		Newcastle Interchange			Every 30 minutes

Currently, the only bus service that travel along Metford Road is the 189 service (between Stockland Green Hills and Thornton), private bus operators and school bus services. The public transport options within the NMH area and surrounds are shown in Figure 3.1.

Figure 3.1: Hunter Valley train and bus network – Metford/ East Maitland



Basemap Source: https://www.cdcbus.com.au/images/files/maps/hunter-valley/Maitland_and_Raymond_Terrace_Region_Map.pdf (accessed 27 January 2019)

3.1.3. Pedestrian and Bicycle Infrastructure

A number of shared user paths (SUP) and footpaths have recently been constructed along Metford Road and Fieldsend Street. This includes the following:

- SUP on the eastern side of Fieldsend Street (see Figure 3.2)
- footpath on the northern side of Metford Road, east of the roundabout with Fieldsend Street (see Figure 3.3)
- SUP directly in front of the NMH frontage on Metford Road to facilitate walking and cycling access from Metford Road and Fieldsend Street (see Figure 3.4)
- associated pedestrian and bicycle facilities for the Metford Road/ Fieldsend Road roundabout (see Figure 3.5 and Figure 3.6)

Figure 3.2: SUP along Fieldsend Street, looking north

Figure 3.3: New footpath along Metford Road, looking west

Figure 3.4: SUP directly in front of future NMH

Figure 3.5: Pedestrian and bicycle crossing refuge

Figure 3.6: Pedestrian and bicycle crossing refuge

The bicycle infrastructure network surrounding the NMH consist of a range of on-road and off-road sections ranging from low difficulty (on-road via local streets) to high difficulty (along higher order roads such as the New England Highway). Some off-road infrastructure exists linking into the Metford area, south-east of the NMH. This is mainly in the form of SUPs.

Within the vicinity of the NMH, Metford Road currently consists of on-road bicycle lanes and SUP along Fieldsend Street from Metford Road to Turton Street. The existing cycling infrastructure as shown in the Roads and Maritime Services Cycleway Finder is presented in Figure 3.7. It is noted that this map has not been updated to reflect the recently installed SUP and footpath near the NMH site.

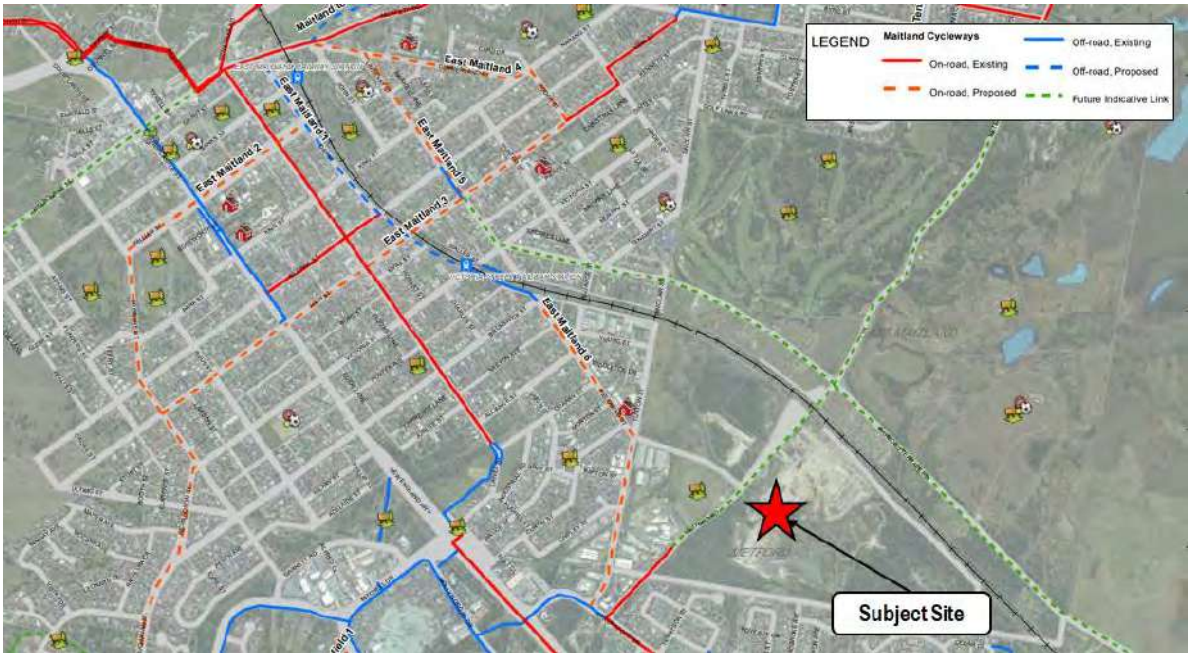
Figure 3.7: Existing bicycle infrastructure around NMH

Basemap Source: https://www.rms.nsw.gov.au/maps/cycleway_finder (accessed 27 January 2019)

As part of Maitland Bike Plan 2014, the existing bicycle network within Maitland LGA was mapped out as were proposed works to improve bicycle connectivity within the LGA and thereby improve safety and encourage more active travel. Future proposals for the bicycle network include indicative links along Metford Road (in both north and south directions) and Raymond Terrace.

The existing (at the time) and proposed bicycle network infrastructure within the Maitland Bike Plan 2014 is shown in Figure 3.8.

Figure 3.8: Existing and proposed bicycle network around NMH (as at 2014)



Basemap Source: Maitland Bike Plan 2014, Maitland City Council

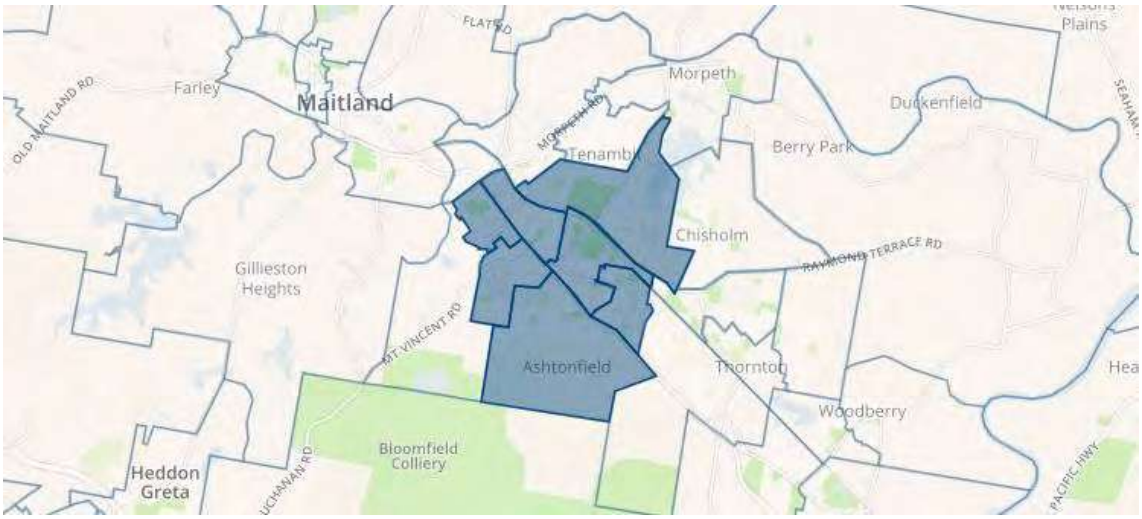
3.2. Existing Travel Behaviour

3.2.1. Journey to Work for Proposed NMH Site

The Journey to Work (JTW) data published by the Bureau of Transport Statistics (BTS) from 2011 Census data provides an understanding of travel patterns to/ from the site and the surrounding area.

The smallest geographical area for which JTW data is available is a Travel Zone. The relevant Travel Zones used for the purposes of this assessment are 6609, 6610, 6611, 6612, 6613, 6614 and 6616 and are shown in Figure 3.9.

Figure 3.9: Travel Zones containing and bordering NMH

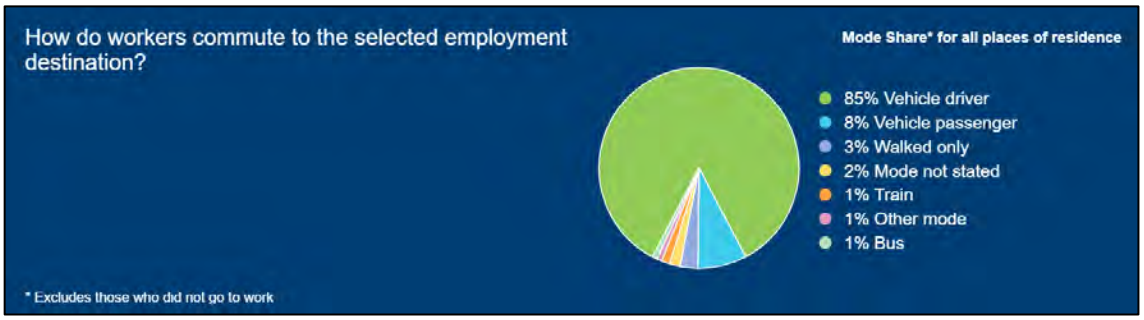


Source: Bureau of Transport Statistics, http://visual.bts.nsw.gov.au/jtwbasic/#6612,6613,6611,6610,6609,6616,6614, accessed 22 June 2017

The JTW data indicates that 6,603 people are employed within the selected Travel Zones.

Figure 3.10 shows the distribution of travel modes by workers employed within the Travel Zones and indicates that 93 per cent of workers travel to the area by private vehicles as a driver or passenger. In addition, the JTW data indicates that sex per cent of workers travelling to the area do so by either walking, train or bus.

Figure 3.10: JTW travel modes for workers travelling to Travel Zones 6609, 6610, 6611, 6612, 6613, 6614 and 6616



Data source: Bureau of Transport Statistics, http://visual.bts.nsw.gov.au/jtwbasic/#6612,6613,6611,6610,6609,6616,6614, accessed 22 June 2017

The JTW data also indicates that around 62 per cent of workers travelling to the Travel Zones originate from the Maitland Area, while Newcastle accounts for 13 per cent, the Lower Hunter for 9 per cent and the remaining areas for 16 per cent.

3.3. Survey Results

3.3.1. Travel Behaviour for Existing Maitland Hospital

GTA prepared a parking demand study in October 2018 to inform the Stage 2 State Significant Infrastructure (SSI) assessment of the NMH. This assessment included a review of the current mode share of staff at the existing Maitland Hospital, located at 560 High Street, Maitland. The hospital currently has 779 full time equivalent (FTE) staff and a total of 198 beds.

The site is well-serviced by public transport, with a bus stop located along the site frontage to High Street with bus services every 20 minutes. Furthermore, Telarah Railway Station is located around 600 metres west of the site.

Staff Surveys

An online staff questionnaire was distributed to all hospital staff in August 2018 to understand existing staff travel patterns, and a total of 74 responses were received. The results of the survey show that car travel was the main mode of travel to/from the hospital, with over 95 per cent of responses travelling by private vehicle (including car passengers and motorcyclists) with an average vehicle occupancy of 1.1 persons per vehicle according to those surveyed. It is noted that this value excluded people who travelled by car for a portion of the trip to/from the hospital, such as parking near a railway station or other public transport facilities as part of their commute.

The survey responses relating to current staff modes of transportation is summarised in Table 3.2.

Table 3.2: Staff travel survey results

Mode of transport	Responses (%)
Car – As a driver	91.9
Car – As a passenger	1.4
Motorcycle / scooter	2.7
Bus	0
Bicycle	0
Walk	1.4
Train	1.4
Taxi	0
Split - Car / Public Transport	1.4

The staff surveys indicated that the two main reasons for staff to travel by the above modes of transport to/from the hospital was due to:

- travel distance
- convenience.

Overall, the results of the existing Maitland Hospital staff survey are generally in line with the JTW seen for workers within Travel Zones for the NMH. This includes a heavy reliance on private vehicle use, and more importantly a low vehicle occupancy. Additionally, there is a low use of active travel and public transport modes of travel.

The staff surveys also indicate that 24 per cent of surveyed staff reside in postcodes that are within 2.5 kilometres of the NMH and 57 per cent reside in postcodes that are within 10 kilometres. This indicates a high proportion of staff living in proximity to the NMH that presents a potential pool for travel via non-car modes and especially walking and cycling.

4. POLICY AND STRATEGY FRAMEWORK

4.1. Introduction

Based on the transport network described above, this section identifies the potential travel patterns to and from the NMH. It builds on the walking and public transport networks already available around the site to identify transport modes which may be best suited to meet the travel demand for the site. This guides the actions specified in Section 5 of this GTP, to respond to available transport infrastructure and current travel patterns in the local area.

4.2. Typical Challenges for Regional Hospitals

Most staff travel associated with regional hospitals will occur via private vehicle as a result of the following:

- The shift nature of staffing requirements for hospitals, with many staff either starting late at night or early in the mornings as well as shifts lasting longer periods than typical work days.
- The general limited availability of convenient public transport within regional areas.

Walking and cycling often prove difficult due to the distance between place of residence and work, as well as a lack of quality facilities in between. In this regard, the following factors are typically attributed to a high mode share for private vehicles at regional hospitals:

- Residential locations and hospital locations can have limited access to public transport services.
- Driving presents attractive travel time advantages for many key staff origins.
- Only a limited number of staff origins in regional locations have access to direct public transport connections that do not require interchanging. This typically results in longer travel times, as well as influencing the perception of a lack of convenience and reliability.
- Time of arrival/ departure, which due to shift work, potentially limits the access to frequent public transport services. Staff that work in shifts with start and end times outside peak hours may also experience personal security issues.
- Time of arrival/ departure influences perceived comfort of traveling via alternate modes of transport, in particular outside peak hours.
- Unpredictable hospital activities may extend staff shift finish times. This can leave staff 'stranded' if public transport options are limited.
- Staff may need to drive to efficiently conduct other activities on their way to/ from the hospital such as school drop-off/ pick-up activities.

Nevertheless, strategies can be implemented to encourage staff to reduce their reliance on private vehicles.

4.3. Analysis

Scenario 1: Business as usual

If no further green travel actions are taken, it is likely that staff will continue to adopt the travel patterns they currently exercise travelling to and from the hospital. If the rates are applied outright to the employment forecasts for the NMH,

the potential future travel demand for different modes of travel can be estimated with a heavy reliance on single occupancy private vehicle use.

Scenario 2: Wayfinding and staff travel information

By targeting staff travel behaviour with quality information about transport options, the NMH can achieve more walking and cycling use by targeting the potential pool of employees that reside within the local residential areas such as Metford, Ashtonfield and East Maitland. Providing wayfinding, public transport information and inductions of end of trip facilities to new staff is an opportunity to demonstrate good transport practices.

Scenario 3: Proactive initiatives to reach set targets

A review of mode shares currently exhibited by comparable hospital developments within regional NSW has been conducted. The results of this are shown in Table 4.1.

Table 4.1: Mode share of comparable hospitals in regional NSW

Mode of Travel	Wyong Private Hospital Mode Share (%)	Gosford Hospital Mode Share (%)	Lismore Hospital Mode Share (%)
Car – As a driver	96.7	86.0	98.6
Car – As a passenger		9.0	
Motorcycle / scooter	Unknown	Unknown	0.4
Bus	0.8	2.6	0
Train			
Bicycle	1.0	1.2	1.0
Walk	1.0	1.2	0.0
Split - Car/ Public Transport	Unknown	Unknown	Unknown

In preparing the proposed mode share targets for the NMH, the following factors have been considered:

- Staff travel surveys and mode shares from the existing Maitland Hospital.
- Mode shares from comparable regional hospitals in NSW (see Table 4.1).
- Proposed facilities within and surrounding the NMH.
- The environment surrounding the NMH.

Based on the above factors, the proposed mode shift for the NMH has been developed with achievable goals in mind, especially in the pursuit of shift to public and active transport. Ultimately, the private car will remain the dominant mode of travel to/from the NMH, however, the key to reducing traffic and parking demand will lie in achieving higher and multi-occupancy vehicles (i.e. carpooling and more car passengers). Therefore, the proposed mode share for the NMH which is considered to be achievable through this GTP is summarised in Table 4.2.

Table 4.2: Existing and proposed mode share targets

Mode of Travel	Survey Mode Share (%)	Proposed Mode Share (%)
Car – As a driver	92	85
Car – As a passenger	1	5
Motorcycle / scooter	3	3
Bus	0	1
Bicycle	0	2
Walk	1	1
Train	1	2
Split - Car/ Public Transport	1	1

The proposed mode share includes encouraging higher occupancy in private vehicles as well as encouraging a take up in active travel modes such as walking and cycling. Understanding the low frequency and range of public transport options, it is not expected that public transport use will significantly increase from the existing one to two per cent, however, a moderate increase should be encouraged. This includes consideration of a bus stop provision within the NMH to allow route alterations to existing routes to service the NMH. In addition, shuttle services to Victoria Street Station could make the use of public transport easier and safer.

4.4. Overview Initiatives

As part of the identified mode share considerations, a number of overview initiatives and principles have been developed with more detailed actions listed in Section 5. The transport aspects likely to influence and initiate mode change within the NMH include:

1. Implementation of the GTP
    - Appoint a Travel Plan Coordinator (TPC) to ensure the successful implementation and monitoring of the GTP. This should be coordinated in an integrated format for the entire NMH precinct. The TPC would manage and review the GTP on an ongoing basis. Usually, the role of a TPC is filled by an employee working in the NMH and would most likely be an administrator.
    - Conduct annual or biennial travel surveys to establish travel patterns in the area and assess success of the GTP. This is to be managed by the appointed TPC. Allow surveys to incorporate suggestions from employees to improve green travel arrangements.
2. Increase walking, running and cycling to work for staff and to other destinations (e.g. recreation, social).
    - Promote bicycle facilities within the NMH by providing staff tours on day of opening as well as staff inductions for new staff.
    - Promote local bicycle facilities within the surrounds of the NMH, as well as shops and bike maintenance courses run by a number of bike shops.
3. Increase car-pooling.
    - Provide a system to allow staff to identify those that reside near them which in turn can be used to organise car-pools between staff. Where possible, arrange shift plans accordingly.
4. Increase available information available to staff and visitors
    - An active system that encourages and facilitates walking, cycling and public transport travel would be beneficial. Sharing available information is a viable option to encourage.

5. ACTIONS

5.1. Implementation

Action	Implementation
Identify a staff member to complete travel coordinator duties in this plan for up to one year at a time	At year of opening
Provide a welcome pack for each new staff member which includes a Travel Access Guide (TAG) and information on how to become involved in the staff car pool system	At year of opening and with each new staff

5.2. Walking

Action	Implementation
Identify employees living near work that may be interested in walking to work	At year of opening and as part of regular updates to the GTP
Produce a map showing safe walking routes to and from your site showing times rather than distances, to local facilities, such as shops and public transport stops	At year of opening as part of Travel Access Guide (TAG)
Have a few umbrellas handy at reception for rainy days – perhaps bearing the NMH logo	At year of opening
Review condition of existing footpaths onsite regularly and upgrade as required	At year of opening and regularly as part of updates to the GTP
Take part in 'National Walk to Work Day'	Every year
Introduce new staff to end of trip facilities as part of their induction	Every time a new staff member begins

5.3. Cycling

Action	Implementation
Establish an internal Bicycle Users Group (BUG). BUGs are formed by people who want to work together to improve facilities for cyclists and encourage cycling	At year of opening with regular check-ins
Develop a 'bike buddy' scheme for inexperienced cyclists	At year of opening
Organise a breakfast for cyclists to incentivise staff to cycle as well as promoting cycling	Once a month
Review bicycle parking regularly to meet peak needs, upgrade as required	Regularly, annually or biannually
Provide bicycle parking for visitors	At year of opening
Ensure bicycle parking is clearly visible or provide signage to direct people to cycle bays	At year of opening
Review condition of existing on-site bicycle routes regularly and upgrade as required	Regularly, annually or biannually
Supply a workplace toolkit consisting of puncture repair equipment, a bike pump, a spare lock and lights	At year of opening with regular review
Provide an on-site bicycle maintenance service (either as a special one-day event or on a regular basis)	Annually or biannually

Action	Implementation
Produce a map showing more leisurely bicycle routes to work	At year of opening, as part of TAG
Participate in annual events such as 'Ride to Work Day'	Annually

5.4. Public Transport

Action	Implementation
Develop a map showing public transport routes to work	At year of opening, as part of TAG
Put up a notice board with leaflets and maps showing the main public transport routes to and from work	At year of opening, as part of TAG
Place information on the work intranet with links to appropriate external websites e.g. transportnsw.info	At year of opening
Provide leaflets or timetables with payslips	At year of opening
Encourage discussions with public transport operators to provide a bus service between Victoria Street station and the hospital	At year of opening

5.5. Carpooling

Action	Implementation
Introduce formal carpooling scheme to encourage staff to share rides	At year of opening
Set up a carpooling database that is updated regularly and used to inform staff	At year of opening
Organise postcode lunches to familiarise staff with each other	At year of opening
Consider carpooling opportunities when rostering staff with involvement by the TPC	At year of opening
Consider allocating priority parking spaces for car-poolers in preferred and visible locations (e.g. close to hospital entrance)	At year of opening

5.6. Car Parking

Action	Implementation
Identify priority users of car park (e.g. people with disabilities and car-poolers) which will be located closer to preferred and visible locations.	At year of opening

6. MONITORING AND REVIEW

In order for the GTP to be effective it must be reviewed on a regular basis. It is important to ensure that the GTP is meeting its objectives and having the intended impact on car use and transport choices for the staff at the NMH. The Plan should be reviewed on a yearly basis with staff travel surveys and in consultation with Council's Planners or Sustainable Transport Officer. The Plan should be updated and changed to reflect changing circumstances.

6.1. Travel Survey

It will clearly be important to understand people's reasons for travelling the way they do, any barriers to changing their behaviour and their propensity to change. This will enable the most effective initiatives to be identified, and conversely fewer effective initiatives can be modified or replaced to ensure the best outcomes are achieved.

To monitor the travel plan, a travel questionnaire should be conducted of all employees. Surveys results should be reported annually by the TPC or senior management and used to inform funding allocation for successful programs/ removal for unsuccessful programs. This would be in consultation with Council Planners or Sustainable Transport Officer, as required. Based on the review the travel plan should be updated to reflect changing circumstances.

An example format for the survey is provided below.

Q1: What is your post code? ____

Q2: How do you usually travel to work? (Select one)

- *Walk / run*
- *Bicycle*
- *Bus*
- *Train*
- *Combination bus and train*
- *Drive a car*
- *Passenger in a car*
- *Other (explain)_____*

Q3: What time do you usually leave for work in the morning?

Q4: Other than travelling to work, what is your main mode of transport around Sydney? (Select one)

- *Walk / run*
- *Bicycle*
- *Bus*
- *Train*
- *Combination bus and train*
- *Drive a car*
- *Passenger in a car*
- *Other (explain)_____*

Q5: To facilitate transport programs, may we share your contact details with green travel champions?

- Yes – I'll walk
  - If 'yes' please provide your email here:
- Yes – I'm a cyclist
  - If 'yes' please provide your email here:
- Yes – I'm a public transport passenger
  - If 'yes' please provide your email here:
- No

6.2. Review In-house Programs

The annual employee travel survey would assist the TPC in the review of the GTP. Other feedback provided to the travel coordinator should be used to update programs as well. Sample feedback could include email responses to programs, monitoring the bike/ car parking spaces used and transport complaints.

People in any organisation like to be part of a successful plan. Staff should be kept informed of green travel achievements, e.g. send out email bulletins, make announcements during meetings, or have a dedicated column within internal/ external publications. Advertise success to staff as part of a sustainability and green campaign for the NMH.

6.3. Gaps

It may occur that transport deficiencies are identified. Some examples may include:

- provision of more car-pool priority spaces may be required as demand grows
- bicycle spaces and lockers for employees and visitors as demand grows.

Transport deficiencies would be tracked by the travel coordinator, these issues may need to be revisited if identified as an issue during monitoring.

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Appendix F

Construction Traffic Management Plan

MULTIPLEX

NEW MAITLAND HOSPITAL

CONSTRUCTION TRAFFIC MANAGEMENT PLAN

STAGE 2 MAIN WORKS

DATE	REQUESTED BY	LOCATION	DESIGNED BY	REVIEWED	VERSION
19/11/18	Steve Russell	Metford Rd, Metford	Brock Donnelly	Gaven Chandler	Version 4
20/02/19	Bede Webb	Metford Rd, Metford	Brock Donnelly	Gaven Chandler	Version 5

Contents

Definitions & Abbreviations

RMS	Roads and Maritime Services
TCP	Traffic Control Plan
TMP	Traffic Management Plan
VMP	Vehicle Management Plan
The Contractor	Multiplex Constructions Pty Ltd

Introduction

2.1 The Project

Multiplex have been engaged by NSW Government Health Infrastructure to carry out the construction of the Early Works for the New Maitland Hospital, and will be collating a submission for the Stage 2 Main Works as noted below:

- Construction and operation of a new 7 storey Acute Services Building, including;
    - Emergency services;
    - Medical, surgical, paediatric and maternity services;
    - Critical care services for adults and babies, including a special care nursery;
    - Operating theatres, delivery suites and assessment rooms;
    - Palliative care and rehabilitation services;
    - Mental health services;
    - Satellite renal dialysis;
    - A new chemotherapy service;
    - Oral health service;
    - A range of ambulatory care and outpatient clinics.
- Internal roadways and car parking for staff, patients and visitors;
- Signage;
- Site landscaping and open space improvements;
- Tree removal; and
- Utility and services connection and amplifications works.

2.1 Time Frame

The New Maitland Hospital Main Works are scheduled to begin in September 2019 and will continue through until May 2021.

Overview of New Maitland Hospital Precinct - Metford Rd & Fieldsend Street, Metford

2.2 Purpose of the TMP

This Traffic Management Plan addresses the proposed construction of the New Maitland Hospital Main Works to be carried out by Multiplex as engaged by NSW Health Infrastructure.

The purpose of this TMP is to provide a framework describing how the Principal Contractor, Multiplex will safely manage the traffic aspects of the Project. The TMP provides the process to ensure that the Project maintains appropriate controls to manage traffic in and around the construction site. The TMP will:

1. Provide a high-level description of the various traffic management elements needed to make the project a success.
2. Serve as the key document that is agreed to by all parties & is the final approval to conduct traffic management during the project.
3. Ensure the safety of road users and construction traffic.

4. Ensure there is a safe interface between construction traffic and local traffic.
5. Eliminate the risk of injury to local traffic users and construction personnel.
6. Ensure that access to adjoining properties is maintained during construction Eliminate/ minimise traffic delays and traffic Issues.

2.3 Scope

This Traffic Management Plan (TMP) becomes the primary document detailing the traffic management arrangements under which this project is to proceed.

In case of emergencies and/or for the management of any incidents during the works the conditions stated in this TMP and/or any of the sub documentation do not apply to any emergency services.

3. Communications Strategy

3.1 Stakeholders List

The Stakeholders of the project are as follows:

CBRE – Project Manager for Health Infrastructure NSW

Contact: Kirsty Gill – Senior Project Manager
Phone: 0408 852 539

Contact: Hamish Rolls – Project Manager
Phone: 0407 296 934

Maitland City Council
Contact: Kevin Stein – Manager Engineering & Design
Phone: (02) 4934 9808

Contact: Scott Henderson – Coordinator Infrastructure Planning Engineer
Phone: (02) 4934 9814

Traffic Management Centre
Contact: Duty Officer
Phone: 02 8874 6806
Email: rol.hunter@rms.nsw.gov.au

Multiplex:
Contact: Jeff Wall – Senior Project Manager
Phone: 0418 314 827

Contact: Glenn Moore – Senior Site Manager
Phone: 0418 314 827

Site Supervisor: Gaven Chandler
Phone: 0497 707 678
Email: gchandler@dservices.com.au

Contact: Mrs Debra Bannerman
Phone: 0426 163 836
Email: dbannerman@dservices.com.au

NSW Fire & Rescue
Contact: Mr Daniel Agland – Station Officer
Phone: 4934 7497
Email: daniel.agland@fire.nsw.gov.au

3.2 Emergency Services

Police Station	Contact: Operator/ Duty Officer	Ph: 000 (02) 4934 0200	3 Carolina Pl, Maitland 2320
Ambulance	Contact: Operator	Ph: 000 13 12 33	21 Gillies St, Rutherford 2320
Fire Station	Contact: Operator/ Duty Officer	Ph: 000 (02) 4934 7497	1, Chelmsford Dr, Metford, 2323

Local Police, Fire & Ambulance services will be contacted & made aware of the project & the changed traffic conditions in place prior to the commencement of the works.

Nearest Hospital:

The Maitland Hospital

PH: (02) 4939 2000

560 High St, Maitland, 2320

4. Traffic Management

4.1 General Outline

This project requires coordinated efforts from a number of agencies as follows:

- The Contractor will coordinate with relevant authorities where required i.e. NSW Police, Fire & Rescue and Roads and Maritime Services to ensure all resources required to manage traffic for the project are provided.

- The NSW Police, will be provided with a copy of the TMP if requested.

- Fire & Rescue NSW will be provided with a copy of the TMP if requested.

4.2 Traffic Control Plans

The works within the site will not be impeding on the use of the road and does not require TCP's.

There will be minimal impact on road users, but will have a minor level of increased truck traffic in the area.

Stage 2 main works project scope includes works outside the site for services upgrades, in these instances both traffic control plans and a road occupancy application will be submitted for approval prior to starting works.

4.3 Responsibilities

Multiplex have engaged Donnelly Services to develop a Traffic Management Plan for the construction of the New Maitland Hospital. A suitable qualified traffic control company will implement any TMP's required prior to any works commencing.

Officials from WorkSafe, Roads & Maritime Services NSW, Multiplex & the local Traffic Commander may inspect/request access to the Traffic Management Plan at any time.

5. Staffing

The proposed traffic control arrangements does not require any traffic controllers, however the gates will be manned with security personnel to control passage of personnel on foot and in vehicles to and from site.

For the external services upgrades outside of the site a TCP detailing traffic control personnel will be submitted for approval.

6. Site Vehicles

Vehicles directly involved in the project are to be parked on the site. All vehicles involved in construction activities will have flashing lights and reversing alarms.

All vehicles entering and exiting the construction carpark will be exempt from the above.

7. Vehicle Movement Procedure

The number of daily truck movements will vary depending on the works being conducted on the specific day or timeframe in the construction programme.

Concrete pour days would expect an increase from in truck deliveries, however the delivery timing will be managed to ensure a smooth traffic flow and the utilisation of onsite truck waiting bays. It is suggested that the average for concrete pour days would be one truck every 5 – 10 minutes. There will be provisions for waiting bays onsite which will avoid trucks queuing or waiting on public roads. The stage 2

structure programme starts October 2019 and finishes July 2020, estimated average of 3 concrete pours per week.

On days outside of concrete pour days it is anticipated that there will be 1-2 truck deliveries per hour between the hours of 7am to 5pm Monday to Saturday.

7.1 Anticipated Truck Delivery Route

The predicted truck delivery routes will likely come from the south east end of New England Highway and eastern end of Raymond Terrace Road, entering site from the Metford road roundabout and the southern access road (once it has been built). See appendix 6 for a high level overview of expected truck delivery routes.

7.2 Site Operational Hours

1. Between 7am and 6pm, Monday to Fridays inclusive; and
2. Between 7am and 5pm, Saturdays.*

Low noise activities carried out (eg hand held tools (including power tools), painting etc.) may be carried out at all times provided the activities do not cause offensive noise.

*Subject to DA approval

*The increase in site operational hours that are subject to the DA approval will not have an effect on the traffic management of the site. The proposal is to increase Saturday working hours only and will not have an effect as Saturdays are generally expected to have less workers onsite than during the week.

7.4 Main Works Timeframes

In accordance with Multiplex's main works programme the general stages of the project will go as follows

- Main Works total programme September 2019 to April 2021
    - Structure: September 2019 to July 2020
    - Façade: July 2021 to February 2021
    - Fitout: March 2020 to April 2021
    - Carpark: October 2019 to March 2021
- Anticipated peak construction time between March 2020 & July 2020

In addition to the above dates the following activities need to be considered for the duration of the project works, to be completed by early 2022.

- Construction Contingency
- Building Commissioning
- Operational Commissioning

8. Cyclist and Pedestrian Impacts

All works will be inside the site area with no access to cyclists or pedestrians. Trucks will be parked in designated areas off the road and footpaths. There will be no impact to cyclists and Pedestrians.

The construction of the in ground high voltage mains (external services upgrades), external to the site will require the submission of a separate traffic control plan, where the impact on public cyclists and pedestrians will be assessed.

9. Road Conditions

Metford Rd is a 2/lane – 2/way sealed road with a posted speed limit of 60km/h.

Fieldsend St 2/lane – 2/way sealed road with a posted speed limit of 50km/h.

Raymond Terrace Rd is a 2/lane - 2/way sealed road with a posted speed limit ranging from 60km/h to 80 km/h

10. Construction workers and vehicles

10.1 Construction Workers on Site

The numbers of workers onsite will vary pending the stage of construction the project is at. The absolute peak number of people anticipated working onsite will be approximately 400 for one day.

10.2 Construction Workers Parking

Multiplex will facilitate contractor car parking onsite. Multiplex will encourage the use of public transport and carpooling to lessen the demand of parking and traffic movements generally.

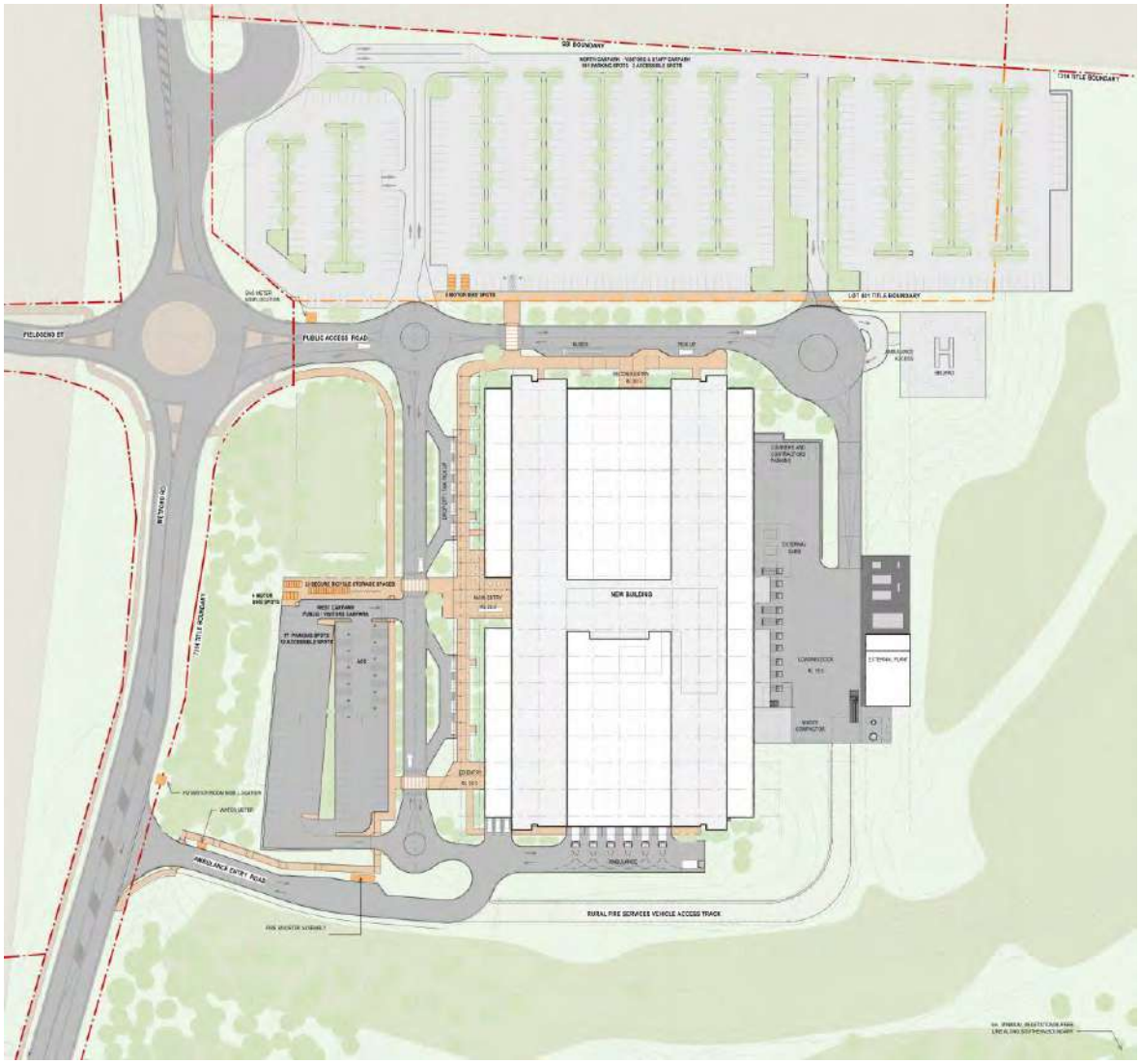
Contractor parking will be made up of temporary parking onsite, with the use of the future expansion pad, landscaped area north of the western carpark and lot 401 to the north. Lot 401, the northern (permanent) carpark will be used as supplementary car parking when the construction of the area begins.

11. Vehicle Movement Plans

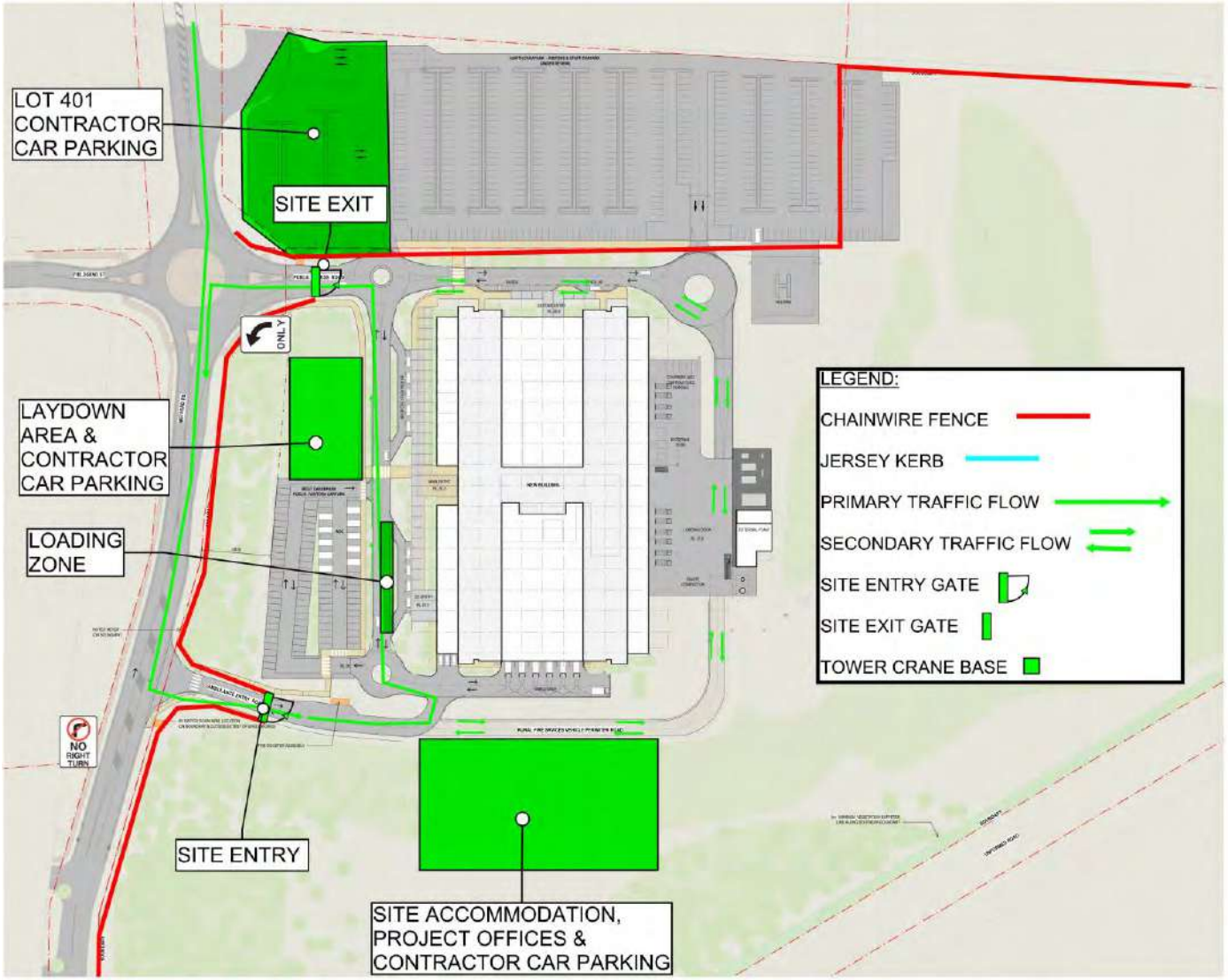
Appendix 2 - 5 details a Vehicle movement plan (VMP) with northern access road as the main entrance to site. Pending the construction of the southern access road (ambulance entry road) an alternative vehicle movement plan will be developed, the stage of construction will need to be assessed in the development of this VMP.

In similar fashion to the above a VMP will be developed for the inclusion of the Northern Carpark (Lot 401) and will need to suit the stage of construction that the project is at.

APPENDIX 1 – BUILDING AND ROAD FOOTPRINT

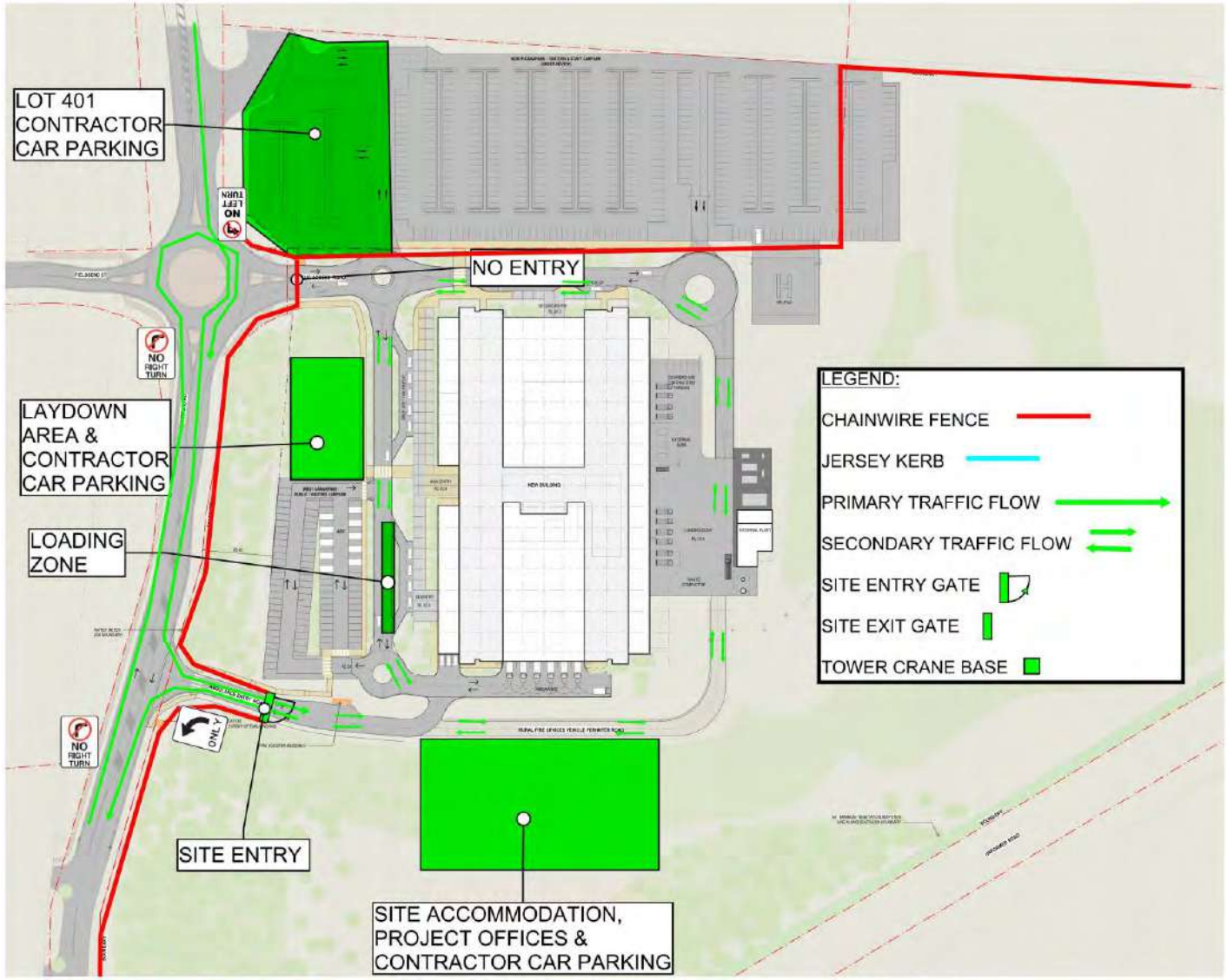


APPENDIX 2 – VEHICLE MOVEMENT PLAN (NORTHERN ENTRY ROAD IN OPERATION)

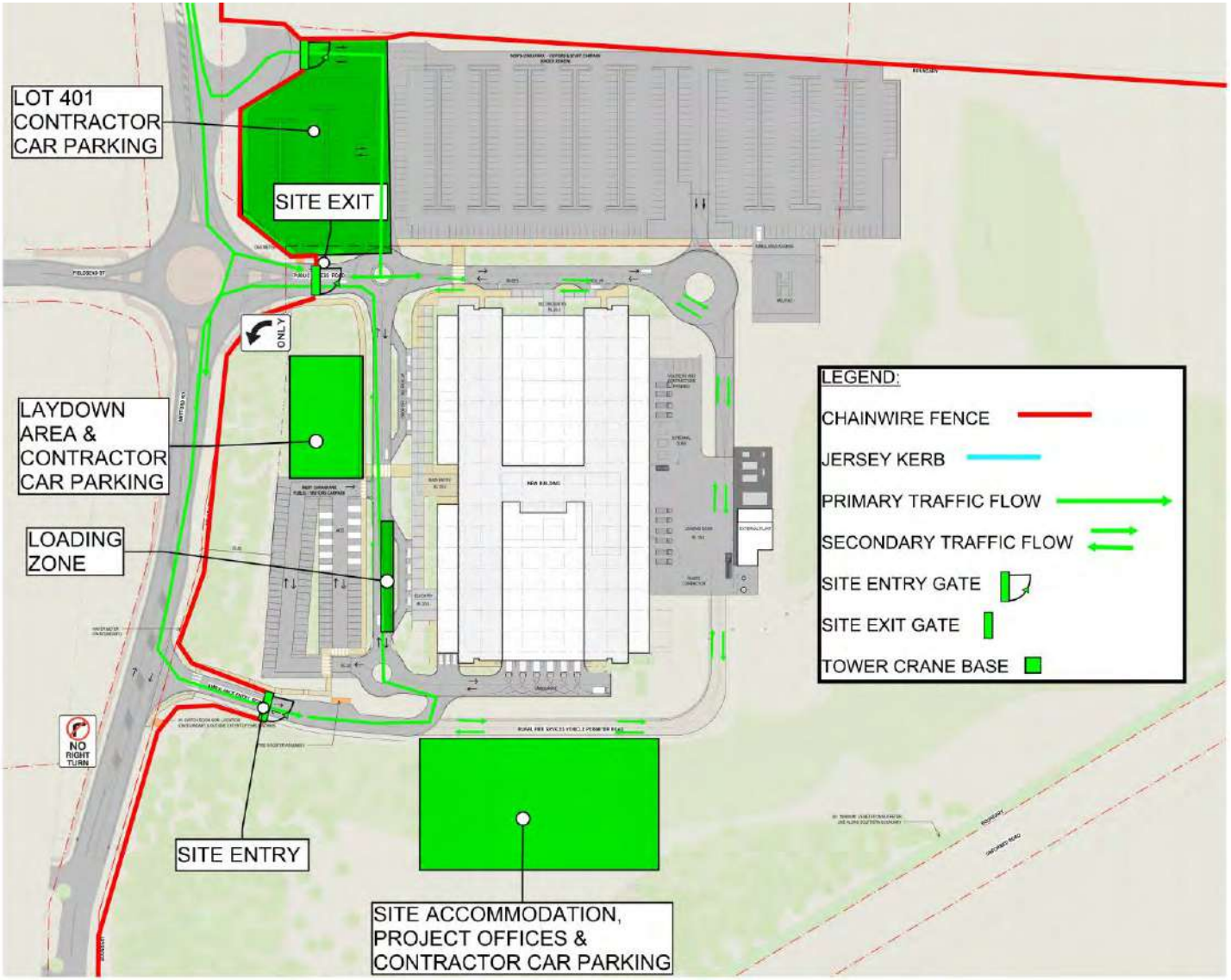


APPENDIX 3 – VEHICLE MOVEMENT PLAN (NORTHERN & SOUTHERN ENTRY ROADS IN OPERATION)

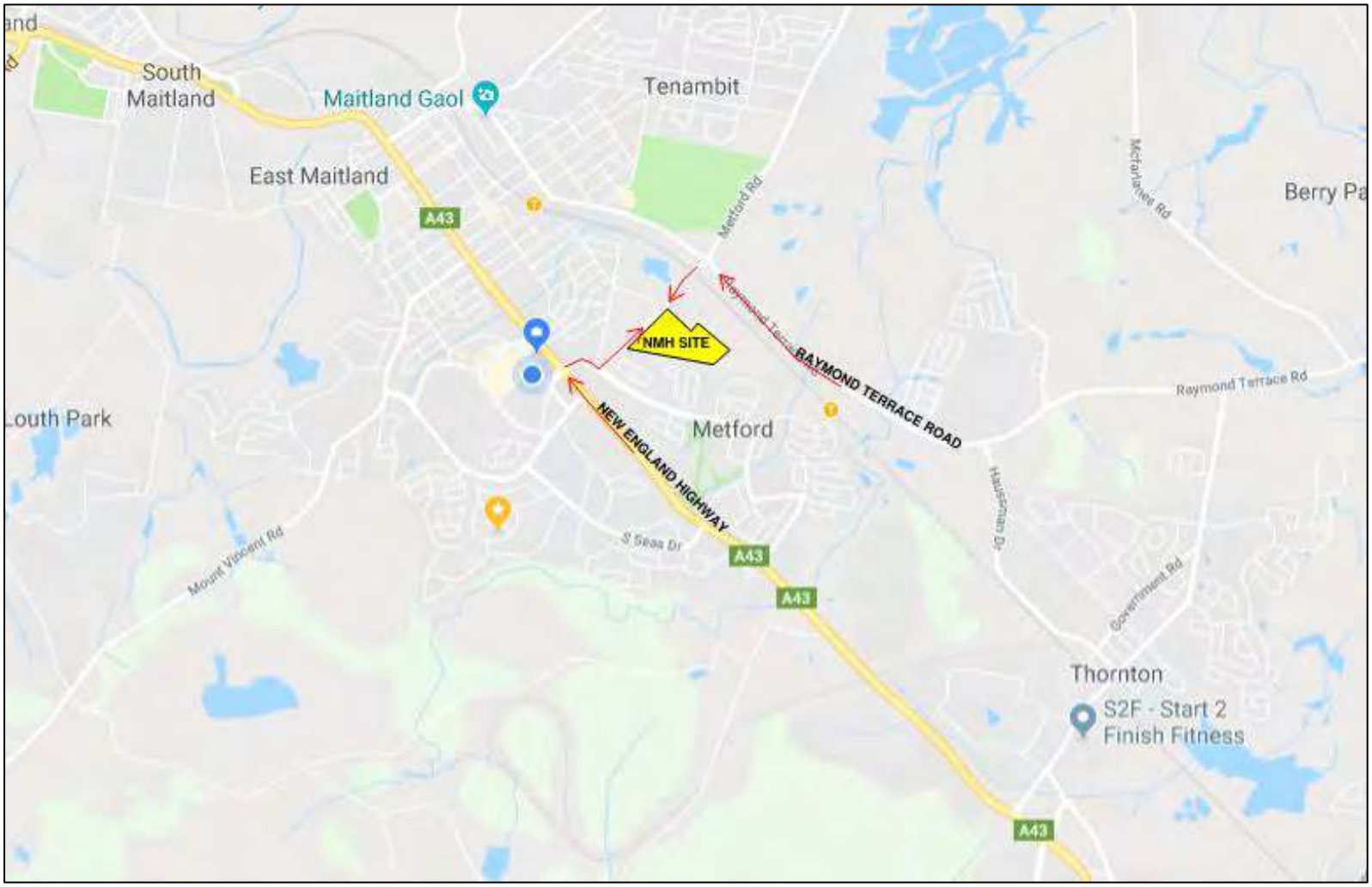
APPENDIX 4 – VEHICLE MOVEMENT PLAN (SOUTHERN ENTRY ROAD IN OPERATION ONLY)



APPENDIX 5 – VEHICLE MOVEMENT PLAN (LOT 401 NORTHERN CARPARK & OTHER ENTRANCES ENTRY IN OPERATION, ALL 3)



APPENDIX 6 – ANTICIPATED TRUCK DELIVERY ROUTES



Appendix G

Parking Demand Study

GTAconsultants

New Maitland Hospital Parking Demand Study

Client //	Health Infrastructure
Office //	NSW
Reference //	N149421
Date //	17/10/18

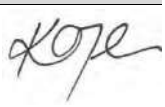
New Maitland Hospital

Parking Demand Study

Issue: A 17/10/18

Client: Health Infrastructure
Reference: N149421
GTA Consultants Office: NSW

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	17/10/18	Final	Andrew Tierney, Ingrid Bissaker	Karen McNatty	Karen McNatty	

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Executive Summary

GTA Consultants (GTA) was commissioned by Health Infrastructure to undertake a car parking demand study to inform the Stage 2 Detailed Design of the State Significant Infrastructure application for the New Maitland Hospital (NMH) at Metford Road, Metford.

This report sets out an assessment of the anticipated car parking requirements for the NMH. This assessment includes a review of the current car parking demand profile of the existing Maitland Hospital, located at 560 High Street, Maitland. To ensure the proposed quantum of parking can accommodate the operations of the proposed NMH, this assessment has considered the parking demand of the NMH at the proposed year of opening, five year and ten-year horizon.

Existing Maitland Hospital

The existing Maitland Hospital currently has 779 full time equivalent (FTE) staff and a total of 198 beds. The site is serviced by parking for up to 439 off-street parking spaces as well as available on-street parking. In addition, a Council-controlled car park accessed from High Street is used by visitors to the hospital.

An online staff questionnaire was distributed to all hospital staff in August 2018 to understand existing staff travel patterns. The results of the survey indicate that car travel was generally the main mode of travel to/from the hospital, with over 95 per cent of responses travelling by private vehicle (including car passengers and motorcyclists). The mode of travel for hospital staff was generally consistent with the Journey to Work data published by Transport for NSW's Transport Performance and Analytics from 2011 Census data.

GTA undertook parking occupancy surveys on 9 August 2018 within the available off-street formal and informal parking areas. The results indicate that off-street car parking demand in the nominated study area remain high across the day and that visitor parking demand exceeds capacity however some staff parking areas are currently underutilised. The peak demand for parking resulted in an overall car parking demand for formal and informal parking facilities of 103 per cent or 521 vehicles. This demand excludes any on-street parking demand. For the purpose of this assessment around 40 per cent of on-street parking has been assumed to be hospital related, this equates to an assumed demand of 74 spaces.

Combined off-street peak parking demand of 521 spaces (including demand for 436 formal spaces and 85 informal spaces) and on-street assumption of 74 spaces indicates that a total demand of 595 spaces is currently being generated by the existing Maitland Hospital.

Additional surveys were undertaken by GTA on Thursday 6 September 2018 to validate the findings.

Parking Demand Model

A collation of attributes involving separate parking for staff, public/ visitors, and LHD controlled fleet vehicle parking has been used to model parking demand. The model attempts to analyse the total number of persons which utilise the site against the parking demand through weighting factors such as rates of attendance, vehicle occupancy, and parking space turnover.

Based on parameters agreed with Health Infrastructure, a demand of 561 spaces is calculated for the existing Maitland Hospital site. This calculated demand is within six percent of the observed demand of 595 spaces, allowing for minor fluctuations in assumptions, this is considered a suitable reflection of the existing demand.

Various other options for determining suitable car parking requirements for the proposed NMH were assessed, including a review of empirical data for other hospitals and the Development Control Plan requirements of Maitland City Council and other nearby Councils. However, the projected parking numbers were considered low when reviewed against the demand of the existing hospital.

New Maitland Hospital

It is proposed that the NMH would consist of 339 beds. It is understood that the hospital is projected to employ around 893 FTE staff at the proposed year of opening, 1,106 FTE staff five years after opening and 1,162 FTE staff ten years after opening.

Based on parameters agreed with Health Infrastructure for the NMH, a demand of 775 spaces is calculated for the proposed NMH for the 10-year design horizon of 2031/2032. It is recommended that the parking supply for the proposed NMH includes a six percent increase to the calculated demand to ensure the variance in the parameters calculated and the current observed demand are accommodated. Therefore, it is recommended that an onsite parking supply of 822 spaces be provided. This includes 578 spaces for staff, 30 spaces for Visiting Medical Officers (VMO), 184 spaces for public (hospital users/visitors) and 30 spaces for LHD and Fleet vehicles. This excludes the provision of additional spaces for ambulance parking.

Summary

It is recommended that an onsite parking supply of 822 spaces be provided for the proposed NMH, this excludes the provision of additional spaces for ambulance parking.

Table of Contents

Tables

1. Introduction

1.1 Background

The existing Maitland Hospital will be redeveloped at a new site at Metford Road, Metford. The New Maitland Hospital (NMH) will cater for a range of health services to residents of the Hunter Valley region, it is expected that the existing Kurri Kurri Hospital will continue to operate at a similar capacity.

GTA Consultants (GTA) prepared a transport impact assessment in May 2018[1] to address the potential transport implications of the Stage 1 Concept Design and site preparation works for the proposed NMH which was submitted as part of the Stage Significant Infrastructure application.

Subsequently, Health Infrastructure has commissioned GTA in August 2018 to prepare this parking demand study to inform the Stage 2 Detailed Design.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated car parking requirements for the proposed NMH. This assessment includes a review of the current car parking demand profile of the existing Maitland Hospital, located at 560 High Street, Maitland. To ensure the proposed quantum of parking can accommodate the operations of the proposed NMH, this assessment has considered the parking demand of the NMH at the proposed year of opening, five year and ten-year horizon.

As part of the assessment, the following matters have been considered:

i Existing parking conditions surrounding the site and current Maitland Hospital
ii Existing parking demand profile of the current Maitland Hospital
iii Existing visitor and staff travel patterns to/ from the current Maitland Hospital
iv The traffic generating characteristics of the proposed NMH
v Various options for determining suitable car parking requirements.

1.3 References

In preparing this report, reference has been made to the following:

- An inspection of the site and its surrounds
- Car parking supply and demand surveys undertaken by GTA
- Car Park Demand Assessment Template, Health Infrastructure, 23 July 2018
- On-site interview surveys with hospital visitors
- Roads and Maritime Services (Roads and Maritime) Guide to Traffic Generation Developments 2002
- Maitland City Council's (Council) Development Control Plan (DCP) 2011
- Other documents and data as referenced in this report.

[1] New Maitland Hospital - State Significant Infrastructure - Transport Impact Assessment, GTA Consultants, 9 May 2018

2. Existing Maitland Hospital

An assessment of the current car parking demand profile of the existing Maitland Hospital is outlined below.

2.1 Current Hospital Operations

The existing Maitland Hospital is located at 560 High Street, Maitland. The hospital is part of the Hunter New England Local Health District (LHD) and serves the cities and towns of Maitland, Cessnock, Kurri Kurri, Singleton, Muswellbrook, Dungog and Raymond Terrace.

The hospital currently has 779 full time equivalent (FTE) staff and a total of 198 beds. The site is serviced by parking for up to 439 off-street parking spaces as well as available on-street parking, outlined further in section 2.4.

The existing Maitland Hospital services are at capacity, resulting in a high percentage of patients attending or being referred to hospitals in Newcastle or Sydney to meet demand. There are limited ambulatory care services to assist in reducing hospital admissions and length of stay. As such, the existing Maitland Hospital facility cannot support the growth and change in the type of services needed to provide contemporary health care to the Hunter Valley Region.

2.2 Site Context

The existing Maitland Hospital has a site area of around 35,000 square metres and is bound by High Street to the west and south, Mount Pleasant Street to the north and an open flood plain to the east. The site currently has a land use classification of SP2 infrastructure.

The surrounding properties generally include small businesses and low-density residential housing.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Existing Maitland site

Source: Nearmap, accessed 21 August 2018.

2.3 Surrounding Road Network

2.3.1 Road Hierarchy

Roads are classified according to the functions they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies which guide the management of the road according to their intended service or qualities.

In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions within Sydney, and throughout the State. Roads and Maritime is responsible for funding, prioritising and carrying out works on State roads. State roads generally include roads classified as freeways, state highways, and main roads under the 1993 Roads Act, and the regulation to manage the road system is stated in the Australian Road Rules (2014).

Roads and Maritime defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility, to high accessibility and low mobility. These road classes are:

Arterial Roads – Controlled by Roads and Maritime, typically no limit in flow and designed to carry vehicles long distance between regional centres.

Sub-Arterial Roads – Managed by either Council or Roads and Maritime under a joint agreement. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their

purpose is to carry through traffic between specific areas in a sub region or provide connectivity from arterial road routes (regional links).

Collector Roads – Provide connectivity between local sites and the sub-arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.

Local Roads – Provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.3.2 Road Network

A description of the surrounding road network is summarised in Table 2.1.

Table 2.1: Surrounding road network

Road Name	Functional Class	Authority	Description
High Street	Collector Road / Sub-Arterial Road	Council	Two-way, two lane road aligned in a north-south direction along the frontage of the site, before curving to an east-west direction to the south of the site. Connects to the New England Highway west of the site.
Mount Pleasant Street	Collector Road	Council	Two-way, two-lane road aligned in an east-west direction proximate to the site. The road connects to the New England Highway in the west.
New England Highway	Arterial Road	Roads and Maritime Services	Two-way, four-lane national highway aligned in a north-south direction proximate to the site.
Bonar Street	Local Road	Council	Two-way, two-lane road aligned east-west proximate to high street. Provides access to significant visitor and staff parking.

2.4 Car Parking

2.4.1 Off-Street

GTA compiled an inventory of formal off-street car parking available for staff and visitors, with a breakdown provided in Table 2.2 and illustrated in Figure 2.2.

It is noted that the car parking facilities were located both on-site, with access provided from Mount Pleasant Street and High Street, and off-site, with access provided from Bonar Street. This includes three short term set-down parking spaces which are used to service public access to the Emergency Department (ED).

The 192 spaces available in carpark 1 comprising of 172 unrestricted all-day parking, 10 unrestricted all-day accessible parking, and 10 2-hour parking spaces. Carpark 1 is utilised by a combination of staff and public users. An additional 63 spaces are available to staff within car park 1A, which are restricted to staff and remain unavailable until 9:30am to accommodate the overlap in car parking demand during staff shift changeovers. Once carpark 1 is full, hospital parking for public users (patients and visitors) overflows into the Council-controlled car park (car park 5) and is accessed via High Street.

Table 2.2: Existing on-site parking supply and restrictions

Car Park	Description	Restrictions	Supply (no. of spaces)
1	Staff and Visitor	All day paid parking	172
		2 hour paid parking	10
		All day accessible parking	10
1A	Staff Only Shift Changeover Parking	Restricted access closed until 9:30am Paid Parking	63
2	Staff Only	No Restrictions	56
3	Staff and Fleet Vehicles	No Restrictions	110
4	VMO/ Special Use	No Restrictions	18
		Subtotal hospital parking	439
5	Visitor Only Council Controlled Car Park	1/2hr, 2hr, 3hr	66
		Total	505

The following spaces are also provided in addition to the parking supply provided in Table 2.2:

- Main Entrance drop off – three P15 spaces (includes one accessible space)
- Five Ambulance parking spaces.

Figure 2.2: Off-street parking proximate to the existing site

Source: Nearmap, accessed 21 August 2018.

2.4.2 Off-street Informal Parking

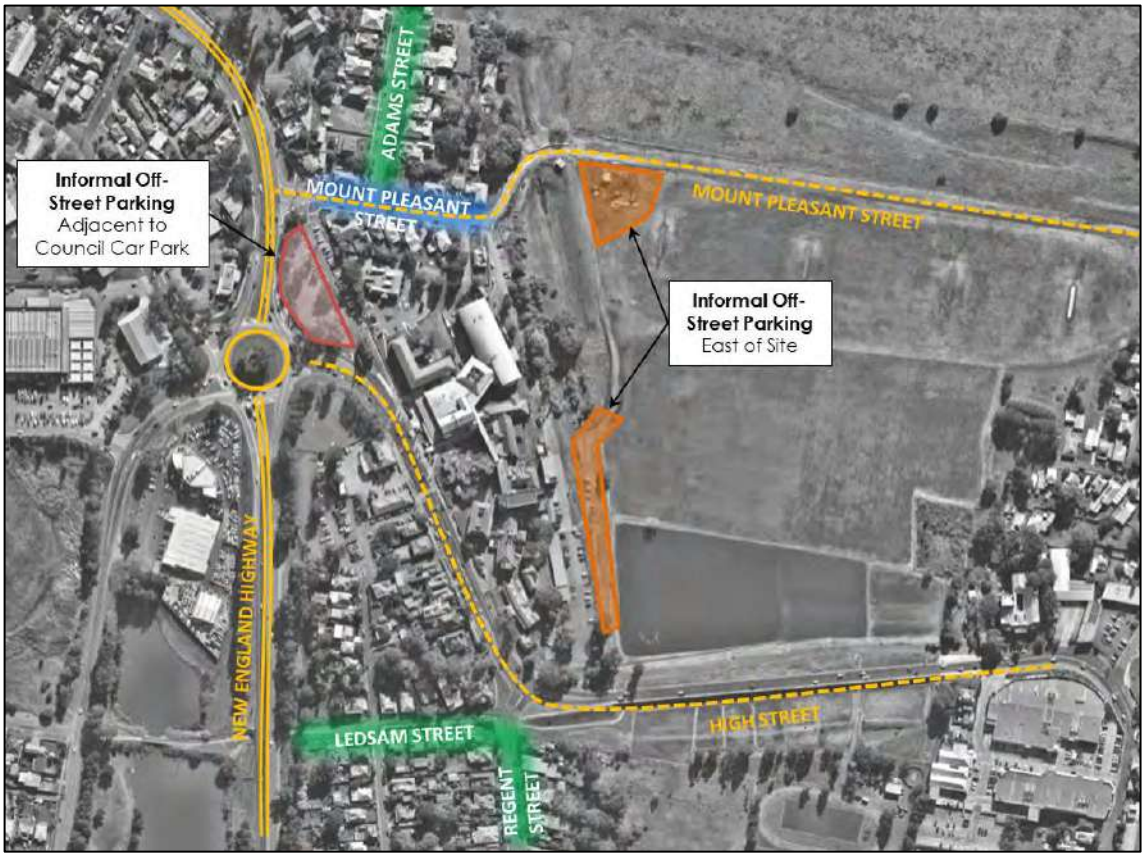
In addition to the formal supply of parking available for use by staff and visitors of the hospital, GTA observed additional demand for informal off-street parking in two locations near the site, illustrated in Figure 2.3, as follows:

- Along the unsealed road located to the east of the site, accessed via Mount Pleasant Street
- Adjacent to the Council-controlled car park (car park 5), accessed via High Street.

A pedestrian connection exists between car park 3 and the southern section of the unsealed road, shown in Figure 2.4. It is therefore assumed that the observed demand for parking at the southern part of the unsealed road is predominately generated by staff.

The informal off-street parking adjacent to the Council-controlled car park is demonstrated Figure 2.5 and was observed to be predominately used by visitors.

Figure 2.3: Informal off-street parking adjacent to the existing Maitland Hospital



Source: Nearmap, accessed 21 August 2018.

Figure 2.4: Pedestrian connection between Maitland Hospital car park 3 and informal parking area (facing south)

Figure 2.5: Informal parking area adjacent to Council-controlled car park (facing north)

2.4.3 On-Street

GTA reviewed and compiled an inventory of publicly available on-street car parking within around 500 metres of the site. On-street parking likely to be utilised by the existing hospital is summarised in Table 2.3 and illustrated in Figure 2.3.

Table 2.3: On-street parking (within 500 metres of the site)

Street	Parking Restriction	Number of available spaces
Mount Pleasant Street	Short-term Parking (2hr)	24
	Accessible Parking	1
Adams Street	Unrestricted Parking	35
High Street	Unrestricted Parking	5
	Short-term Parking (P10 Parking)	2
Ledsam Street	Unrestricted Parking	18
Regent Street	Unrestricted Parking	100
TOTAL	-	185

As detailed in Table 2.3, there are approximately 158 unrestricted parking spaces, 26 short term parking spaces, and one accessible space available on-street near the site.

During GTA's site visit, demand for on-street car parking along Ledsam Street and Regent Street was observed to be high. Vehicular access to Adams Street and Mount Pleasant Street was restricted to accommodate construction works associated with the Mount Pleasant Street road upgrade.

An additional site visit was undertaken once road works on Mount Pleasant Street were completed and on street parking available, this identified that the unrestricted parking on Adams Street was completely occupied and that regular parking turnover was occurring on Mount Pleasant Road with three to five parking spaces generally available.

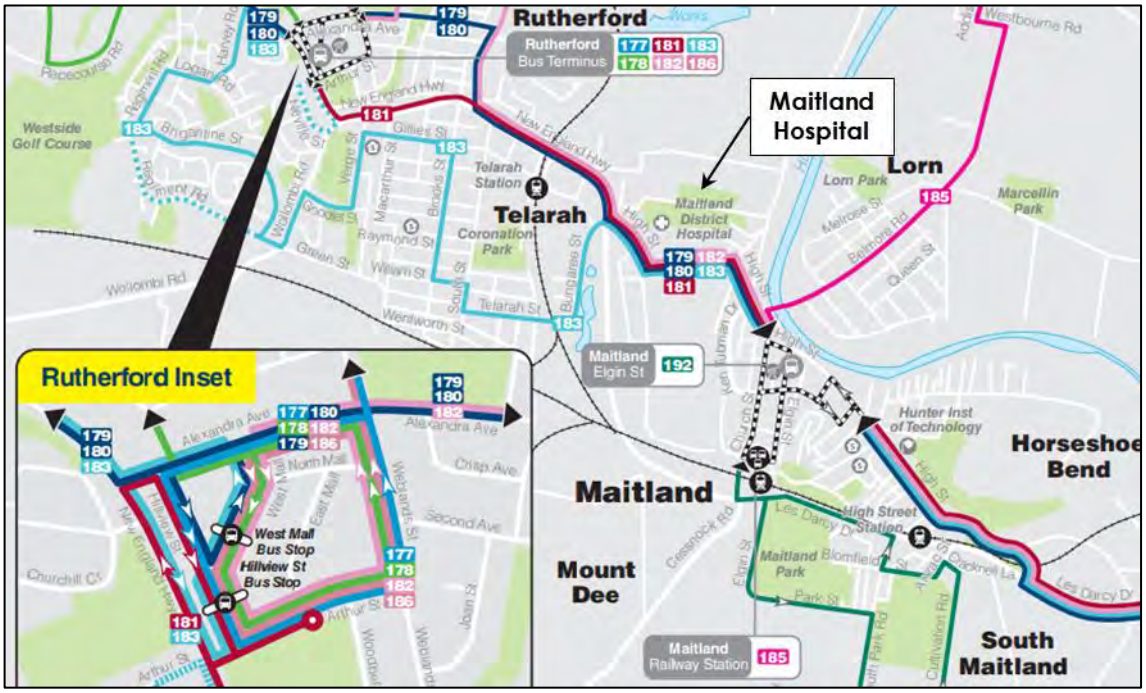
2.5 Public Transport

The subject site is well-serviced by public transport, with a bus stop located along the site frontage to High Street, providing local connections to Maitland, East Maitland, Metford, Woodberry and Rutherford. Bus services are generally provided every 20 minutes.

Telarah Railway Station is located around 600 metres west of Maitland Hospital. It is part of the Hunter Line, with services running from Newcastle to Dungong. Services at Telarah Railway Station are generally provided every 30 minutes.

A review of the public transport available near the site is illustrated in Figure 2.6.

Figure 2.6: Hunter Valley train and bus network – Maitland/ Rutherford



Source: Hunter Valley Coaches – Maitland and Raymond Terrace District, accessed 21 August 2018.

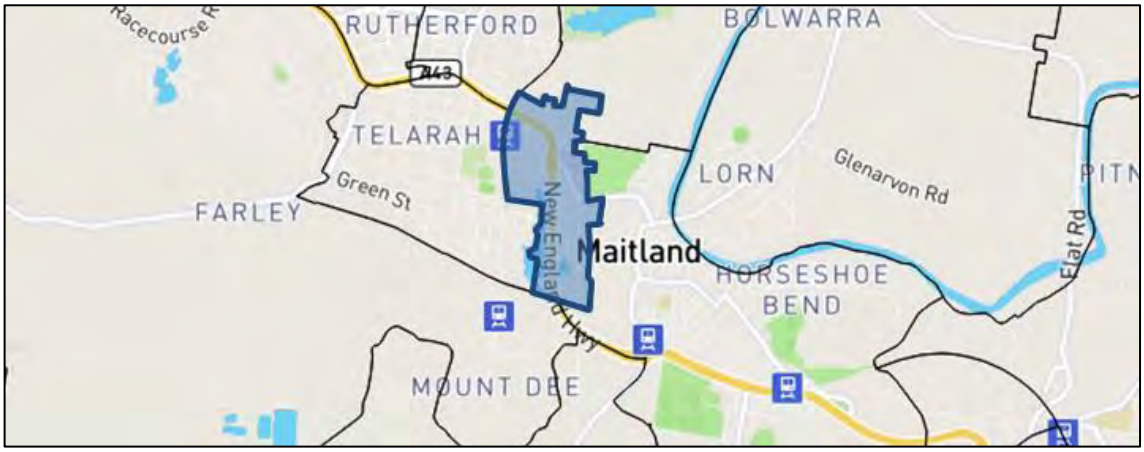
2.6 Travel Patterns

2.6.1 Journey to Work

The Journey to Work (JTW) data published by Transport for NSW's Transport Performance and Analytics from 2011 Census data provides an understanding of the travel patterns to/ from the site and surrounding area.

The smallest geographical area for which JTW data is available is a Travel Zone (TZ). The relevant Travel Zone used for this assessment is 6600, shown in Figure 2.7.

Figure 2.7: Travel Zone containing Maitland Hospital



Base map source: https://www.transport.nsw.gov.au/data-and-research/forecasts-and-projections/travel-zone-explorer, accessed 23 August 2018.

The JTW data indicates that a total of 1,268 persons work within the selected Travel Zone.

Table 2.4 shows the distribution of travel modes by the workers employed in the Travel Zone, which indicates that of the people that travel to work around 93 percent of workers travel to the area by private vehicle as a driver or passenger.

Table 2.4: TW travel modes by workers within the Travel Zone

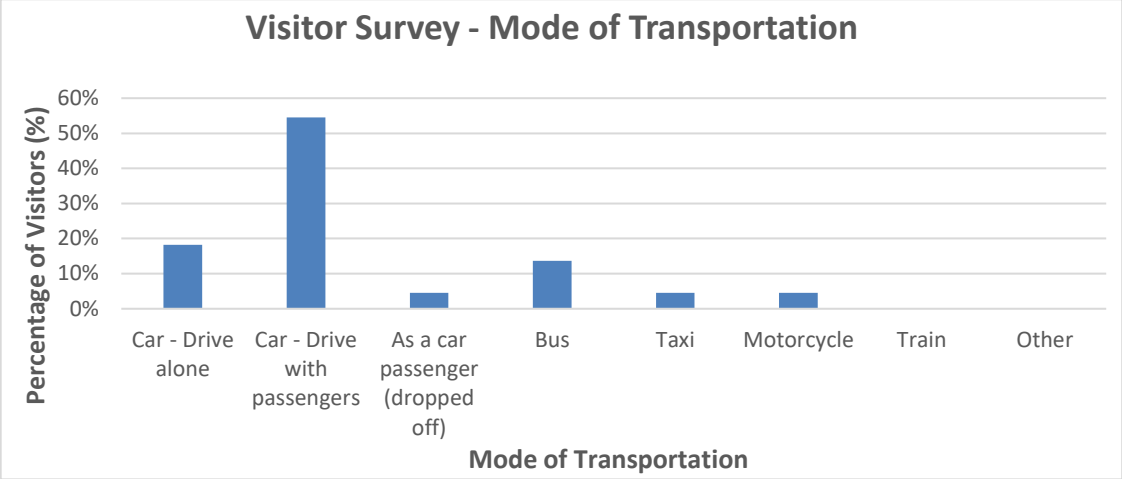
Travel Mode	Mode Share Split (%) [1]	
Vehicle Driver	88	93
Vehicle Passenger	5	
Train	2	
Bus	0	
Waked	1	
Other	1	
Not Stated	2	

[1] Excludes those who did not travel to work

2.6.2 Visitor Surveys

Visitor surveys were undertaken during typical visiting times to understand current visitor travel patterns to/ from the hospital. GTA staff were located on High Street between car park 5 (Council controlled car park) and car park 1(combined staff visitor car park off Bonar Street) on Thursday, 9 August 2018. It was difficult to obtain a representative number of surveys, with a total of 22 visitor responses received during the weekday survey, a summary of mode of transportation shown in Figure 2.8.

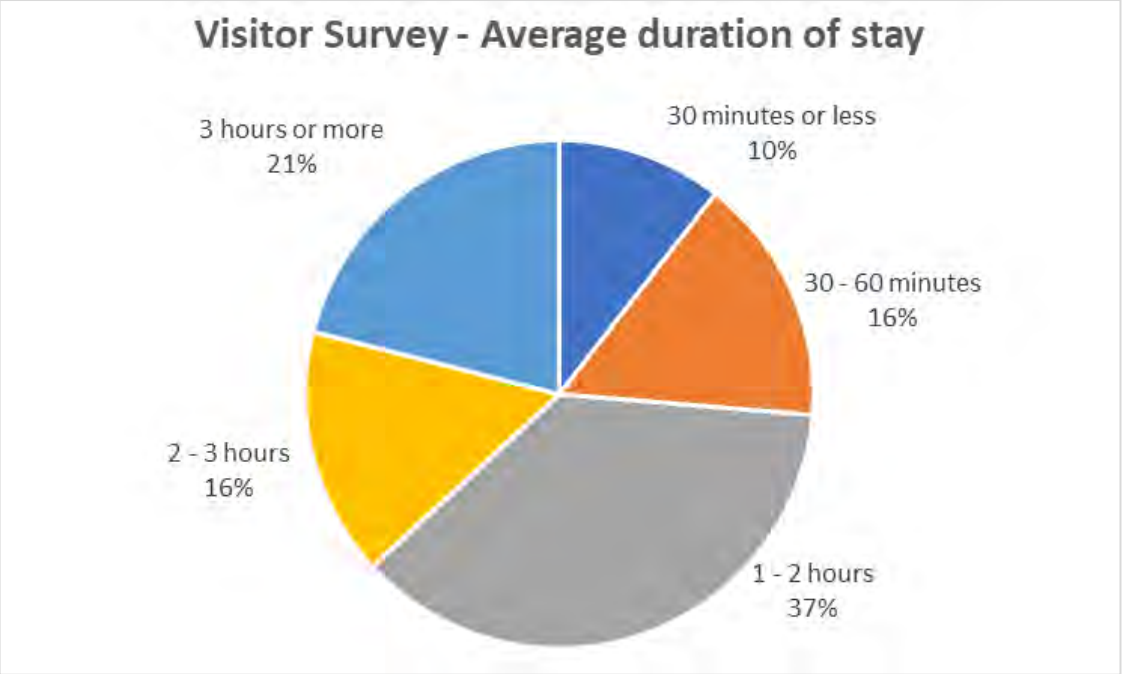
Figure 2.8: Visitor Survey – Maitland Hospital mode of transportation



As shown in Figure 2.8, respondents predominately arrived by car and no respondents were recorded for train as a mode of transport.

The visitor surveys indicated that 37 per cent of visitors surveyed stayed at the hospital for a duration between one and two hours, with 53 per cent of those surveyed staying at the hospital between the range one and three hours. 21 per cent of those surveyed identified as having a duration of stay longer than three hours. A summary of responses is identified in Figure 2.9.

Figure 2.9: Visitor Survey – Average duration of stay



2.6.3 Staff Surveys

An online staff questionnaire was distributed to all hospital staff in August 2018 to understand existing staff travel patterns, and a total of 74 responses were received. The results of the survey indicate that car travel was generally the main mode of travel to/from the hospital, with over 95 per cent of responses travelling by private vehicle (including car passengers and motorcyclists)

with an average vehicle occupancy of 1.1 persons per vehicle according to those surveyed. It is noted that this value excluded people who travelled by car for a portion of the trip to/from the hospital, such as parking near a railway station or other public transport facilities as part of their commute.

The mode of travel for hospital staff was generally consistent with the 2011 JTW data noted in section 2.6.1. The survey responses relating to current staff modes of transportation is summarised in Table 2.5.

Table 2.5: Mode of travel of staff

Mode of transport	Responses (%)
Car – As a driver	91.9
Car – As a passenger	1.35
Motorcycle / scooter	2.7
Bus	0
Bicycle	0
Walk	1.35
Train	1.35
Taxi	0
Split - Car / Public Transport	1.35

It was found that the two main reasons for staff selection of these modes of transportation to/from the hospital was due to:

- Travel distance
- Convenience.

Based on survey responses, 54 per cent of participants have a duration of travel to/from the hospital which is greater than 20 minutes, typically in the morning peak between 7am and 9am (65 per cent of those surveyed) and evening peak between 4pm and 6pm (60 per cent of those surveyed). It was found that 50 per cent of responses identified as originating from the postcodes of 2320, 2323, and 2321.

A summary of the origins of staff travel to/from the hospital is shown in Figure 2.10, and typical travel time is shown in Figure 2.11.

Figure 2.10: Staff Survey - Staff origins

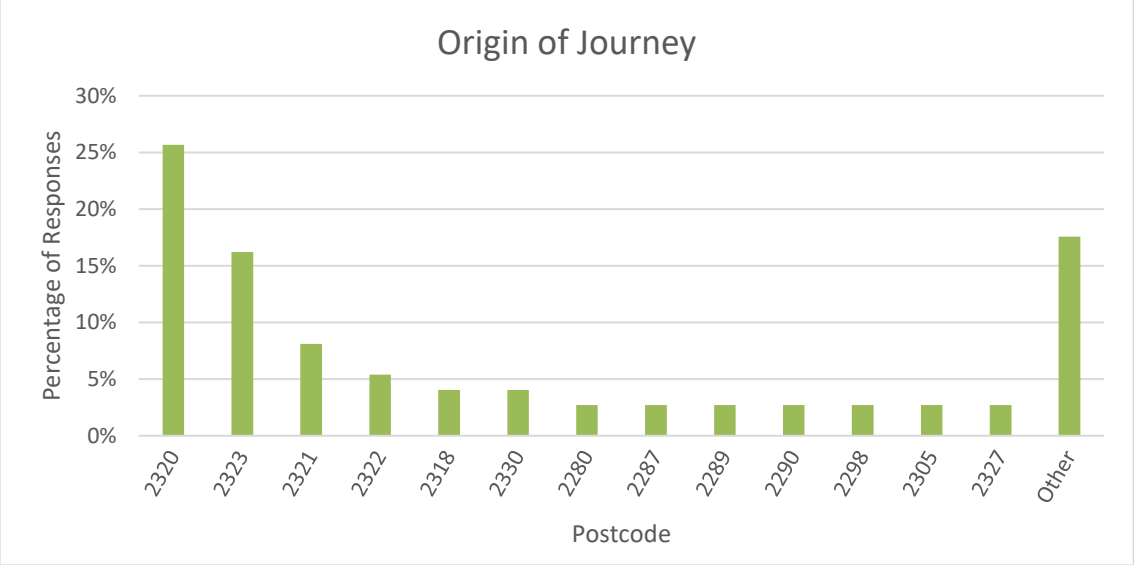
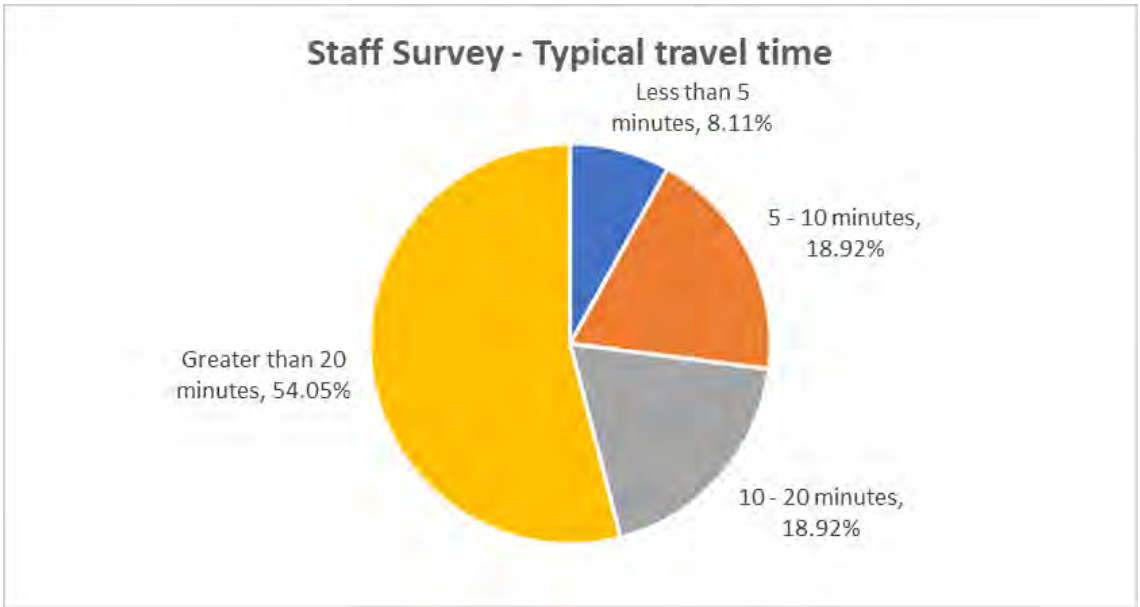


Figure 2.11: Staff survey – Typical travel time

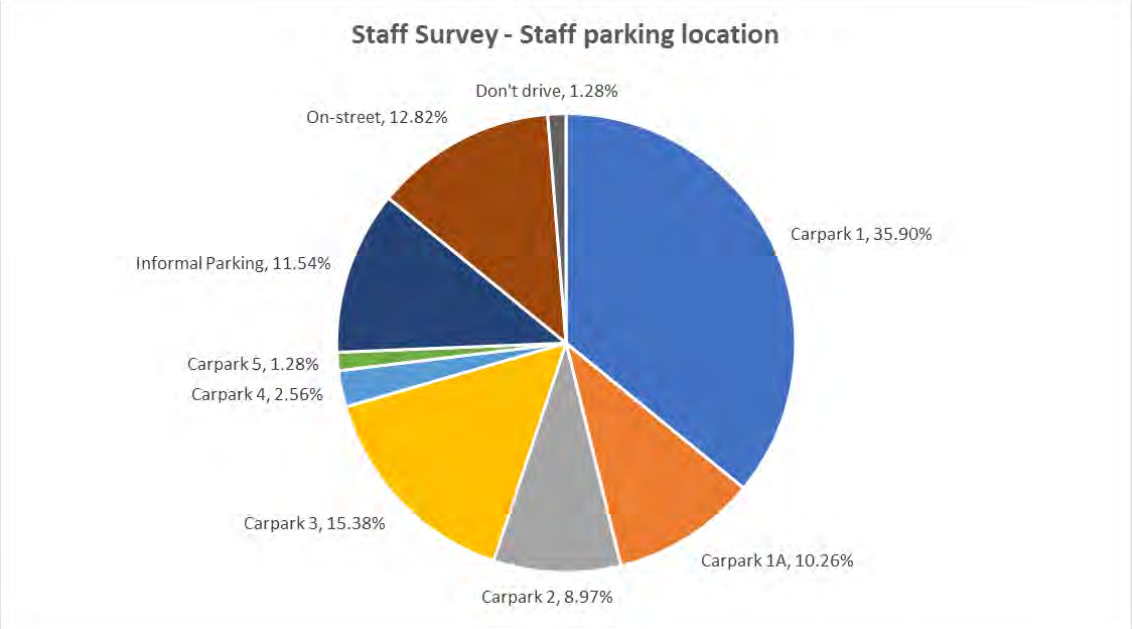


The survey results indicated high car usage for staff, a summary of typical staff parking locations is outlined in Table 2.6 and locations identified in Figure 2.12.

Table 2.6: Staff parking methods

Description	Staff percentage (%)
All day staff parking (formal)	73
Informal parking (east of site)	11.5
Surrounding streets	13
Council carpark	1.25
Non-driving staff	1.25

Figure 2.12: Staff Survey – staff parking location



The survey found that staff found that 35 per cent of the issues raised related to having a suitable number of parking spaces for staff, and 18 per cent of the issues raised related to the provision of better facilities for these carparks such as lighting, security and safety, and protected walkways.

Around 75 per cent of staff surveys work a day shift starting between 7am – 9am, with around 60 per cent finishing between 4pm -6pm. Around 25 per cent start that their working hours are variable with rotating shift work and out of hours on call.

A summary of specific staff feedback is provided in Appendix B.

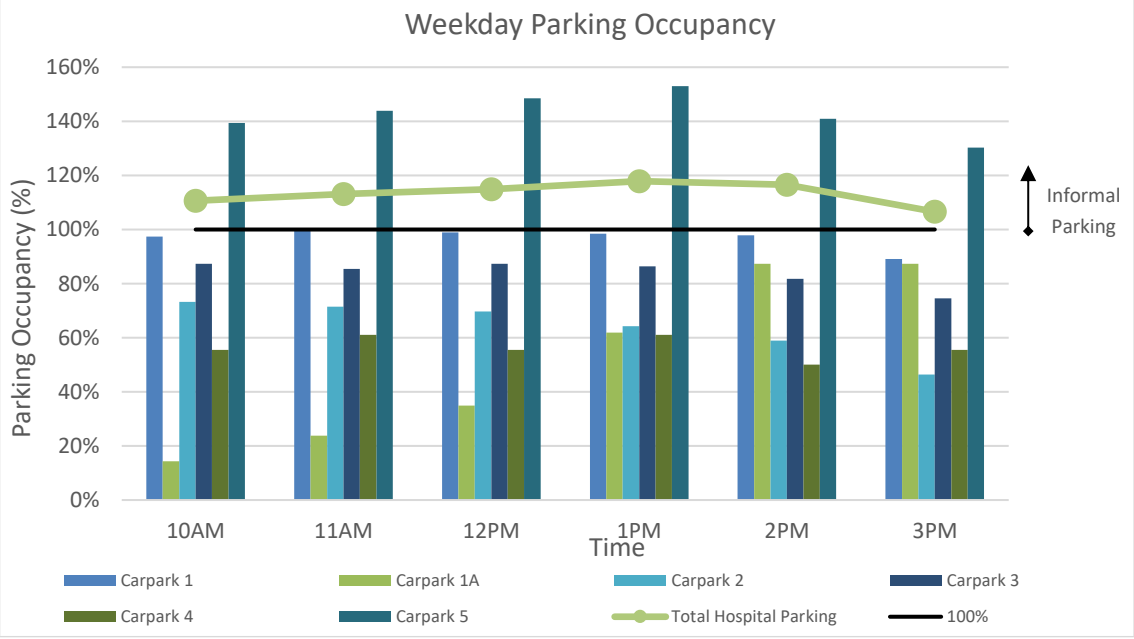
2.7 Current Parking Demand

GTA undertook a parking occupancy survey within the available off-street formal and informal parking areas, respectively identified in Section 2.4.1 and Section 2.4.2, to help understand the current demand for parking at the hospital. The survey was undertaken on Thursday, 9 August 2018, between 10am and 3pm. Additional surveys were also undertaken on Thursday 6 September 2018 to validate the demand.

It was assumed that all demand for parking within the Council controlled car park (car park 5) and adjacent informal parking area is related to the Hospital.

The car park demand profile of each car park is illustrated in Figure 2.13, noting car park 5 includes the demand for the adjacent informal parking area. The total hospital parking includes all demand for parking, including both informal parking areas and is shown relative to the hospital parking supply of 439 spaces.

Figure 2.13: Weekday parking occupancy [1]



[1] Informal Parking east of the site is included in total hospital parking

The results of the surveys are further summarised in Table 2.7. The results are reported according to the average demand, peak demand per car park and overall peak demand for parking at any one time.

Table 2.7: Summary of peak public parking demand surveys

Car Park	Description	Restrictions	Supply (No. of spaces)	Peak hour Demand (No. of Spaces)	Parking Occupancy Rate		
					Average	Car Park Peak	Common Peak (1:00pm)
1	Staff and Visitor	All day Paid	172	170	97%	100%	98%
		2hr, Paid	10	10			
	Accessible	All day Paid	10	9			
1A	Staff Only	All day after 9:30am, Paid	63	39	52%	87%	62%
2	Staff Only	No Restrictions	56	36	64%	73%	64%
3	Staff Only		97	87	88%	93%	90%
	Fleet Vehicles		13	8	55%	69%	62%
4	VMO Vehicles		7	5	57%	86%	71%
	Staff Only		11	6	56%	73%	55%
Official Hospital Parking Sub Total			439	370	81%	85%	84%
5 Council Car Park	Visitor (excl. informal Parking)	½ hr, 2hr, 3hr	66	66	99%[2]	100%[2]	100%[2]
	Informal overflow parking	Unrestricted parking	-	35	(29)[1]	(35)[1]	(35)[1]
East of Site	Informal - Assumed Staff	Unrestricted parking	-	50	(50)[1]	(54)[1]	(50)[1]
Overall Parking			505	521	84%[2]	87%[2]	86%[2]

[1] Total vehicles provided. Formal supply count unavailable.
[2] Occupancy rate excluding overflow.

Figure 2.13 indicates that off-street car parking demands in the nominated study area remain high across the day. The peak demand for parking occurred at 1:00pm with an overall car parking demand for formal parking facilities of 87 per cent or 436 vehicles when excluding informal parking, or 103 per cent or 521 vehicles when including informal parking. This demand excludes any on-street parking demand.

The average demand for parking across the entire survey period was 84 per cent or 422 vehicles when excluding informal parking, or 99 per cent or 501 vehicles when including informal parking.

Table 2.7 indicates that visitor parking demand exceeds capacity. It is noted that 73 vehicles were turned away from car park 1 on the day of survey between the hours of 10am and 3pm, equating to around 15 vehicles per hour.

Table 2.7 indicates that car park 1A is currently being underutilised, with a peak observed demand of 87 per cent or 55 vehicles between 2:00pm and 3:00pm. During the common peak of 1pm, the car park had a demand of 62 per cent, or 39 vehicles. It is also noted that demand for staff parking in car park 2 or 3 both did not reach capacity. This however was most likely due to the road works currently occurring on Mount Pleasant Road which had an impact on the access to these car parks during the survey.

On-street parking provides approximately 192 spaces in proximity to the site. These are a combination of unrestricted and 2-hour restricted parking. Due to car park 1 being occupied by 9am it is likely that a significant percentage of the surrounding on street parking is occupied by hospital related vehicles. For the purpose of this assessment around 40 per cent of on-street

parking has been assumed to be hospital related, this equates to an assumed demand of 74 spaces. A breakdown of assumed parking is outlined in Table 2.8.

Table 2.8: On-street parking supply

Location	Total supply (no. of spaces)	Assumed utilisation	Assumed Demand (no. of spaces)
Mount Pleasant St	25	40%	10
Adams St	35		14
High St	7		3
Ledsam St	18		7
Regent St	100		40
TOTAL	185		74

Combined off-street peak parking demand of 436 spaces, informal parking demand of 85 spaces and on-street assumption of 74 spaces outlines that a total demand of 595 spaces is currently being generated. This summation is outlined in Table 2.9.

Table 2.9: Observed demand summary

Source	Demand (no. of spaces)
Formal parking demand	436
Informal parking demand	85
Sub-Total	521
On-street parking demand	74
TOTAL	595

As mentioned, additional surveys were undertaken on Thursday 6 September to validate the findings above and also note any changes resulting from the completion of road works on Mount Pleasant Street. The demand surveys were verified over the previously identified peak periods and are outlined in Table 2.10.

Table 2.10: Summary of peak public parking demand surveys

Car Park	Description	Restrictions	Supply (No. of spaces)	Parking Occupancy Rate (12pm)	Parking Occupancy Rate (2pm)
1	Staff and Visitor	All day Paid	172	100%	97%
		2hr, Paid	10		
	Accessible	All day Paid	10		
1A	Staff Only	All day after 9:30am, Paid	63	44%	100%
2	Staff Only	No Restrictions	56	84%	84%
3	Staff Only		97	94%	94%
	Fleet Vehicles		13	62%	77%
4	VMO Vehicles		7	71%	71%
	Staff Only		11	64%	55%
Official Hospital Parking Sub Total			439	87%	93%
5 Council Car Park	Visitor (excl. informal Parking)	½ hr, 2hr, 3hr	66	100%[2]	100%[2]
	Informal overflow parking	Unrestricted parking	-	(66)[1]	(54)[1]
East of Site	Informal - Assumed Staff	Unrestricted parking	-	(17)[1]	(17)[1]
Overall Parking			505	97%[2]	101%[2]

[1] Total vehicles provided. Formal supply count cannot be provided.
[2] Occupancy rate excluding overflow.

The additional parking occupancy surveys validate the onsite car parking demand for the existing hospital. The notable change was the informal parking previously occurring on the Council fields to the east of the site has reduced with Council closing off access to the northern section. This parking location was assumed to be temporary while road works where occurring on Mount Pleasant Road when no on street parking was available.

3. New Maitland Hospital

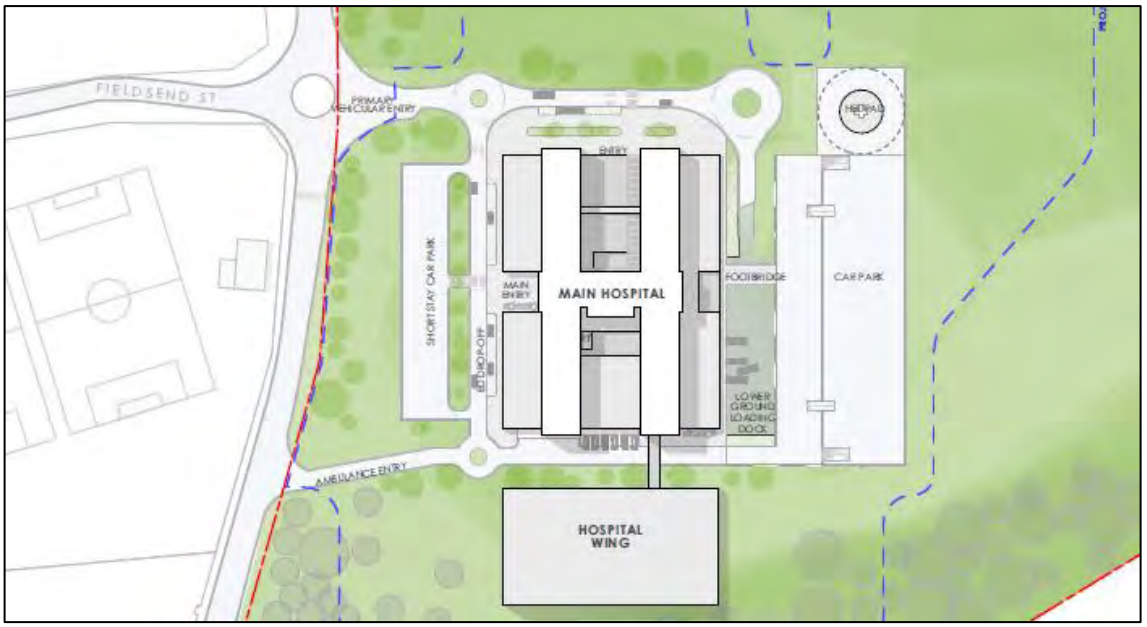
3.1 Description of Proposed Operations

The proposed NMH provides an opportunity to develop contemporary health facilities that will meet the needs of the Hunter Valley Region well into the future. The range of services at the proposed new hospital include emergency care, critical care, surgical care, acute care, maternity services, paediatric care, inpatient medical and surgical beds, rehabilitation, mental health, palliative care, chemotherapy and ambulatory care.

It is proposed that the NMH would consist of 339 beds. It is understood that the hospital is projected to employ around 893 FTE staff at the proposed year of opening, 1,106 FTE staff five years after opening and 1,162 FTE staff ten years after opening.

An indicative layout of the proposed hospital is provided in Figure 3.1.

Figure 3.1: Proposed NMH



Source: Fitzpatrick and partners dated 16 February 2018

3.2 Site Context

It is proposed that the NMH will be located on Lot 7314 and Part Lot 401 within the south-western portion of the 'Metford Triangle' along Metford Road, Metford. The site has a western frontage of 500 metres to Metford Road. The site currently has a land use classification of RU2 Rural Landscape and is generally cleared and disturbed land.

The surrounding properties include:

- Council Sports Fields opposite the site on the corner of Fieldsend Street and Metford Road
- Council's depot on Metford Road
- Redundant brickworks site to the northeast of the site
- Bushland and residential to the south of the site.

The location of the subject site and its surrounding environs is shown in Figure 3.2.

Figure 3.2: Subject site and its environs

Source: Fitzpatrick+Partners 16 February 2018

3.3 Surrounding Road Network

This section provides an understanding of the current road network surrounding the proposed site in terms of characteristics and operational performance.

3.3.1 Road Network

Metford Road

Metford Road functions as a sub-arterial road and is aligned in a north-east, south-west direction on the western boundary of the site. It is a two-way road with one traffic lane in each direction, configured with a nine-metre wide carriageway. Kerbside parking is not permitted on Metford Road adjacent to the site.

Metford Road is shown in Figure 3.3 and carries around 13,000 vehicles per day[2]. There is no on-street parking available on Metford Road.

Fieldsend Street

Fieldsend Street functions as a local road and intersects Metford Road at the northern corner of the site. It is aligned in a north-west, south-east direction and is two-way with one traffic lane in

2 Based on the peak hour traffic counts undertaken by GTA in May 2017 and assuming a peak-to-daily ratio of 10 per cent for arterial roads and 10 per cent for local roads. `

each direction. No kerbside parking is permitted near the site and limited angled parking has been installed adjacent to Fieldsend Oval.

Council has identified road, cycleway and pedestrian infrastructure upgrades for Fieldsend Street in their Capital Works Program 2016-2020. This includes the construction of a cycleway between Metford Road and Brunswick Street, as well as pedestrian footpaths between Metford Road and Turnton Road. The cycleway has recently been completed.

Fieldsend Street also provides access to the Council Sports Fields on the corner of Fieldsend Street and Metford Road.

Fieldsend Street, prior to the road upgrades, is shown in Figure 3.4 and carries around 2,000 vehicles per day[3].

Figure 3.3: Metford Road (looking south-west)

Figure 3.4: Fieldsend Street (looking north-west)

New England Highway

New England Highway is classified as a State road in the Roads and Maritime *Schedule of Classified Roads and State and Regional Roads* versions 2011/1. Near the site it is aligned in a north-west, south-east direction and is two-way with two traffic lanes in each direction. No kerbside parking is permitted.

Raymond Terrace Road

Raymond Terrace Road is classified as a State road in the Roads and Maritime *Schedule of Classified Roads and State and Regional Roads* versions 2011/1. Near the site it is aligned in a north-west, south-east direction and is two-way with one traffic lane in each direction. No kerbside parking is permitted.

Chelmsford Drive

Chelmsford Drive is classified as a sub-arterial road and is aligned in the north-west, south-east direction. It is a two-way road separated by a median, with one traffic lane as well as one bicycle lane and one parking lane in each direction east of Metford Road and two traffic lanes in each direction west of Metford Road, configured in a 20 meters wide carriageway. Unrestricted kerbside parking is permitted on both sides of the road east of Metford Road, and no kerbside parking is permitted on Chelmsford Drive west of Metford Road.

3 Based on the peak hour traffic counts undertaken by GTA in May 2017 and assuming a peak-to-daily ratio of 10 per cent for arterial roads and 10 per cent for local roads.

3.4 Public transport

Bus services provide local connections to the outer areas of Metford, including East Maitland and Thornton.

Victoria Street Railway Station is located around 1.5 kilometres from the NMH site. It is part of the Hunter Line, with services alternately running from Newcastle to Telarah, Dungong and Scone. Services at Victoria Street Railway Station are generally provided every 30 minutes.

A review of the public transport available near the site is summarised in Table 3.1 and illustrated in Figure 3.5.

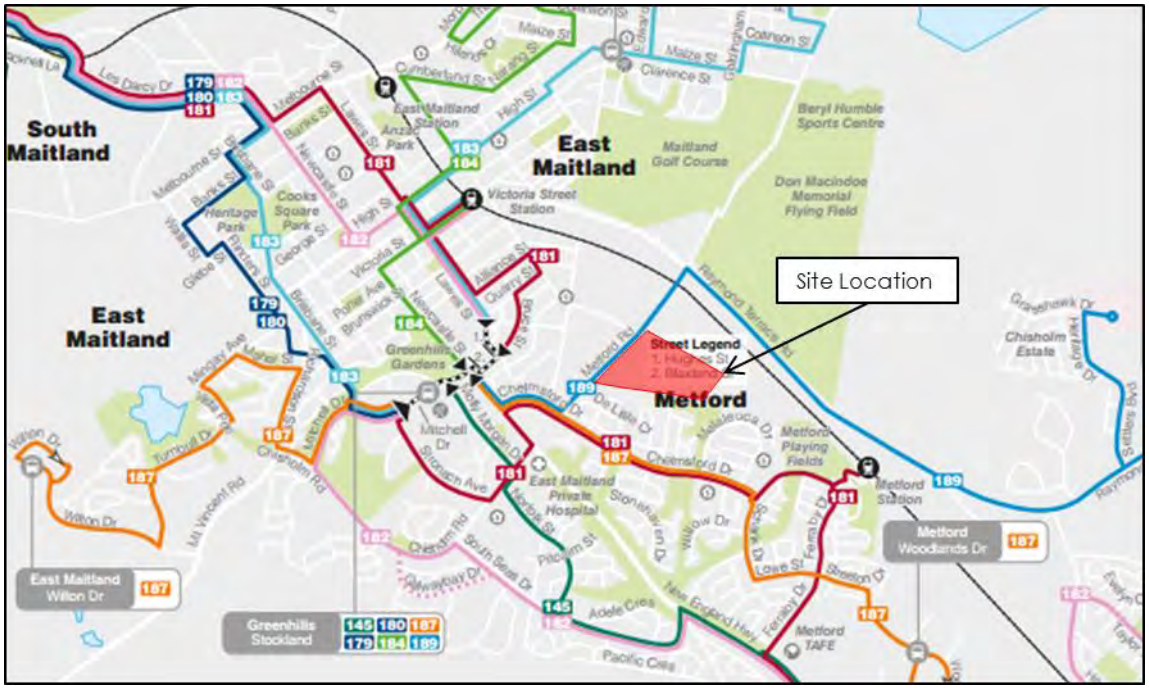
Table 3.1: Public transport routes and frequencies

Service	Route number	Route description	Location of stop	Distance to nearest stop[1]	Frequency on/ off-peak
Bus	181	Rutherford to Woodberry	Metford Road/Chelmsford Street	650 m	Hourly
	187	East Maitland and Metford Loop			Hourly peak / every 2 hours off peak
	189	Stockland Green Hills to Thornton			Hourly peak / every 2 hours off peak
Train	n/a	Hunter Line	Victoria Street Station	1.4 km	Every 30 min
			Metford Station	2.7 km	

[1] Distance taken from the Metford Road/Fieldsend Street intersection

Currently the only bus services using Metford Road is the 189 bus service, private operators and school bus services.

Figure 3.5: Hunter Valley train and bus network – Metford/ East Maitland



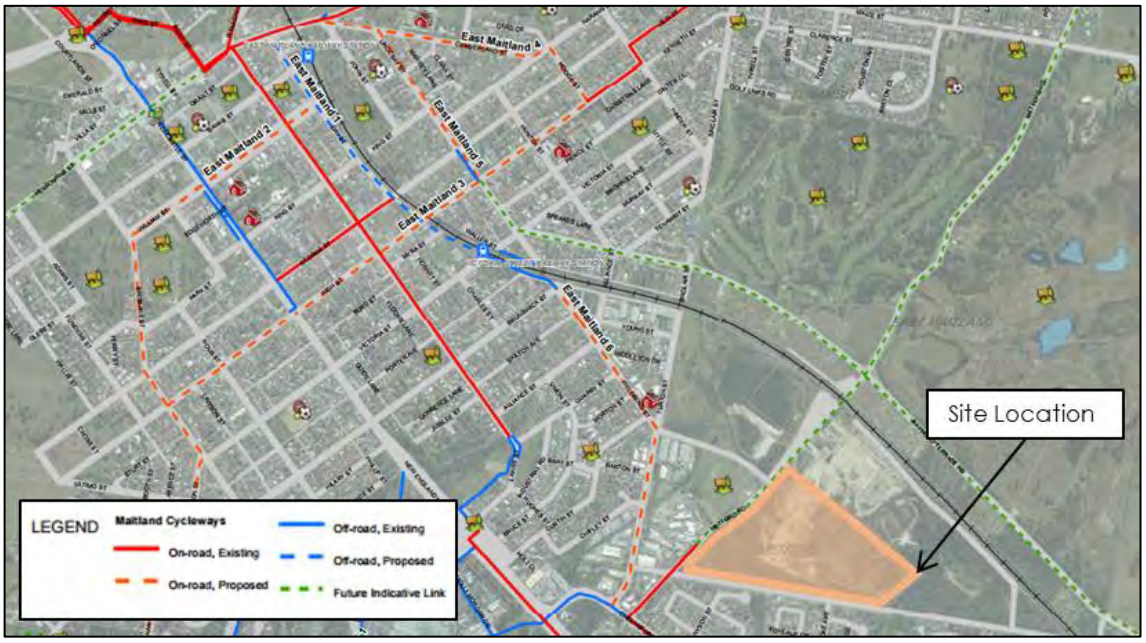
Basemap Source: http://www.cdcbus.com.au/images/files/maps/hunter-valley/Maitland_and_Raymond_Terrace_Region_Map.pdf (accessed 5 May 2017)

3.5 Pedestrian and Bicycle Infrastructure

There are currently no pedestrian paths adjacent to the site on Metford Road. A shared path has recently been constructed on Fieldsend Street connecting Metford Road through to Victoria Street Station.

The cycling network of East Maitland, including proposed on-road and off-road cycleways is shown in Figure 3.6.

Figure 3.6: Maitland bike network



Basemap Source: https://www.maitland.nsw.gov.au (accessed 1 March 2018)

3.6 Travel Patterns

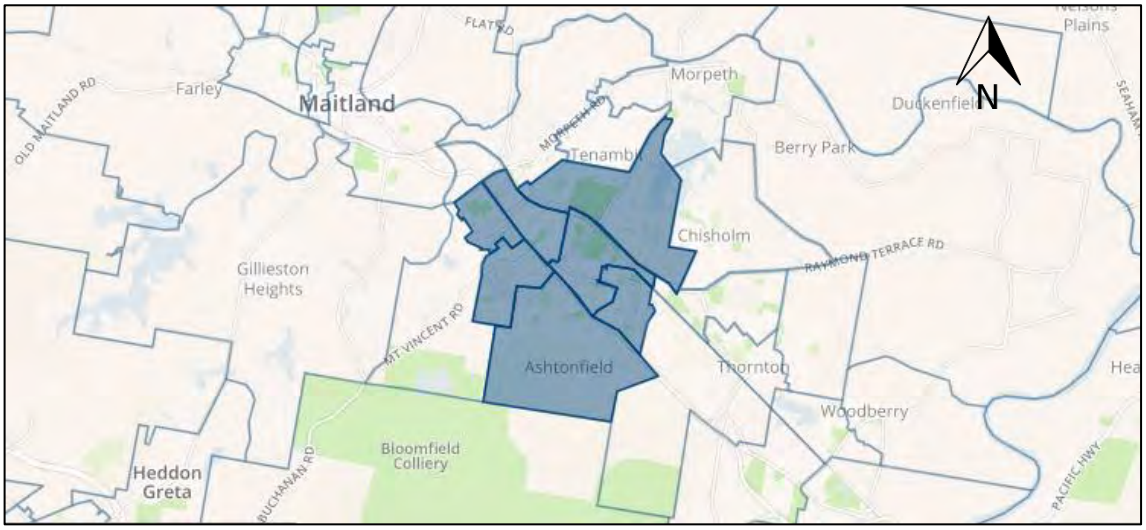
3.6.1 Journey to Work Data

The Journey to Work (JTW) data published by the Bureau of Transport Statistics[4](BTS) from 2011 Census data provides an understanding of travel patterns to/ from the site and the surrounding area.

The smallest geographical area for which JTW data is available is a Travel Zone. The relevant Travel Zones used for the purposes of this assessment are 6609, 6610, 6611, 6612, 6613, 6614 and 6616 and are shown in Figure 3.7.

[4] Now the "Transport Performance and Analytics" section of Transport for NSW

Figure 3.7: Travel Zones

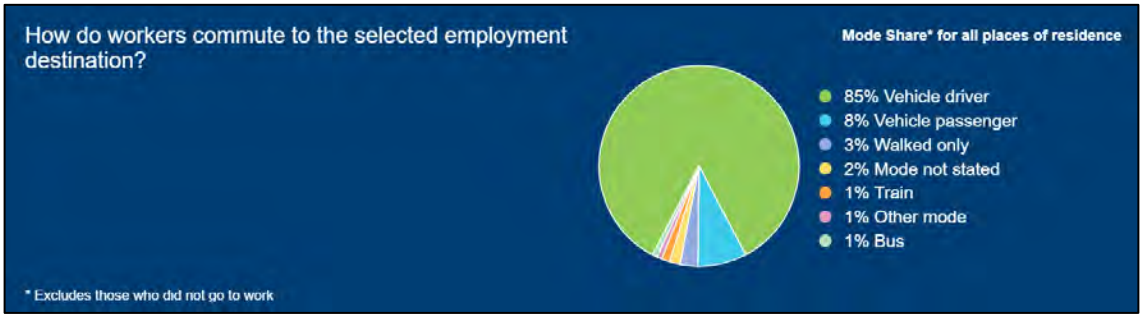


Source: Bureau of Transport Statistics, http://visual.bts.nsw.gov.au/jtwbasic/#6612,6613,6611,6610,6609,6616,6614, accessed 22 June 2017

The JTW data indicates that a total of 6,603 people work within the selected Travel Zones.

Figure 3.8 shows the distribution of travel modes by the workers employed in the Travel Zones, which indicates that around 93 per cent of workers travel to the area by private vehicle as a driver or passenger. In addition, the JTW data indicates that six per cent of workers travelling to the area choose an alternate mode of transport such as walking, bus or train.

Figure 3.8: JTW travel modes by workers to the selected Travel Zones



Data source: Bureau of Transport Statistics, http://visual.bts.nsw.gov.au/jtwbasic/#6612,6613,6611,6610,6609,6616,6614, accessed 22 June 2017

The JTW data also indicates that around 62 per cent of workers travelling to the Travel Zone originate from the Maitland Area, while Newcastle accounts for 13 per cent, the Lower Hunter for nine per cent and the remaining areas for 16 per cent.

3.6.2 Proposed Mode Split

Based on the 2011 JTW data for the current Maitland Hospital and NMH sites, in addition to the results of the 2018 travel surveys for the current Maitland Hospital, a private vehicle mode share of 93% has been adopted for the NMH.

3.7 Proposed Car Parking Demand

This section outlines the various options for determining suitable car parking requirements for the NMH and is based on a combination of the following:

- NSW Health Infrastructure parameters/ scope
- Other hospital developments
- Maitland City Council Development Control Plan (DCP) and various other Council DCPs
- Roads and Maritime Guide to Traffic Generating Developments (2002)
- Empirical Assessment of Car Parking Demand.

3.7.1 Health Infrastructure Parameters / Scope

A collation of attributes involving separate parking for staff, public/ visitors, and LHD controlled fleet vehicle parking has been used to model parking demand. The model attempts to analyse the total number of persons which utilise the site against the parking demand through weighting factors such as rates of attendance, vehicle occupancy, and parking space turnover.

Staff Parking

Consideration for staff parking is made based on the total driving staff numbers present at work at any one time. Total FTE staff numbers are factored by the percentage of staff who will be present on site at any one time, the percentage of staff who drive to work, the average occupancy rates of staff vehicles, as well as a nominal staff shift changeover allowance.

This number is increased by an allowance for VMO vehicle demand, which is also factored by driving demand, vehicle occupancy and vehicle space turnover.

Public / Visitor Parking

Consideration for public/ visitor parking is based on a combination of outpatient visitors, inpatients, Emergency Department (ED) presentations and other on-site users not accounted for otherwise.

Outpatient demand is a factor of the annual average number of service events, factored by total weekdays each year, percentage of outpatients who drive, and parking space turnover rates.

ED demand is a factor of annual average number of ED presentations, factored by total weekdays each year, percentage not admitted to an overnight bed, percentage who will have a related party travel by vehicle (non-ambulance presentations and related parties), day-time presentations, and parking space turnover rates.

Inpatient demand is a factor of the total number of beds, by the weekday occupancy rates, visitors per bed, percentage of visitors who drive and the vehicle occupancy rates, day-time visitors, and parking space turnover rates.

LHD Controlled Spaces

LHD controlled parking is provided as a nominal figure. These are allocated for the LHD fleet and service vehicles.

Existing Demand Calculation

Based on the agreed parameters a demand of 561 spaces is calculated for the existing site. This calculated demand is within six percent of the observed demand of 595, allowing for minor fluctuations in assumptions, this is considered a suitable reflection of the existing demand.

Demand Assumptions

The assumptions surrounding staffing and service parameters which were used as the base for the demand calculations is outlined in Table 3.2 and Table 3.3.

Table 3.2: Health Infrastructure Parameters – Demand Assumptions (staff)

Factor	Input			Reference Source
	Existing	Opening Year	10-year design horizon	
	2018	2021/2022	2031/2032	
FTE Staff	779	893	1,162	NMH Financial Statement 7 June 2018
Percentage staff present on weekdays	75%	75%	75%	Average of other regional hospitals
Maximum percentage of staff present on shift changeover	65%	65%	65%	Average of other regional hospitals
Percentage of staff driving to work	93%	93%	93%	NSW Journey to work data and staff survey
Average staff vehicle occupancy	1.1	1.1	1.1	Staff survey (Section 2.6.3)
VMOs present on weekdays	46	46	56	Assumption agreed with HI
Percentage VMOs driving to work	100%	100%	100%	Assumption agreed with HI
Average VMO vehicle occupancy	1.0	1.0	1.0	Assumption agreed with HI
VMO space turnover factor	2.0	2.0	2.0	Assumption agreed with HI
Nominal changeover allowance	65 spaces	65 spaces	65 spaces	Based on existing allocation for changeover

Table 3.3: Health Infrastructure Parameters – Demand Assumptions (public)

Factor	Input				Reference Source
	Existing	Opening Year	10-year design horizon	Sensitivity Scenario	
	2018	2021/2022	2031/2032	2031/2032	
Outpatients service events annual (weekday daily)	56,612	71,555 (284)	71,555 (284)[1]	72,843 (+18%)[1&2]	NMH Financial Impact Statement
Percentage outpatient driving	80%	80%	80%	90%	Average of other regional hospitals
Outpatient space turnover factor	2.7	2.7	2.7	2.7	Average of other regional hospitals
ED presentations annually (daily)	51,777	57,878 (159)	72,420 (199)	72,420 (199)	NMH Financial Impact Statement 7 June 2013
ED presentation utilising private vehicle	85%	85%	85%	85%	Average of other regional hospitals
ED presentations not admitted to an overnight bed	72%	72%	72%	72%	Bureau of Health Information – State Average
ED presentations in day time	60%	60%	60%	60%	Average of other regional hospitals
ED presentation vehicle turnover factor	2.7	2.7	2.7	2.7	Average of other regional hospitals
Inpatient Beds	198	264	339	339	HI Business case
Inpatient weekday bed occupancy	85%	85%	85%	85%	Target Occupancy
Inpatient visitor vehicle occupancy	1.8	1.8	1.8	1.8	Average of other regional hospitals
Inpatient turnover factor (daytime)	2.7	2.7	2.7	2.7	Average of other regional hospitals
Percentage inpatient daytime visitors	65%	65%	65%	65%	Assumption based on other regional hospitals
Number of visitors per bed	2	2	2	2	Average of other regional hospitals

[1] HNELHD projects a step-up increase in 2021/22 and projects the activity remains at the same level from 2021/22 onwards. The sensitivity testing assumes the outpatient service events may increase at the projected population growth rate (18 per cent).

[2] Source: http://www.healthstats.nsw.gov.au/Indicator/dem_pop_lgamap/dem_pop_proj_age_trend

Based on the demand assumptions outlined in Table 3.2 and Table 3.3, a parking demand of 775 spaces are to be provided to accommodate onsite parking.

3.7.2 Other Hospitals

A review of empirical data for similar large regional hospitals (more than 70 beds) was undertaken.

A review of Dubbo Base Hospital and Bowral and Districts Hospital parking indicates a recommended hospital parking rate of around 1.83 spaces per bed. Application of this rate results in NMH parking demand for around 620 parking spaces for the 339 in-patient beds to be provided.

However, it is also noted that the data set has a rate of 2.6 staff per bed, whereas the current and proposed hospitals respectively have a rate of 3.9 and 3.4 staff per bed. A parking demand of 620 parking spaces may therefore be considered lower than the actual demand.

The provided rate of 1.83 spaces per bed equates to a demand of 363 for the existing hospital, substantially lower than the observed demand.

3.7.3 Roads and Maritime Guidance

The Roads and Maritime Guide to Traffic Generating Developments does not provide rates for public hospitals. However, the private hospital rate indicates that the Peak Parking Accumulation (PPA) can be estimated referencing the total number of beds and the average staff per weekday shift (ASDS). It is noted that the ASDS has been calculated as 80 per cent of the Full Time Equivalent (FTE) staff.

- PPA= -19.56 + 0.85B + 0.27ASDS, where B is the number of beds.

Based on the Roads and Maritime Guide, the peak parking accumulation for the NMH would be 520 car parking spaces.

3.7.4 Maitland City Council DCP

The car parking provision requirements for different development types are set out in the Maitland City Council DCP 2011. A review of the car parking requirement rates and the floor area schedule results in a DCP 2011 parking requirement for the proposal as summarised in Table 3.4.

Table 3.4: DCP 2011 car parking requirements

Council	Defined use	Size	DCP parking rate	DCP parking requirement
Maitland City	Hospitals, Residential Care, Hostels	339 beds 1,162 full time equivalent (FTE) staff [1]	One space per 10 beds; plus one space per two employees; plus one space per ambulance	499 spaces [2]
Total				499 spaces

[1] Daily staff numbers have been calculated as 80 per cent of FTE staff.
[2] Ambulance area not included as part of this DCP parking assessment.

Based on the DCP 2011 requirements, the NMH would be required to provide 499 car parking spaces.

Based on the DCP requirements, the existing would generate a demand of 332 car parking spaces, substantially below the existing observed demand of 629.

A comparison of various DCP hospital car parking requirements for Councils surrounding Maitland City Council is summarised in Table 3.5.

Table 3.5: Hospital car parking requirements comparison

Council DCP	DCP	Size	DCP parking rate	DCP parking requirement
Newcastle	DCP 2012	339 beds 1,162 full time equivalent (FTE) staff [1]	One space per three beds; plus one space per two employees	579 spaces
Singleton	DCP 2014		One space per two beds; plus one space per five employees	533 spaces
Mid-Coast	Great Lakes DCP 2014 and Gloucester DCP 2010		Car parking will be assessed in accordance with RTA Guidelines	520 spaces
	Greater Taree City Council DCP 2010		One space per three beds; plus one space per 15 beds for visiting doctors; plus one space per two employees; plus one space per ambulance	601 spaces
Total				520 - 601 spaces

[1] Daily staff numbers have been calculated as 80 per cent of FTE staff.
[2] Ambulance area not included as part of this DCP parking assessment.

Based on Table 3.5, the car parking requirements set out in DCP 2011 are low.

3.7.5 Increase in Beds / Staff from existing hospital

The car parking provision for the existing hospital services:

- 779 staff (FTE)
- 198 beds.

The total demand observed on site is 629 spaces during the recorded peak.

The increase in staff numbers and in-patient beds projected for the new hospital is outlined in Table 3.6.

Table 3.6: Hospital staff and bed growth

Source	Existing Maitland Hospital	New Maitland Hospital 2032 Projection	Percentage Increase (%)
Staff	779	1,162	+50
In-patient beds	198	339	+71
Combined	977	1,501	+53

Increasing the current demand by 53 per cent will increase the current demand to 963 spaces.

4. Parking Demand Recommendation

4.1 Parking Demand Comparison

A comparison of the demand projected by different models is outlined in Table 4.1.

Table 4.1: Parking demand comparison

Model	Existing Hospital Demand	Variance to Existing Demand	Projected Demand for NMH		Recommended Supply for NMH (Fully operational 2032)
			Opening Year	Fully Operational	
			2021/2022	2032	
Existing demand	595	-	-	-	
Health Infrastructure Parameters	561	-34 (-6%)	640	775	822 [1]
Other Hospitals	363	-266	483	620	
Maitland DCP	332	-297	384	499	
Sensitivity Scenario [2]				787	835 [1]

[1] Projected demand +6% variance from existing demand.
[2] Parameters outlined in Table 3.2 and Table 3.3.

Table 4.1 shows that other hospitals and the Maitland City Council DCP project a low demand for the existing hospital to that observed on site. Utilising the Health Infrastructure parameters more accurately reflects the existing demand with a six percent variance. Therefore, it is recommended that the supply for the NMH includes a six percent increase to ensure the variance in the parameters calculated and the current observed demand are accommodated. Therefore, it is recommended that an onsite parking supply of 822 spaces be provided, this excludes the provision of additional spaces for ambulance parking.

4.2 Car Parking Requirements

The projected parking demand appears to be best modelled by the Health Infrastructure parameters, projecting a demand of 822 spaces in total. A summary of the car parking demand projections based on the NSW Health Infrastructure parameters/ scope for the opening year of 2021/22, five-year design horizon of 2026/27 and 10-year design horizon of 2031/32 is outlined in Table 4.2.

Table 4.2: Recommended car parking demand (peak)

Source	Existing Hospital	Opening Year	5-year horizon	10-year horizon	Sensitivity Scenario
	2018	2021/22	2026/27	2031/32	2031/32
Staff	222	461	554	578	578
VMOs	7	24	30	30	30
Public (hospital users)	195	164	175	184	197
LHD & Fleet vehicles	18	30	30	30	30
Total demand	442	679	789	822	835
Total incremental peak parking demand		-	110	143	156

5. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

i The existing Maitland Hospital services are at capacity, resulting in a high percentage of patients attending or being referred to hospitals in Newcastle or Sydney to meet demand.

ii The existing car parking facilities are located both on-site, with access provided from Mount Pleasant Street and High Street, and off-site, with access provided from Bonar Street and three short term set-down parking spaces which are used to service public access to the ED. In addition, a Council-controlled car park accessed from High Street is used by visitors to the hospital. The current formal parking off street supply is 513 spaces, including drop off and ambulance spaces.

iii Visitor parking demand currently exceeds capacity, the demand for the existing hospital when combining on-street, off-street, and informal parking areas generates a total demand of 595 spaces.

iv The Health Infrastructure parameters projects a demand of 561 spaces for the existing site. This demand projection is six percent lower than the observed demand of 595 spaces.

v Various options for determining suitable car parking requirements for the NMH were assessed, when comparing the projected demand through reviewing empirical data for other hospitals and DCP requirements of Maitland City Council and other nearby Councils the projected parking numbers where considered low when reviewed against the demand of the existing hospital.

vi It is recommended that an onsite parking supply of 822 spaces be provided for the NMH, this excludes the provision of additional spaces for ambulance parking.

Appendix A

Staff Survey Comments

Staff Survey Summary for Question 9

Q9. What is most important to you / what would you like to see in the car park?

35%	38	More parking
3%	3	Cheaper parking
4%	4	More access locations
18%	19	Better facilities (lighting, security/safety, etc)
10%	11	Free parking
1%	1	Earlier access to restricted parking
2%	2	Motorcycle EoT facilities
1%	1	Better PT
5%	5	Larger parking spaces
5%	5	Close parking
2%	2	No queuing on entry or exit
2%	2	Staged parking (delayed opening)
1%	1	Priority parking (e.g. for car pool schemes)
1%	1	Colour coded parking to distinguish use
1%	1	"A 15 minute drop off / pick up bay with wheelchairs locked up similar to supermarket trolleys, so visitors can access and return them easily"
1%	1	No increase in parking cost
1%	1	Free dedicated exec positions, covered access to the hospital main entrance"
1%	1	More accessible parking spaces
2%	2	Accessibility, affordability and safety"
1%	1	Appropriate parking for the cost being paid
6%	6	Staff and visitor separate carparks

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