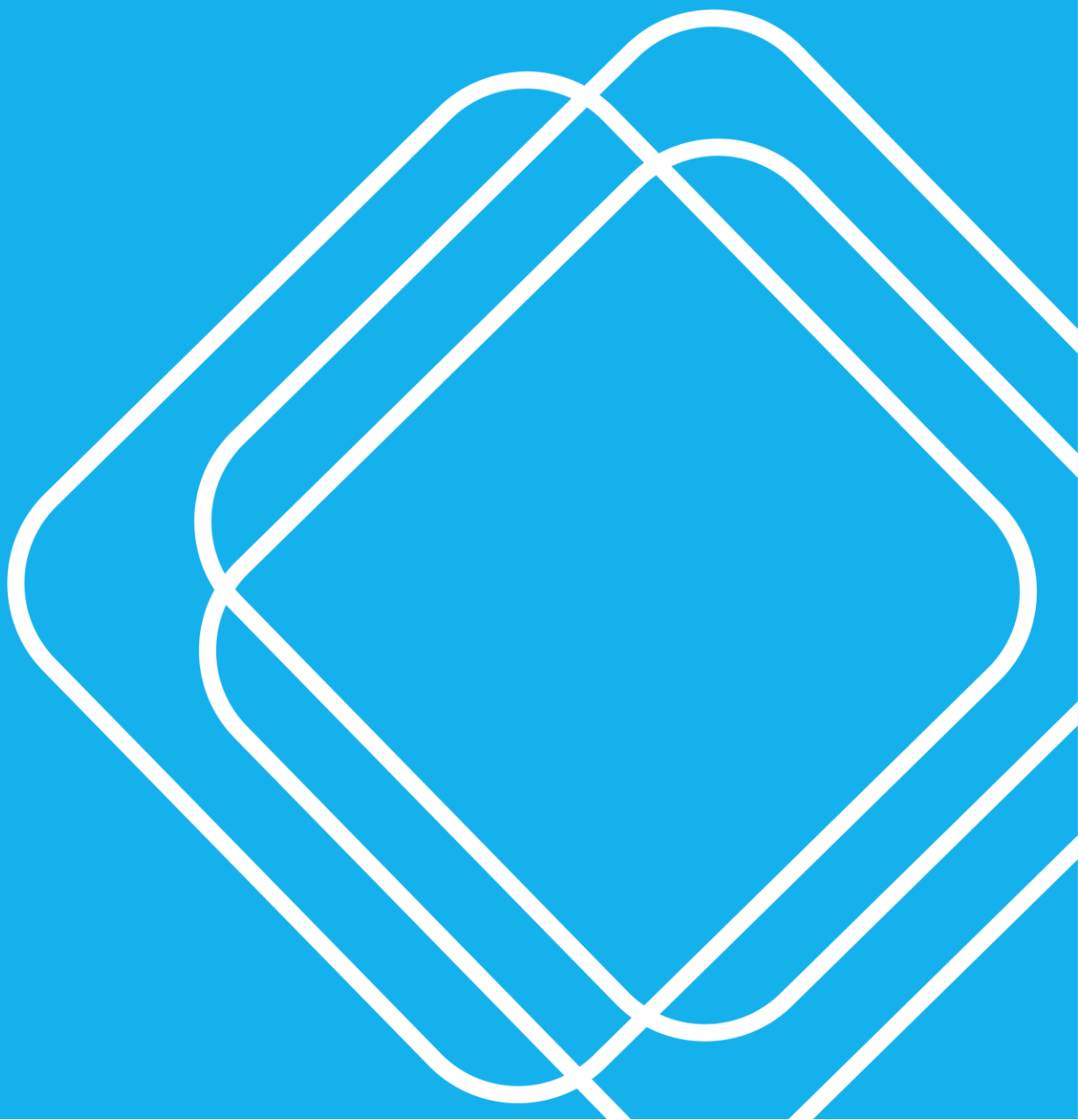
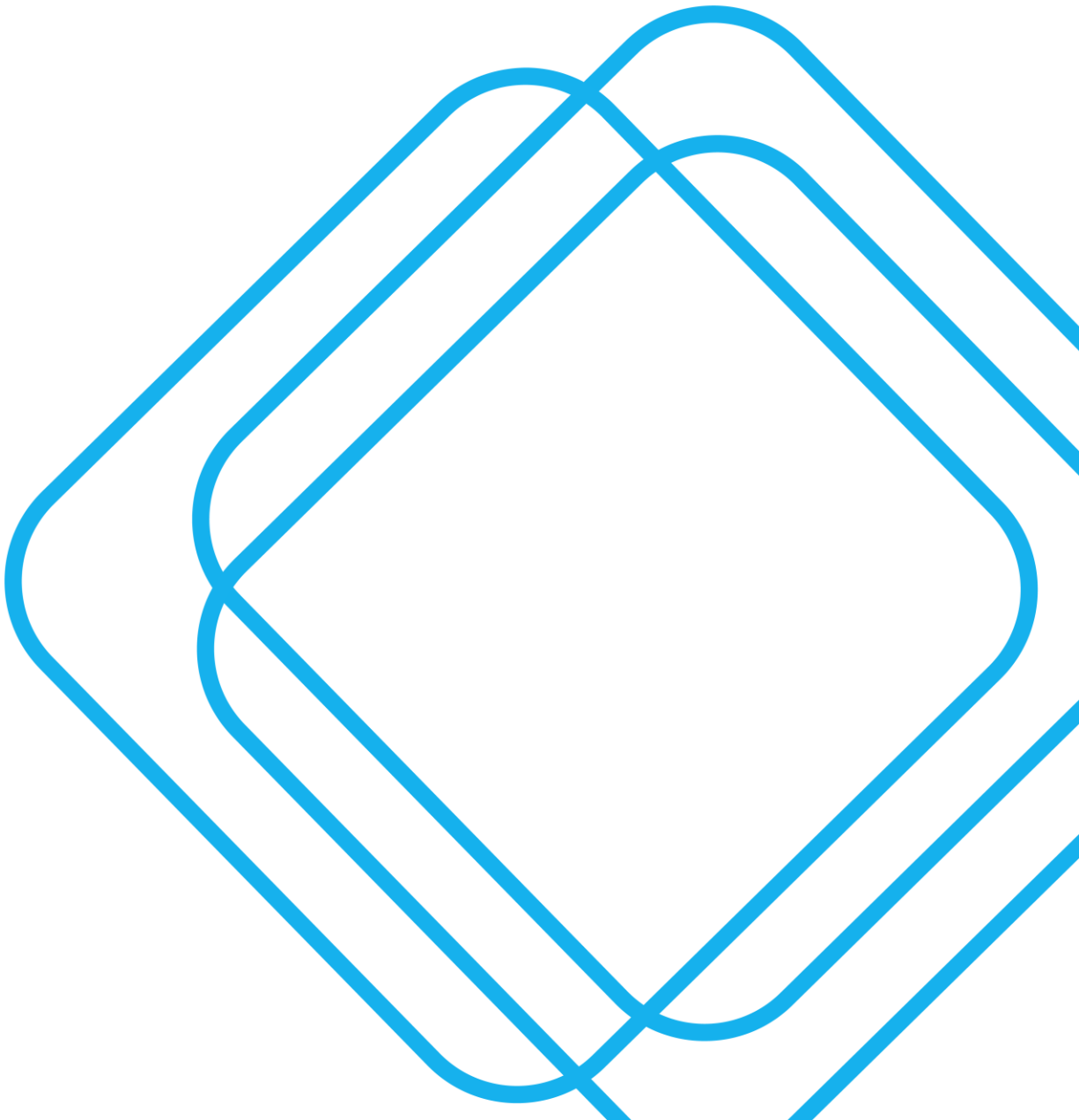
SCT Consulting

SOUTH CREEK WEST – COBBITTY SUB-PRECINCT 5 (PART)

Transport Mobility and Access Plan

19 MAY 2026





Quality Assurance

Project:	South Creek West – Cobbitty Sub-Precinct 5 (Part)		
Project Number:	SCT_00264		
Client:	JJ Cobbitty Developments Pty Ltd	**ABN:**	34 673 731 658
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Revision	Revision Date	Details
1.0	13 September 2021	Draft report
2.0	29 September 2021	Draft report
3.0	15 June 2022	Draft report
4.0	8 December 2022	Draft report
5.0	15 December 2022	Draft report
6.0	22 March 2024	Updated draft report
7.0	28 March 2024	Final report
8.0	13 October 2025	Updated final report
9.0	25 October 2025	Updated final report (with revised ILP for Gateway Exhibition)
10.0	9 December 2025	Updated based on DPHI feedback and revised ILP
11.0	17 February 2026	Incorporation of Aimsun modelling
12.0	19 May 2026	Minor update to remove reference of local centre

Contents

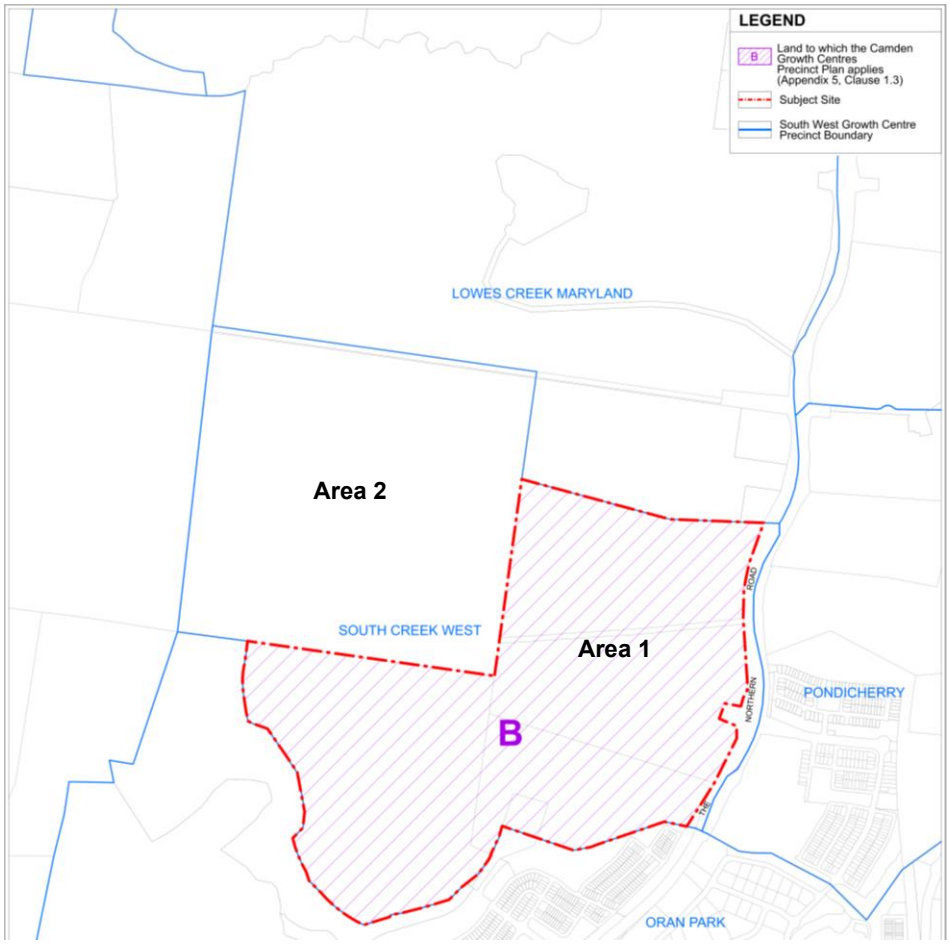
Executive Summary

Purpose of the study

SCT Consulting was engaged by JJ Cobbitty Developments Pty Ltd (JJCD, the proponent), the applicant to prepare a Transport Mobility and Access Plan (TMAP) to support the planning proposal of the Cobbitty part of Sub-Precinct 5, also known as Cobbitty - Sub-Precinct 5 (part), located in the South West Growth Area (SWGA). The TMAP accompanies a Planning Proposal for a proposed amendment to the State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (**Parkland City SEPP**) for the site located along The Northern Road and which forms part of Cobbitty Sub-Precinct 5.

Precinct 5 (**Figure E-1**) is located within the south-west portion of the South Creek West Land Release (SCWLA) area within the suburb of Cobbitty in the Camden LGA. The Precinct adjoins the Lowes Creek Maryland Precinct, which has recently been rezoned to the north, the Pondicherry precinct to the east which is in the process of being rezoned and the growing town centre and suburbs of Oran Park to the south. JJCD owned land (Area 1) comprises 172.74 hectares of that land.

Figure E-1 Sub-Precinct 5 Planning Proposal Area



Source: Design & Planning, 2025

Future planning context

The SCW Release Area where the site sits anticipates a capacity of 30,000 dwellings and 1,000 new jobs. Significant growth of employment and residents are expected in the vicinity of the site in the future. Western City District Plan establishes a housing target of 184,500 by 2036. Aerotropolis Core to the north of the site, as part of the Western Sydney Aerotropolis Plan, is estimated to have 50,000 to 60,000 jobs and 20,000 to 24,000 residents, while the residential dwelling target for the Oran Park Precinct to the south is 7,540 dwellings. This will be supported by several

committed transport projects and projects under investigation to realise the vision of the 30-minute city and modal change to sustainable transport.

The planned rail corridor including Sydney Metro Western Sydney Airport / The South West Rail Link Extension and the provision of Rapid Bus service on The Northern Road could promote public transport use especially for commuting to/from Aerotropolis and Greater Sydney. The first stage of the North-South Rail Link has been committed, named Sydney Metro - Western Sydney Airport between St Marys to Western Sydney Airport and Badgerys Creek Aerotropolis. The delivery of the Sydney Metro - Western Sydney Airport and stations in the vicinity of the site at the Aerotropolis and Oran Park would improve rail access to the wider rail network of Greater Sydney, further reducing the reliance on private vehicles to travel to the employment areas and activities.

The potential Outer Sydney Orbital is identified approximately 2.5 kilometres to the west of the site and may have an interchange at Greendale Road, making it convenient to access from/to the site.

Existing conditions

The 2016 Method of Travel to Work data was analysed to determine current travel behaviour and patterns to and from the site during peak travel periods. While the 2021 census is more recent, it was conducted during COVID-19 lockdowns and therefore had a distorted picture of typical daily mode share. The study area showed a higher proportion of car use in the local area, 72 per cent, in comparison to 53 per cent for Greater Sydney. Train and bus usage was low at a total of nine per cent given the long commuting time to jobs by public transport, whereas Greater Sydney showed 22 per cent in total. Active transport use was low given the limited employment opportunities in the vicinity and a gap in cycling infrastructure provision in the local area to connect to the regional network.

The road network around the site mainly includes The Northern Road and Bringelly Road which are now being upgraded by TfNSW. The Northern Road has been widened to a four-lane road (with two lanes in each direction) and a wide median will allow for a future six-lane configuration. A grade separate intersection has been provided at The Northern Road | Bringelly Road | Greendale Road intersection to provide enough capacity as part of the project upgrade. This aligns with the findings in the historical study where the existing intersection has shown poor performance and the mid-block traffic volumes have exceeded the road capacity during the commuting peaks.

Dick Johnson Drive is a key route to the south of Precinct 5 that provides access to the Oran Park Town Centre. It intersects with The Northern Road at a signalised intersection.

The site is around seven kilometres to the west of Leppington Railway Station which is a terminal station that provides T2 Inner West & Leppington Line and T5 Cumberland Line services. It has a frequency of about seven services during AM peak hour. Bus service is only available on The Northern Road and Bringelly Road, with low bus frequency at the nearby bus stops. Given the rural nature and lack of urban development in the vicinity of the site, pedestrian and cycling accessibility are generally poor.

Proposed development

This planning proposal is seeking to rezone 150.21ha of land within Precinct 5. The remainder of Precinct 5 is owned by a separate landowner, which is not subject to this Planning Proposal. The intended outcomes of this planning proposal are to amend the Parkland City SEPP as follows:

– Incorporate the site on the ‘Land Application Map’ for the Parkland City SEPP

– Rezone the land to part:

  - C2 Environmental Conservation
  - C4 Environmental Living
  - B4 Mixed Use
  - R2 Low Density Residential
  - R3 Medium Density Residential
  - RE1 Public Recreation
  - SP2 Infrastructure

– Introduce building heights as follows:

  - 9 metres for low-density residential uses, allowing for developments of up to two storeys in height.

- 12 metres for medium-density residential uses, allowing for development of up to three storeys in height.

The Planning Proposal is supported by a revised Indicative Layout Plan which will accommodate approximately 2,650 residential dwellings.

The proposed ILP has also sought to embed the Government Architect's Connecting with Country design framework through its design. The ILP has designed with Country by protecting ridgelines; creeks and view corridors; celebrating the riparian corridors and waterways through incorporation into open space and locating key uses on flat parts of the site to limit cut and fill.

The proposed amendments seek to transition the existing rural landscape into a new residential community, which importantly builds on the NSW Government's vision and aspirations under the Western Sydney Growth Areas program. In line with the NSW Government's vision, a diverse range of housing typologies will be planned, targeted for and delivered to meet the residential market desire in Southwest Sydney.

The yield of the Sub-Precinct 5 (part) ILP is shown in the below table.

Use	Yield[1]	Source
Environmental living (10 dwellings/ha)	56 dwellings	Design+Planning Yield Calculation Rev F, dated 23 October 2025
Low density housing (10 – 25 dwellings/ha)	1,017 dwellings	
Medium density housing (32 dwellings/ha)	1,577 dwellings	
School	1 primary school	Design+Planning ILP Rev F, dated 23 October 2025
Service station	800 sqm of retail GFA	

Transport assessment

Walking and cycling assessment

With footpaths proposed on both sides of all roads, active transport can be one of the most convenient modes for short-distance trips. The road network is grid-like in structure, providing numerous crossing opportunities and reducing travel distance between residential areas and the local open spaces.

The site makes a significant contribution to cycling connectivity by providing a shared path on both sides of the Sub-arterial and Collector Roads. This enables cyclists to connect seamlessly to The Northern Road shared path.

The site is within a 4km distance of the future Sydney Metro Bradfield Station, which is within a cycling distance. The Northern Road is provided with a shared path that connects the precinct to the Aerotropolis. As the Aerotropolis develops, a network of cycling networks will provide residents with a viable alternative mode of transport to private vehicles.

Public transport assessment

All roads in the precinct are proposed to be bus capable, enabling the entirety of the area to be covered by bus services. The north-south sub-arterial and collector roads also provide an opportunity for services to travel through the precinct to Oran Park in the south where a station for Sydney Metro Western Sydney Airport may be located in the future.

Bus Rapid Transit on The Northern Road would be a significant intervention that would dramatically increase public transport mode share. While the precinct and surrounding areas is currently agricultural land, NSW Government plans for significant employment surrounding the future Western Sydney Airport. Bus Rapid Transit would make working at the aerotropolis more attractive by public transport than car, particularly considering the constrained parking approach adopted.

[1] It is noted that the yields are the best and most realistic estimates at the time of preparing this version of the ILP and will continue to evolve as the ILP develops. Updates to the yield post and modelling of the maximum development potential will occur post gateway.

General vehicle assessment

The transport assessment methodology follows the same approach that was approved for SCW Belmore Precinct 2 that was developed in collaboration with TfNSW and DPHI. The agreement during the early assessment process for the precinct was that Sydney Traffic Forecasting Model (STFM) would be conducted for the pre-Gateway assessments and that Aimsun mesoscopic modelling would be conducted for exhibition.

The importance of the Outer Sydney Orbital (OSO) was also investigated to determine whether its withdrawal or non-implementation would impact the findings of this analysis. The investigation concluded that the OSO, although reduces throughput on The Northern Road, did not have an impact on the upgrade requirements.

This modelling (undertaken post-Gateway of Precinct 2[2]) has now been updated to incorporate Aimsun mesoscopic modelling in line with the agreed methodology. Background traffic forecasts were obtained using Sydney Traffic Forecasting Model (STFM), to which traffic generation was manually added that captured the SCW precincts and Lowes Creek Maryland. OSO was not included in the traffic assessment.

A single forecasting year of 2041 was adopted to understand the cumulative impact of the development of the corridor.

Aimsun modelling was undertaken based on two scenarios:

– **Scenario 1 (General Traffic Lanes):** Delivery of an additional general traffic lane on The Northern Road with no additional mode shift

– **Scenario 2 (Bus Lanes):** Delivery of an additional bus lane on The Northern Road with mode shift.

The assessment of Scenario 1 found that a six-lane section on The Northern Road was acceptable except in some parts of the southbound carriageway. Four-lane southbound approach towards Bringelly Road interchange.

– Two-lane southbound off ramp to Bringelly Road (**+ one lane**).

– Three-lane underpass of Bringelly Road (**+ one lane**).

– Two to one lane merge along the southbound on ramp from Bringelly Road. This single on-ramp lane continues to form the fourth lane of The Northern Road southbound corridor (**+ one lane**).

– This four-lane southbound configuration continues past The Northern Road | Belmore Road intersection towards Carrington Road, whereby the kerbside lane is allocated as a dedicated left turn lane into Carrington Road, with The Northbound Road reduced to three lanes southbound for the entirety of the modelled corridor. This was paired with a right turn ban into Belmore Road, which provides one of the southbound lanes.

The assessment of Scenario 2 found that a six-lane corridor (of which two lanes are dedicated bus lanes) required a 50 per cent mode shift for the traffic to work at an acceptable level of service.

[2] Model Scoping Note approved for SCW Precinct 2 Post-Gateway Traffic Assessment is included in Appendix A of this report.

Infrastructure schedule

The development of South Creek West and Lowes Creek Maryland should be accompanied by supporting investment in infrastructure. The proposed infrastructure schedule has been identified below.

Infrastructure	Nexus	Party Responsible
The Northern Road widening	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth	TfNSW, with funding including the Housing and Productivity Contribution (HPC)
Bringelly Road widening		
Greendale Road widening		
Upgrade of Kelvin Park Drive | Bringelly Road		
Upgrade of The Northern Road | Bringelly Road		
Greendale Road | New Sub-arterial Road		
Upgrade of The Northern Road | Belmore Road | Bent Road intersection		
Upgrade of The Northern Road | Lowes Creek Link Road		
Upgrade of The Northern Road | Marylands Link Road 3 intersection		
Upgrade of The Northern Road | Marylands Link Road 2 intersection		
Upgrade of The Northern Road | Marylands Link Road 1 intersection		
Indicative Layout Plan street network	Landowners as development occurs	Landowners (DCP roads) Council or landowners as in-lieu works (SP2-zoned roads)

The infrastructure schedule has been prepared based on the Aimsun and SIDRA modelling, which identifies the necessary infrastructure to support the cumulative development of the growth in the area. All the offsite road upgrades have a nexus not just to this development to all the development in the precinct. Hence the Housing and Productivity Contribution should be the primary means of funding these upgrades to ensure fairness across all the different landowners.

1.0 Introduction

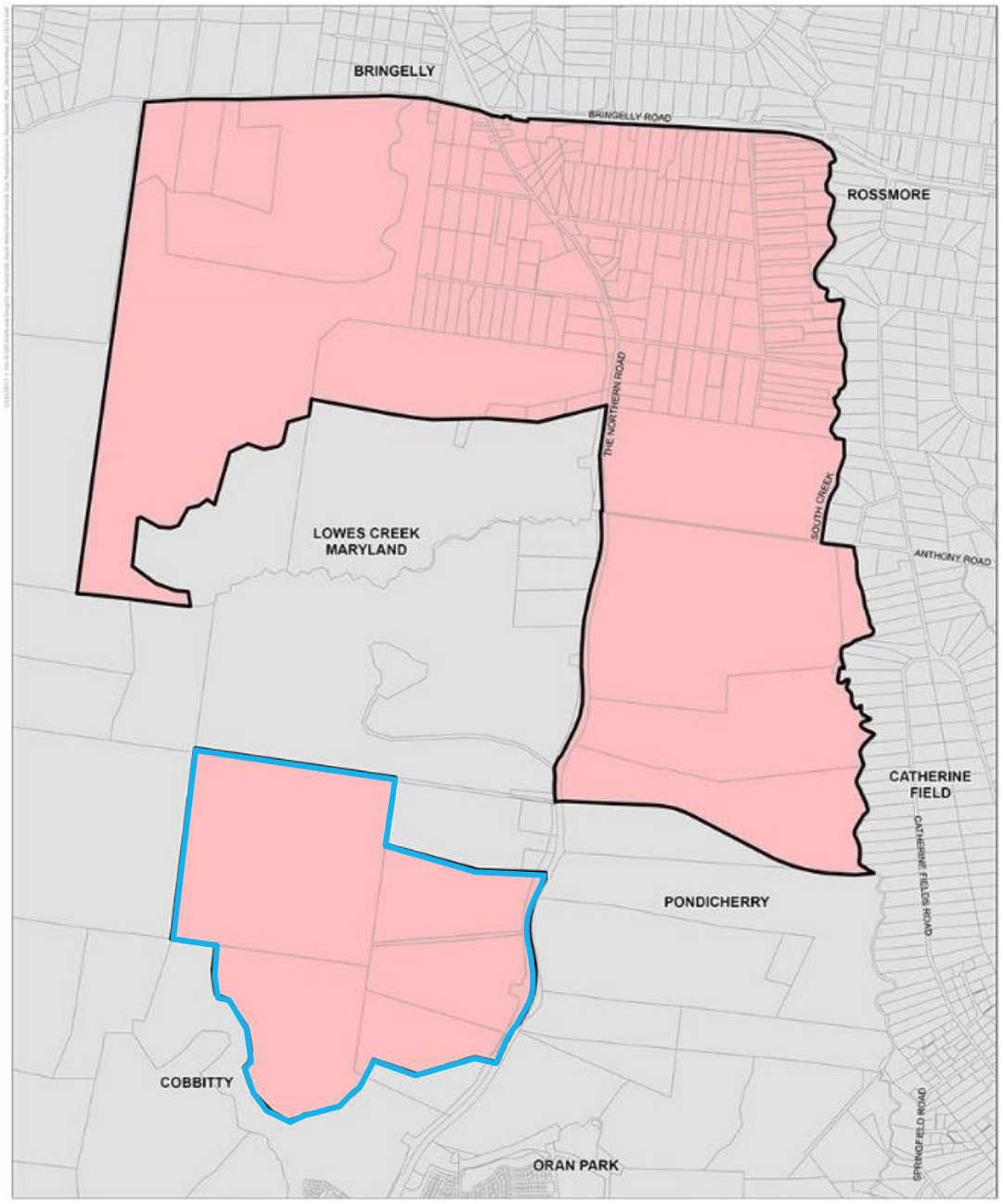
1.1 Background

The South Creek West Land Release Area forms part of the South West Growth Area (SWGA). Given the scale of the release area, the Department of Planning and Environment (DPHI) divided it into five distinct precincts numbered 1 – 5. The land to which this Planning Proposal relates is referred to as Cobbitty part of Sub-Precinct 5, also known as Cobbitty - Sub-Precinct 5 (part).

The precinct was released by the Minister for Planning on 24 November 2017 for urban development. The release formally commenced the rezoning process for land within the precinct, including the subject site.

Figure 1-1 illustrates the site boundaries of Precinct 5 (highlighted in blue) and SCWLA.

Figure 1-1 South Creek West release area



Source: NSW Department of Planning, Housing and Infrastructure (DPHI), 2017

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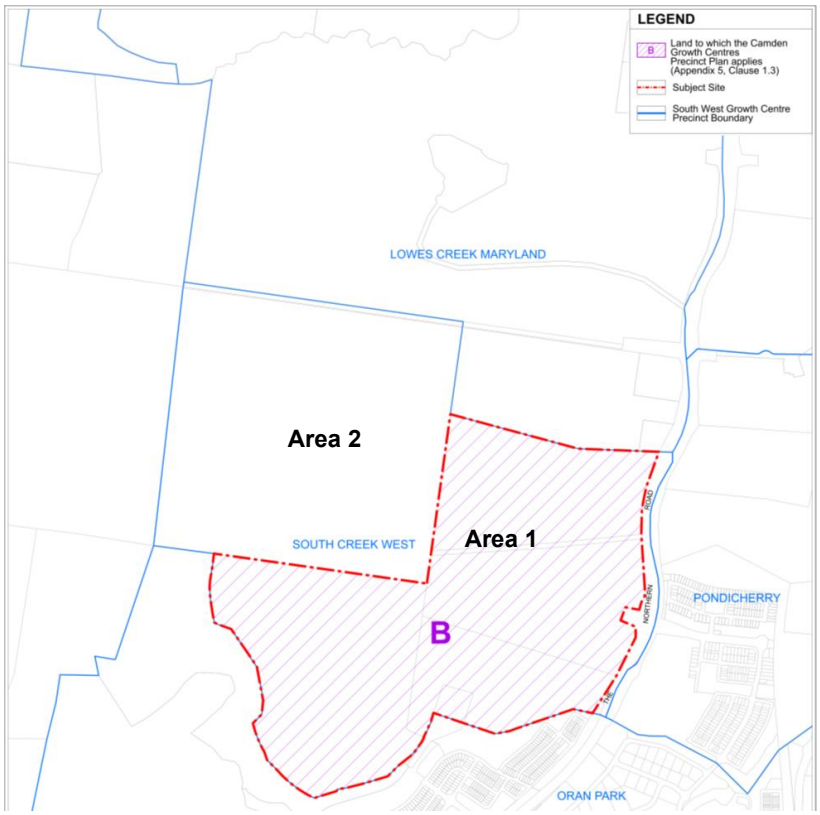
Figure 1-2 Sub-Precinct 5 Planning Proposal Area



Source: Design & Planning, 2025

JJCD owned land (Area 1) comprises 172.74 hectares of that land. This planning proposal is seeking to rezone 150.21ha of land within Precinct 5. The remainder of Precinct 5 is owned by a separate landowner, which is not subject to this Planning Proposal. The intended outcome of this planning proposal is to amend the Parkland City SEPP as follows:

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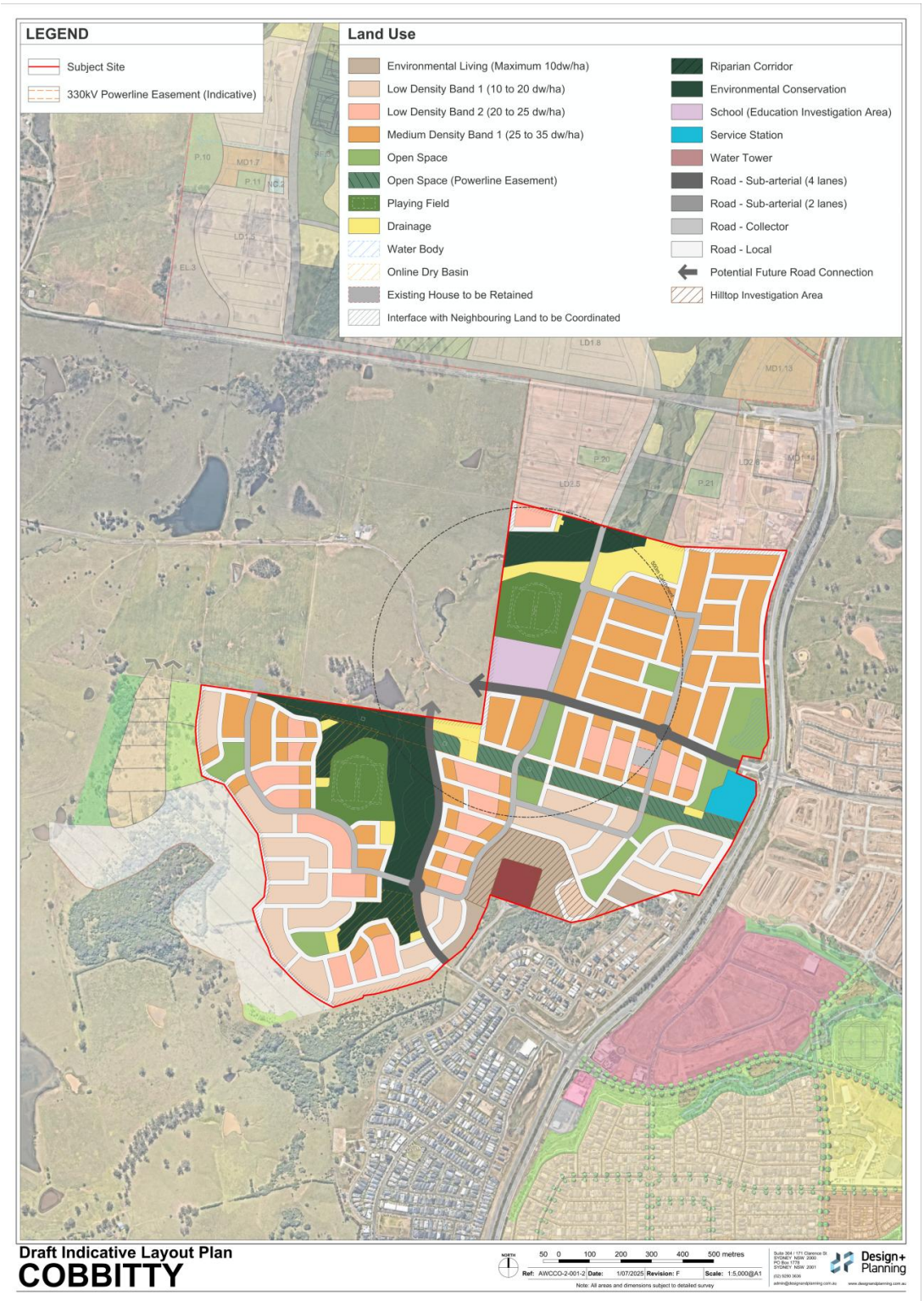
  - 12 metres for medium-density residential uses, allowing for development of up to three storeys in height.

The Planning Proposal is supported by a revised Indicative Layout Plan (shown in **Figure 1-3)** which will accommodate approximately 2,650 residential dwellings.

Figure 1-3 Cobbitty Sub-Precinct 5 (part) Indicative Layout Plan



Source: Design+Planning, 2026

Following an extensive review by Council (and the APP Group) and the Local Planning Panel, the planning proposal and transport, traffic and access assessment have been amended to reflect feedback and enable Council endorsement for its progression to gateway.

This report addressed the following comments and feedback received from Council and the Local Planning Panel.

Table 1-1 Response to Council/APP Comments

Comment	Response
The proposed local street shown on the ILP, west of the school site, would have a frontage to the school. If the school has a rear gate, accessible to parents, then based on recent experience elsewhere in Camden, it would inevitably result in extensive queuing at pick up times. It is likely to result in queuing south to the east-west sub-arterial road, impacting on traffic flow along that road. If this street were built to a local street standard, the impacts would be magnified and would also impact on access to the neighbourhood centre.	Note the neighbourhood centre has been removed in accordance with DPHI advice, and to ensure consistency with the retail centres hierarchy of the South West Growth Centre.
The ILP would need to be amended to show the section of collector street (shown below) to be extended to the north to accommodate the catchment east of the riparian corridor, which may seek to a travel south.	Resolved, collector road alignment updated to travel further north. Refer to updated road hierarchy map shown in **Figure 4-2**.
Concern has been expressed that if the car parking area for the reserve (playing fields) is provided along the western side of the north-south collector street, then a roundabout should be provided to give access to and from it. The ILP depicts a roundabout between the school site and open space. It would be ideal to have the roundabout further north as provision of wombat crossings should be installed along the school frontage. Having a roundabout here may be too cluttered. Roundabouts are also not ideal locations for pedestrian crossings at a school.	Resolved, roundabout moved further north (closer to the reserve) to enable access to the car parking. Additionally, wombat crossings have been provided across the collector road in front of the school. Note the neighbourhood centre has been removed in accordance with DPHI advice, and to ensure consistency with the retail centres hierarchy of the South West Growth Centre.
The extract of the ILP below shows a substantial business area around the existing service station (with allowance for substantial expansion) at the intersection of The Northern Road and the entrance road to Sub Precinct 5. A sub-arterial road normally has a median island. Council's Traffic Team have indicated that they are unlikely to support a break in the median to allow right turn by vehicles across the sub-arterial road close to the intersection. This is likely to increase traffic at the roundabout to the west of the site and potentially negatively impact business at the service station. This would suggest that the area of the proposed business area should be reduced to minimise the potential for further traffic problems.	Noted, we understand the requirements for the likely intersection treatment for sub-arterial roads. However, the likely increase in traffic and potential impacts to the roundabout will be assessed in future DAs.
Subject to TfNSW support, the proponents update the ILP as a result of the findings of the Detailed Traffic Assessment.	Noted.

1.2 Purpose of report

The purpose of this traffic, transport and access assessment is to support the planning proposal based on the design of the proposed concept masterplan, including:

- Inform future planning controls to ensure a coordinated and efficient approach to land use planning, environmental management and transport infrastructure
- Provide an integrated approach to determining the optimal mix of land uses and density concentrations as a means of minimising (where possible) trip generation and transport-related demand
- Ascertain the cumulative and regional traffic and transport impacts associated with future land-based demands associated with the rezoning
- Maximise efficiency and safety of the existing/proposed transport systems in proximity to the subject site.

1.3 Scope and limitations

The scope of this study is to:

- Undertake a background information and documentation review
- Collate existing traffic and travel pattern data
- Review of existing traffic and transport conditions
- Understand the status of any planned and committed infrastructure upgrades
- Understand trip generation and trip distribution to understand the likely implications of the proposed development
- Determine likely infrastructure upgrades required to cater for the proposed development
- Identify public and active transport measures and sustainable travel initiatives for the development, as well as the likely required parking provision.

All source of data used in this study has been carefully verified and checked by SCT Consulting. However, given the level of detail of the assessment, the modelling accuracy will be affected by any potential changes to the assumptions in the future.

1.4 Report structure

This report has been structured into the following sections:

- **Section 2.0** provides a summary of the review of all relevant background documents
- **Section 3.0** describes the existing transport conditions for all modes of transport
- **Section 4.0** describes the proposed development, its access strategy and a review of parking and access requirements
- **Section 5.0** outlines the traffic and transport appraisal which describes the modelling undertaken, the likely trip generation, indicative impact as a result of the proposed development
- **Section 6.0** assesses the gateway risks
- **Section 7.0** summarises the report content and presents the conclusions.

2.0 Strategic Context

2.1 Site context

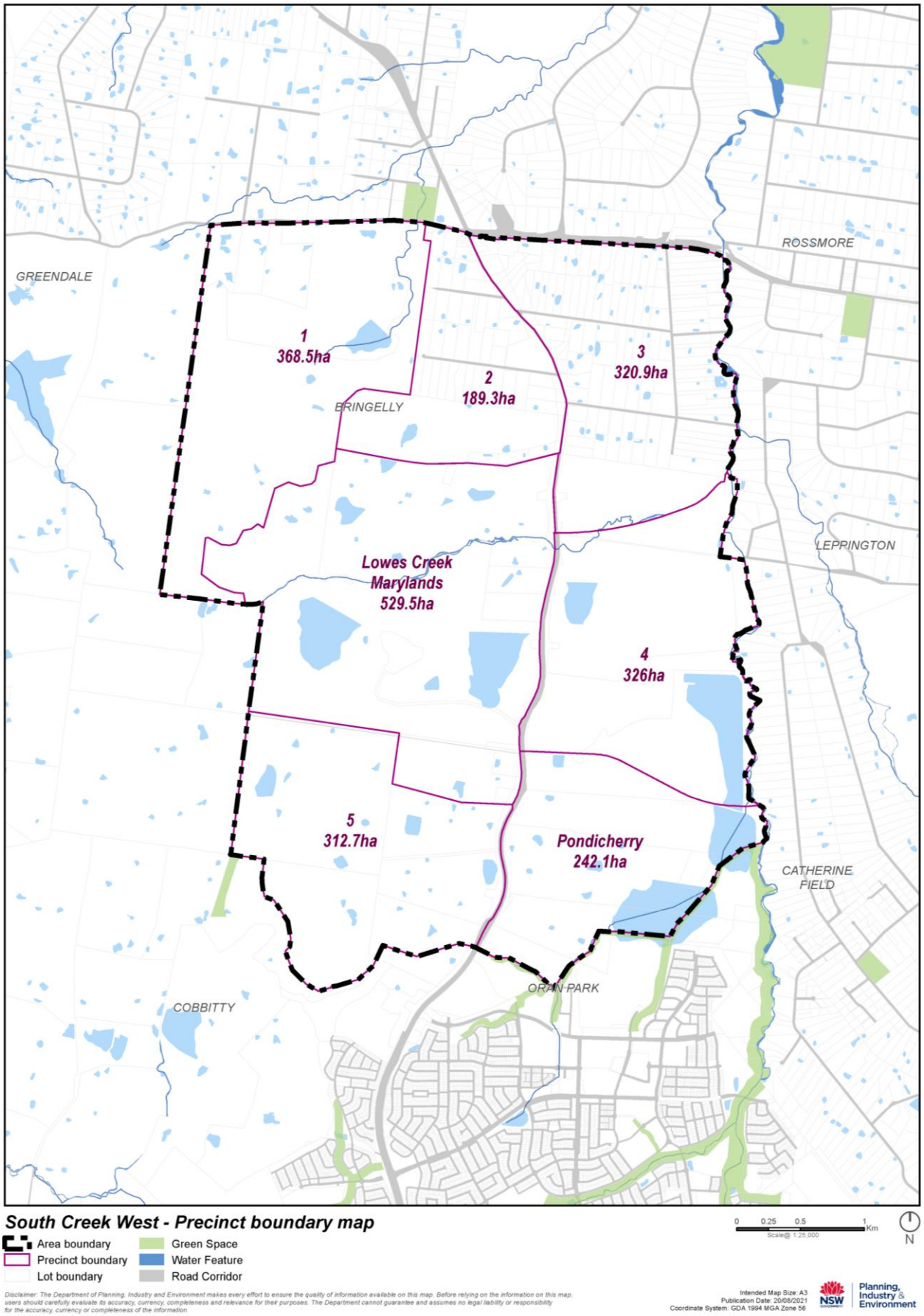
Precinct 5 is located within the south-west portion of the South Creek West Land Release (SCWLA) area within the suburb of Cobbitty in the Camden LGA. The Precinct adjoins the Lowes Creek Maryland Precinct, which has recently been rezoned to the north, the Pondicherry precinct to the east which is in the process of being rezoned and the growing town centre and suburbs of Oran Park to the south. Its regional context is shown in **Figure 2-1**.

Precinct 5 totals approximately 303 hectares and has been characterised by rural residential and agricultural land uses and activities.

Leppington Station is seven kilometres to the east of the site, providing connectivity to the Sydney Greater Metropolitan Area (GMA) through mass transit services.

As part of the SWGA, the site aims to be redeveloped into a community with ready access to employment, public transport, education and commercial facilities and is well-positioned to be integrated into infrastructure development in the wider regional area outlined in future details below.

Figure 2-1 Precinct 5 in a regional context



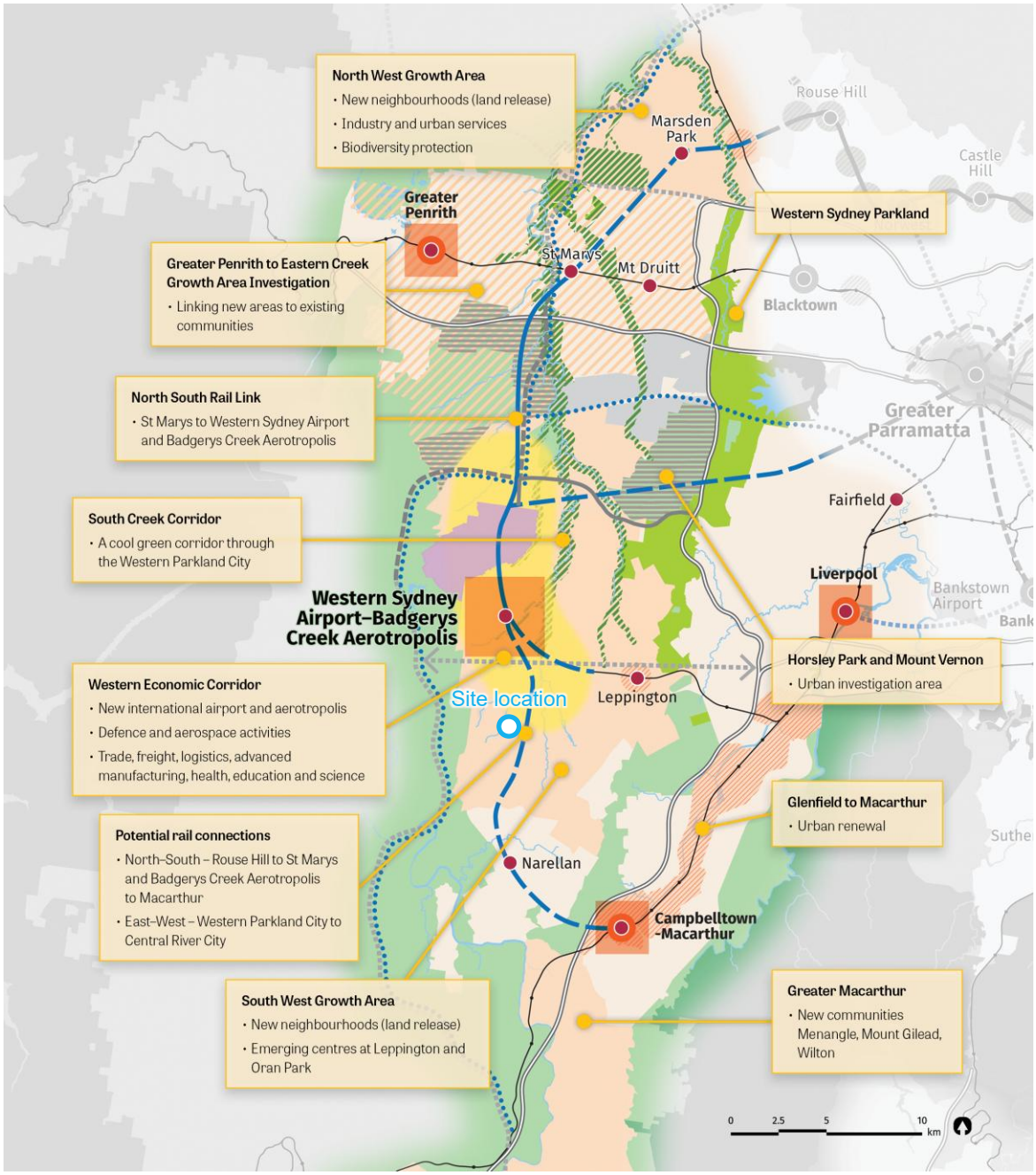
2.2 Regional planning and land use context

2.2.1 Greater Sydney Region Plan – A Metropolis of Three Cities (Greater Sydney Commission), 2018

The Greater Sydney Region Plan, A Metropolis of Three Cities, is aiming at delivering three cities where most residents are within a 30-minute commute to employment, education, and health facilities, services, and great places. The vision seeks to develop Greater Sydney into a metropolis comprised of the Western Parkland City, the Central River City, and the Eastern Harbour City.

The site currently resides in what seeks to become the Western Parkland City which encompasses current and future centres of Greater Penrith, Western Sydney Airport – Badgerys Creek Aerotropolis, and Campbelltown – Macarthur. Development projects. These are shown in **Figure 2-2**, which outlines key growth areas and infrastructure upgrades envisioned to develop the Western Parkland City.

Figure 2-2 Western City Parkland Infrastructure Development



Source: Greater Sydney Commission, 2018

The vision of the Western Parkland City is to form new city-shaping transport and to introduce the airport that makes the city the most connected place in Australia:

– The Australian and NSW Governments will deliver the first stage of the North-South Rail Link from St Marys to the Western Sydney Airport and Badgerys Creek Aerotropolis

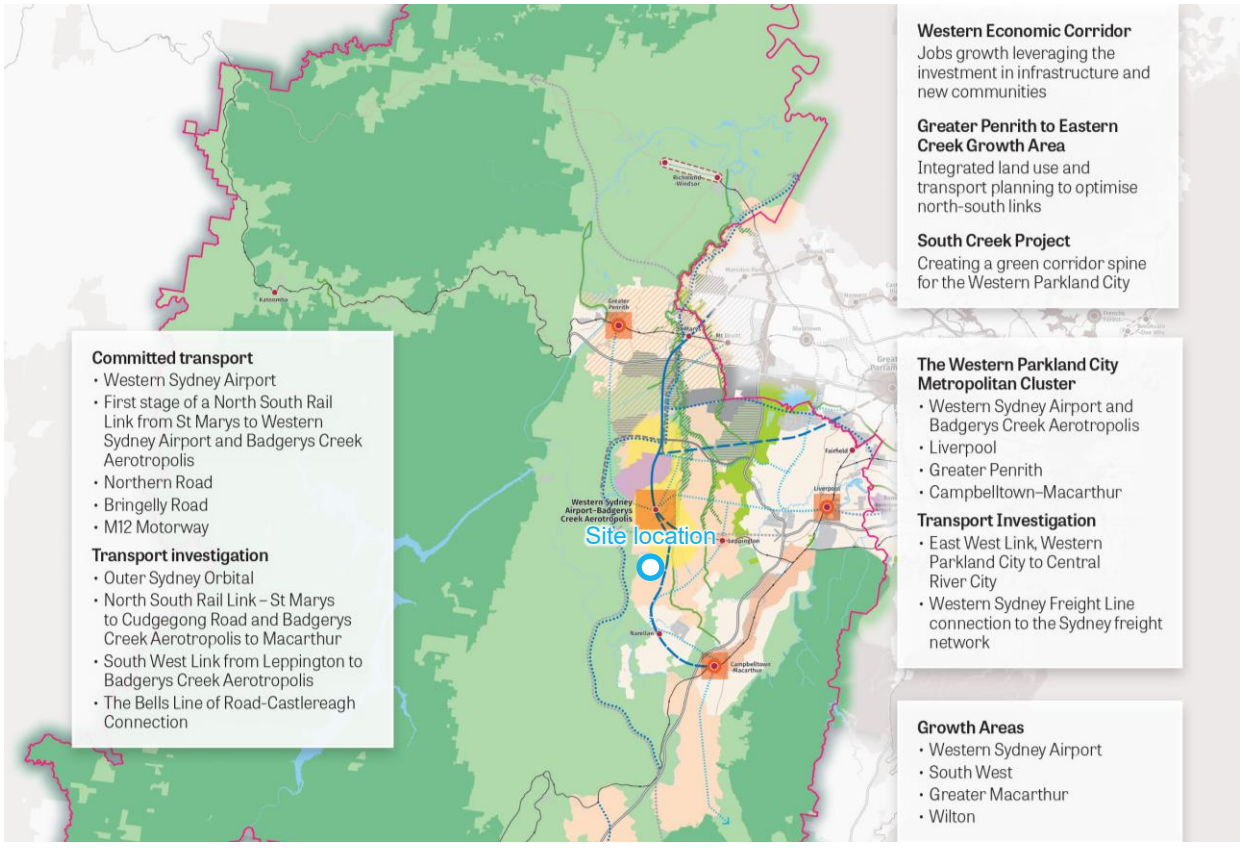
– A potential new east-west mass transit corridor will connect the Western Parkland City to the Central River City

– Potential Outer Sydney Orbital will provide the city with direct connections to Greater Newcastle, Wollongong and Canberra.

2.2.2 Western City District Plan

The Western City District Plan involves the local government areas of Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith and Wollondilly. It aims to ensure future generations have excellent connections to local jobs, housing, services, and great places. Under the Plan, the site is located south of the Western Sydney Airport – Badgerys Creek Aerotropolis as shown in **Figure 2-3**.

Figure 2-3 Western City District Plan



Source: Western City District Plan, 2018

The Western Sydney Airport and Badgerys Creek Aerotropolis, located to the north of the site are expected to transform the Western City District, creating a once-in-a-generation economic boom for residents, bringing infrastructure, businesses and knowledge-intensive local jobs to residents.

The Plan establishes a housing target of 39,850 new dwellings by 2021 and 184,500 by 2036, with 11,800 additional dwellings in Camden LGA to accommodate this growth by 2021, the Draft District Plan outlines several overarching priorities and actions that will shape the future and guide policy decisions for this District. They include:

– Planning a city supported by infrastructure, including infrastructure that supports the new Western Sydney Airport and responds to growth

– Giving people housing choices by providing housing supply, choice and affordability, with access to jobs and services

– Designing places for people by creating and renewing great places and local centres, and respecting the district's heritage
– Developing a more accessible and walkable city by establishing the land use and transport structure to deliver a liveable, productive and sustainable Western Parkland City
– Creating the conditions for a stronger economy by actions including leveraging the industry opportunities from the Western Sydney Airport and Badgerys Creek Aerotropolis, planning and managing industrial and urban services land and growing investment, business opportunities and jobs in strategic centres
– Valuing green spaces and landscapes by actions including creating a protecting and enhancing bushland and biodiversity Planning Priority, better managing rural areas and delivering high-quality open spaces.

2.2.3 Western Sydney City Deal

The Western Sydney City Deal is a partnership between the Australian Government, NSW Government, and local governments of the Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith and Wollondilly, announced on 4 March 2018.

Of most relevance to this study are the committed improvements in connectivity through the Western Sydney City. The new Western Parkland City will be one of Australia's most connected cities. In an emerging 30-minute city, innovative public transport, aviation and digital infrastructure will bring residents closer to jobs, centres, education and the world. The key features of transport improvements of the Western Sydney City Deal are shown in **Figure 2-4**.

The Australian and NSW Governments jointly committed to delivering the first stage of the North-South Rail Link from St Marys to Badgerys Creek Aerotropolis via Western Sydney Airport, with a joint objective of having rail connected to the Western Sydney Airport in time for its opening.

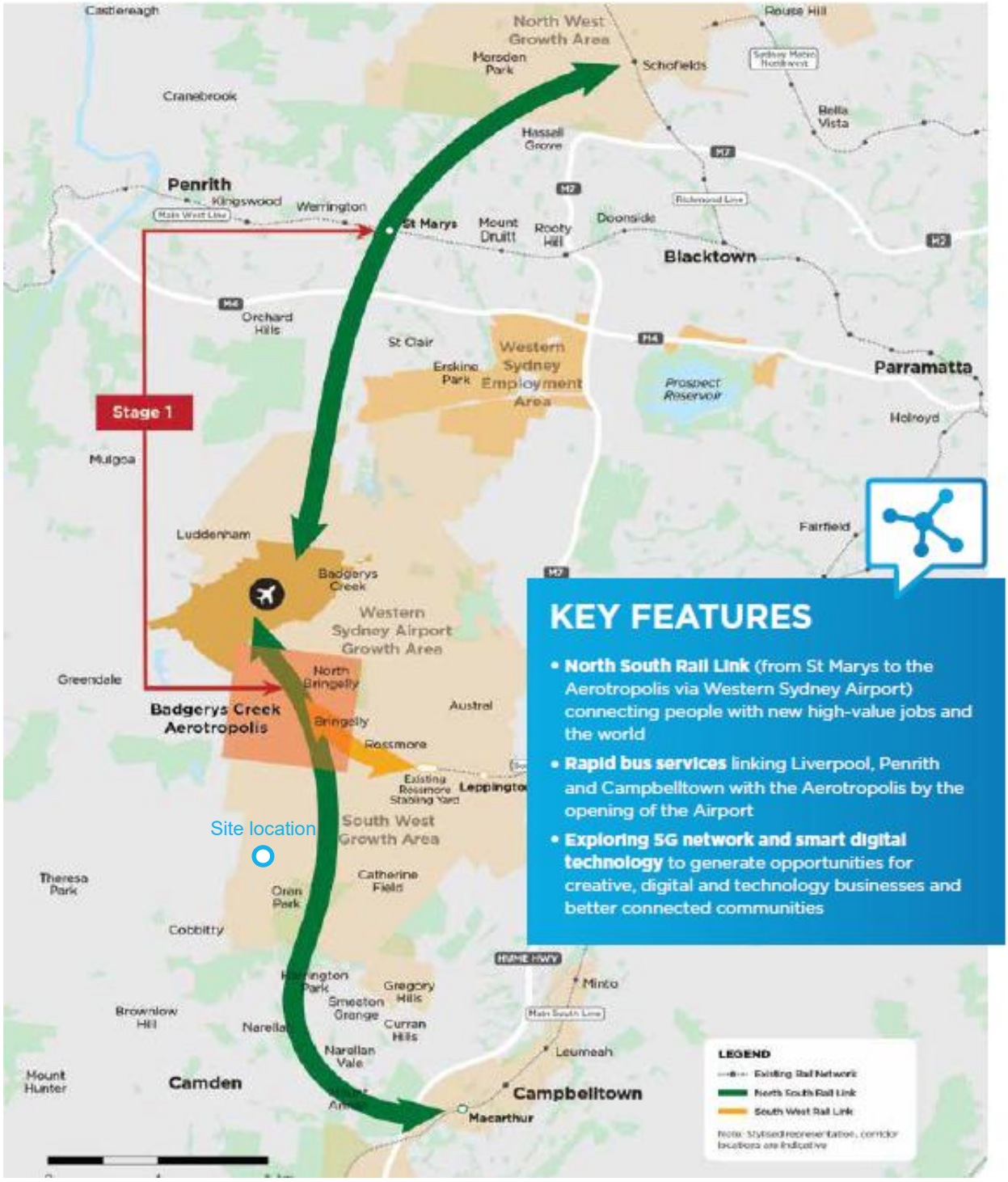
Work will immediately commence on a thorough design and investment case for the North-South Rail Link (including the South West Rail Link) as part of an integrated planning and city-shaping approach. Both governments will contribute up to $50 million each to a business case process, in consultation with the local government. This will include an investigation of integrated transport and delivery options for a full North-South Rail Link from Schofields to Macarthur and a South West Rail Link to connect Leppington to the Western Sydney Airport via an interchange at the Badgerys Creek Aerotropolis.

The NSW Government will establish rapid bus services from the metropolitan centres of Penrith, Liverpool and Campbelltown to the Western Sydney Airport before it opens in 2026, and to the Badgerys Creek Aerotropolis.

Implications for the site

The site will be developed to house residents who are envisioned to be employed mainly in the surrounding centres and Greater Sydney Metropolitan Area. As part of the vision for a 30-minute commute, the site will benefit from upgrades to roads, public transport, and active transport networks in the region including North-South Rail Link, Outer Sydney Orbital and rapid bus services.

Figure 2-4 Key features of improved connectivity and public transport options



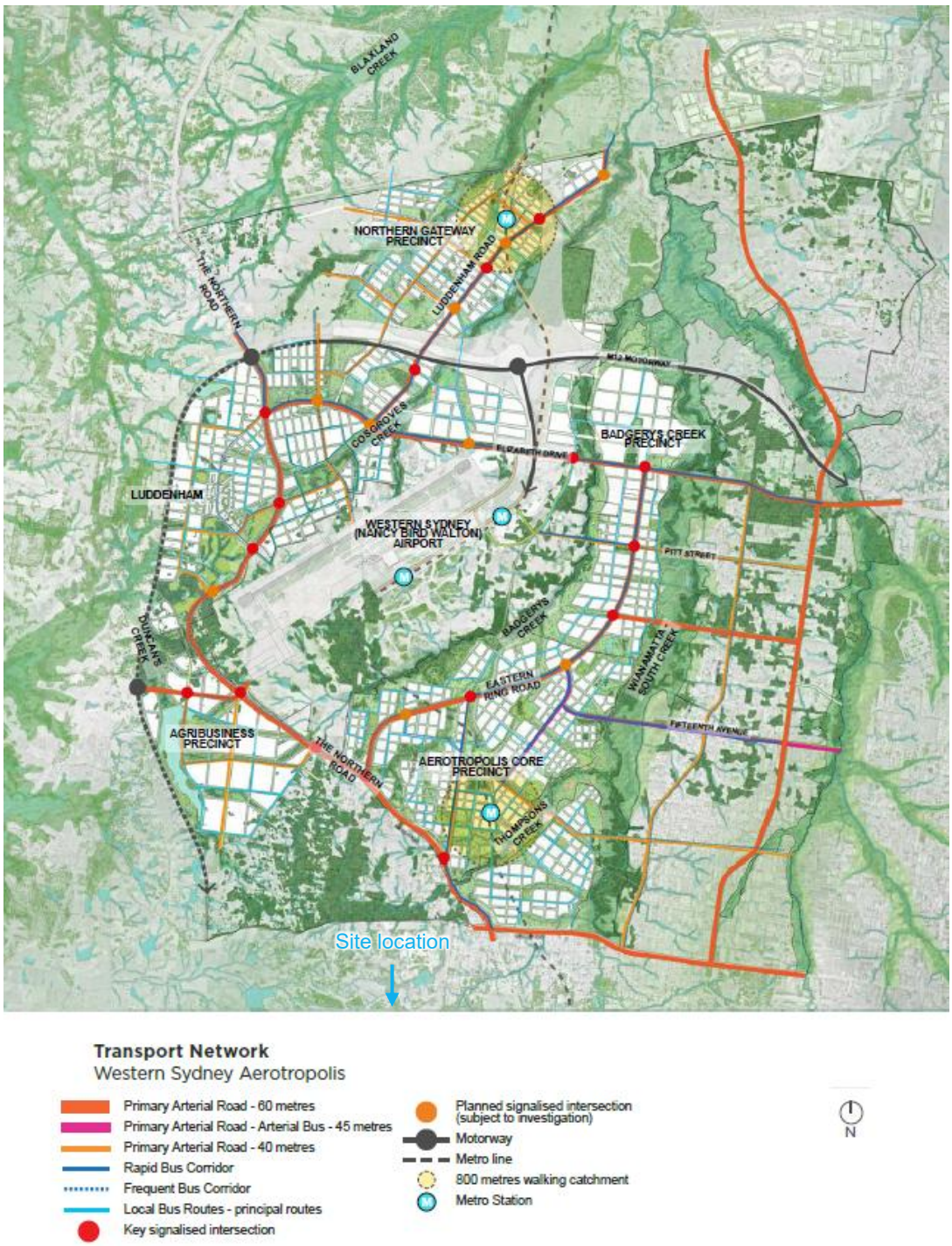
Source: Western Sydney City Deal, 2018

2.2.4 Western Sydney Aerotropolis Planning Package

The Western Sydney Aerotropolis Plan outlines the plan to develop an 11,200-hectare site surrounding the future Western Sydney International Airport. The plan envisions a 24-hour metropolitan centre that is accessible, innovative and accommodates high-value jobs close to where people live. When complete, the Aerotropolis will be home to a potential 34,000 residents and more than 100,000 jobs throughout its 10 precincts.

Aerotropolis Core Precinct in the immediate north of the site will become a diverse, dynamic and sustainable global airport city with attractive places for workers, residents and visitors accommodating 50,000 to 60,000 potential jobs and 20,000 to 24,000 potential residents.

Figure 2-5 Proposed transport network of Western Sydney Aerotropolis



Source: Western Sydney Aerotropolis Plan, 2020

As shown in **Figure 2-5**, the proposed transport network in and around the Aerotropolis includes:

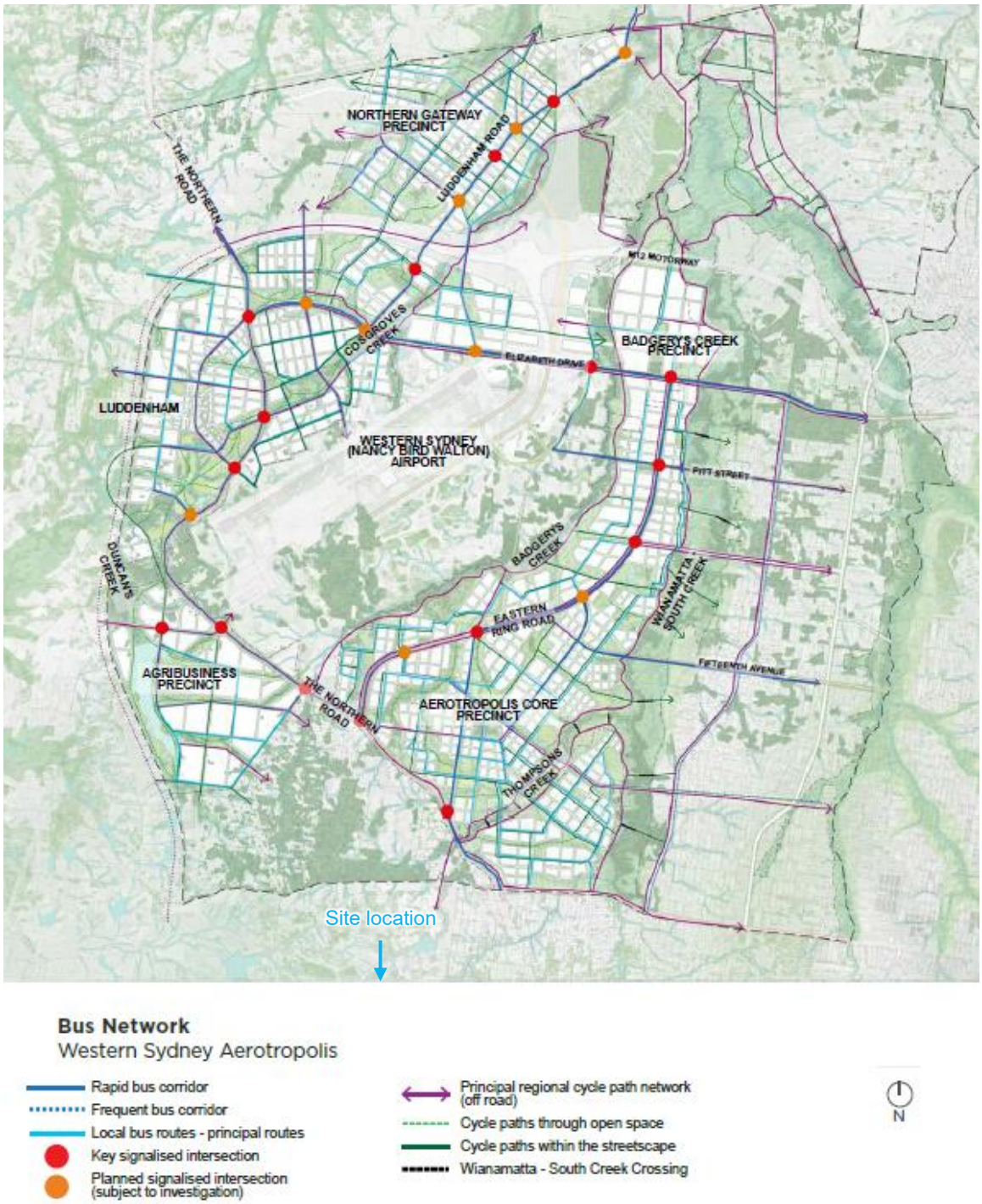
– The proposed Sydney Metro line and metro stations

– Rapid bus services proposed to link Liverpool, Penrith and Campbelltown with the Airport and Aerotropolis Core

– The proposed M12 Motorway to be the major access route to the Airport and connect to Sydney's motorway network

– The proposed Outer Sydney Orbital Corridor is to be the major north-south transport corridor between Richmond Road in the north and the Hume Motorway in the south.

Figure 2-6 Proposed bus (and cycle paths) network of Western Sydney Aerotropolis



Source: Western Sydney Aerotropolis Plan, 2020

Figure 2-6 further identifies the principal regional cycle path network (off-road) in and around the Aerotropolis to support a target mode share for active transport at six per cent. This includes cycle paths on Bringelly Road, The Northern Road and an extension of the cycle path along Thompsons Creek.

The Greater Sydney Commission notes on its website that it is delivering the Western Sydney Place-based Infrastructure Compact (PIC) program for the NSW Government, as part of the Western Sydney City Deal. A PIC is a highly collaborative model that looks holistically at a place to identify at a high level the most cost-effective sequencing for growth aligned with the provision of infrastructure over 10, 20 and 40 years. This will be one of the means of planning for the changes in the Western Sydney Aerotropolis Growth Area.

Implications for the site

Residents will likely be commuting to/from the Aerotropolis for work. With the site's advantage close to the Aerotropolis, the site should seek to maximise the ability for residents to commute to the Aerotropolis in 30 minutes, in line with the targets of the NSW Government and the Western Sydney Aerotropolis Plan. The site will benefit from the investment that the Aerotropolis brings into the area, including more frequent and reliable transport options.

2.2.5 South West Growth Centre Structure Plan

The South West Growth Centre Structure Plan (**Figure 2-7**) outlines prospected land use zoning and centres in the South West Growth Area.

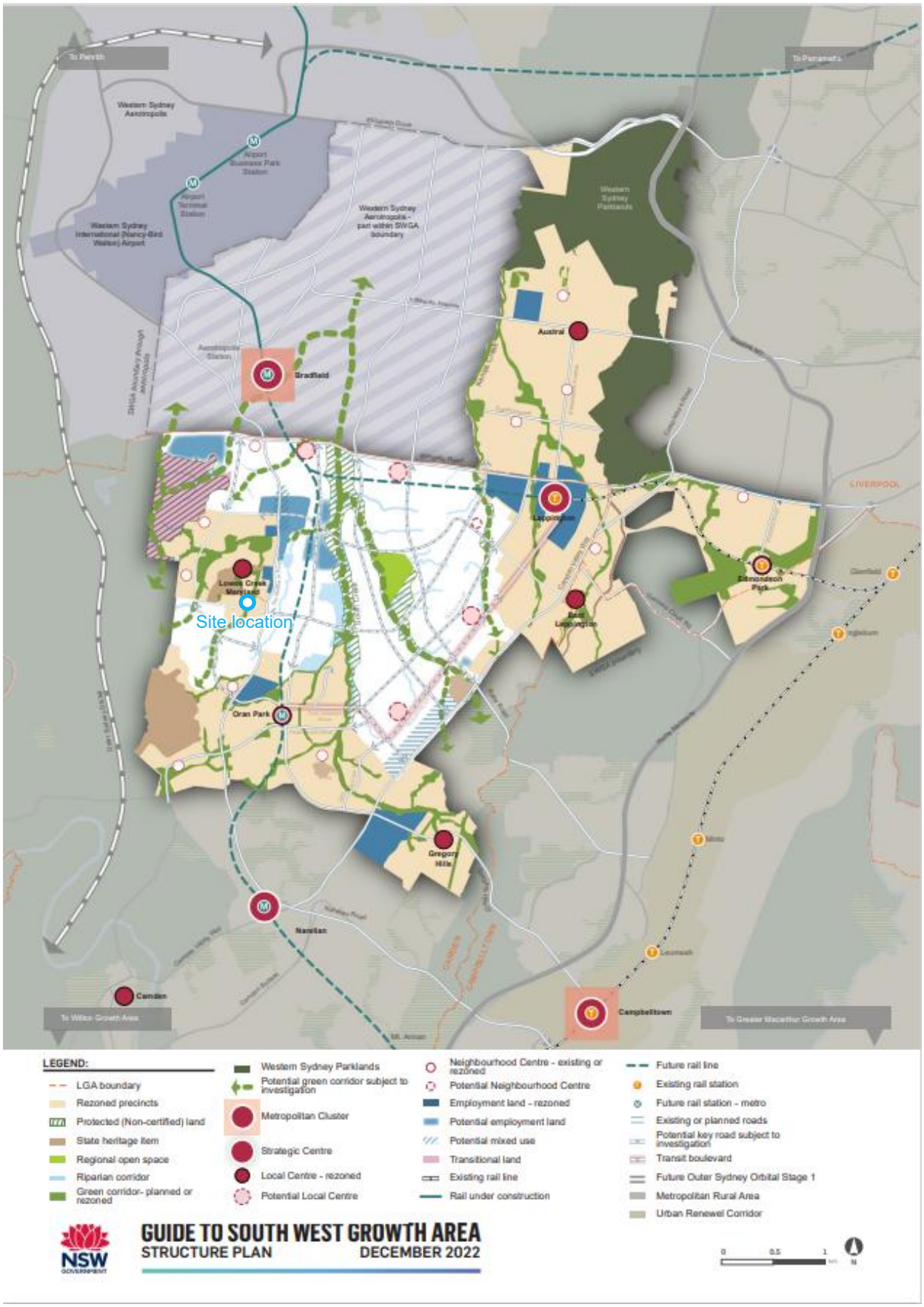
The main focus on the South West Growth Centre Structure Plan is the implementation of the new metro rail line that Camden Local Strategic Planning Statements (LSPS)

Camden Local Strategic Planning Statements (LSPS), prepared in 2019, provides a 20-year land use vision for Camden and outlines directions for future growth and strategic planning. The LSPS sets short, medium, and long term-actions related to land use, transport and sustainability objectives, as well as other strategic directions related to the Greater Sydney Region Plan and the Western City District Plan.

Transport objectives within the LSPS relate heavily to the 30-minute Western Parkland City envisioned by the Greater Sydney Region Plan, with a focus on sustainable transport including rail and rapid buses within Camden LGA and its surroundings. Key actions include:

– Advocacy for the delivery of the North-South Rail and South West Rail Link Extension
– Rapid bus service route to connect key Camden centres with the Western Sydney Airport and Aerotropolis (along The Northern Road)
– Outer Sydney Orbital with an alternative underground route and appropriate east/west connections within the Camden LGA.

Figure 2-7 South West Growth Centre Structure Plan (Edition 3)



Source: Guide to the South West Growth Centre Structure Plan, 2022

2.2.6 Camden Local Strategic Planning Statements (LSPS)

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– Advocacy for the delivery of the North-South Rail and South-West Rail Link Extension

– Rapid bus service route to connect key Camden centres with the Western Sydney Airport and Aerotropolis (along The Northern Road)

– Outer Sydney Orbital with an alternative underground route and appropriate east/west connections within the Camden LGA.

Figure 2-8 Infrastructure and collaboration local priority

Source: Camden LSPS, 2020

Implications for the site

The site will benefit from public transport and road network upgrades associated with delivering a 30-minute city. With the development of adjacent strategic centres and local centres comes employment opportunities and access to health, education, and community services. The expansion and integration of the public transport network will further benefit the site's connectivity to the wider region, its communities and place.

2.3 Future transport context

2.3.1 Future Transport Strategy

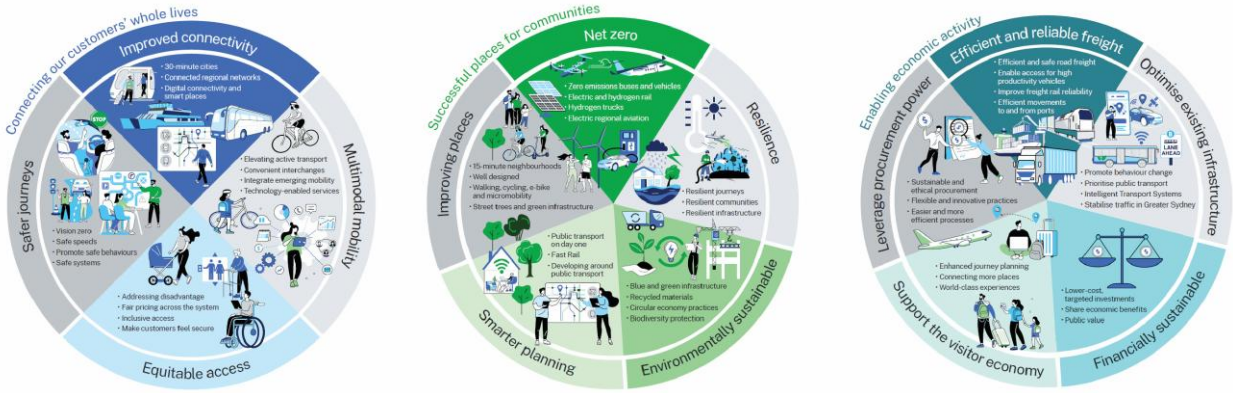
The Future Transport Strategy builds on the success of Future Transport 2056, released in 2018, and sets out Transport for NSW's (TfNSW) long-term vision to provide a safe, sustainable, accessible and integrated travel network for all passenger and freight journeys. The vision is to help make NSW the most liveable state in the world.

The Strategy was updated from the Future Transport 2056 Strategy to address significant social, cultural and economic trends/events such as the COVID-19 pandemic, the energy transition, the digital economy and enduring natural disasters. It also considers population growth, new and emerging technology and global megatrends.

The new Strategy continues to put people and places at the centre of decision making and has a renewed focus on ensuring NSW is an economic powerhouse filled with vibrant and sustainable communities where people are connected by one integrated and multimodal transport system.

The key vision and outcomes from the strategy along with brief descriptions are shown in **Figure 2-9**.

Figure 2-9 Vision and outcomes



Future Transport Strategy, TfNSW 2022

Implications for the site

Future transport initiatives are aimed at connecting people to jobs, goods and services in our cities and regions through increased permeability of public transport networks. This provides benefits to the site. The specific provision for pedestrian and cyclist activity and efficient interchanging contributes to a safe and comfortable walking environment, promoting an increase in sustainable transport mode share.

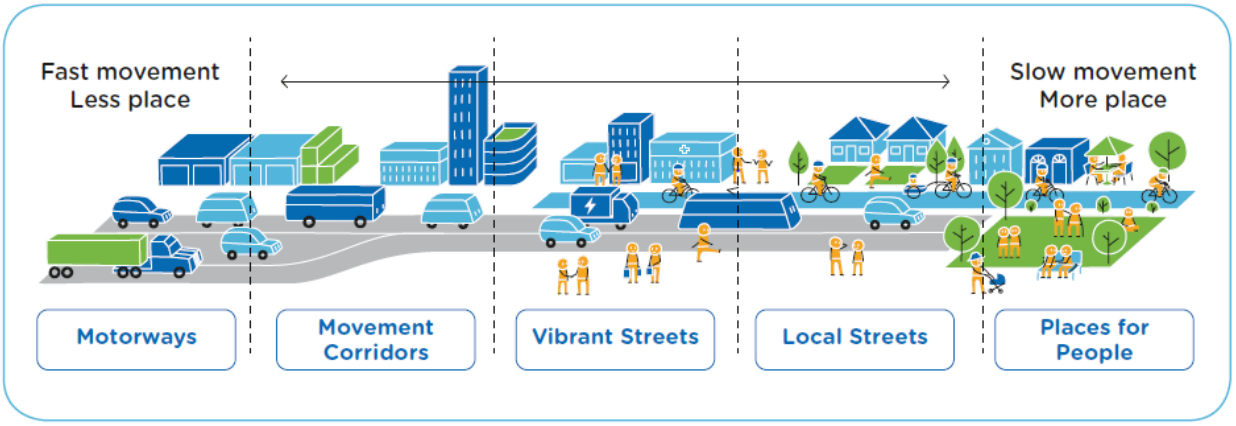
2.3.2 Greater Sydney Services Infrastructure Plan

The Greater Sydney Services and Infrastructure Plan is a 40-year plan for transport in Sydney. It is designed to support the land use vision for Sydney. Building on the state-wide transport outcomes identified in the Future Transport Strategy 2056, the Plan establishes the specific outcomes that transport customers in Greater Sydney can expect and identifies the policy, service and infrastructure initiatives to achieve these.

To support the liveability, productivity and sustainability of places for the transport network, a Movement and Place Framework was developed. The Framework acknowledges that transport networks have different functions and roles

and serve as both a destination and a means to move people and goods. The Movement and Place Framework will enable us to plan, design and operate the transport network to meet these different needs by providing greater transparency, and supporting collaboration between those responsible for land use, transport and roads while also encouraging input from the community. Through the Framework, it is possible to design a future network that is better used and supports the safe, efficient and reliable movement of goods and the need for the liveability of places along with it.

Figure 2-10 Different movement environments under the Movement and Place Framework



Source: https://future.transport.nsw.gov.au/wp-content/uploads/2018/plans/Greater_Sydney_Services_Infrastructure_Plan.pdf (2018)

2.3.2.1 City-shaping network

The city-shaping network includes higher speed and volume linkages between our cities and centres. The function of this network is to enable people living in any of the three cities to access their nearest metropolitan centre within 30 minutes and to be able to travel efficiently between these metropolitan centres.

As Greater Sydney transitions to a metropolis of three cities, the city-shaping network will need to expand to provide improved access to and between each metropolitan city/centre, particularly Greater Parramatta and centres in the metropolitan cluster in the Western Parkland City.

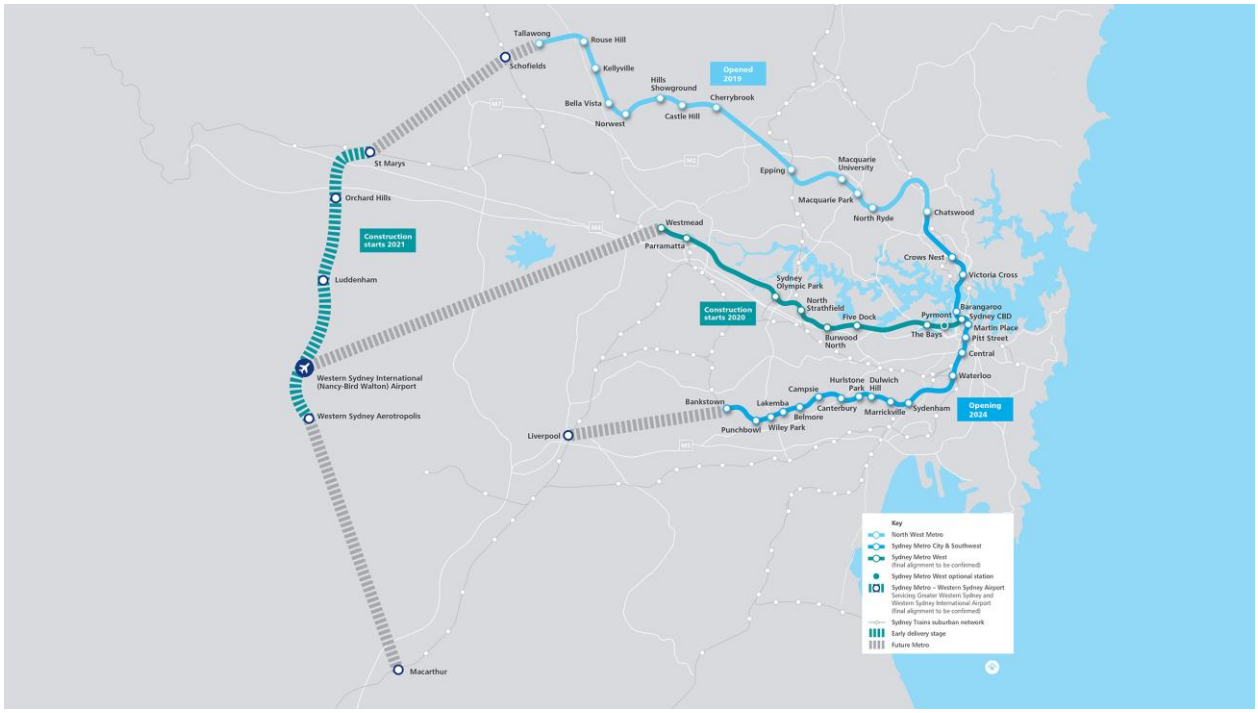
Specific infrastructure items included in the *Greater Sydney Services & Infrastructure Plan,* which forms part of *Future Transport 2056,* that are relevant to Canterbury Bankstown include:

– Sydney Metro Western Sydney Airport

– Future metro extensions to the airport from Parramatta and Macarthur.

These connections are shown in **Figure 2-11**.

Figure 2-11 Sydney Metro and future corridors

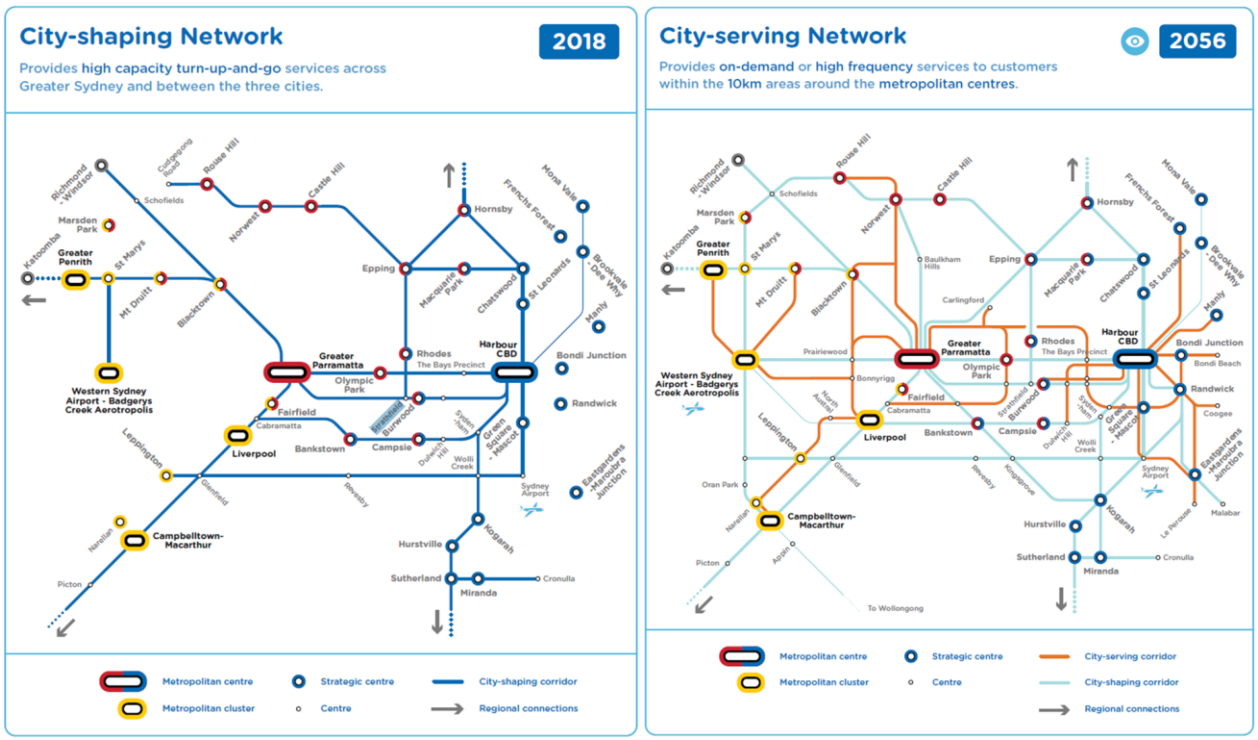


Source: Transport for NSW

2.3.2.2 City-serving network

The city-serving network will provide high-frequency services within a ~10km radius of the three metropolitan cities/centres. This will support access within some of the densest land use in Greater Sydney where travel demand is most concentrated. As these inner urban areas in each of the three cities develop and become denser, the government will investigate the prioritisation of on-street public transport services and invest in higher frequency services.

Figure 2-12 Greater Sydney and 2056 transport network vision



Source: https://future.transport.nsw.gov.au/wp-content/uploads/2018/plans/Greater_Sydney_Services_Infrastructure_Plan.pdf (2018)

Implication for the site

The site sits south of a funded metro project connecting St Marys and Western Sydney Airport. It also sits within the vicinity of a future metro connection from Macarthur to the airport. The development of transport infrastructure both within and between metropolitan centres provides benefits to the site by providing accessibility to a wider community, providing connectivity to employment, education, recreation, and commercial spaces.

2.3.2.3 Principle Bicycle Network

Building on the existing network, an immediate focus is working with local councils to deliver committed Priority Cycleway projects to address key missing links around the Harbour CBD, Greater Parramatta, Greater Penrith, Blacktown and Liverpool, such as the Nepean River Green Bridge and Inner West Greenway. Council partnership programs are delivering local bicycle infrastructure. Bicycle parking is also being rolled out at interchanges.

By 2056:

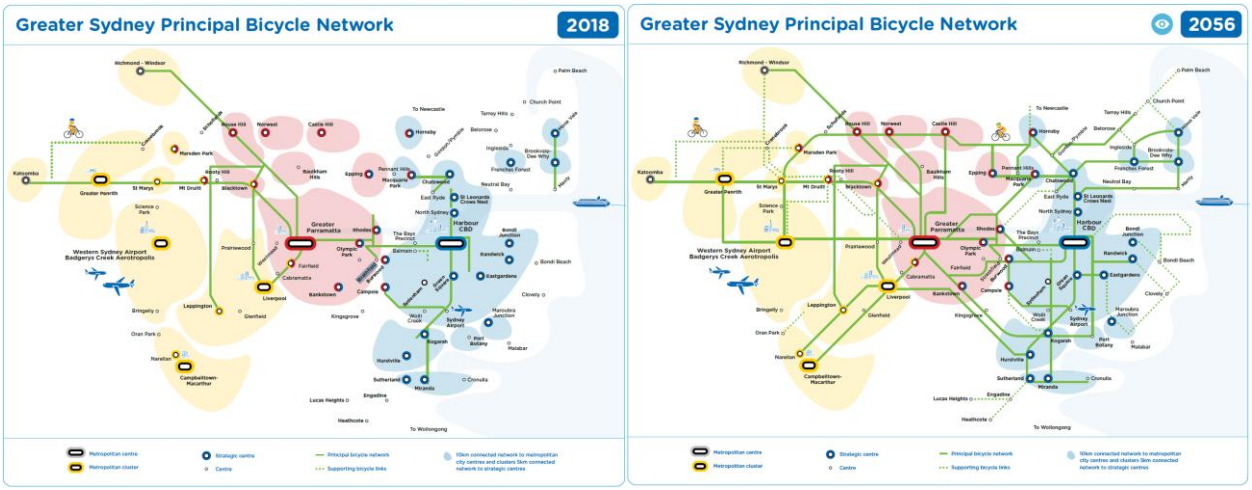
– Walking and cycling network coverage will be improved by using state-held corridors for public transport, pipelines, waterways, crown land and service easements for bicycle network infrastructure

– All strategic centres have connected walking and cycling networks, including strategic centres across the Western Parkland City

– Further investment in connections to strategic centres and the Principal Bicycle Network will support walking or cycling as the most convenient option for short trips, improving health outcomes, safety and convenience for customers as well as boosting the productivity, liveability and sustainability of Greater Sydney.

Figure 2-13 shows the current/committed Greater Sydney Bicycle Network alongside the envisioned 2056 Bicycle Network.

Figure 2-13 Current/committed and 2056 Greater Sydney Principal Bicycle Network



Source: https://future.transport.nsw.gov.au/wp-content/uploads/2018/plans/Greater_Sydney_Services_Infrastructure_Plan.pdf (2018)

2.3.3 The Western Sydney Infrastructure Plan (WSIP)

The Western Sydney Infrastructure Plan (WSIP) is delivering major road infrastructure upgrades to support an integrated transport solution for the region and capitalise on the economic benefits of developing the Western Sydney Airport at Badgerys Creek. These high-quality road improvements will deliver significant, ongoing safety and congestion-relieving benefits for customers. The WSIP comprises the following projects, as shown in **Figure 2-14**:

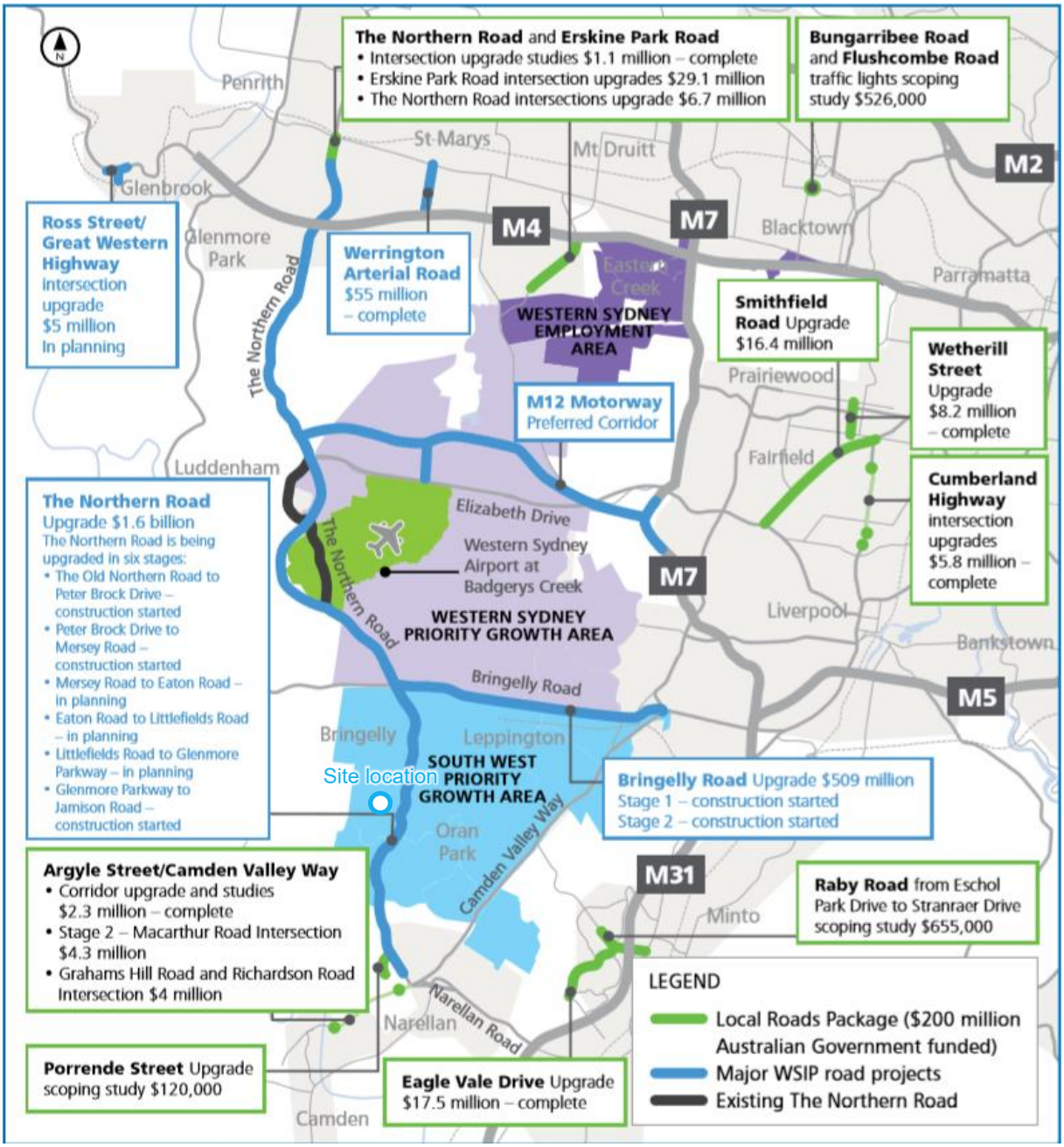
– The Northern Road upgrade project will upgrade approximately 35 kilometres of The Northern Road to a minimum of 4 lanes between The Old Northern Road, Narellan and Jamison Road, South Penrith (completed in 2020)

– The Bringelly Road upgrade involves the upgrade of approximately 10 kilometres of Bringelly Road between Camden Valley Way and The Northern Road (completed in 2020)

– The M12 Motorway project will provide an east-west link between the M7 Motorway and The Northern Road, while also providing a connection to the Western Sydney Airport

– The Local Roads package will enable a range of Western Sydney councils to complete minor road improvement works in the Western Sydney area.

Figure 2-14 The Western Sydney Infrastructure Plan projects



Source: The NSW Government (2017)

The WSIP road upgrades, particularly The Northern Road and Bringelly Road upgrades, are expected to improve accessibility to the site and are further described in the following sections.

2.3.4 Outer Sydney Orbital Corridor

TfNSW is currently identifying land for the Outer Sydney Orbital corridor, to be used to provide a future freight rail line and north-south motorway. It is planned to connect Box Hill in the north, and the Hume Motorway near Menangle in the south. The recommended corridor is designed to support the population, housing, freight requirements and job growth across Western Sydney.

In the future, there will be further investigations to identify land to enable the Outer Sydney Orbital to provide connections between the Illawarra and the Central Coast. This development may not commence construction for many years, however by identifying and protecting the land now stakeholders and the community will know exactly where the infrastructure will be built in the future.

Figure 2-15 Recommended Outer Sydney Orbital Corridor

Source: Transport for NSW, 2018

Implication for the site

The Outer Sydney Orbital travels approximately 2 kilometres to the west of the site and may have an interchange at Greendale Road, making it very convenient to access from/to the site. It could offer medium to long-term benefits especially reducing traffic loadings on The Northern Road, especially the longer distance regional trips.

2.3.5 North-South Rail Link / The South West Rail Link Extension

With the Western Sydney International (Nancy-Bird Walton) Airport and Aerotropolis at its centre, Western Sydney will have new economic and social opportunities, and be an exciting hub for new communities. The North-South Rail Line is a passenger rail line connecting St Marys with Macarthur, running from the Main West Line (T1 Western Line) to the Main South Line (T8 Airport and South Line). It will connect to the new Western Sydney Airport, Aerotropolis and surrounding business areas with the following key objectives:

– Provide a major transport link between the North West, Western Sydney, Greater Macarthur and South West Priority Growth Areas

– Provide transport options to support population, jobs and economic growth across Western Sydney and for the planned Western Sydney Airport

– Support future town centres to be designed and planned around transport infrastructure.

Over the next ten years, further impact assessments will be undertaken to allow the required infrastructure for the North-South Rail Link to be built. Currently, consultations are continuing to take place as part of future planning.

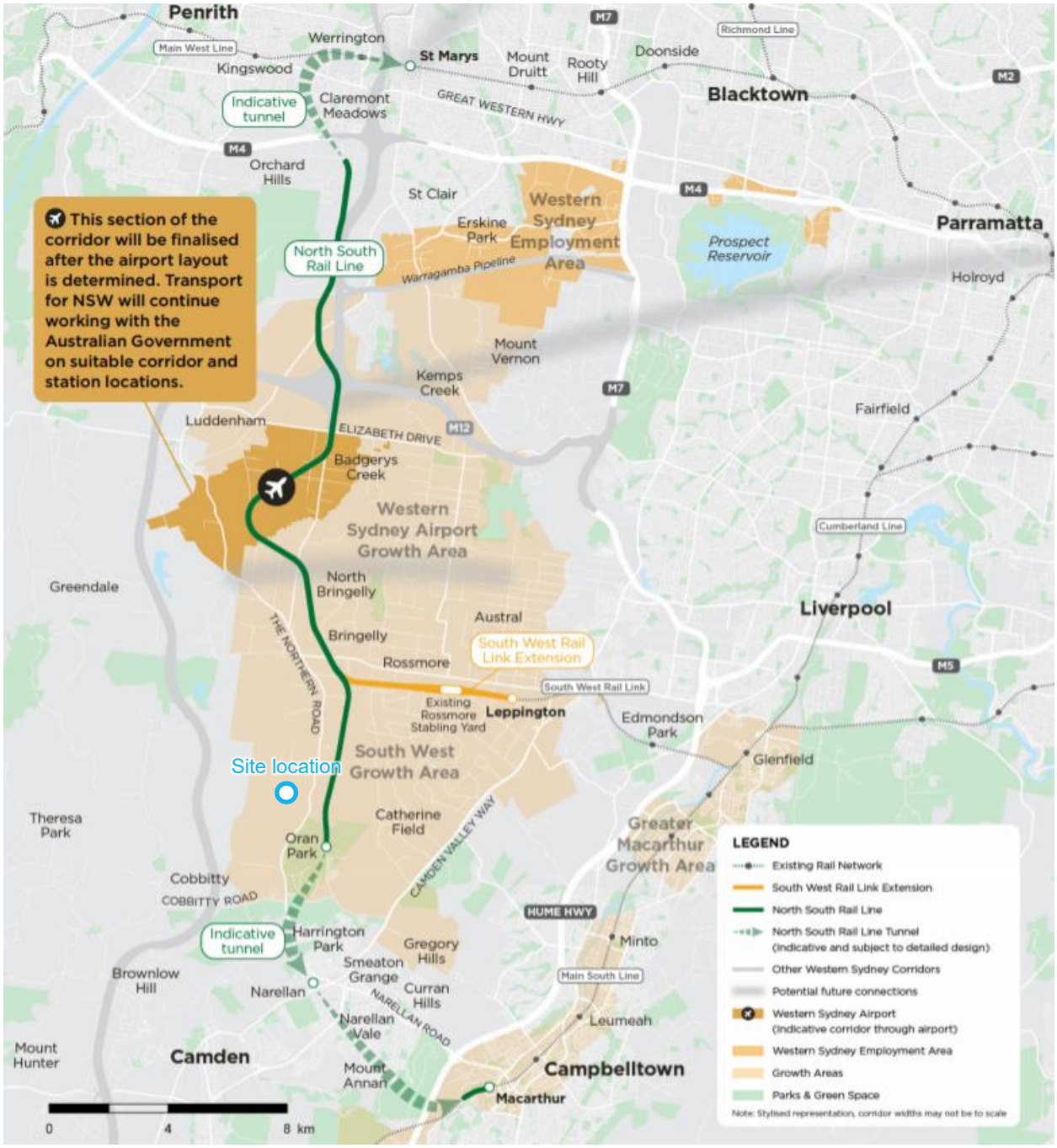
The South West Rail Link Extension Corridor project investigates how to provide transport infrastructure to support the proposed Western Sydney Airport and future urban development in Sydney's West. The proposed route is part of the Western Sydney Rail Needs Scoping Study and the initial plans for the route are to connect Leppington to Bringelly. **Figure 2-16** shows the map of the North-South Rail Link / The South West Rail Link Extension.

The first stage of the project has been committed, named Sydney Metro – Western Sydney Airport between St Marys to Western Sydney Airport and Badgerys Creek Aerotropolis. The 23-kilometre railway line will be a combination of tunnel, surface and viaduct sections. A total of six stations and two service facilities will be provided (**Figure 2-17**).

Implications to the site

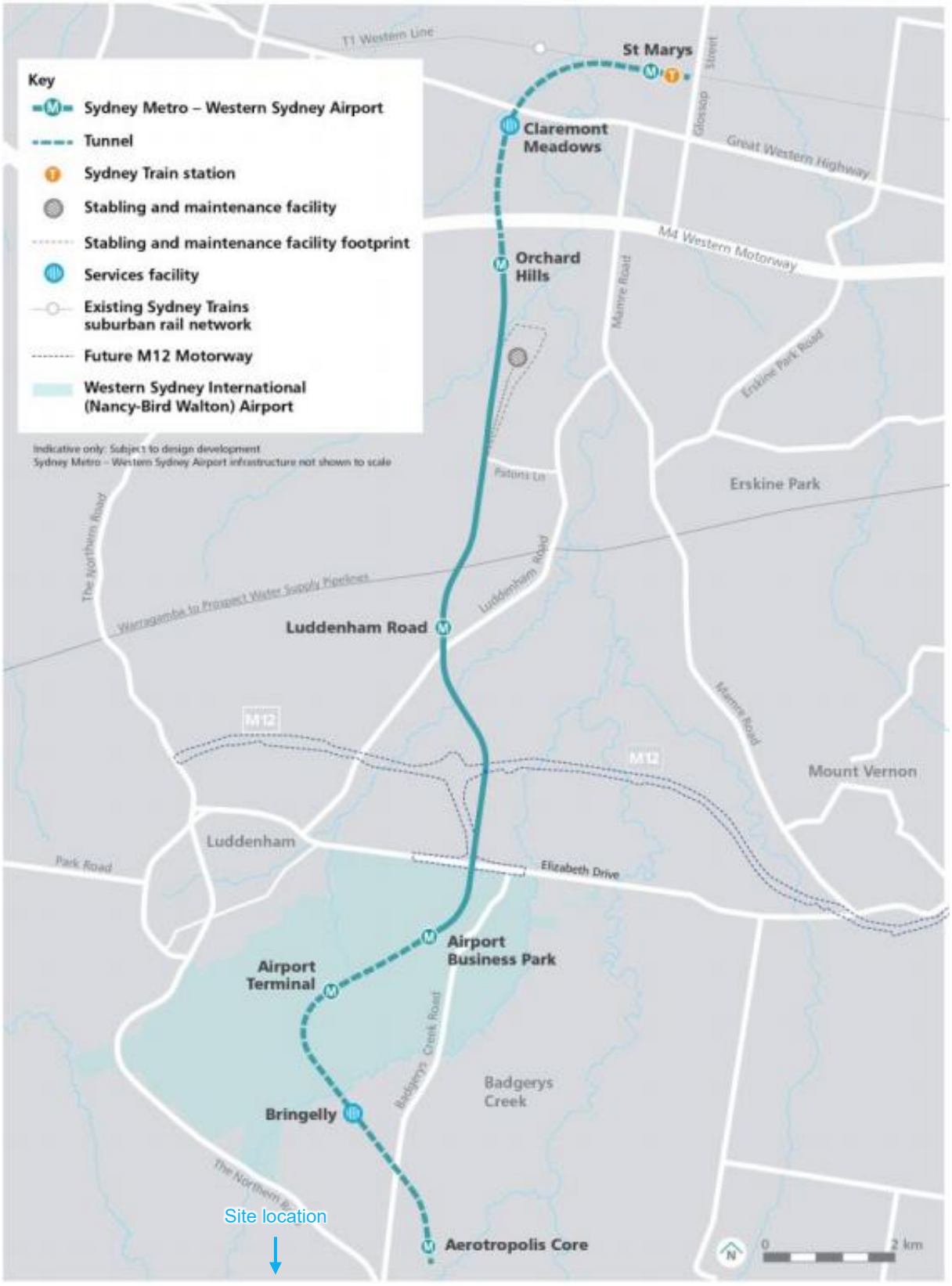
The delivery of the Sydney Metro – Western Sydney Airport and stations in the vicinity of the site at the Aerotropolis and Oran Park would improve rail access to the wider rail network of Greater Sydney, further reducing the reliance on private vehicles travel to the employment areas and activities.

Figure 2-16 Planned North-South Rail Link and South West Rail Link Extension



Source: Transport for NSW, 2020

Figure 2-17 The alignment of Sydney Metro – Western Sydney Airport



Source: Environmental Impact Statement for Sydney Metro, Western Sydney Airport, 2020

3.0 Existing Conditions

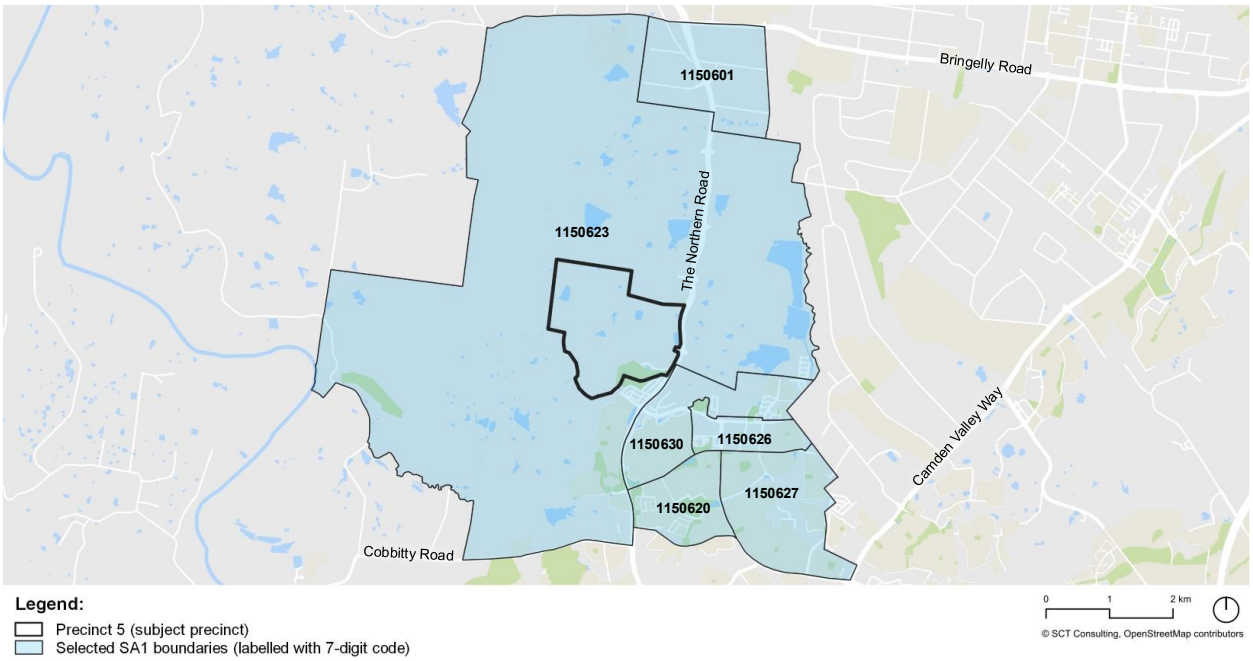
3.1 Travel behaviour

3.1.1 Method of Journey to Work data

Given the variability of the data in 2021 because of the COVID-19 lockdowns, the 2016 dataset is deemed as a more suitable measure for travel behaviour in Oran Park.

Method of Journey to Work (JTW) 2016 data for the relevant Statistical Areas level 1 (SA1) were analysed to determine the travel behaviour of the existing residents in the vicinity of the site as shown in **Figure 3-1**. All six selected SA1 locations are located within the Cobbitty-Leppington Statistical Areas Level 2 (SA2).

Figure 3-1 Study area for the method of JTW analysis



At the time of the JTW data being collected in 2016, about 2,862 trip samples were included in the survey for the area. According to the Australian Bureau of Statistics, people in employment are those of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit.

The study area showed a higher proportion of drivers, 72 per cent, in comparison to the 53 per cent of Greater Sydney, showing a high dependency on private car use. Train and bus usage was low at nine per cent given the commuting time to jobs by public transport, whereas Greater Sydney showed a total of 22 per cent. Active transport use was very low, i.e. zero per cent for cycling and one per cent for walking, given limited employment opportunities in the vicinity and the gap in cycling infrastructure provision to connect to the regional network. Around 20 per cent of the samples were working at home or other transport modes.

Of the 24,386 people who work in Camden Council Area, a large majority of workers (48 per cent) live in Camden LGA, followed by Campbelltown (17 per cent) and Wollondilly (14 per cent). Smaller origins include Liverpool (five per cent), and other origins across the Greater Sydney region each generating less than two per cent of work-related trips to Camden.

Around 30 per cent of the residents worked in the same Camden LGA followed by Campbelltown (16 per cent) and Liverpool (11 per cent). Other destinations of work-related trips were all below five per cent except the City of Sydney (seven per cent). Hence, the medium-long commuting distance to major employment tallies with the fact of high car use, which is relatively convenient and cost-effective in the transport context.

3.1.2 Household Travel Survey

The proposed site sits within the statistical area "Bringelly – Green Valley" as defined by the Australian Bureau of Statistics, 2019 / 2020 Household Travel Survey (HTS) as shown in **Figure 3-2**. For analysis, it was assumed that HTS data provides a suitable reflection of the travel characteristics during AM and PM peak hour periods on an average weekday, due to the high proportion of trips during this period associated with the journey to work trips.

The data collected during the COVID-19 lockdown was not regarded as a suitable representation of the region's travel habits. Therefore, the 2019/2020 HTS dataset, which was prior to the COVID-19 lockdown, was used.

Figure 3-2 Study area for household travel survey analysis

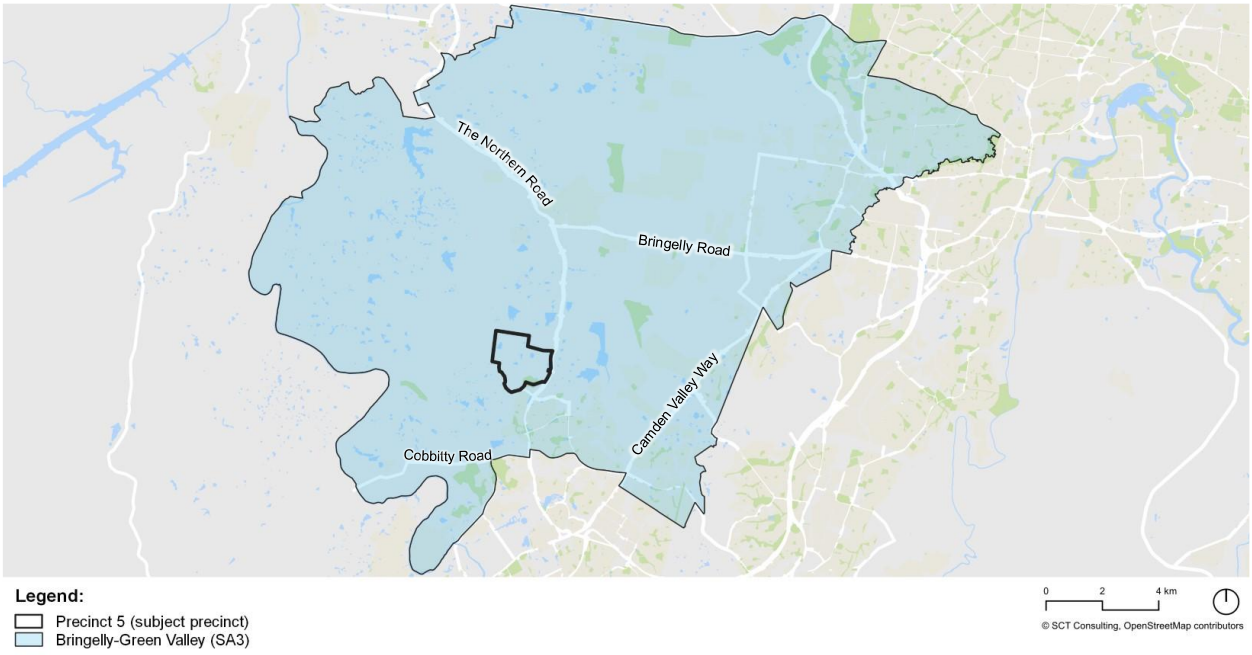


Table 3-1 and **Table 3-2** provide a summary of the overall mode choice and purpose of travel by residents of Bringelly – Green Valley against the Sydney average. The average travel distance for each category was also listed.

Table 3-1 Household travel survey – residents within Bringelly – Green Valley, travel by mode

Mode of travel	Bringelly – Green Valley		Greater Sydney	
	Percentage of total trips	Average distance	Percentage of total trips	Average distance
Vehicle Driver	51.1%	13.3 km	39.8%	9.9 km
Vehicle Passenger	29.4%	9.3 km	17.4%	8.1 km
Train	3.1%	26.5 km	5.7%	17.9 km
Bus	2.9%	9.1 km	4.8%	7.5 km
Walk Only	5.8%	0.5 km	14.8%	0.8 km
Walk Linked	6.5%	0.5 km	15.9%	0.6 km
Other	1.3%	5.3 km	1.6%	5.9 km
Total	100%	-	100%	-

Source: https://www.transport.nsw.gov.au/data-and-research/passenger-travel/surveys/household-travel-survey-hts, 2020

The study area had more vehicle drivers and vehicle passengers at 51.1 per cent and 29.4 per cent compared to Greater Sydney's 39.8 per cent and 17.4 per cent. Higher vehicle occupancy was observed in the study area due to 12 per cent more vehicle passenger mode share.

Comparatively, other modes of transport such as train and walking (both linked and unlinked) trips were close to half the Greater Sydney average due to the long distance to activities and low-density development and jobs. Additionally, the average distance travelled by train exceeded 25 kilometres, reflecting that destinations worth travelling to by train are further away than jobs that are accessible by car.

Table 3-2 Household travel survey – residents within Bringelly – Green Valley, travel by purpose

Trip purpose	Bringelly – Green Valley		Greater Sydney	
	Percentage of total trips	Average distance	Percentage of total trips	Average distance
Commute	15.1%	22.4 km	17.0%	15.7 km
Work-related business	10.1%	22.5 km	6.3%	16.4 km
Education/childcare	15.3%	7.8 km	10.0%	6.3 km
Shopping	9.4%	6.7 km	15.4%	5.5 km
Personal business	5.2%	8.4 km	5.5%	7.0 km
Social/recreation	19.8%	10.1 km	25.3%	8.4 km
Serve passenger	24.1%	8.0 km	18.2%	5.8 km
Other	1.0%	11.3 km	2.2%	4.7 km
Total	100%	-	100%	-

Source: https://www.transport.nsw.gov.au/data-and-research/passenger-travel/surveys/household-travel-survey-hts, 2020

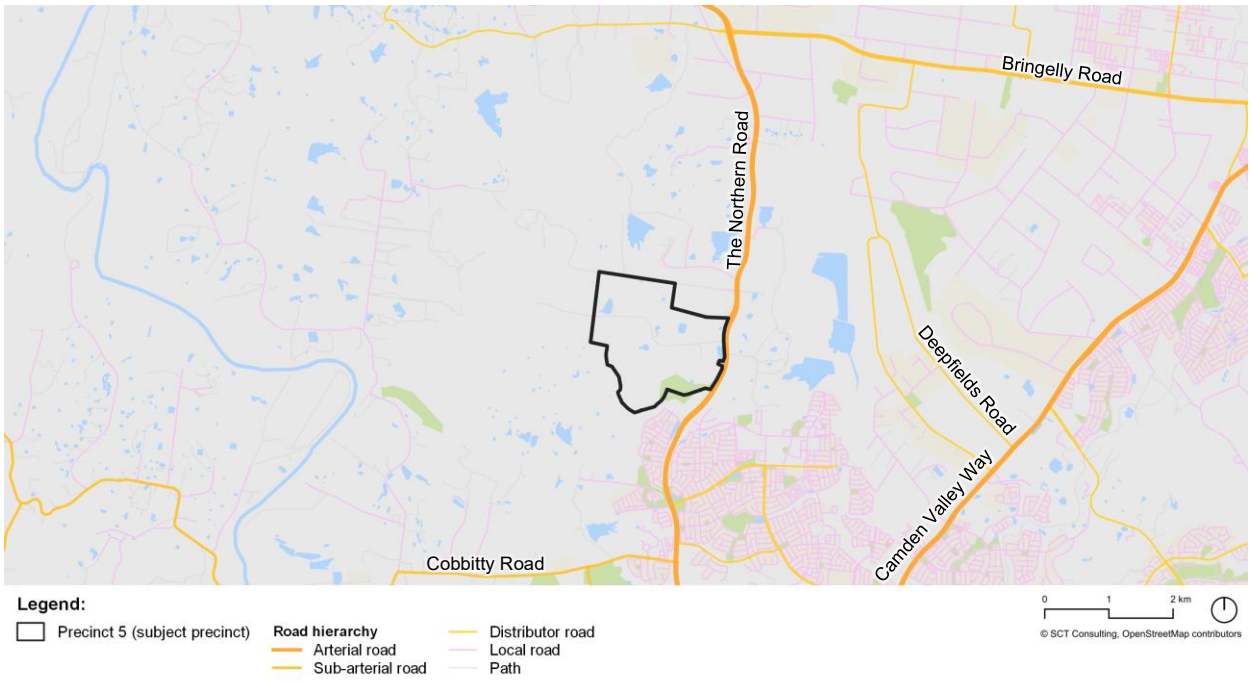
The main trip purpose in Bringelly – Green Valley was ‘serve passengers’ at 24.1 per cent, followed by social/recreation at 19.8 per cent. This is the exact opposite of the Greater Sydney average as social/recreation was the main trip purpose at 25.3 per cent, followed by serve passengers at 18.2 per cent.

The average distance travelled by all modes of transport and by trip purposes were both around 12.15 kilometres which was 39 per cent longer than Greater Sydney (8.7 kilometres). This can be attributed to the area’s long distance to Sydney CBD, requiring residents to travel further to reach destinations. Trip purposes showed a further average distance travelled in comparison to Greater Sydney such as work-related business, which is related to jobs in Sydney CBD or other strategic centres. The low use of active transport also tallies with this increased distance.

3.2 Road network and classification

The major roads in the vicinity of the site include The Northern Road, Bringelly Road, Greendale Road, and Dick Johnson Drive. The road network is shown in **Figure 3-3**.

Figure 3-3 Road network around the site



The characteristics of the key road network, surrounding the subject site are:

– **The Northern Road**, managed by TfNSW, forms part of the A9 Western Sydney Bypass. It is an arterial road running adjacent to the east of the subject site and connects Narellan Road to the south to the Great Western Highway to the north. The Northern Road provides direct access from the site to the Western Sydney, SWGA and Western Sydney Airport at Badgerys Creek, north of the site. The site can access The Northern Road via Greendale Road, Loftus Road and Belmore Road. The Northern Road has recently been upgraded by TfNSW from two lanes to a four-lane divided road (with dedicated bus lanes at intersection approaches). The provision of a wide median allows for six traffic lanes in the future. The Northern Road has a posted speed limit of 80 km/h. A dedicated off-road shared path runs along the eastern side of this corridor.

– **Bringelly Road** is a sub-arterial road, managed by TfNSW and connects The Northern Road at Bringelly, through to Camden Valley Way at Horningsea Park. It is approximately 10 kilometres in length and was an undivided carriageway with one lane in each direction. Bringelly Road is now being upgraded from two lanes to a six-lane divided road between the eastern side of Upper Canal Bridge and the western side of the Eastwood Road Intersection, through the future Leppington Town Centre. The rest of Bringelly Road will also be upgraded from two lanes to a four-lane divided road with a central median. The speed limit varied from 40 km/h to 80 km/h depending on different land use along the road.

– **Greendale Road** is an undivided carriageway under the management of Liverpool City Council. It is 16 kilometres long and contains one lane in each direction with unsealed shoulders. It is a collector road that connects Park Road at Wallacia to Bringelly Road where it intersects with The Northern Road signalised intersection. Greendale Road typically has a signposted speed limit of 80 km/h with residential precincts signposted at a 60 km/h speed limit.

– **Dick Johnson Drive** is a newly constructed 4-lane sub-arterial road that provides an east-west connection between The Northern Road and Oran Park Town Centre. It meets The Northern Road at a set of traffic lights and then extends further west as a two-lane sub-arterial road that provides a future connection to Precinct 5.

3.3 Aimsun traffic model development

SCT Consulting prepared an Aimsun mesoscopic model, including developing, calibrating, and validating the Base Aimsun mesoscopic model for the study area as per Traffic Modelling Guidelines (RMS, 2013).

The study area for mesoscopic modelling area is provided in **Figure 3-4** (overleaf).

The model was calibrated and validated in line with the Traffic Modelling Guidelines (RMS, 2013), specifically the 'Highway Assignment Modelling' chapter. This included:

– Calibrating two-hour model for morning peak and three-hour model for afternoon peak.

– Meeting turn volume and R^2 criteria as outlined in Table 10.3 (screen line, cordon, and link criteria are not used).

– Satisfying travel time calibration criteria as specified in Table 10.4.

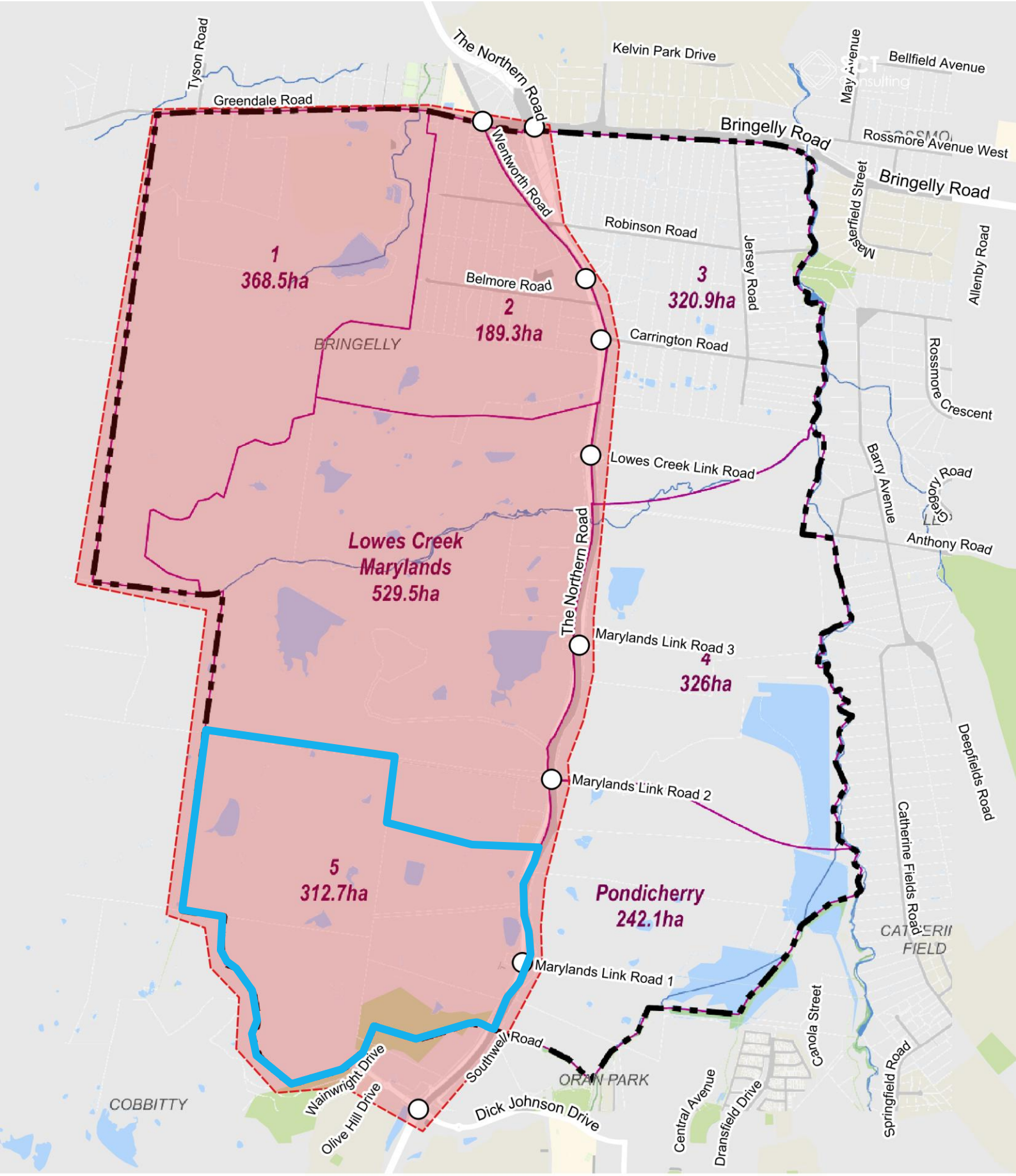
Turning movement count surveys were conducted on Tuesday 12 November 2024 at twelve key intersections. The data collected from these intersection surveys has been used to generate base year demand matrices, which serve as inputs for the base model.

Data was collected for light vehicles, heavy vehicles, buses, cyclists, and pedestrians at 15-minute intervals. Based on the survey volumes, the peak periods for modelling are summarised in **Table 3-3**.

Table 3-3 Survey and model duration

Peak	Survey duration	Peak period for modelling	Duration
AM peak	6.30–9.30am	6.30–8.30am	2 hours
PM peak	3.30–6.30pm	3.30–6.30pm	3 hours

The model was endorsed by TfNSW as fit for purpose. Detailed reporting on the calibration and validation is provided in **Appendix B**.



Modelled Intersections
Model Study Area
Precinct boundaries
Site boundary

Figure 3-4 Traffic modelling study area

0 0.5 1 km

3.4 Existing traffic performance

Intersection Level of Service (LoS) is a typical measure used by traffic engineers to identify when roads are congested. The Level of Service, as defined in the *Traffic Modelling Guidelines* (Roads and Maritime Services, 2013), is provided in **Table 3-4**.

Table 3-4 Level of Service definitions

Level of Service	Average delay (d) per vehicle in seconds	Performance explanation
A	d ≤ 14.5	Good operation
B	14.5 < d ≤ 28.5	Good with acceptable delays and spare capacity
C	28.5 < d ≤ 42.5	Satisfactory
D	42.5 < d ≤ 56.5	Operating near capacity
E	56.5 < d ≤ 70.5	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control method.
F	d > 70.5s	Unsatisfactory with excessive queuing, requires other control method.

Source: Roads and Maritime Services, 2002, *Traffic Modelling Guidelines* and Akcelik & Associates, 2024, *SIDRA Intersection User Guide*.

There is a difference between LoS determination between traffic signals and non-signalised. For traffic signals, the average movement delay and level of service should be taken over all movements. For roundabouts and priority control intersections (with Stop and Give Way signs or operating under the T-junction rule), the critical movement for LoS assessment should be the one with the worst movement delay.

As acknowledged in the *Guide to Transport Impact Assessments* (Transport for NSW, 2024), a comparison of the existing and future average delay provides a better appreciation of the impact of a proposal, and not simply the change in the level of service.

The intersection performance during the morning peak is provided in **Table 3-5** and the afternoon peak is shown in **Table 3-6** (overleaf).

Table 3-5 Existing (2024) morning peak performance – Aimsun assessment

Intersection	6.30-7.30am			7.30-8.30am		
	Demand	Delay	LoS	Demand	Delay	LoS
Bringelly Road | Wentworth Road	204	14.8	B	256	2.3	A
The Northern Road | Bringelly Road	1713	27.5	B	1699	26.2	B
Bringelly Road | Kelvin Park Road	1696	4.6	A	1635	5.4	A
The Northern Road | Belmore Road	2495	13.5	A	2580	4.6	A
The Northern Road | Lowes Creek Link Road	2459	0.7	A	2571	1.2	A
The Northern Road | Maryland Link Road 3	2442	0.6	A	2518	0.6	A
The Northern Road | Maryland Link Road 2	2465	0.8	A	2508	0.8	A
The Northern Road | Maryland Link Road 1	2654	4.4	A	2617	3.1	A
The Northern Road | Dick Johnson Drive	2643	16.6	B	2949	17.7	B
The Northern Road | Peter Brock Drive	2561	18.4	B	3437	21.2	B

The results show that the demands are significantly below the capacity of the network. All intersections operate with minimal delays.

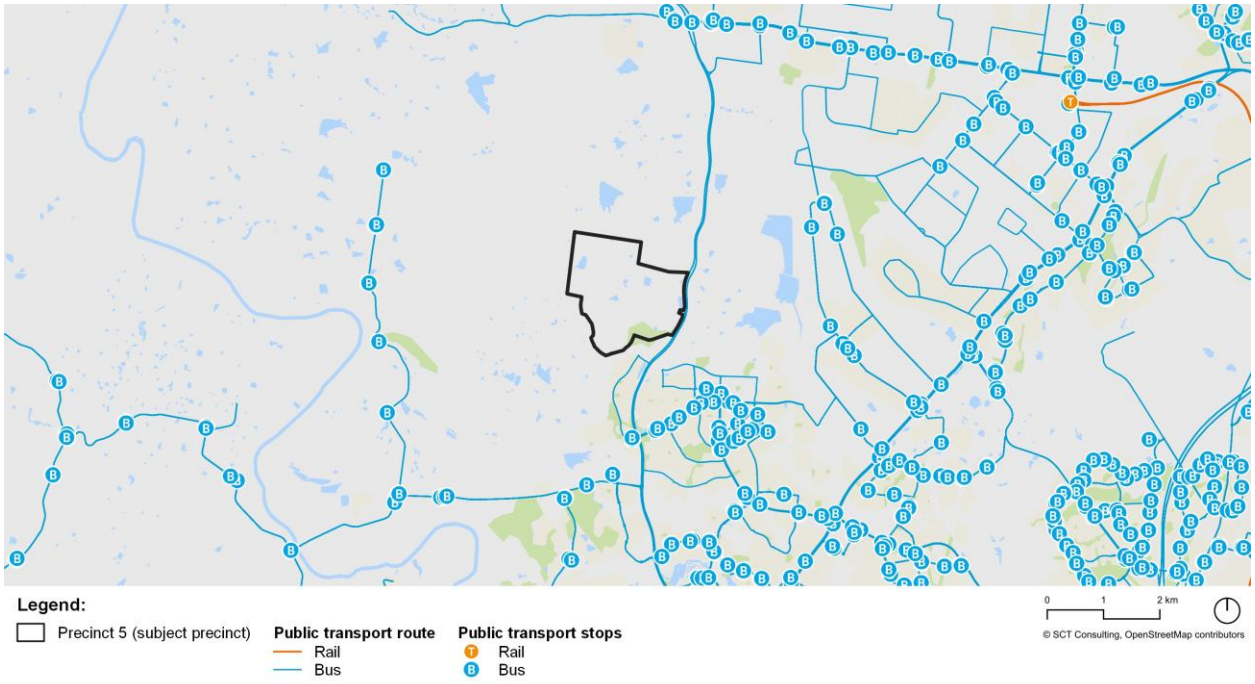
Table 3-6 Existing (2024) afternoon peak performance – Aimsun assessment

Intersection	3.30-4.30pm			4.30-5.30pm			5.30-6.30 pm		
	Demand	Delay	LoS	Demand	Delay	LoS	Demand	Delay	LoS
Bringelly Rd | Wentworth Rd	279	8.4	A	314	10.6	A	314	10.6	A
The Northern Rd | Bringelly Rd	1645	17.6	B	1685	19.2	B	1685	19.2	B
Bringelly Rd | Kelvin Park Rd	1607	4.1	A	1575	3.6	A	1575	3.6	A
The Northern Rd | Belmore Rd	2590	2.0	A	2806	1.4	A	2809	1.5	A
The Northern Rd | Lowes Creek Link Rd	2590	1.3	A	2802	0.9	A	4674	0.6	A
The Northern Rd | Maryland Link Rd 3	2553	0.4	A	2797	0.7	A	2797	0.7	A
The Northern Rd | Maryland Link Rd 2	2539	1.0	A	2804	1.6	A	2804	1.6	A
The Northern Rd | Maryland Link Rd 1	2645	4.6	A	2973	4.5	A	2973	4.5	A
The Northern Rd | Dick Johnson Dr	2941	17.5	B	3281	17.4	B	5197	11.0	A
The Northern Rd | Peter Brock Dr	3614	18.9	B	3825	19.5	B	3825	19.5	B

3.5 Public transport network

Public transport facilities around the site are shown in **Figure 3-5**.

Figure 3-5 Public transport around the site



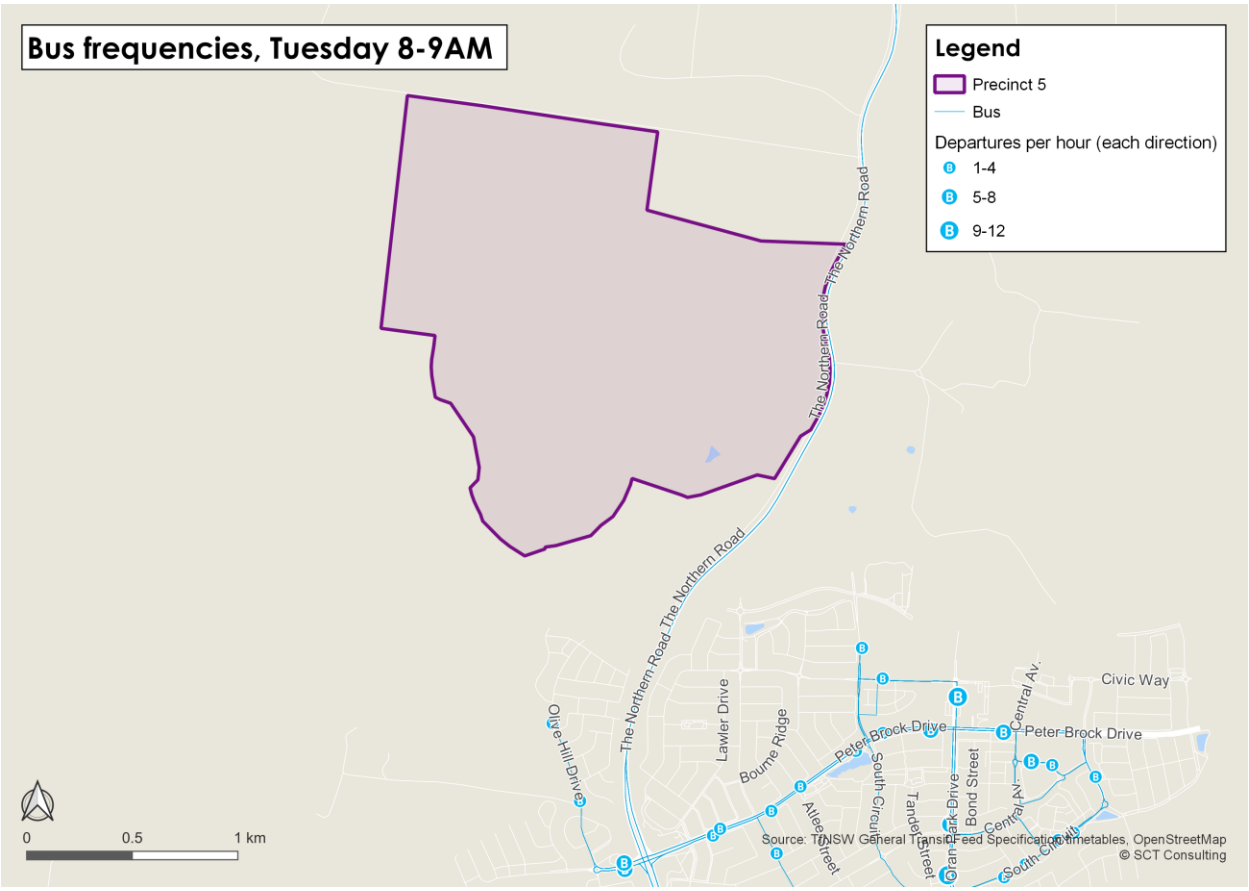
Leppington train station is the closest station (seven kilometres) from the site, which provides around seven services per hour during a typical morning peak hour. It is the terminal of T2 Inner West and Leppington Line and T5 Cumberland Line, which provide direct connectivity to several of Sydney's key commercial, and population centres including Liverpool, Parramatta, Strathfield, and Sydney CBD. The station provides new facilities, a park-and-ride service area and large commuter car parks.

There is bus route 856 on Bringelly Road and The Northern Road (north of the site), providing service between Bringelly to Liverpool via Leppington Station and Prestons. The frequency of the 856 buses is very low – about five to six services per day in each direction with most of the activity occurring during peak hours.

To the south of the site, bus route 896 operates between Campbelltown and Oran Park via Gregory Hills. It provides up to 2 services per hour throughout the day, as shown in **Figure 3-6**.

No other bus services operate on The Northern Road in proximity to the subject site. Public school students from Bringelly Public School and Rossmore Primary School are offered school bus services in the area.

Figure 3-6 Service frequency at the bus stops during a typical weekday AM peak hour



Based on the travel behaviour analysis of the study area identified in **Section 3.1**, due to the relatively long distance to major employment destinations and activities, public transport was not an attractive transport mode in the local area. The modal shift could take place when new development and public transport infrastructure are delivered in the vicinity.

3.6 Active transport

Given the rural nature and lack of urban development in the vicinity of the site, pedestrian and cycling accessibility are generally poor.

Concrete footpaths are available only along both sides of Dick Johnson Drive at the southern end of the study area.

There are few cycling opportunities around the site as there are no cycleways along major roads. However, a dedicated off-road shared path is running along the eastern side of The Northern Road corridor with the recent upgrade completed.

Walking and cycling opportunities via dedicated infrastructure are currently very limited. However, the active transport mode share might increase after the delivery of the structure plan in the future and the connection to a wider cycle path network such as the shared path along The Northern Road.

4.0 The planning proposal

4.1 Proposed development

JJ Cobbitty Developments Pty Ltd (JJCD) is creating and delivering market-leading, quality residential and commercial communities where Australians live and work. JJCD has identified future dwelling demand in key growth corridors across South West Sydney – concerning projected population growth and proximity to the Western Sydney International (Nancy-Bird Walton) Airport and the greater Aerotropolis.

This region is further supported by a range of significant infrastructure committed by all levels of government, including, The Northern Road upgrade, the M12 Motorway, and Sydney Metro Western Sydney Airport.

4.1.1 Proposed land use (Indicative Layout Plan)

This planning proposal is seeking to rezone 150.21ha of land within Precinct 5. The remainder of Precinct 5 is owned by a separate landowner, which is not subject to this Planning Proposal. The intended outcome of this planning proposal is to amend the Parkland City SEPP as follows:

– Incorporate the site on the 'Land Application Map' for the Parkland City SEPP

– Rezone the land to part:

  - C2 Environmental Conservation
  - C4 Environmental Living
  - B4 Mixed Use
  - R2 Low Density Residential
  - R3 Medium Density Residential
  - RE1 Public Recreation
  - SP2 Infrastructure

– Introduce building heights as follows:

  - 9 metres for low-density residential uses, allowing for developments of up to two storeys in height.
  - 12 metres for medium-density residential uses, allowing for development of up to three storeys in height.

The ILP of Cobbitty – Sub-Precinct 5 (Part) is provided in **Figure 4-1**. The Planning Proposal is supported by a revised Indicative Layout Plan which will accommodate approximately 2,650 residential dwellings.

The proposed ILP has also sought to embed the Government Architect's Connecting with Country design framework through its design. The ILP has designed with Country by protecting ridgelines; creeks and view corridors; celebrating the riparian corridors and waterways through incorporation into open space and locating key uses on flat parts of the site to limit cut and fill. The proposed amendments seek to transition the existing rural landscape into a new residential community, which importantly builds on the NSW Government's vision and aspirations under the Western Sydney Growth Areas program. In line with the NSW Government's vision, a diverse range of housing typologies will be planned, targeted for and delivered to meet the residential market desire in Southwest Sydney.

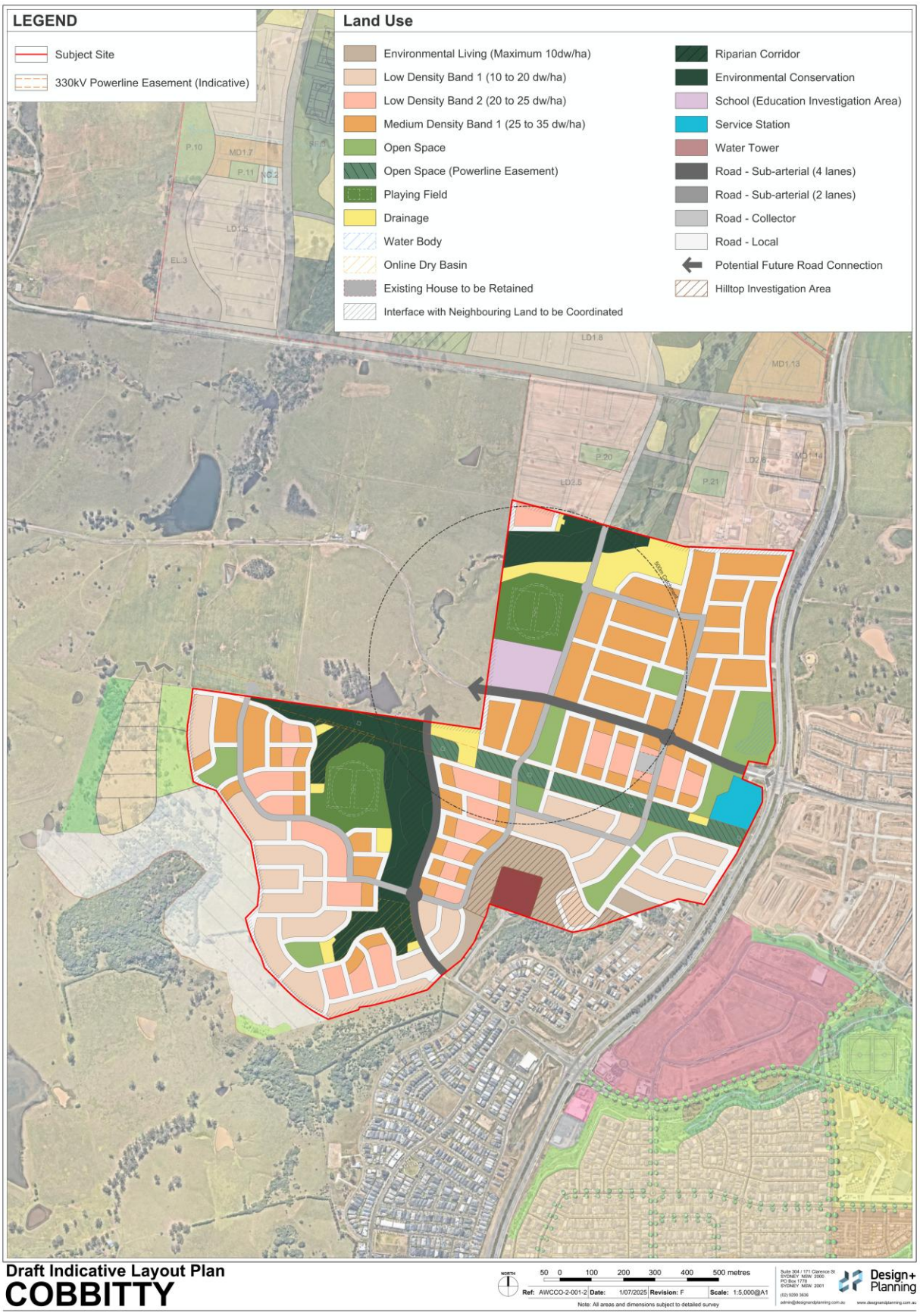
The proposed yield of the Cobbitty – Sub-Precinct 5 (Part) ILP is shown in **Table 4-1**.

Table 4-1 Proposed yield of Cobbitty – Sub-Precinct 5 (Part) ILP

Use	Yield[3]	Source
Environmental living (10 dwellings/ha)	56 dwellings	Design+Planning Yield Calculation Rev F, dated 23 October 2025
Low density housing (10 – 25 dwellings/ha)	1,017 dwellings	
Medium density housing (32 dwellings/ha)	1,577 dwellings	
School	1 primary school	Design+Planning ILP Rev F, dated 23 October 2025
Service station	800 sqm of retail GFA	

[3] It is noted that the yields are the best and most realistic estimates at the time of preparing this version of the ILP and will continue to evolve as the ILP develops. Updates to the yield post and modelling of the maximum development potential will occur post gateway.

Figure 4-1 Cobbitty – Sub-Precinct 5 (Part) ILP



Source: Design+Planning, 2026

4.2 Proposed transport network

The proposed transport network needs to cater to the travel characteristics of the proposed land uses and integrate appropriately with the surrounding network.

The majority of trips leaving Cobbitty – Sub-Precinct 5 (Part) are expected to be by private vehicle, so the most important interface for the precinct is with the existing road network.

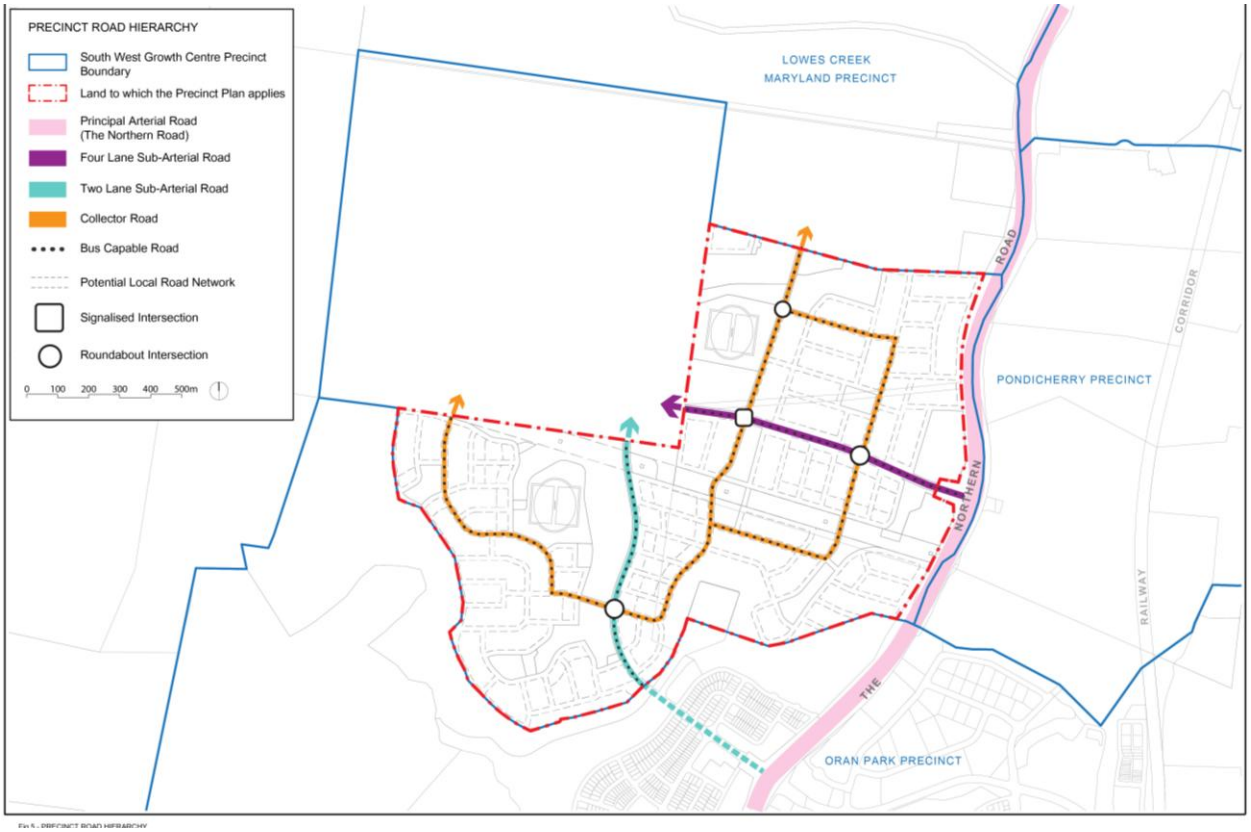
4.2.1 Road network and hierarchy

The Lowes Creek Maryland ILP identified a road network structure that extended beyond the precinct that could be extended further south towards the Oran Park precinct. The Cobbitty – Sub-Precinct 5 (Part) ILP proposes to continue these north-south connections as they form legible alternatives to The Northern Road for travel between precincts as well as ensuring that vehicles can access the main intersections along The Northern Road.

The Northern Road upgrade has already identified several intersection connections that have recently been constructed along with the corridor interfacing with the South Creek West Land Release Area, so the main role of the Cobbitty – Sub-Precinct 5 (Part) ILP is to connect effectively with these intersections with the right hierarchy roads.

The Cobbitty – Sub-Precinct 5 (Part) ILP road network has a direct connection with The Northern Road at the traffic lights at Marylands Link Road 1. **Figure 4-2** below shows the future road network proposed as part of the Cobbitty – Sub-Precinct 5 (Part) ILP, focusing on sub-arterial and collector roads.

Figure 4-2 Future road network hierarchy



Source: Design+Planning, 2025

Key features of the road network are:

- A north-south (four-lane) sub-arterial road network within Cobbitty – Sub-Precinct 5 (Part) ILP that connects from Precinct 2 at Greendale Road through Lowes Creek Maryland precinct and to Oran Park and provides an alternative to The Northern Road between Bringelly Road and Marylands Link Road 1
- A 2-lane sub-arterial as a branch from the north-south sub-arterial to provide a connection to Dick Johnson Dr
- A network of collector roads that provide a connection between the sub-arterial roads and the local roads.

4.2.2 Public transport network

The bus network that would service the Cobbitty – Sub-Precinct 5 (Part) ILP is not able to be resolved at this time due to the concurrent planning processes for Western Sydney Airport, the Aerotropolis, Sydney Metro Greater West as well as other land use changes and transport projects. Each of these projects has implications for the bus network at a strategic level, changing key destinations, route options and types of bus services required.

The critical contribution of this proposal is to maximise the potential for buses to service the precinct to ensure integration with any potential future schemes. The entirety of the sub-arterial and collector road network is proposed to be bus capable (as shown in **Figure 4-2**), ensuring full integration with any future scheme. Although the local road network will continue to evolve, the cross-section of local roads is also bus capable (with a 9m carriageway width).

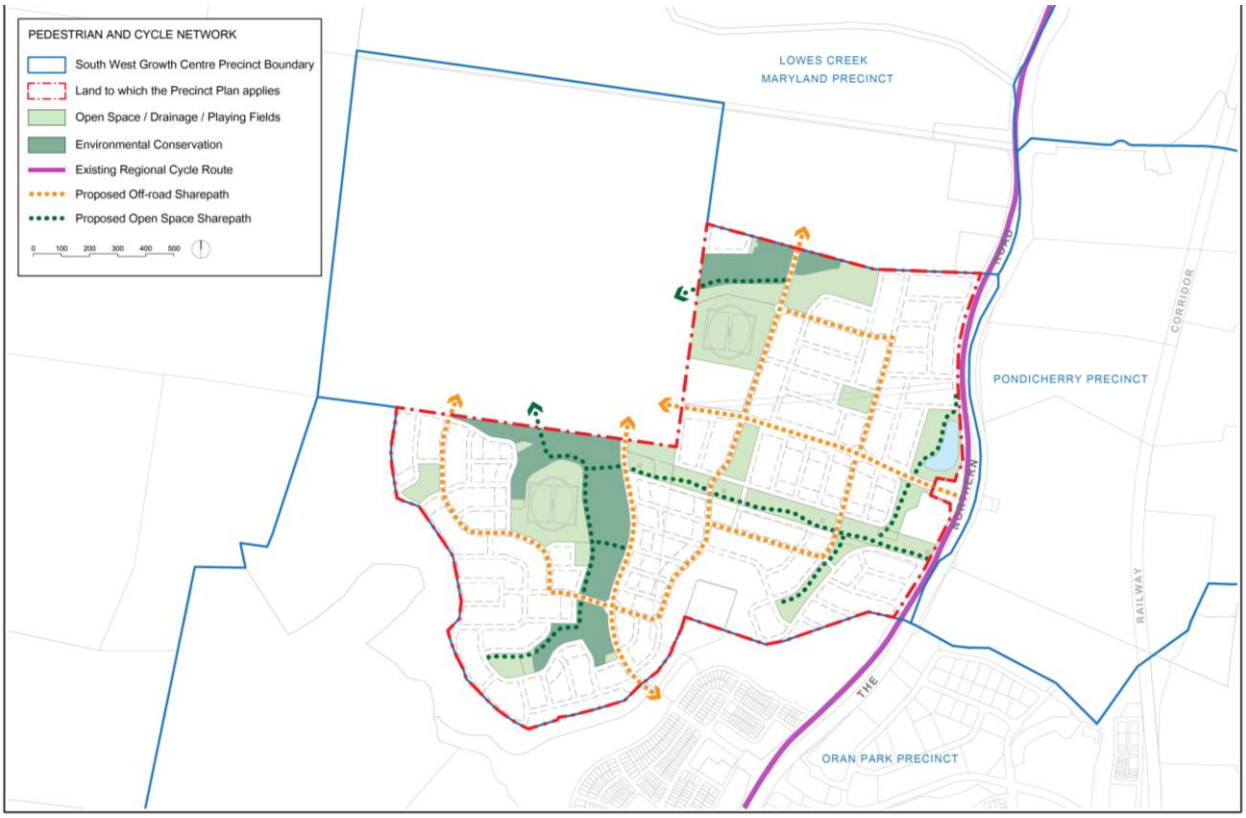
A full network of bus-capable roads will ensure that the entirety of the residential areas in the precinct is within 400 m of potential bus routes.

The network is also in a grid-like fashion, with the sub-arterial and collector roads forming north-south and east-west access ways. This enables higher-order bus routes, such as suburban bus routes, to operate efficiently within the precinct and in connection with surrounding centres such as Oran Park.

4.2.3 Active transport network

As the precinct is being designed from a blank slate, there are extensive opportunities for high-quality walking and cycling facilities. All of the roads proposed in the precinct will have footpaths on both sides. The sub-arterial and collector roads are also proposed to have shared paths on both sides. When paired with the shared path proposed on the eastern side of The Northern Road, cycling provision is extensive within the precinct. **Figure 4-3** shows the proposed cycle network.

Figure 4-3 Proposed pedestrian and cycle network



Source: Design+Planning, 2025

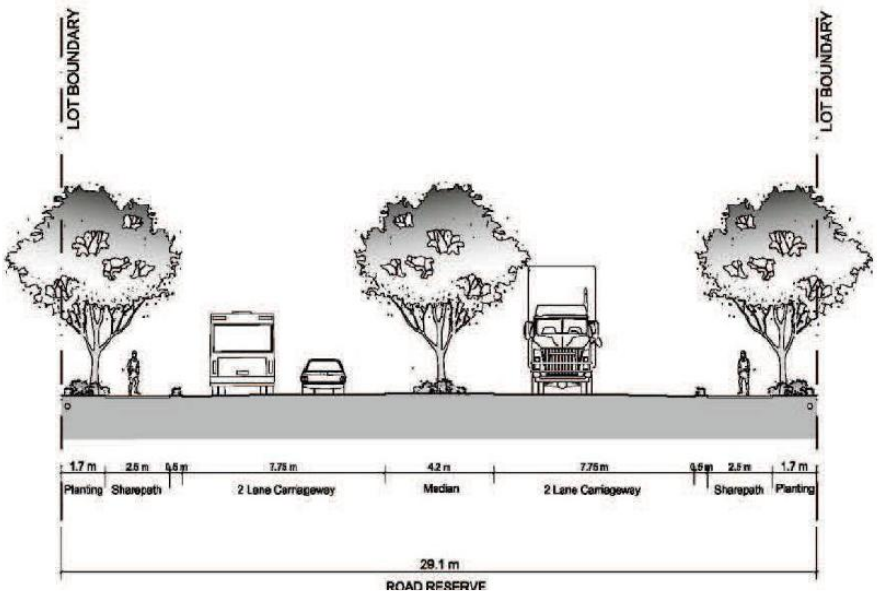
The grid-like cycling network enables cyclists to have high-quality facilities for longer-distance trips as well as shorter-distance trips to the local open spaces. The Cobbitty – Sub-Precinct 5 (Part) ILP is also supplemented by a network of shared paths in the open space network that allows future families to enjoy recreational activities and for children to travel to school on foot or by cycling.

4.2.4 Proposed cross-section requirements

Cross-sections for the sub-arterial, collector and local roads are based on proposed sections from Camden Growth Centres Development Control Plan (DCP), to ensure consistency of road layout and cross-section across sites.

A 29.1m road reserve is proposed for the (4-lane) sub-arterial road in the Cobbitty – Sub-Precinct 5 (Part) ILP, based on the Camden Growth Centres DCP. The width allows for bus-capable travel lanes and segregated shared paths on both sides of the road, which supports public transport, walking and cycling access. The proposed cross-section is shown in **Figure 4-4**.

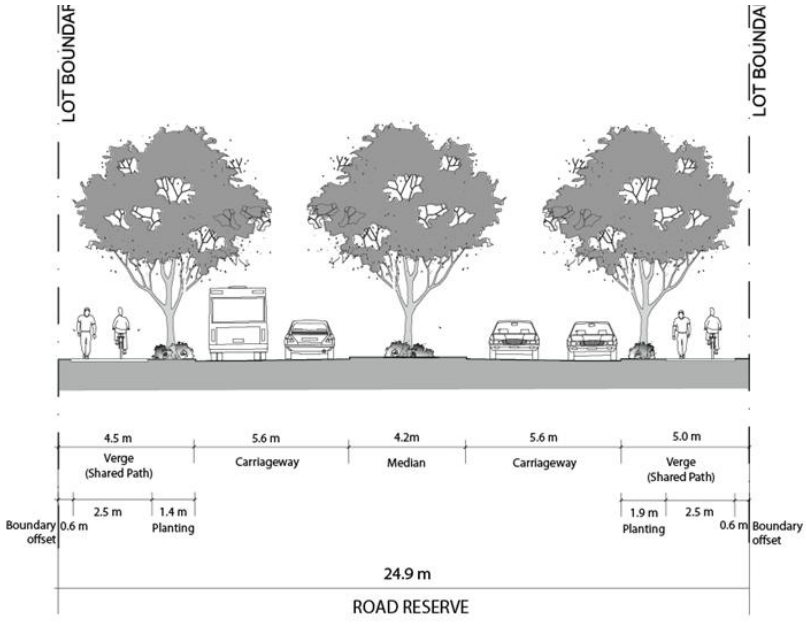
Figure 4-4 Proposed (4-lane) sub-arterial road cross-section



Source: Camden Growth Centres DCP

A 24.9m road reserve is proposed for the (2-lane) sub-arterial road in the Cobbitty – Sub-Precinct 5 (Part) ILP, which provides an alternative connection between the 4-lane sub-arterial road and Dick Johnson Drive. This cross-section is consistent with the cross-section of the Dick Johnson Drive extension to the west of The Northern Road. The proposed cross-section is shown in **Figure 4-5**.

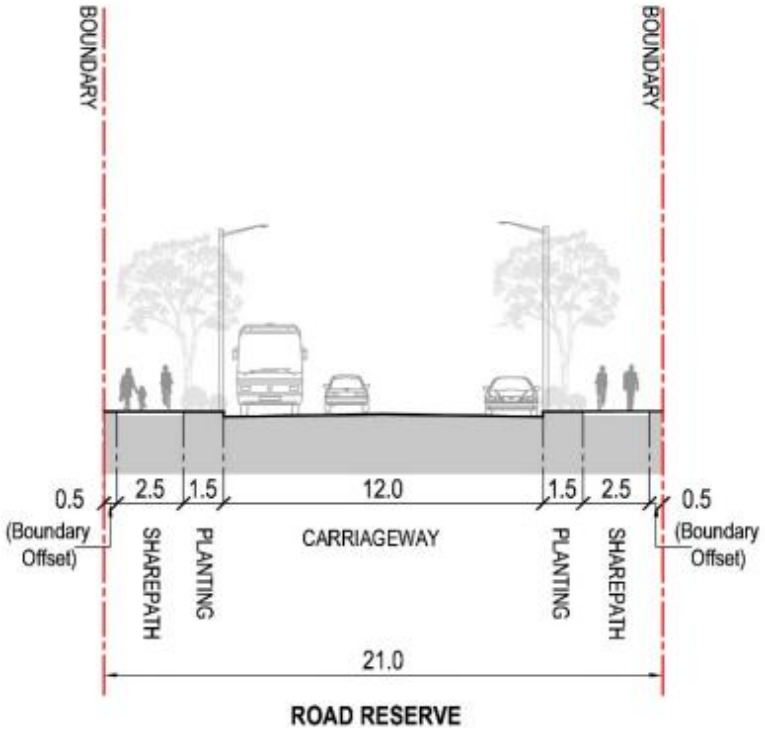
Figure 4-5 Proposed (2-lane) sub-arterial road cross-section



Source: Design+Planning, 2024

A 21.0m road reserve is proposed for collector roads in the Cobbitty – Sub-Precinct 5 (Part) ILP, based on the Camden Growth Centres DCP. The width allows for one bus-capable travel lane and one parking lane in each direction. Segregated shared paths are proposed on both sides of the road, which support walking and cycling access. The proposed cross-section is shown in **Figure 4-6**.

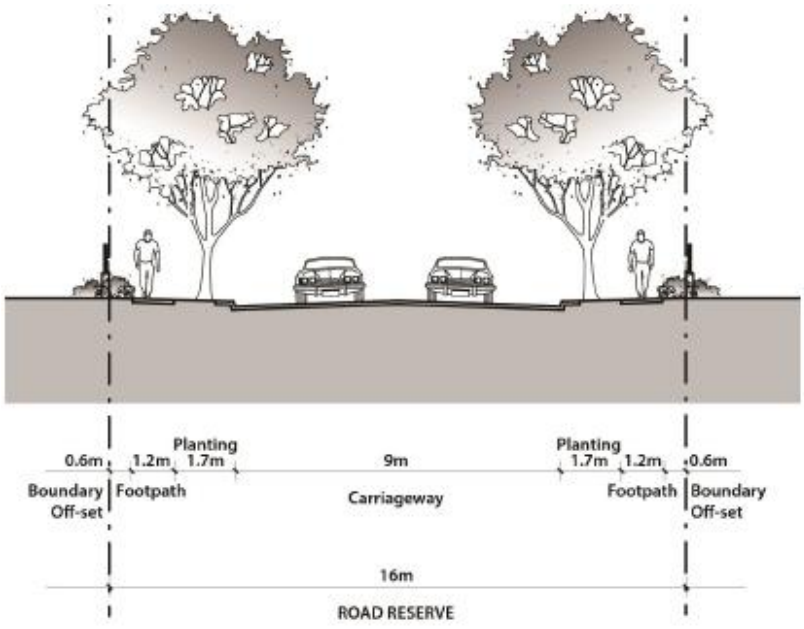
Figure 4-6 Proposed collector road cross-section



Source: Camden Growth Centres DCP

A 16.0m road reserve is proposed for local roads in the Cobbitty – Sub-Precinct 5 (Part) ILP, based on the Camden Growth Centres DCP. A 9.0m carriageway is proposed that allows local traffic to travel and park in both directions. Footpaths are proposed on both sides of the road. The cross-section is replicated in **Figure 4-7**.

Figure 4-7 Proposed local road cross-section



Source: Camden Growth Centres DCP

4.3 Travel Demand Management measures

Sustainable transport and Travel Demand Management (TDM) strategies involve the application of policies, objectives, measures and targets to influence and encourage the uptake of sustainable forms of transport, i.e., non-car modes, wherever possible. TDM measures have proven to reduce congestion created by growth within urban areas and unlock urban renewal opportunities. They result in travel behaviour that uses less road space than single-occupant vehicle commutes and takes advantage of spare transport capacity outside the morning and afternoon peaks.

TDM strategies generally guide all relevant customers (residents, employees and visitors) in changing their travel behaviour in the following ways:

– Reduce travel

– Re-mode (consideration of travel via alternative modes)

– Re-time (consideration of travel at alternative times)

– Re-route.

A Travel Plan should be developed and monitored for the Cobbitty – Sub-Precinct 5 (Part) to deliver best-practice travel programs and initiatives to manage travel demand. Key initiatives and measures could be developed to:

– Reduce the need to travel

  - Planning for a range of uses is to be provided or integrated into the development to provide a range of services in a single location to maximise trip containment within or in the proximity of the site and encourage the use of active transport (walking and cycling) for short trips.
  - Encourage internet use to reduce the need to travel, such as Australia Post and parcel drop-off /pick-up facilities.
  - Encourage using the internet and technology to facilitate remote work via smart work hubs with high-quality facilities or work from home.
  - Develop and use carpooling for wider precincts and communities.

– Re-think the mode of travel

  - Walking and cycling:
    - A highly permeable and safe pedestrian network throughout the development.
    - Dedicated cycle routes that connect to the regional routes and major transport hubs.
    - Key design principles to integrate walking and cycling networks and facilities into the planning and delivery of the development.
    - High quality, safe and accessible end-of-trip facilities (centralised cycle hubs that are integrated within the development at convenient locations, on-street secure bicycle storage located conveniently at end-of-cycle destinations, parking hubs for shared bikes, lockers and showers).
    - Free bicycles for residents, employees and visitors to travel within the site and nearby transport interchanges (to be agreed upon with Councils and TfNSW).
    - Promoting bicycle initiatives – NSW bicycle week, cycle to work day, free bike check-up events.
    - Establishment of a Bicycle User / Consultation Group.
    - ‘Cycle Update’ newsletter.
  - Public transport:
    - Reimbursement of public transport costs such as giving out Opal cards with credits.
    - Early provision of frequent public transport services to establish a non-car travel behaviour.
    - Good quality public transport stops in the vicinity of the development.
    - Tailored information with clear mapping and walking catchments at public transport stop.
    - Provision of public transport information from home via television channel or community app.

- Parking measures as a mean to encourage alternative modes of travel:
    - Reduced parking rates with flexibility in parking arrangements such as decoupled parking, and shared vehicle parking to accommodate the parking needs of all residents.
    - Parking spaces/stations dedicated to electric vehicles, with charging stations.
    - Parking spaces dedicated to car-share schemes and community car-share vehicles, both on-street and incorporated in easily accessed public car parks.

– Re-time and Re-route journeys:

- Development of specific community app/community engagement program to enable changing travel behaviour which includes:
    - Active and public transport maps
    - Personalised journey planner
    - Notifications of the latest travel information
    - Shared vehicles information
    - Car-pooling opportunities
    - Other precinct-related information
- Real-time information embedded into development and public transport stops.
- Employers promote and encourage flexible working hours and arrangements.

While it is important to develop a Travel Plan that is aimed at managing travel demand and reducing reliance on car travel, it is more important to monitor and evaluate the effectiveness of individual measures and the need to adjust the measures. The planning and implementation of a targeted Travel Plan with the above green travel initiatives/principles in the Cobbitty – Sub-Precinct 5 (Part) ILP will provide significant opportunities for alternative travel options and reduce the need for car travel.

5.0 Traffic and Transport Impact Appraisal

5.1 Active transport impacts

With footpaths proposed on both sides of all roads, active transport can be one of the most convenient modes for short-distance trips. The road network is grid-like in structure, providing numerous crossing opportunities and reducing travel distance between residential areas and the local open spaces.

The site makes a significant contribution to cycling connectivity by providing a shared path on both sides of the Sub-arterial and Collector Roads. This enables cyclists to connect seamlessly to The Northern Road shared path.

The site is within a 4km distance of the future Sydney Metro Western Sydney Airport Line - Oran Park Station, which is within a cycling distance. The Northern Road is provided with a shared path that connects the precinct to the Aerotropolis and future metro stations along the Sydney Metro Western Sydney Airport Line. As the Aerotropolis develops, a network of cycling networks will provide residents with a viable alternative mode of transport to private vehicles.

5.2 Public transport impacts

Delivery of the planned Sydney Metro Western Sydney Airport Line - Oran Park Station would be 4km east of the site. The new metro stations along the Sydney Metro Western Sydney Airport Line and a bus network that could be delivered could significantly change travel behaviour in the area.

All roads in the precinct are proposed to be bus capable, enabling the entirety of the area to be covered by bus services. The north-south sub-arterial and collector roads also provide an opportunity for services to travel through the precinct to Oran Park in the south where a station for Sydney Metro Western Sydney Airport may be located in the future.

The network is also in a grid-like fashion, with the sub-arterial and collector roads forming north-south and east-west access ways. This enables higher-order bus routes, such as suburban bus routes, to operate efficiently within the precinct.

5.3 Traffic assessment approach

The transport assessment methodology follows the same approach that was approved for SCW Belmore Precinct 2 that was developed in collaboration with TfNSW and DPHI. The agreement during the early assessment process for the precinct was that Sydney Traffic Forecasting Model (STFM) would be conducted for the pre-Gateway assessments and that Aimsun mesoscopic modelling would be conducted for exhibition.

The importance of the Outer Sydney Orbital (OSO) was also investigated to determine whether its withdrawal or non-implementation would impact the findings of this analysis. The investigation concluded that the OSO, although reduces throughput on The Northern Road, did not have an impact on the upgrade requirements.

This modelling (undertaken post-Gateway of Precinct 2[4]) has now been updated to incorporate Aimsun mesoscopic modelling in line with the agreed methodology. Background traffic forecasts were obtained using Sydney Traffic Forecasting Model (STFM), to which traffic generation was manually added that captured the SCW precincts and Lowes Creek Maryland. OSO was not included in the traffic assessment.

A single forecasting year of 2041 was adopted to understand the cumulative impact of the development of the corridor.

5.4 Trip generation and distribution

The agreed traffic generation rates for the development are shown in **Table 5-1**. Based on these rates, a total trip count was calculated for each precinct and divided equally between its related travel zones. The total trip generation of the (part) Precinct is approximately 2,300 peak hours trips.

[4] Model Scoping Note approved for SCW Precinct 2 Post-Gateway Traffic Assessment is included in Appendix A of this report.

Table 5-1 Agreed trip generation rates for the SCW Precincts

Proposed land use	AM peak hour (In / Out proportion)	PM peak hour (In / Out proportion)	Trip generation rate source
Residential	0.87 / dwelling (20% / 80% or 30%/70%)	0.87 / dwelling (20% / 80% or 30%/70%)	Guide to Traffic Generating Developments - Updated traffic surveys (TDT 2013/04a)
Non-residential including a supermarket and specialty retail	7.76 per 100 m^2 GLFA (50% / 50%)	10.41 / 100 m^2 GLFA (50% / 50%)	Page 11 of the 2018 RMS Trip Generation Surveys Small Shopping Centres Analysis Report
Primary school	0.67 / student (60% / 40%)	0 / student	Table 4-3 of the RMS Trip Generation Surveys, Schools Analysis Report 2014

5.5 Cumulative growth

The assumed yields for each precinct are summarised in **Table 5-2**.

Table 5-2 Yields by precinct

Proposed land use	Belmore Road Precinct	Lowes Creek Maryland	Precinct 5	Total
Residential (dwellings)	3,375	7,060	2,650	**13,085**
Non-residential including a supermarket and specialty retail (GFA sqm)	8,820	40,000	800	**49,620**
Primary school (Students)	1,000	3,500	1,000	**5,500**
High school (Students)	-	3,500	-	**3,500**
Wentworth Road Employment Precinct	350 jobs (35,00m^2 GFA)	N/A	N/A	350 jobs (35,00m^2 GFA)
Source of yields	Landowner Employment Analysis (Urbis, 2025)	Traffic and Transport Exhibition Report 2020, GHD (September 2018)	Yield Calculation Rev E, Design+Planning (09/09/2022)	

Traffic from the employment precinct is expected to generate only minor traffic, which will generally be outside of the commuter peak periods.

5.6 Traffic internal to the precinct

If the SCW and LCM are considered together, some of the land uses would generate only marginal trips which would leave this collective precinct. School traffic is an example of traffic which would generally be directed only to locations within the precinct. Retail is another example. The majority of retail traffic would be directed towards the precinct.

The traffic identified as internal and external is provided in **Table 5-3** (overleaf).

Table 5-3 Allocation of internal vs external trips

Development Use		Attractions						Productions					
		SCW Precinct 2	LCM			SCW Precinct 5	External	SCW Precinct 2	LCM			SCW Precinct 5	External
			Zone 1	Zone 2	Zone 3				Zone 1	Zone 2	Zone 3		
SCW Precinct 2	Residential	Residential trips left over after assignment to internal zones are external											
	Non-residential	18%	7%	7%	7%	5%	**57%**	18%	5%	5%	5%	5%	**62%**
	Primary School	80%	0%	0%	0%	0%	**20%**	80%	0%	0%	0%	0%	**20%**
LCM Zone 1	Residential	Residential trips left over after assignment to internal zones are external											
	Non-residential	11%	9%	9%	9%	13%	**50%**	10%	8%	8%	8%	8%	**57%**
	High school	27%	9%	9%	9%	27%	**20%**	27%	9%	9%	9%	27%	**20%**
	Primary School	0%	27%	27%	27%	0%	**20%**	0%	27%	27%	27%	0%	**20%**
LCM Zone 2	Residential	Residential trips left over after assignment to internal zones are external											
	Non-residential	11%	9%	9%	9%	13%	**50%**	10%	8%	8%	8%	8%	**57%**
	High school	27%	9%	9%	9%	27%	**20%**	27%	9%	9%	9%	27%	**20%**
	Primary School	0%	27%	27%	27%	0%	**20%**	0%	27%	27%	27%	0%	**20%**
LCM Zone 3	Residential	Residential trips left over after assignment to internal zones are external											
	Non-residential	11%	9%	9%	9%	13%	**50%**	10%	8%	8%	8%	8%	**57%**
	High school	27%	9%	9%	9%	27%	**20%**	27%	9%	9%	9%	27%	**20%**
	Primary School	0%	27%	27%	27%	0%	**20%**	0%	27%	27%	27%	0%	**20%**
SCW Precinct 5	Residential	Residential trips left over after assignment to internal zones are external											
	Non-residential	10%	7%	7%	7%	15%	**55%**	5%	7%	7%	7%	15%	**60%**
	Primary School	0%	0%	0%	0%	80%	**20%**	0%	0%	0%	0%	80%	**20%**

Traffic which went from one sub-precinct to itself (e.g. South Creek West Precinct 5 to South Creek West Precinct 5) was assumed to use the local road network, which was not coded within the Aimsun model.

Traffic which went from one sub-precinct to another (e.g. South Creek West Precinct 5 to LCM) was included in the model. Traffic which went from any of the sub-precinct to or from external zones was included in the model.

5.7 Aimsun future year modelling (2041)

Traffic demands for 2041 AM and PM periods were determined from a process of extracting the forecast growth from the TfNSW STFM model runs and distribution of the anticipated traffic generation of the based on the STFM forecasts.

Aimsun modelling was undertaken based on two scenarios:

– **Scenario 1 (General Traffic Lanes):** Delivery of an additional general traffic lane on The Northern Road with no additional mode shift

– **Scenario 2 (Bus Lanes):** Delivery of an additional bus lane on The Northern Road with mode shift.

5.7.1 Future year demands

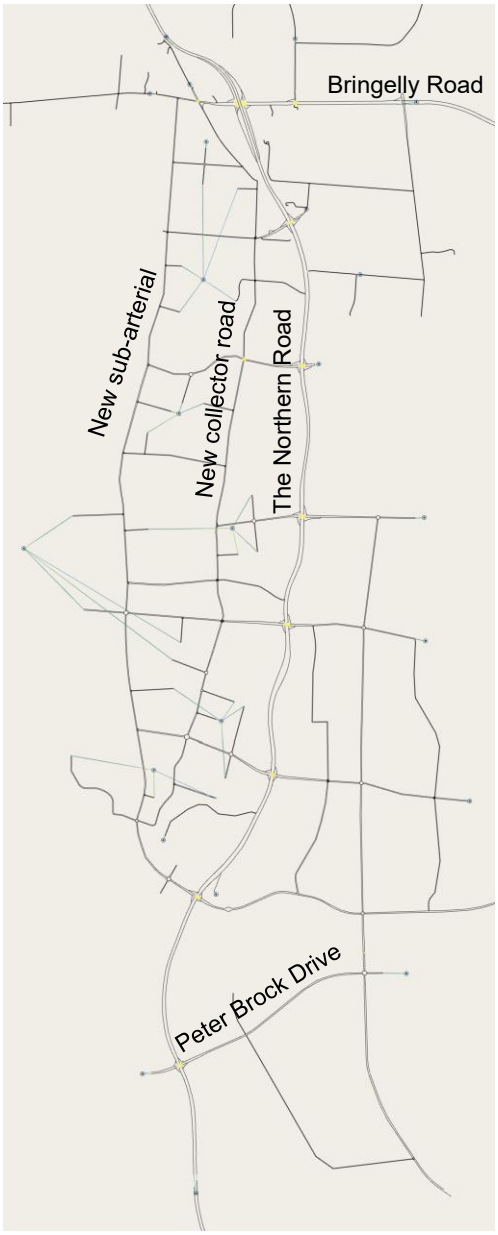
STFM cordons were supplied by TfNSW for 2021 and 2041. Given the limited growth since COVID-19, the traffic volumes from 2021 were considered appropriate to use to determine growth. The absolute volume difference was added to the network with different vehicle types added for each component of growth (development traffic, background growth traffic and existing traffic).

Demands were added to the network using the same traffic profile as existing. This was undertaken by factoring the growth matrices by the existing traffic profile.

The AIMSUN mesoscopic models were expanded to cover the road network of South Creek West Precinct 5, Lowes Creek Maryland, and South Creek West Precinct 2. This model network included sub-arterial and collector-level roads within these precincts, which would be aligned parallel to The Northern Road and as such support the local north-south traffic movements generated by these developments.

The network layout of the Aimsun mesoscopic model is shown in **Figure 5-1** (overleaf).

Figure 5-1 Model extent of SCW Precinct model



Source: SCT Consulting, 2025

Initial modelling of the 2041 demands showed that the existing four-lane general traffic corridor configuration of The Northern Road would result in extensive delays if the full development extent of SCW Precinct is to be accommodated.

For Scenario 2 (**Bus Lanes**), a mode shift assessment was conducted. External demands associated with the precinct (South Creek West Precinct 2 and 5 and Lowes Creek Maryland) were factored down until the performance was within an acceptable range.

5.7.2 Network statistics

The resultant network statistics of these scenarios are summarised in the following **Table 5-4**.

Table 5-4 shows that the 50% external trip reduction of the SCW Precinct trips equates to cuts of 19% and 26% of overall trips during the AM and PM peak periods, noting that the PM peak period is representative of a longer simulation model duration (three hours). Notably, the scenario with reduced development trips produced better network conditions than the full development yield scenario, as a lesser number of vehicles results in lower network delays and higher average speeds.

Table 5-4 Network statistics

Statistic	Scenario			
	2041 AM with bus lanes 50% SCW Precinct demand	2041 PM with bus lanes 50% SCW Precinct demand	2041 AM without bus lanes & 100% SCW Precinct demand	2041 PM without bus lanes & 100% SCW Precinct demand
Total demand	37,165	44,713	46,071	60,019
Vehicle Kilometres Travelled (VKT)	149,207	192,671	184,053	244,940
Vehicle Hours Travelled (VHT)	3,067	4,141	4,080	8,765
Average vehicle delay (seconds per kilometre)	19	22	25	72
Unreleased vehicles	1	0	27	1,760
Average network travel speed	48	47	45	36

Finding

Bus lanes on The Northern Road would need to be accompanied by a 50% mode shift towards public transport to be feasible. The decision about whether The Northern Road is provided with general traffic lanes or dedicated bus lanes is ultimately a decision for Transport for NSW. Regardless of which option is selected, the precinct is considered feasible.

5.8 SIDRA modelling

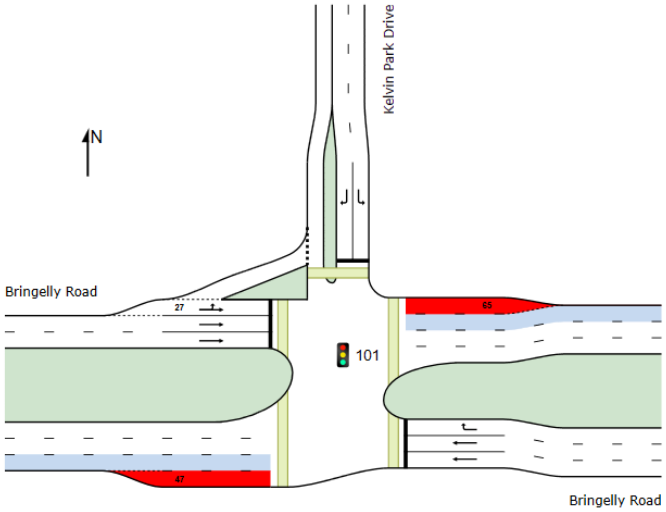
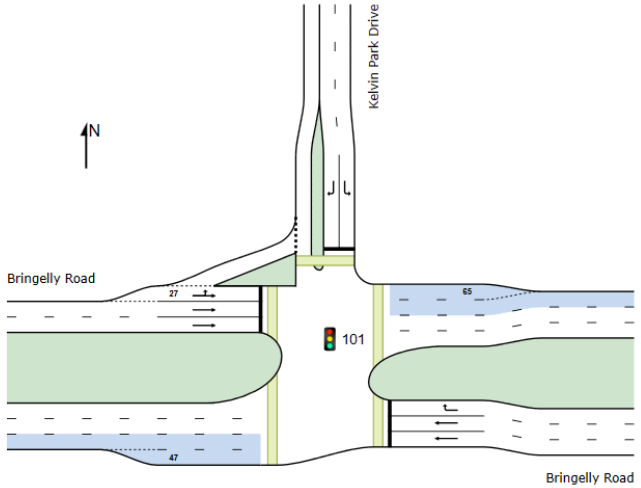
SIDRA modelling was undertaken of the volumes extracted from the Aimsun model. The major lane requirements within Aimsun (namely the number of lanes on The Northern Road, Bringelly Road and Greendale Road were not adjusted in SIDRA. These major lane requirements were necessary to achieve the network throughput within Aimsun, so were not deemed suitable for removal in SIDRA, even if they may have been feasible when considering Level of Service. Rather the number and length of turn bays were adjusted to achieve as close to Level of Service D as possible. The following sections show the road widening requirements for each intersection.

5.8.1 Kelvin Park Drive | Bringelly Road

To facilitate the development trip demands, the following network adjustments were assumed:

– Additional exit lanes on the eastern and western leg of Bringelly Road

Table 5-5 Intersection performance – Bringelly Road | Kelvin Park Drive (new lanes in blue)

Scenario	2041 AM + bus lanes 50% SCW demand					2041 AM no bus lanes 100% SCW demand				
Layout										
Peak	**Volume**	**Type**	**DoS**	**Delay(s)**	**LoS**	**Type**	**Volume**	**DoS**	**Delay(s)**	**LoS**
AM	1,971	Signalised	0.44	10	**A**	Signalised	981	0.31	9	**A**
PM	1,457	Signalised	0.43	11	**A**	Signalised	3,001	0.62	14	**A**

5.8.2 The Northern Road | Bringelly Road

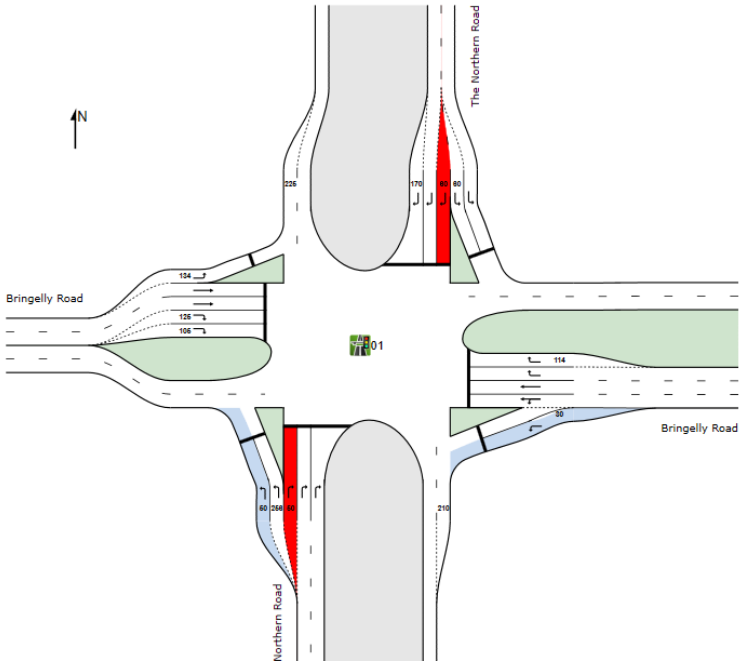
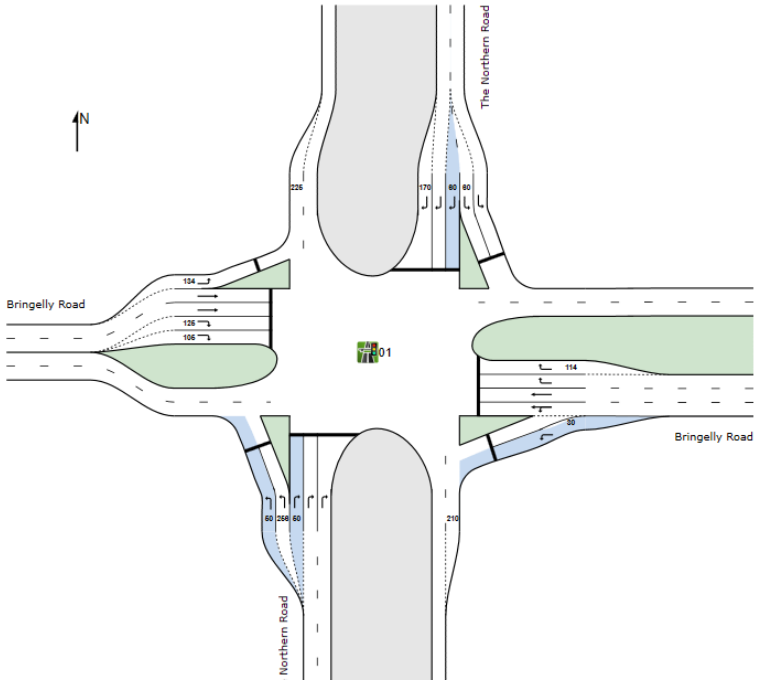
– Two-lane southbound off ramp

– Three-lane The Northern Road southbound underpass of Bringelly Road

– Two-lane northbound left turn exit onto Bringelly Road westbound from The Northern Road southern approach

– Two-lane left turn entry onto The Northern Road southbound from Bringelly Road eastern approach

Table 5-6 Intersection performance – The Northern Road | Bringelly Road (new lanes in blue)

Scenario	2041 AM + bus lanes 50% SCW demand					2041 AM no bus lanes 100% SCW demand				
Layout										
Peak	Volume	Type	DoS	Delay(s)	LoS	Type	Volume	DoS	Delay(s)	LoS
AM	2,155	Signalised	0.47	42	C	Signalised	2,728	0.57	46	D
PM	2,649	Signalised	0.37	35	C	Signalised	3,806	0.83	45	D

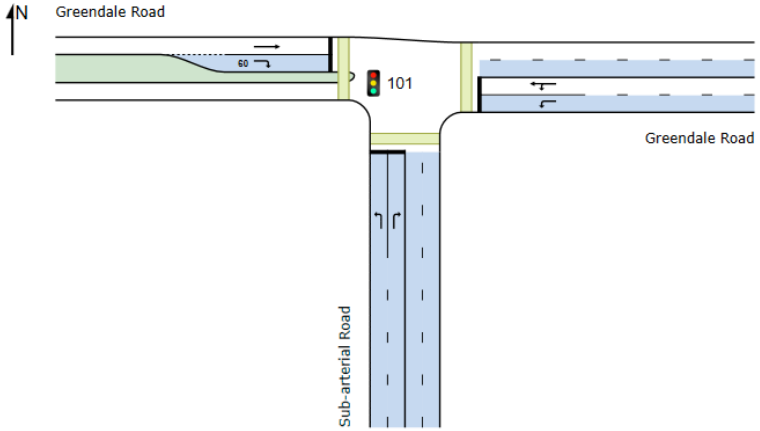
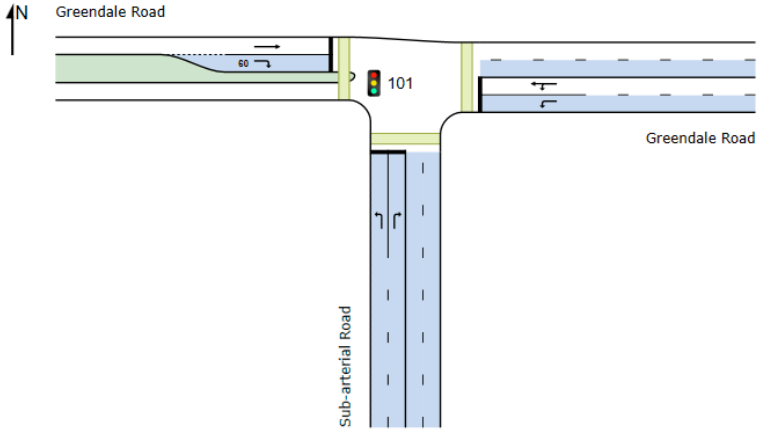
5.8.3 Greendale Road | New Sub-Arterial

– One shared left and right turn lane and a full length right turn lane on the eastern approach of New Sub-Arterial.

– One short right turn lane and a full length through lane on the western approach of Greendale Road.

– Sub-arterial road with full length left and right turn lanes.

Table 5-7 Intersection performance – Greendale Road | New Sub-Arterial Road (new lanes in blue)

Scenario	2041 AM + bus lanes 50% SCW demand					2041 AM no bus lanes 100% SCW demand				
Layout										
Peak	**Volume**	**Type**	**DoS**	**Delay(s)**	**LoS**	**Type**	**Volume**	**DoS**	**Delay(s)**	**LoS**
AM	471	Signalised	0.12	22	**B**	Signalised	1,175	0.50	20	**B**
PM	1,139	Signalised	0.33	19	**B**	Signalised	2,078	0.66	15	**A**

5.8.4 The Northern Road | Belmore Road | Bent Road intersection

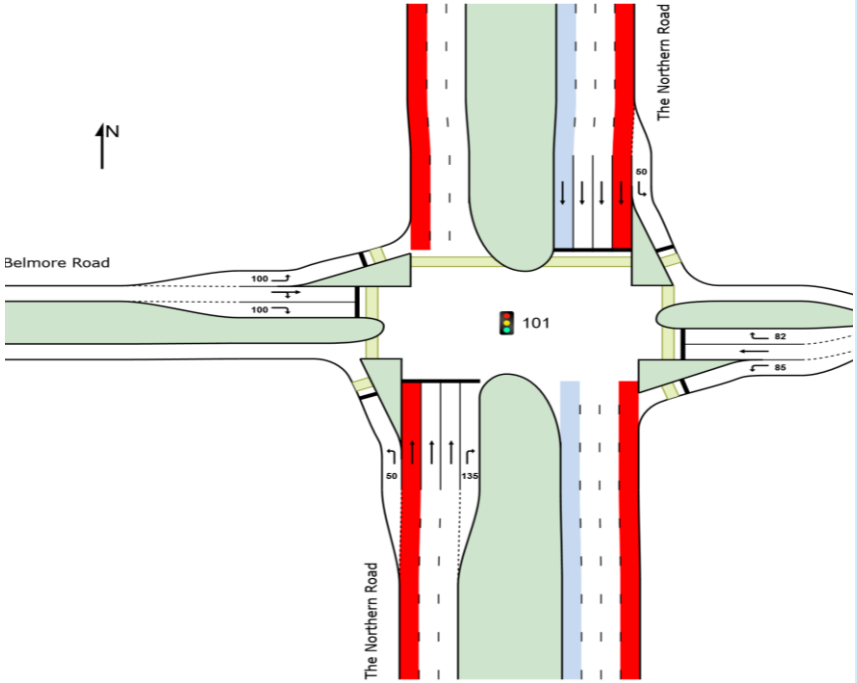
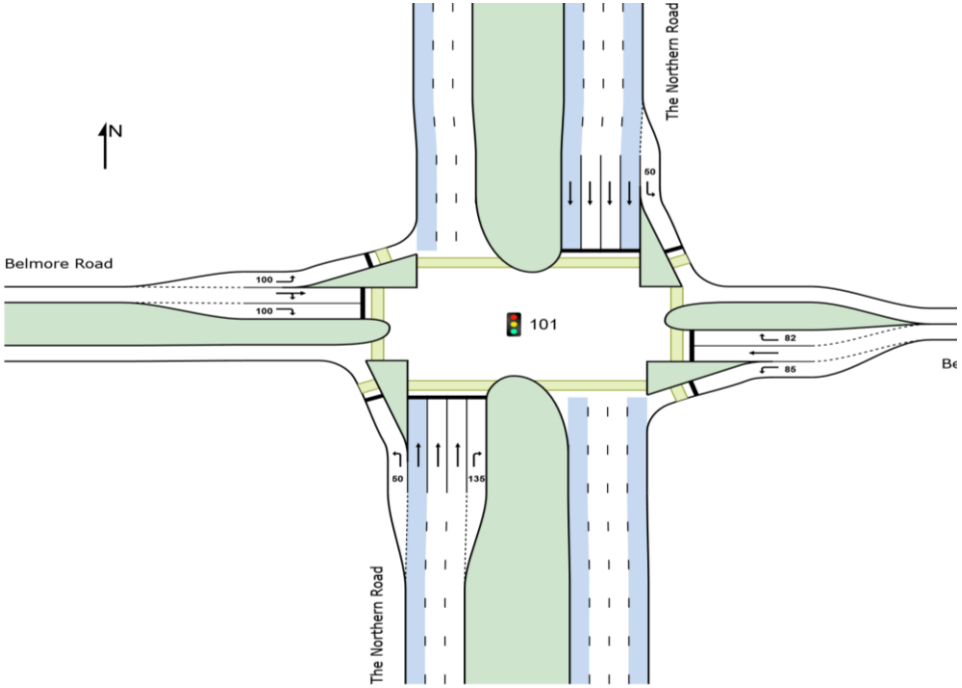
– Four-lane southbound along The Northern Road

– Right turn ban from The Northern Road north approach to Belmore Road

– Banning the right turn movement onto Belmore Road

– Removal of pedestrian crossing on the southern leg of The Northern Road to maintain acceptable performance.

Table 5-8 Intersection performance – The Northern Road | Belmore Road (new lanes in blue)

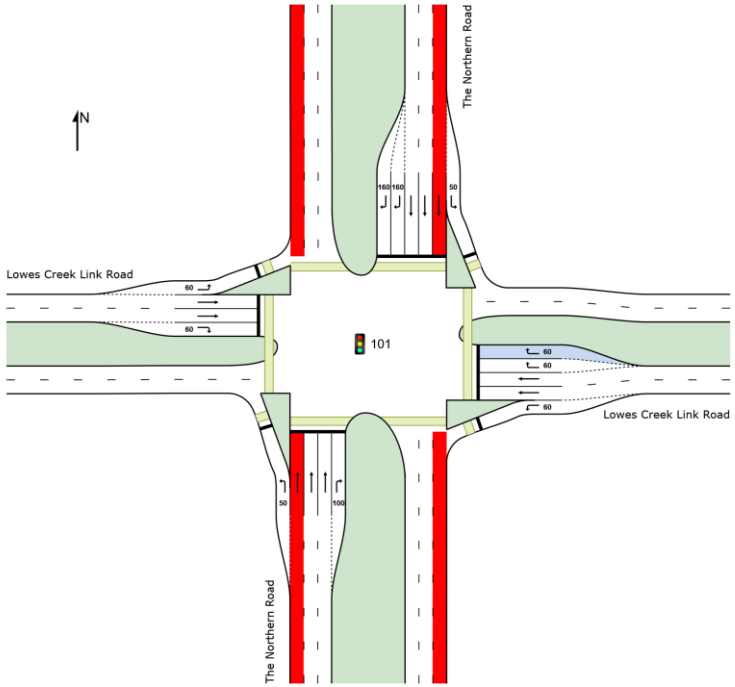
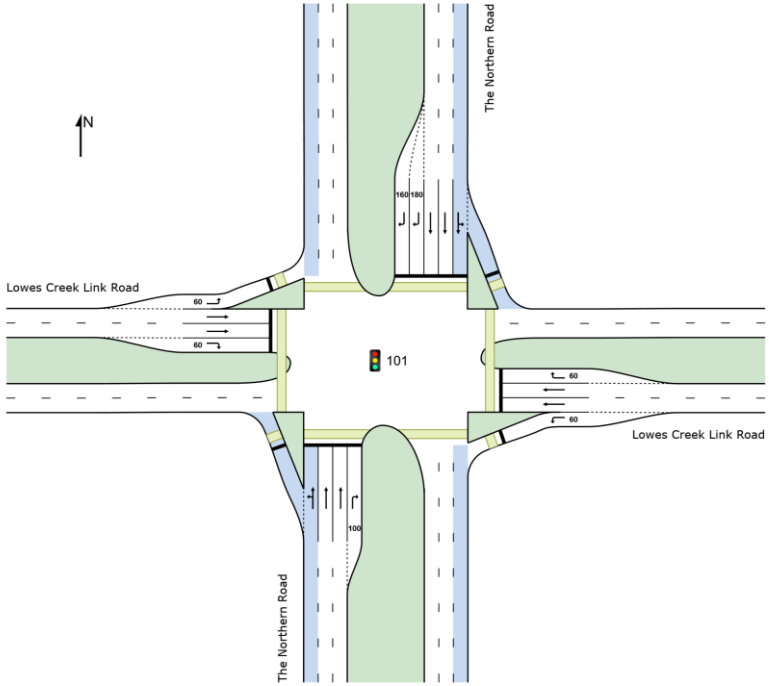
Scenario	2041 AM + bus lanes 50% SCW demand					2041 AM no bus lanes 100% SCW demand				
Layout										
Peak	**Volume**	**Type**	**DoS**	**Delay(s)**	**LoS**	**Type**	**Volume**	**DoS**	**Delay(s)**	**LoS**
AM	3,492	Signalised	0.90	42	**C**	Signalised	3,706	0.75	36	**C**
PM	3,725	Signalised	0.65	19	**B**	Signalised	3,837	0.56	26	**B**

5.8.5 The Northern Road | Lowes Creek Link Road intersection

– Dual right-turn lanes from The Northern Road northern approach and Lowes Creek Link Road eastern approach to maintain acceptable performance.

– If no bus lanes are provided, then the intersection does not require upgrade except for the six lanes on The Northern Road.

Table 5-9 Intersection performance – The Northern Road | Lowes Creek Link Road (new lanes in blue)

Scenario	2041 AM + bus lanes 50% SCW demand					2041 AM no bus lanes 100% SCW demand				
Layout										
Peak	**Volume**	**Type**	**DoS**	**Delay(s)**	**LoS**	**Type**	**Volume**	**DoS**	**Delay(s)**	**LoS**
AM	3,165	Signalised	0.72	32	**C**	Signalised	3,521	0.75	42	**C**
PM	4,119	Signalised	0.99	53	**D**	Signalised	4,308	0.73	36	**C**

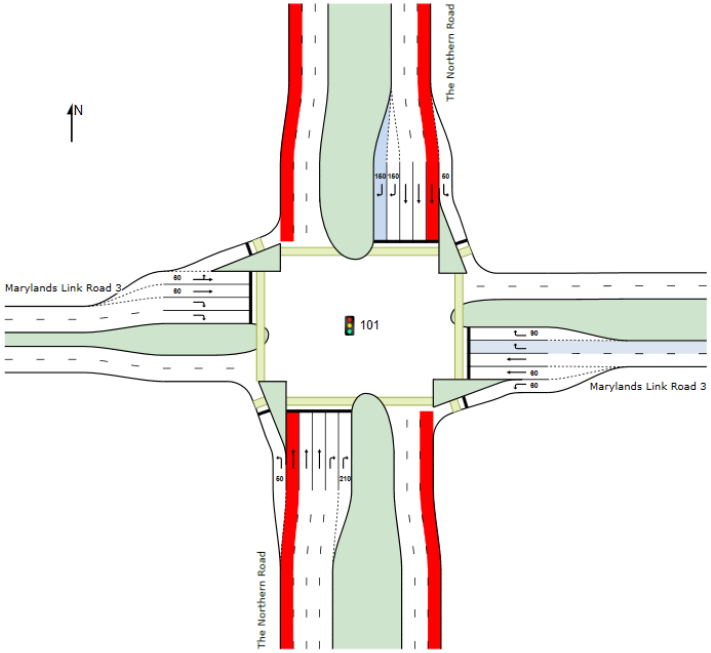
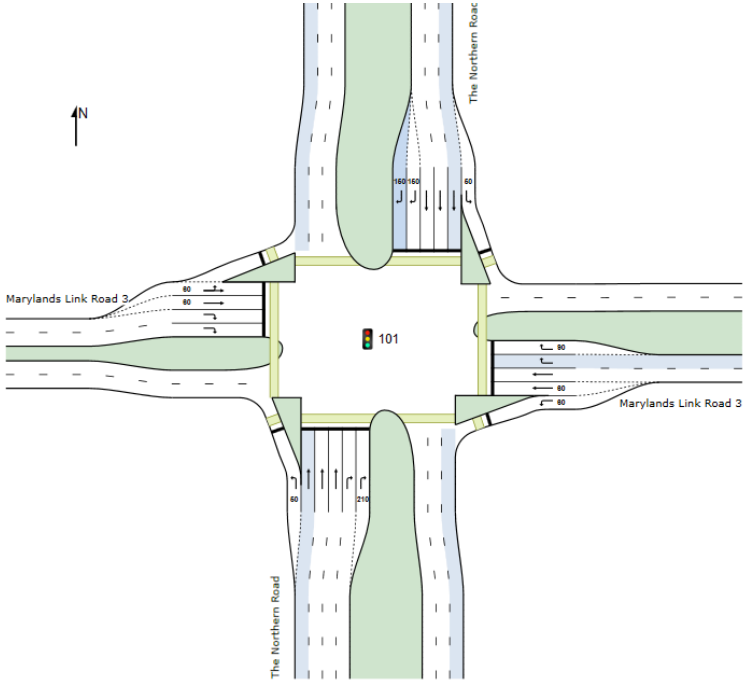
5.8.6 The Northern Road | Marylands Link Road 3 intersection

– Dual right-turn lanes from The Northern Road northern approach

– Dual right-turn lanes from Marylands Link Road 3 eastern approach

– The intersection operates acceptably at LOS D or better in both future scenarios. The 100% demand scenario resulted in an increase of up to 13 seconds of delay in the AM peak.

Table 5-10 Intersection performance – The Northern Road | Marylands Link Road 3 (new lanes in blue)

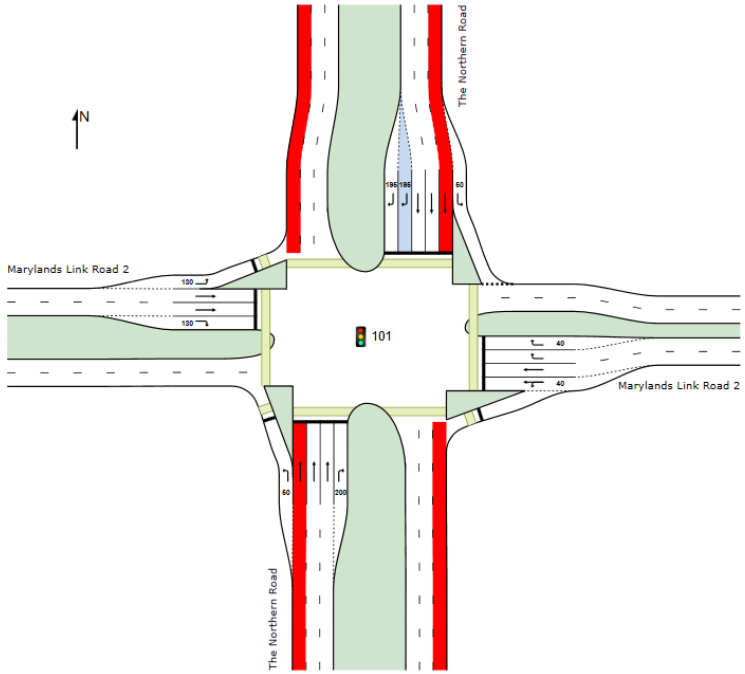
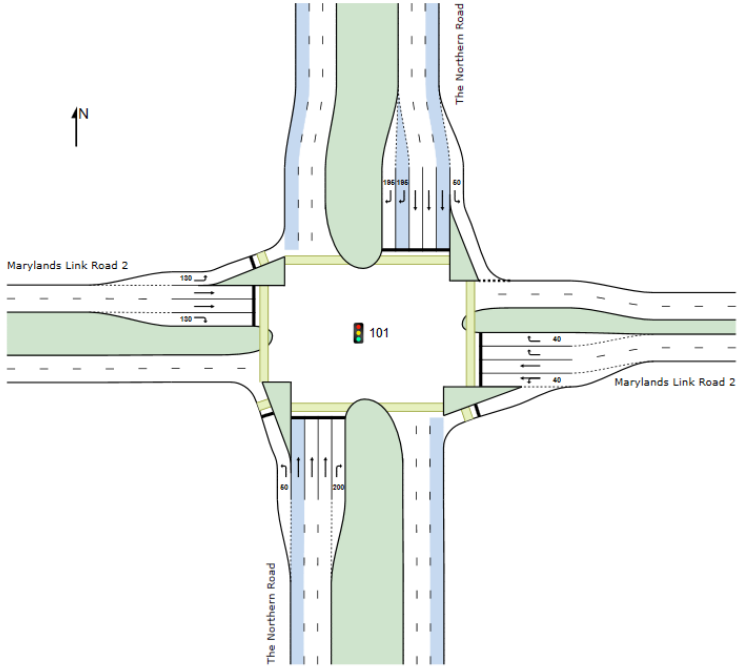
Scenario	2041 AM + bus lanes 50% SCW demand					2041 AM no bus lanes 100% SCW demand				
Layout										
Peak	**Volume**	**Type**	**DoS**	**Delay(s)**	**LoS**	**Type**	**Volume**	**DoS**	**Delay(s)**	**LoS**
AM	2,905	Signalised	0.68	38	**C**	Signalised	3,351	0.77	51	**D**
PM	4,137	Signalised	0.92	45	**D**	Signalised	4,636	0.81	52	**D**

5.8.7 The Northern Road | Marylands Link Road 2 intersection

– Dual right-turn lanes from The Northern Road northern approach

– The intersection operates acceptably at LOS D or better in both future scenarios. The 100% demand scenario resulted in an increase of up to 14 seconds of delay in the AM peak.

Table 5-11 Intersection performance – The Northern Road | Marylands Link Road 2 (new lanes in blue)

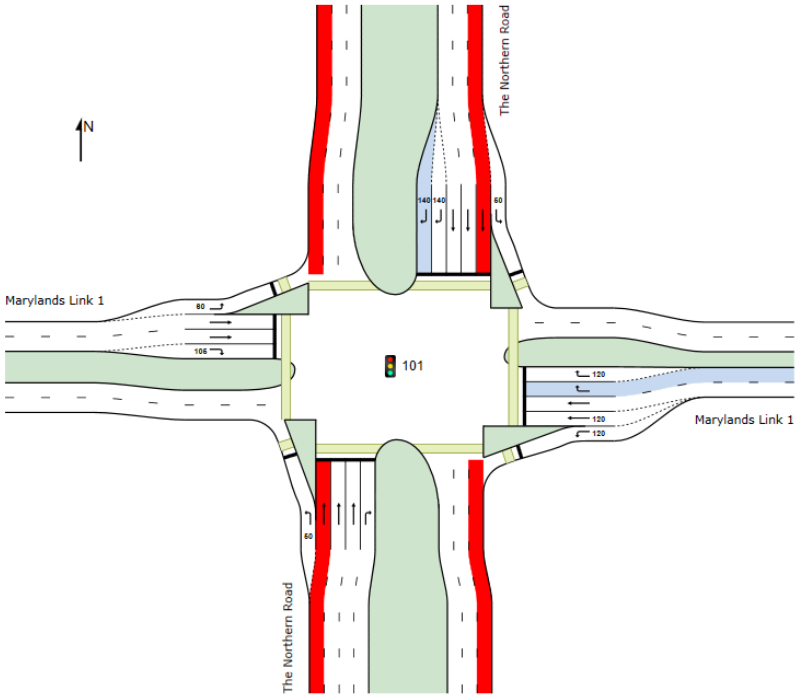
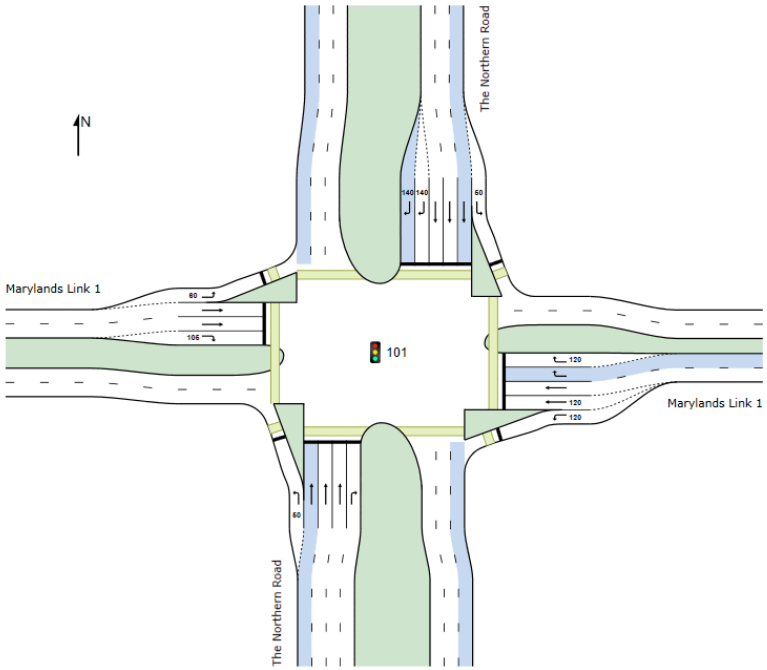
Scenario	2041 AM + bus lanes 50% SCW demand					2041 AM no bus lanes 100% SCW demand				
Layout										
Peak	**Volume**	**Type**	**DoS**	**Delay(s)**	**LoS**	**Type**	**Volume**	**DoS**	**Delay(s)**	**LoS**
AM	2,386	Signalised	0.55	28	**B**	Signalised	2,661	0.50	41	**C**
PM	3,621	Signalised	0.89	43	**D**	Signalised	3,809	0.75	50	**D**

5.8.8 The Northern Road | Marylands Link Road 1 intersection

– Dual right-turn lanes from The Northern Road northern approach

– Dual right-turn lanes from Marylands Link Road 1 eastern approach

Table 5-12 Intersection performance – The Northern Road | Marylands Link Road 1 (new lanes in blue)

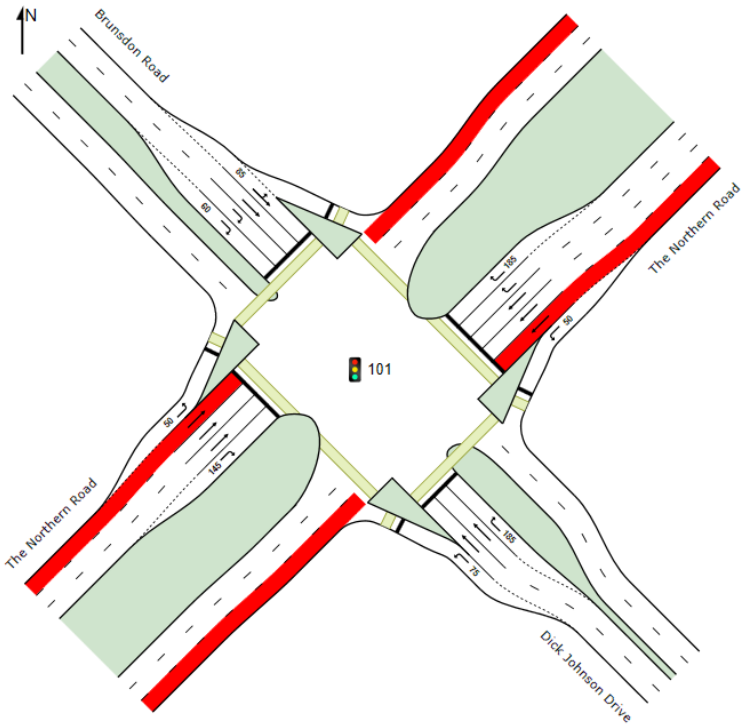
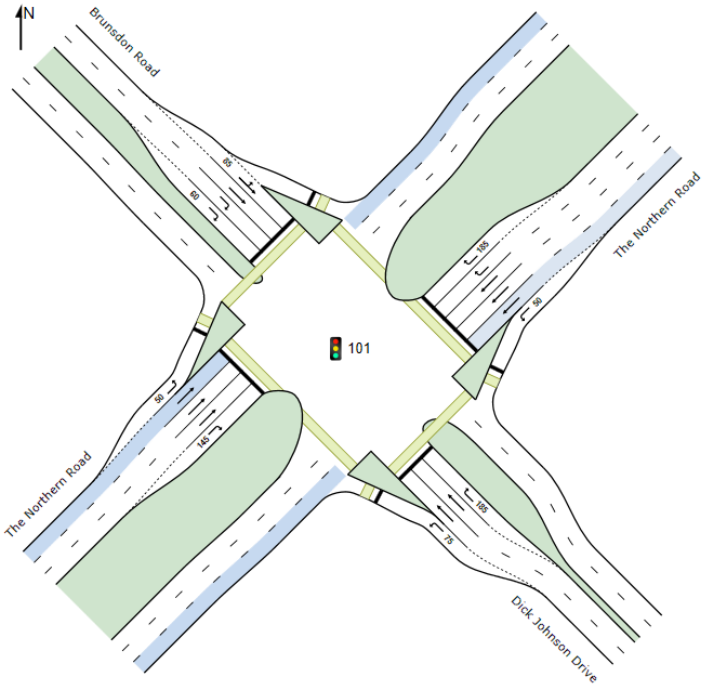
Scenario	2041 AM + bus lanes 50% SCW demand					2041 AM no bus lanes 100% SCW demand				
Layout										
Peak	**Volume**	**Type**	**DoS**	**Delay(s)**	**LoS**	**Type**	**Volume**	**DoS**	**Delay(s)**	**LoS**
AM	2,562	Signalised	0.57	49	**D**	Signalised	2,540	0.45	48	**D**
PM	3,657	Signalised	0.75	45	**D**	Signalised	3,797	0.62	47	**D**

5.8.9 The Northern Road | Dick Johnson Drive | Brunson Road intersection

– No geometric changes are required at this intersection other than the widening on The Northern Road

– Signal timings and sequencing have been adjusted to improve traffic operations under future traffic conditions.

Table 5-13 Intersection performance – The Northern Road | Dick Johnson Drive/ Brunson Road (new lanes in blue)

Scenario	2041 AM + bus lanes 50% SCW demand					2041 AM no bus lanes 100% SCW demand				
Layout										
Peak	**Volume**	**Type**	**DoS**	**Delay(s)**	**LoS**	**Type**	**Volume**	**DoS**	**Delay(s)**	**LoS**
AM	2,369	Signalised	0.49	35	**C**	Signalised	2,693	0.91	45	**D**
PM	3,093	Signalised	0.60	24	**B**	Signalised	3,551	0.98	54	**D**

6.0 Conclusion and Next Steps

6.1 Infrastructure schedule

The development of South Creek West and Lowes Creek Maryland should be accompanied by supporting investment in infrastructure. The infrastructure schedule is provided in **Table 6-1**.

Table 6-1 Detailed infrastructure schedule

Infrastructure	Details	Nexus
The Northern Road widening	Either: – Expansion by one additional lane along The Northern Road for general traffic – Expansion of The Northern Road to provide a dedicated bus lane and provision of a Bus Rapid Transit service	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth
Bringelly Road widening	– Additional westbound lane between Kelvin Park Road and The Northern Road – Additional eastbound lane to Jersey Road – Widening to minimum of two lanes in each direction from The Northern Road to Wentworth Road	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth
Greendale Road widening	– Widening to four lane corridor from Wentworth Road to new sub-arterial road	South Creek West (Precinct 2 and 5), Lowes Creek Maryland
Upgrade of Kelvin Park Drive | Bringelly Road	– Additional westbound lane between Kelvin Park Road and The Northern Road – Additional eastbound lane to Jersey Road	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth
Upgrade of The Northern Road | Bringelly Road	– Additional left turn lane from Bringelly Road to The Northern Road southbound – Bringelly Road widening on the western approach to two lanes in each direction – Additional left turn lane from The Northern Road offramp northbound	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth
Greendale Road | New Sub-arterial Road	– Provision of traffic signals	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth
Upgrade of The Northern Road | Belmore Road | Bent Road intersection	– Southbound right turn ban – Additional northbound and southbound lane on The Northern Road (bus/general traffic)	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth
Upgrade of The Northern Road | Lowes Creek Link Road	– Additional right turn bay on Lowes Creek Link Road (east approach) (bus lane option only) – Additional northbound and southbound lane on The Northern Road (bus/general traffic)	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth

Infrastructure	Details	Nexus
Upgrade of The Northern Road | Marylands Link Road 3 intersection	– Additional right turn bay on The Northern Road (north approach) – Additional right turn bay on Marylands Link Road 3 (east approach) – Additional northbound and southbound lane on The Northern Road (bus/general traffic)	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth
Upgrade of The Northern Road | Marylands Link Road 2 intersection	– Additional right turn bay on The Northern Road (north approach) – Additional right turn bay on Marylands Link Road 2 (east approach) (bus lane option only) – Additional northbound and southbound lane on The Northern Road (bus/general traffic)	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth
Upgrade of The Northern Road | Marylands Link Road 1 intersection	– Additional right turn bay on The Northern Road (north approach) – Additional right turn bay on Marylands Link Road 1 (east approach) – Additional northbound and southbound lane on The Northern Road (bus/general traffic)	South Creek West (Precinct 2 and 5), Lowes Creek Maryland, background traffic growth
Indicative Layout Plan street network	– As per Indicative Layout Plan	Landowners as development occurs Camden Council or landowners as in-lieu works (SP2 Roads)

6.2 Conclusion

This traffic study shows that the (part) Precinct 5 ILP is feasible as:

– The study uses a modelling methodology that was developed in collaboration with TfNSW and DPHI, showing a willingness to work with TfNSW and DPHI to achieve an appropriate outcome for the future.

– The requirements of the Gateway Determination have been satisfied by preparation of this TMAP, including the requirement to remain within The Northern Road corridor reservation.

– All sub-arterial and collector roads will be bus-capable, enabling all populated areas of the Precinct to be within 400m distance of a bus route.

– The road cross sections proposed for the Belmore Precinct are from LCM's DCP, showing a willingness to work with recent DPHI planning for the area.

– All roads are proposed to have footpaths on both sides, active transport can be one of the most convenient modes for short-distance trips. The road network is grid-like in structure, providing numerous crossing opportunities and reducing travel distance between residential areas and the local open spaces.

– The infrastructure schedule has been prepared based on the Aimsun and SIDRA modelling, which identifies the necessary infrastructure to support the cumulative development of the growth in the area. All the offsite road upgrades have a nexus not just to this development to all the development in the precinct. Hence the Housing and Productivity Contribution should be the primary means of funding these upgrades to ensure fairness across all the different landowners.

APPENDIX A

MODEL SCOPING NOTE

Technical Advisory Note

Project	SCW Precinct 5 Stage 2	**Project Number**	SCT_00629
Client	Always Consultancy Pty Ltd		
Document Name	Model Scoping Note		
Version	5.0	**Date**	27 October 2025
Author	Rohan Shetkar	Senior Consultant	
Reviewer	Jonathan Busch	Associate Director	
Authoriser	Andy Yung	Director	

1.0 Introduction

1.1 Background

SCT Consulting was engaged by Always Consultancy Pty Ltd to undertake Stage 2 (post-gateway) detailed traffic assessment to support the planning proposal of Cobbitty Sub-Precinct 5, also known as Precinct 5. Precinct 5 totals approximately 303 hectares and is characterised by rural residential and agricultural land uses and activities.

Precinct 5 is located within the southwest portion of the South Creek West Land Release area within the suburb of Cobbitty in the Camden LGA. The Precinct adjoins the Lowes Creek Maryland (LCM) Precinct, which has recently been rezoned to the north, the Pondicherry precinct to the east, which is in the process of being rezoned and the growing town centre and suburbs of Oran Park to the south. **Figure 1** illustrates the site boundaries of Precinct 5 (highlighted in red) and the South Creek West Land Release area. Figure 2 show the indicative layout plan for Precinct 5 and the surrounding land.

The stage 1 analysis of the pre-gateway determination was conducted. In stage 1, SCT Consulting undertook a preliminary capacity/performance analysis and provided the traffic assessment based on a high-level assessment of strategic network impacts. TfNSW provided Strategic Traffic Forecasting Model (STFM) outputs which were used to quantify impacts on the external road network (i.e. The Northern Road).

This model scoping note explains the scope and methodology of the detailed assessment in Stage 2 (post-gateway determination). The overall methodology is a detailed Aimsun mesoscopic and SIDRA intersection modelling to support the planning proposal.

Figure 1 Precinct 5 (red outline) in a regional context

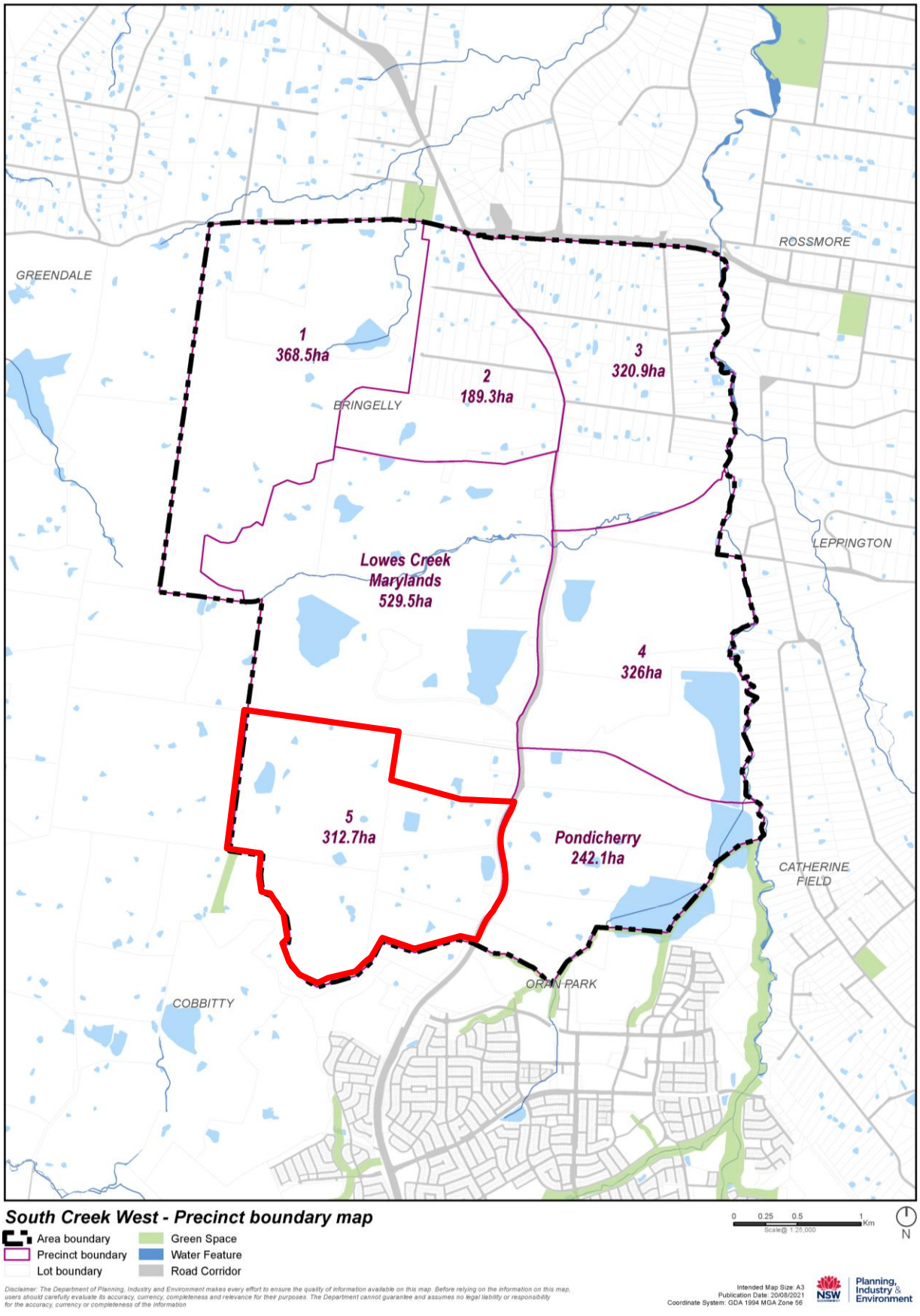
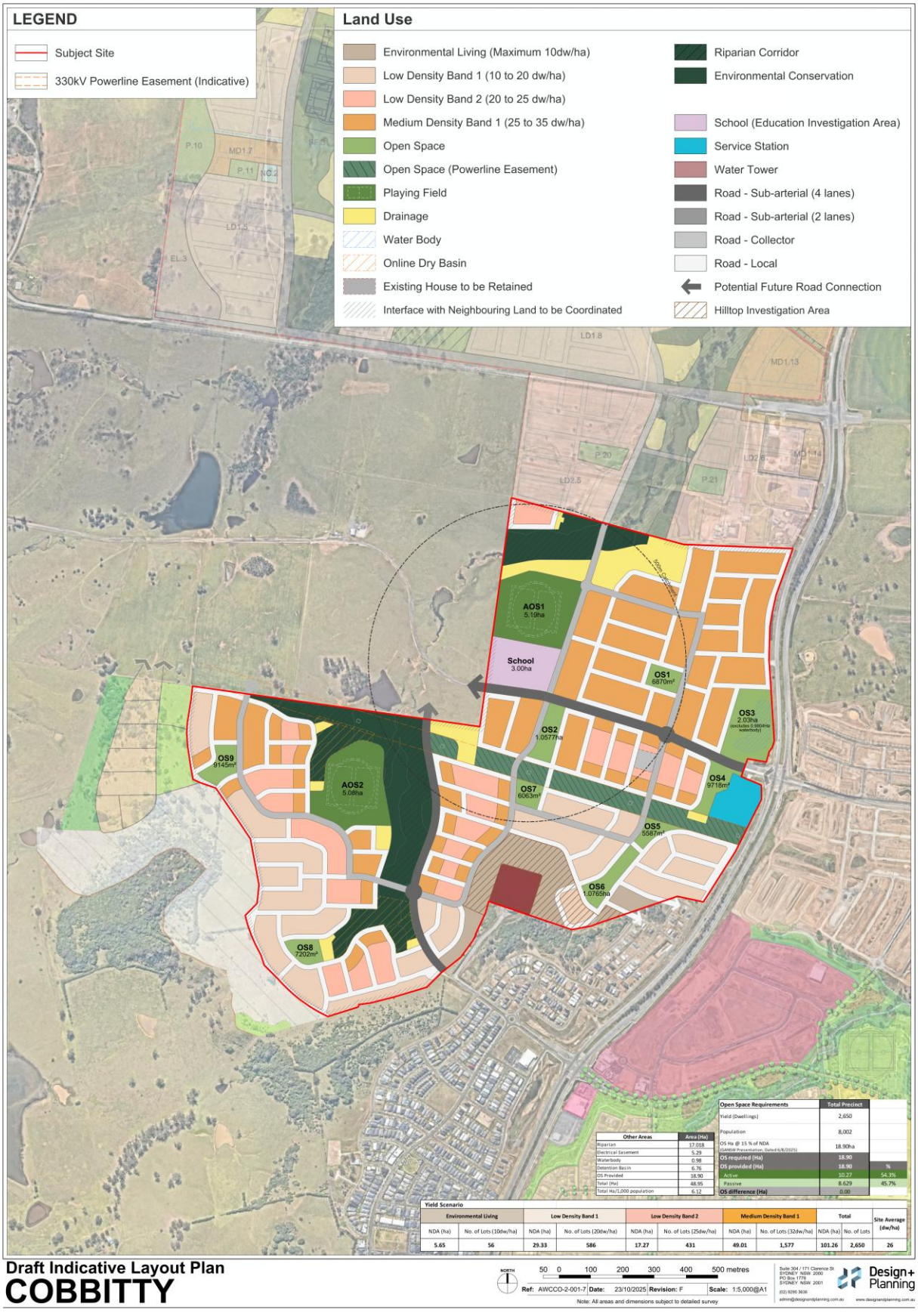


Figure 2 Precinct 5 Indicative Layout Plan



Source: Design+Planning, 2025

1.2 Project objective

The project aims to:

- Amend the current State Environmental Planning Policy (Precincts—Western Parkland City) 2021 to facilitate the urban development of Precinct 5 as part of the South West Growth Centre and envisaged in the Greater Sydney Commission's Regional Plan and District Plan.
- Quantify the impact of the proposed development in the Precinct 5 land on the surrounding transport network.
- Propose mitigation measures for road network, public transport, and active transport.

1.3 Scope of work

The scope of services is provided in **Table 1**.

Table 1 Scope of services

Deliverable	Tasks
Data collection	– Intersection turning count and queue length collection at 10 (all traffic signals) intersections and turning counts at two intersections (the priority intersections) for three hours in the morning and three hours in the evening peak of a typical weekday. Classification by light, heavy, bus, and cyclist. – A floating car travel time survey for three hours in the morning and four hours in the evening peak for The Northern Road from Bringelly Road to Peter Brock Drive with segments at each set of signals of a typical weekday. – Request for TfNSW traffic signal data for 10 intersections.
Finalise *Traffic, Transport and Access Assessment*	Update the SCT Consulting *Traffic, Transport and Access Assessment*: – To attach the base year calibration and validation report – Document future year model assumptions, infrastructure and network/intersection performance statistics. – Document updates to the precinct layout (such as road hierarchy, yield, active transport network, etc.)
Update *Traffic, Transport and Access Assessment* based on authority feedback	– One iteration of updates to the model based on TfNSW and Council feedback. This does not allow for changes to principles agreed in the rezoning lodgement or any positions agreed in writing.
Meetings, coordination and ad hoc advice	– An upper limit fee to support meetings, stakeholder engagement, coordination, and finalisation of the master plan. This item will be charged at hourly rates. This was estimated at 40 hours of Associate Director time based on the project's expected duration.
Base year model	Prepare a mesoscopic model: – Two hours will be used for calibration in the morning peak and three in the afternoon peak. The additional data will be used for warm up. – Calibrated and validated Aimsun mesoscopic model for the dashed area/intersections shown in **Figure 3** in line with the Traffic Modelling Guidelines (RMS, 2013) based on the 'Highway Assignment Modelling' chapter: • Meet Table 10.3 for turn volumes and R^2 criteria. Screen line, cordon and link criteria not used. • Table 10.4 travel time calibration criteria met – Calibrated and validated SIDRA models for all traffic signals (x10) in line with Traffic Modelling Guidelines (RMS, 2013) based on the 'Single intersection modelling' chapter: • Intersection models will be built for the busiest hour at each intersection • Intersection settings will be set to reflect conditions • Calibrate model throughput so full intersection turning count data can travel through each intersection • Modelled queue lengths are similar to surveys.

Deliverable	Tasks
Base year model calibration reporting	– Prepare a base year calibration and validation report per TTD 2017/001 Operational modelling reporting structure. – Allowance for one draft and final before submitting to TfNSW.
Base year model updates after authority feedback	– One iteration of updates to the model and reporting based on authority feedback. This does not allow for changes to model design, which will be agreed in the model scoping note.
Strategic modelling	– Request STFM forecasts for: • 2036 with background growth only • 2036 with development • 2041 with background growth only • 2041 with development
Future year modelling	– Conduct the following scenarios in the Aimsun mesoscopic model: • 2036 with background growth only • 2036 with development • 2041 with background growth only • 2041 with development – The Aimsun mesoscopic model will be expanded to cover the road network of South Creek West Precinct 5, Lowes Creek Maryland and South Creek West Precinct 2. This network coding will only include the Sub Arterial and collector level roads. Local streets would not be useful for forecasting. – The Aimsun mesoscopic model scenario will be developed to the point where congestion levels are appropriate. Then, demands will be transferred into SIDRA, where they are used to determine intersection layouts. – Level of Service benchmarks will be agreed with TfNSW before work commences.
Future year model updates after authority feedback	– One iteration of updates to the model based on TfNSW and Council feedback. This does not allow for changes to model design or growth assumptions, which will be agreed in the model scoping note. This does not include new scenarios being conducted (e.g. different future years), only edits to agreed scenarios.

We aren't allowing major staging work to occur in preparing the planning proposal. We have allowed one interim stage (2036) and one final stage (2041). Further detailed staging would need to be planned for subdivision applications, which may require additional modelling.

1.4 Stakeholders

The key stakeholders are:

– Department of Planning, Housing and Infrastructure

– Transport for NSW

– Camden Council

– Always Consultancy Pty Ltd.

1.5 Report outline

This report has been structured into the following sections:

– **Section 1** introduces this report, its context, and its purpose

– **Section 2** describes the project in more detail

– **Section 3** explains the traffic surveys and other input data to the models

– **Section 4** describes the modelling methodology

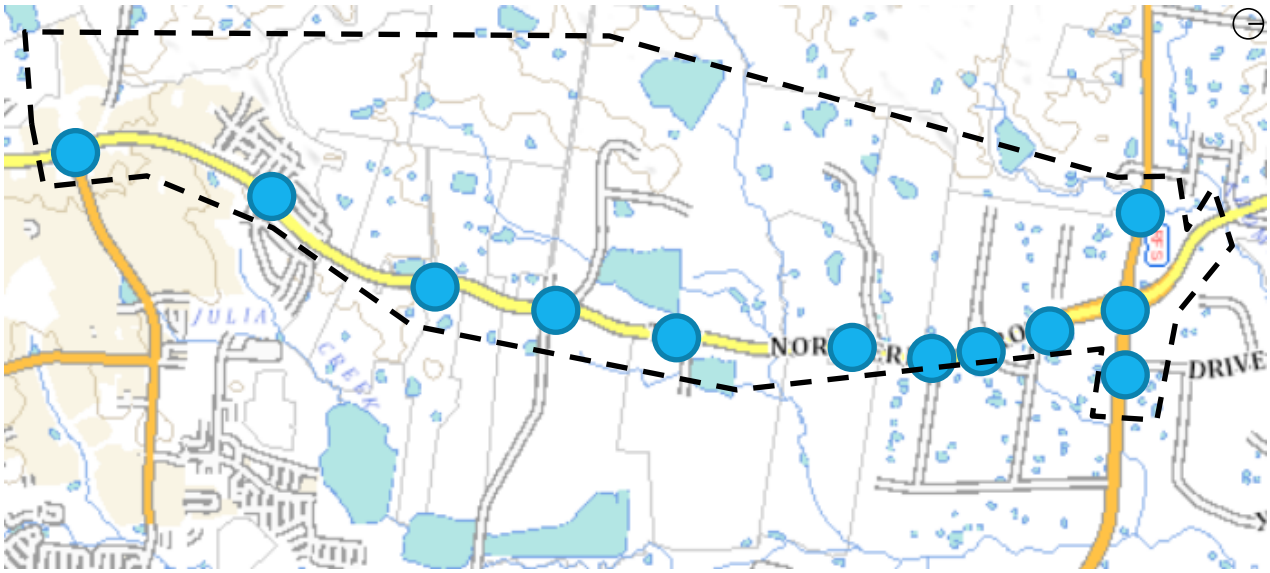
– **Section 5** captures the minutes of the inception meeting.

2.0 Project description

2.1 Study area

The assumed study area is provided in **Figure 3**.

Figure 3 Traffic modelling study area



Source: Six Maps, annotations by SCT Consulting, 2024

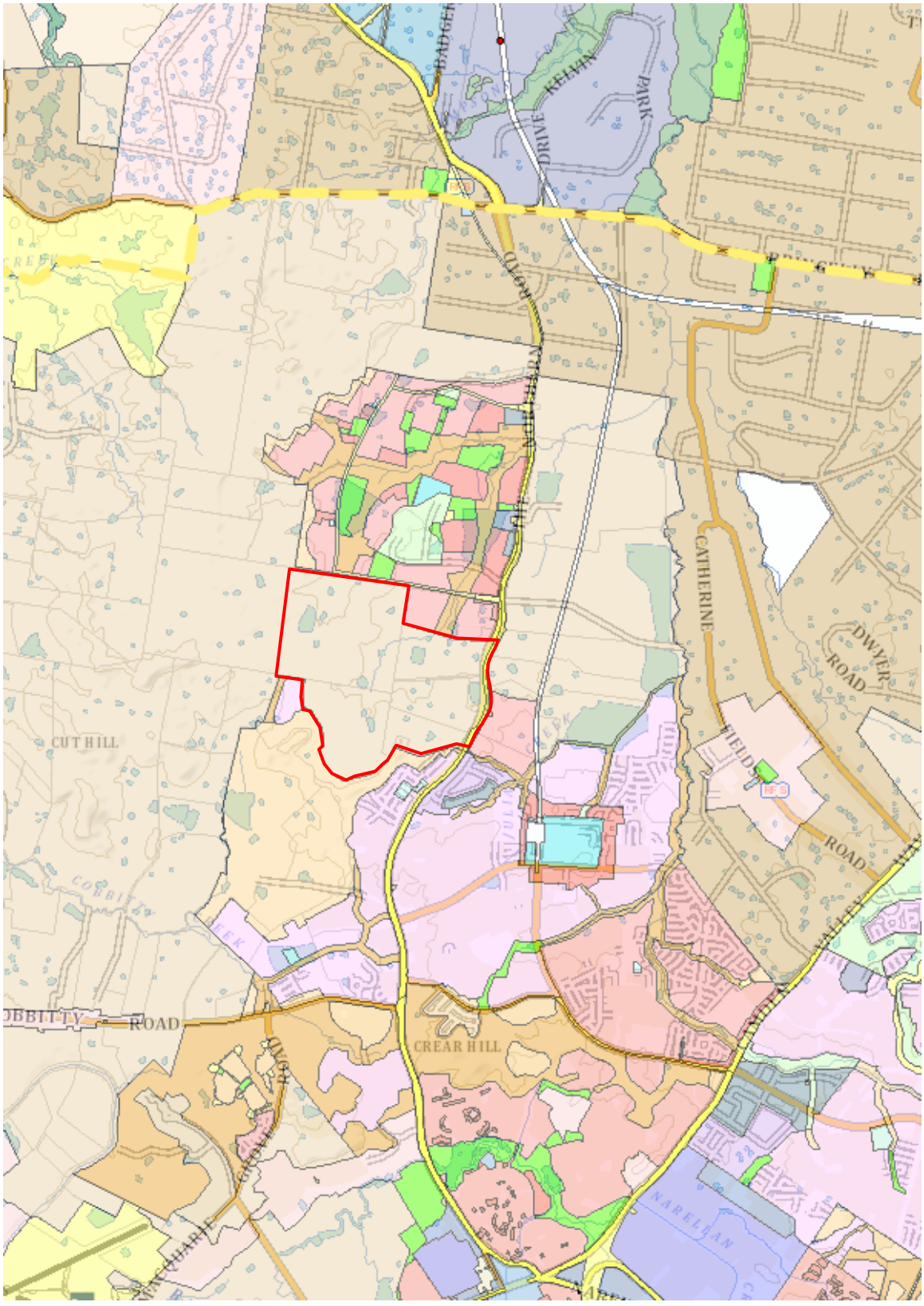
The intersections covered by this study area are:

- The Northern Road / Bringelly Road (signals)
- Bringelly Road / Kelvin Park Drive (signals)
- Bringelly Road / Wentworth Road (signals)
- The Northern Road / Belmore Road (signals)
- The Northern Road / Carrington Road (left in left out)
- The Northern Road / Lowes Creek Link Road (signals)
- The Northern Road / Marylands Link Road 3 (signals)
- The Northern Road / Marylands Link Road 2 (signals)
- The Northern Road / Marylands Link Road 1 (signals)
- The Northern Road / Dunk Pl offramp (priority)
- The Northern Road / Dick Johnson Drive (signals)
- The Northern Road / Peter Brock Drive (signals)

2.2 Land-use

The area in Precinct 5 is currently zoned rural agricultural land use (**Figure 4**). Most of the area surrounding Precinct 5 is zoned as rural agricultural land use or is transitioning to be zoned to residential and mixed uses or has recently been transitioned from to residential/mixed-use.

Figure 4 Land Zoning Map for the area adjacent to Precinct 5 (red outline)

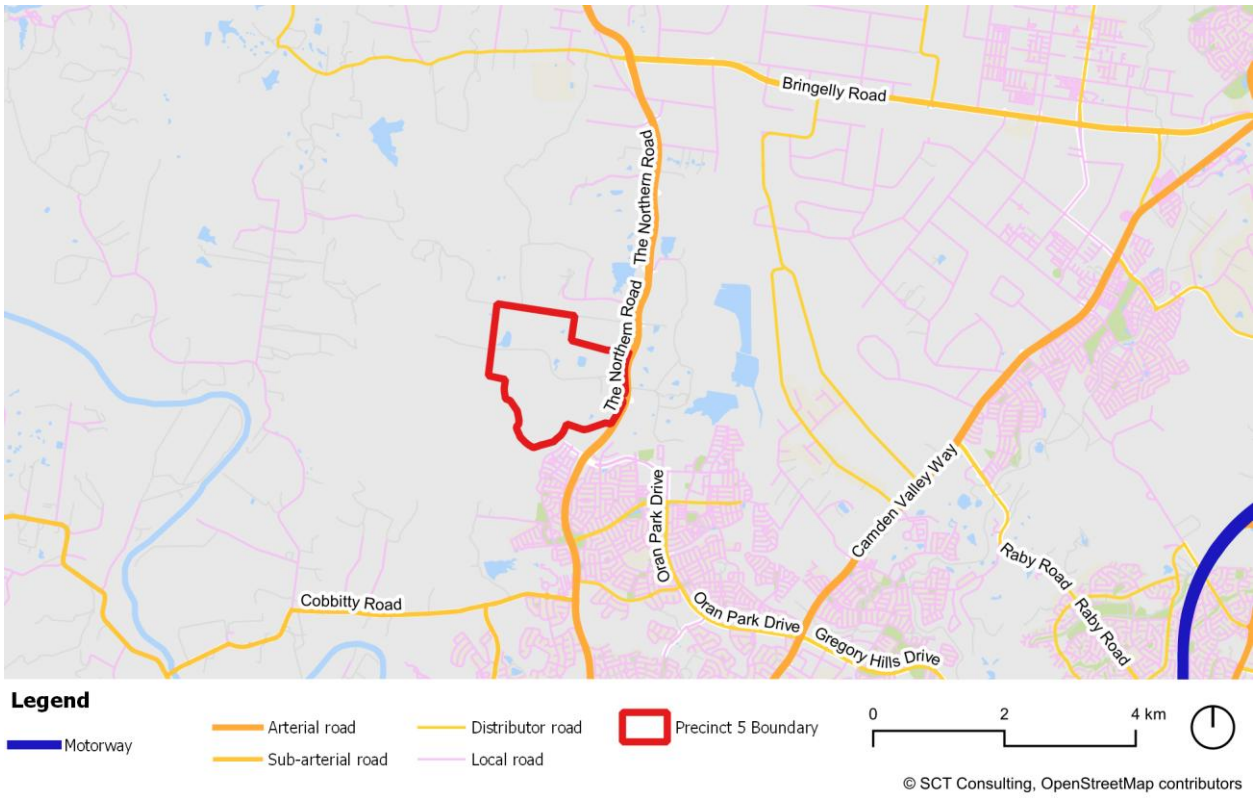


Source: NSW Planning Portal Spatial Viewer, accessed on 16th August 2024

2.3 Transport infrastructure

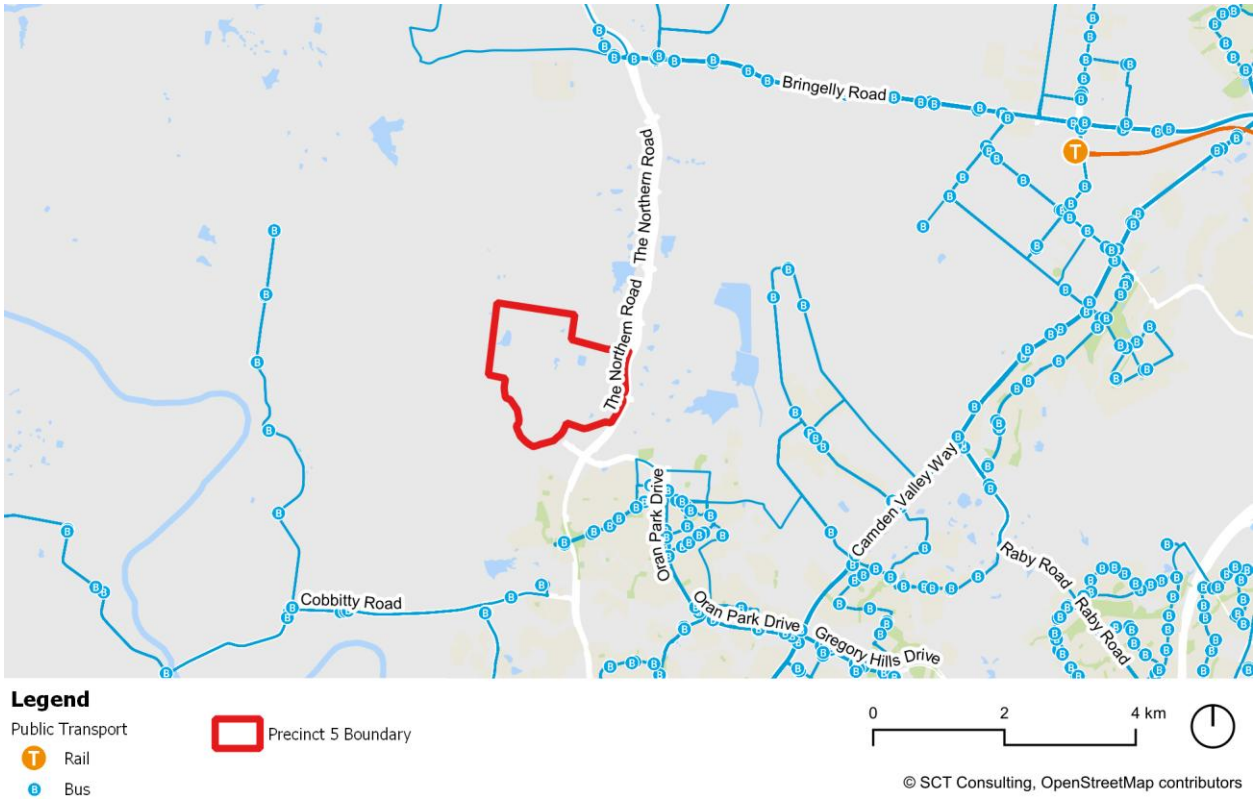
The Precinct 5 site is mainly connected by The Northern Road (**Figure 5**). The Northern Road is a four-lane divided arterial road with additional turn bays at the intersections, connecting the northern and southern parts of the city. The road has been subject to significant upgrades and improvements to enhance traffic flow and safety.

Figure 5 Road network surrounding study area



Public transport network in the vicinity of Precinct 5 is limited, with Leppington as the closest train station and sparce bus connectivity (**Figure 6**).

Figure 6 Public transport network surrounding Precinct 5



Active transport facilities are limited in this area due to low density.

2.4 Assessment years and time periods

All previous traffic modelling and assessments relating to LCM and SCW Precinct 5 were undertaken for 2021, 2026, 2031, 2036 and 2041.

For ongoing traffic modelling and assessments for the SCW Precinct 5 planning proposal, modelling would be undertaken for 2036 and 2041 (two-hour weekday AM and PM peaks with half an hour warmup and cooldown) to provide an understanding of the proposed development's interim and full development implications on the surrounding road network.

3.0 Input data

3.1 Traffic surveys

The traffic surveys proposed are identified in **Table 2**.

Table 2 Traffic surveys proposed

Element	Details
Intersection turning count	Data collection is proposed at 12 intersections (including ten, i.e. all traffic signals) for three hours in the morning and three hours in the evening peak of a typical weekday. Vehicle classification by light, heavy, and bus.
Queue length surveys	Queue length collection at 10 (all traffic signals) intersections for three hours in the morning and three hours in the evening peak of a typical weekday coinciding with intersection turning count.
Traffic signal settings	Request TfNSW traffic signal data for ten intersections.
Travel times	A floating car travel time survey for three hours in the morning and four hours in the evening peak for The Northern Road from Bringelly Road to Peter Brock Drive with segments at each set of signals of a typical weekday. The survey is expected to collect data on ten complete runs of the entire section in each direction within one hour, ensuring a representative sample of the vehicles.

The proposed surveys will be conducted during the middle of the week (Tuesday to Thursday) in a typical school week.

3.2 Assumptions

Assumptions related to the demand estimation will be carried forward from Stage 1 pre-gateway analysis. The Aimsun mesoscopic models and SIDRA models will be calibrated and validated as per the TfNSW Traffic Modelling Guidelines, 2013.

3.3 Strategic model

The following modelling scenarios (**Table 3**) are proposed to be included in the study.

Table 3 Modelling scenarios for Precinct 5 Stage 2 traffic modelling and study

Modelling scenario	TfNSW base case network assumptions	Land Use Assumptions			
		TfNSW base case land use assumptions	LCM Precinct (Rezoned)	Precinct 2 (subject to separate Planning Proposal)	Precinct 5 (subject precinct)
#1 - 2036 with background growth only	✓	✓	✓	✓	
#2 - 2036 with development	✓	✓	✓	✓	✓
#3 - 2041 with background growth only	✓	✓	✓	✓	
#4 - 2041 with development	✓	✓	✓	✓	✓

The purpose of each of the scenarios is as follows:

– Scenarios #1 and #3 provide a land use and transport baseline to assess the net impacts of the proposed land use changes of Precinct 5. Hence, the land use of SCW Precinct should include the approved residential and employment targets in the DPE forecasts minus those in Precinct 5.

– Scenarios #2 and #4, when compared with Scenarios #1 and #3, respectively, would specifically evaluate the impacts of the proposed land use change of Precinct 5.

The specific land use assumptions as presented above will be reviewed (in consultation with TfNSW) upon commencement of the modelling exercise, to confirm the scenarios are set up properly to assess the impacts of Precinct 5 only (for the purpose of the planning proposal).

The zone structure of the STFM modelling in the study area will also be reviewed (in consultation with TfNSW) upon commencement of the modelling exercise to reflect realistic trip distribution between the development and the surrounding road network.

3.4 Traffic signals

Signals will be vehicle actuated, covering at a minimum the following aspects of SCATS:

– Reference phase extension

– Phase skipping/early termination based on demand

– Offsets will be coded as per SCATS data in the Aimsun and SIDRA models.

– Diamond operations.

4.0 Methodology

4.1 Base model

4.1.1 Modelling Platform

The modelling method used in the assessments of precincts near Precinct 5 was studied, and a similar methodology has been proposed. A mesoscopic corridor model using Aimsun software will be developed for path assignment and to identify and mitigate congestion along the corridor. The key intersections along The Northern Road will further be analysed using SIDRA software.

4.1.2 Traffic demand

Traffic demand will be determined based on surveyed traffic volumes. We will compare the demand used in the modelling against the STFM 2024 model volume to evaluate how closely the surveyed volumes align with the STFM models.

Subsequently, the flows will be adjusted to match local traffic volumes. A comparison of trip length will be conducted to review the change in trip length.

4.1.3 Traffic zones/input

Zones will be generated for each of the entries and exits of the study area.

4.1.4 Traffic profile

Matrices will be developed during the calibration process for each fifteen minutes of model simulation. The warm-up period will be based on actual counts rather than a warm-up factor. Separate matrices will be developed for light and heavy vehicles.

4.1.5 Road type

Default TfNSW road types will be adopted. As the model does not have any route choice, road type (in terms of attractiveness parameters) will not be significant.

4.1.6 Driving behaviour and speed profile

The default driving behaviour and speed profiles will be used. Gap acceptance parameters will be adopted based on the Traffic Modelling Guidelines Appendix E Recommended Gap Acceptance Parameters.

4.1.7 Public transport

Include the process and source that will be used to develop the public transport data.

4.1.8 Traffic signals

Data will be requested from SCATS.Traffic.Signal.Data@transport.nsw.gov.au and is to be charged at standard cost rates to SCT Consulting. Signal settings will be reviewed as the model is calibrated and validated (namely typical phase length, and waste settings) to attempt to reflect the local conditions.

4.1.9 Pedestrians and cyclists

The intersections in the study area have limited pedestrian demands and, in some cases, do not have pedestrian crossings. As future modelling is expected to require modelling of pedestrian demand increases, pedestrian calls will be included in signal logic.

Cyclists will not be modelled.

4.1.10 Assignment type

The assignment type will be dynamic user equilibrium. The proposed model network will be a corridor, and hence, it does not have any route choice, but lane choice is important and will require iteration.

4.2 Future model

4.2.1 Scenario testing

Strategic model runs using the STFM will be requested from TfNSW and all the necessary information needed for these runs to be provided to TfNSW. The forecasts for the following scenarios will be assessed:

– 2036 with background growth only

– 2036 with development

– 2041 with background growth only

– 2041 with development

The above-mentioned scenarios will be assessed using a mesoscopic simulation model, using forecasts from strategic models. The Aimsun mesoscopic simulation model will be expanded to cover the road network of South Creek West Precinct 5, Lowes Creek Maryland, and South Creek West Precinct 2. This network coding will only include the Sub-arterial and collector-level roads. Local streets would not be useful for forecasting.

Level of Service benchmarks will be agreed with TfNSW before work commences.

4.2.2 Future base case assumptions

The proposed network upgrades to the Northern Road and surrounding area, which are part of the STFM, will also be included in the Aimsun model. The proposed network upgrades that are within the study area will be discussed with TfNSW before future year modelling commences.

4.2.3 Traffic demand/growth

4.2.3.1 Trip generation rates

The assumptions regarding trip generation rates, trip containment, and trip distribution used in Stage 1 of the assessment will be applied consistently in Stage 2. For additional details on the trip generation assumptions from Stage 1, please refer to Attachment 1.

4.2.3.2 Strategic demand models

Traffic growth will be obtained from STFM. As STFM is not capacity-constrained, an initial run will be used to determine the extent of traffic that is unable to enter the network to inform manual adjustments to the demand, which could include:

– Switching from car to bus/train where a reliable bus/train service exists

– Peak spreading (see discussion in traffic profile)

– Re-routing outside of the study area.

Any necessary adjustments to the demand will be submitted to TfNSW for approval and incorporated into the models upon receiving confirmation.

The future year's traffic generation will represent the net increase above existing traffic generation within each site. Any changes to demand for the future year will be discussed with TfNSW before implementation.

4.2.4 Traffic profile

The traffic profile identified from the base year data collection will be retained in the initial iteration of the model.

Based on the preliminary results, the need for peak spreading will be identified and discussed with TfNSW. Any adjustments will be evidence-based and based on a comparable area.

4.2.5 Public transport

Public transport improvements, including bus priority lanes and new services, will be included into the study based on the committed upgrades. The team will explore opportunities to enhance public transport access to the site.

4.2.6 Traffic signals

Traffic signals will need adjustments based on the changed demand profile. The intersection signal timings setting will be iteratively updated to get a reasonable outcome.

Table 4 Cycle time updates

Situation	Explanation
Minor reduction in demands, no change to demands and/or no change phasing	Cycle times will remain at the same level as the base year. Phase times will be optimised. Coordination (offsets) will remain the same as base year data.
Increases in demands, new intersection approaches, new traffic signals	Phasing will be set to optimised with a maximum of 140 seconds cycle time.

4.2.7 Assignment type

The assignment type will be retained from the base calibration model. The internal streets of the Precinct 5 will not be included in the future models.

5.0 Inception meeting outcome

The model scoping note prepared for the Stage 1 pre-gateway analysis is attached to this document, along with the TfNSW's confirmation about the Stage 1 Preliminary Traffic and Transport Analysis.

APPENDIX B

AIMSUN CALIBRATION AND VALIDATION REPORT

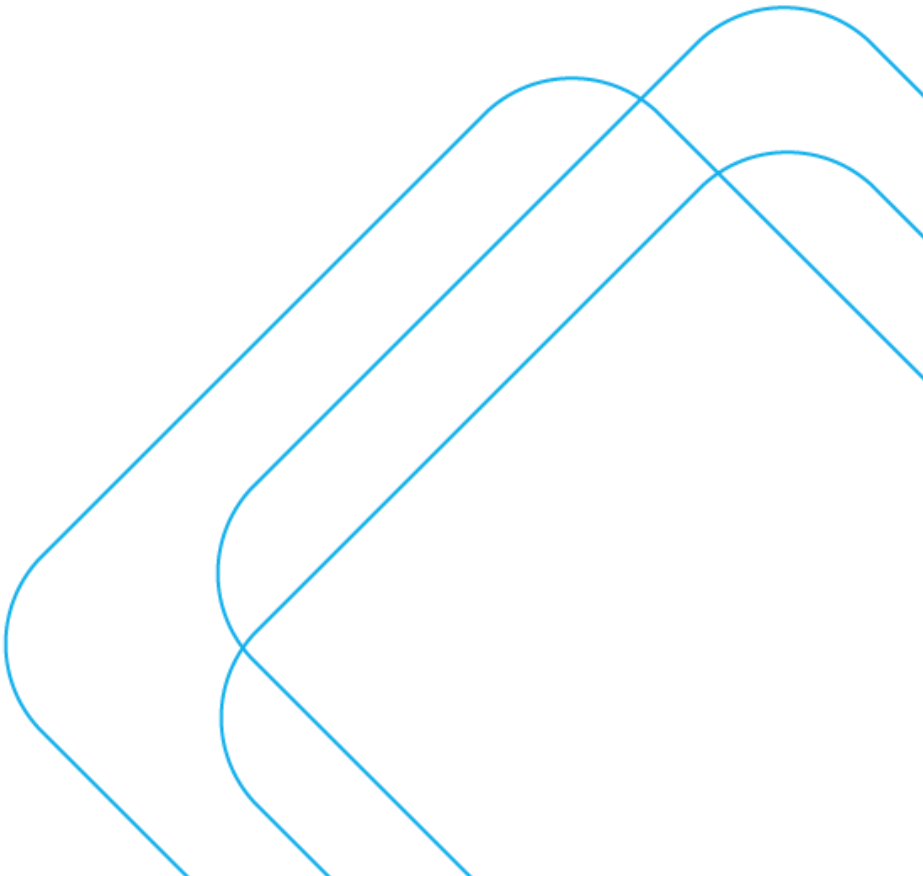
SCT Consulting

SOUTH CREEK WEST PRECINCT 5

Base year model report

11 JUNE 2025

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



Quality Assurance

Project:	South Creek West Precinct 5		
Project Number:	SCT_00629		
Client:	Always Consultancy Pty Ltd	**ABN:**	26 664 197 933
Prepared by:	SCT Consulting PTY. LTD. (SCT Consulting)	**ABN:**	53 612 624 058

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Authoriser:	Andy Yung	Director	

Version	Date	Details
1.0	7 March 2025	Draft
2.0	20 May 2025	Revised draft
3.0	11 June 2025	Revised draft – travel time comparison update

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1.0 Introduction

1.1 Background

SCT Consulting was engaged by Always Consultancy Pty Ltd to undertake Stage 2 (post-gateway) detailed traffic assessment to support the planning proposal of Cobbitty Sub-Precinct 5, also known as Precinct 5. Precinct 5 totals approximately 303 hectares and is characterised by rural residential and agricultural land uses and activities.

Precinct 5 is located in the southwest of the South Creek West Land Release area, within Cobbitty in the Camden LGA. It adjoins the recently rezoned Lowes Creek Maryland Precinct to the north, the Pondicherry Precinct (under rezoning) to the east, and Oran Park to the south.

During Stage 1 (pre-gateway) works, SCT Consulting conducted a preliminary analysis using TfNSW provided Strategic Traffic Forecasting Model (STFM) outputs to assess impacts on The Northern Road.

This report details the development of a base Aimsun mesoscopic model for Stage 2 (post-gateway), to evaluate Precinct 5's traffic impacts on the surrounding transport network and inform the planning proposal.

1.2 Project Objective

The project aims to:

– Amend the State Environmental Planning Policy (Precincts—Western Parkland City) 2021 to enable the urban development of Precinct 5, aligning with the South West Growth Centre and the Greater Sydney Commission's Regional and District Plans.

– Quantify the impact of the proposed development in Precinct 5 on the surrounding transport network.

– Propose mitigation measures for the road network, public transport, and active transport to address identified impacts.

1.3 Scope of Work

The scope of work covered in this report includes developing, calibrating, and validating the Base Aimsun mesoscopic model for the study area as per Traffic Modelling Guidelines (RMS, 2013), specifically the 'Highway Assignment Modelling' chapter. This includes:

– Calibrating two-hour model for morning peak and three-hour model for afternoon peak.

– Meeting turn volume and R^2 criteria as outlined in Table 10.3 (screen line, cordon, and link criteria are not used).

– Satisfying travel time calibration criteria as specified in Table 10.4.

1.4 Stakeholders

The key stakeholders are:

– Department of Planning, Housing and Infrastructure

– Transport for NSW

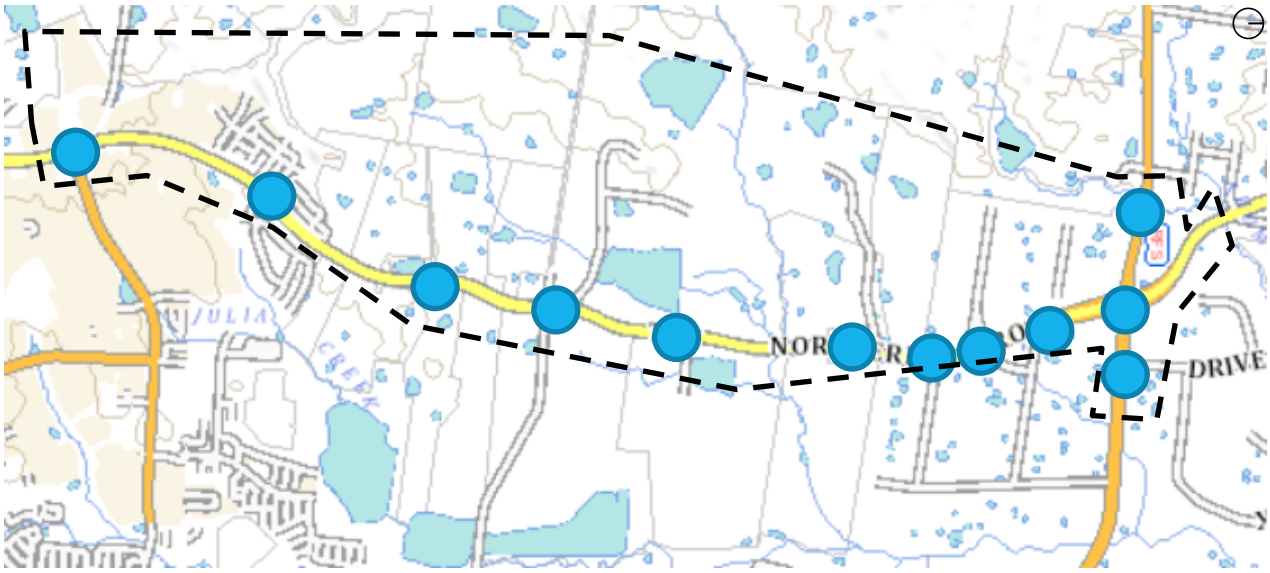
– Camden Council

– Always Consultancy Pty Ltd.

1.5 Study Area

The assumed study area is provided in **Figure 1-1**.

Figure 1-1 Traffic modelling study area



Source: Six Maps, annotations by SCT Consulting, 2024

The intersections covered by this study area are:

- The Northern Road / Bringelly Road (signals)
- Bringelly Road / Kelvin Park Drive (signals)
- Bringelly Road / Wentworth Road (signals)
- The Northern Road / Belmore Road (signals)
- The Northern Road / Carrington Road (left in left out)
- The Northern Road / Lowes Creek Link Road (signals)
- The Northern Road / Marylands Link Road 3 (signals)
- The Northern Road / Marylands Link Road 2 (signals)
- The Northern Road / Marylands Link Road 1 (signals)
- The Northern Road / Dunk Pl offramp (priority)
- The Northern Road / Dick Johnson Drive (signals)
- The Northern Road / Peter Brock Drive (signals).

1.6 Report Outline

This report is structured into the following sections:

- Chapter 1 introduces the report, context, and purpose.
- Chapter 2 outlines the existing traffic and transport conditions in the study area.
- Chapter 3 details the base year modelling assumptions and input data.
- Chapter 4 describes the model calibration, validation, and limitations.
- Chapter 5 concludes the report with findings from the base model development and assesses its suitability for impact assessment and mitigation purposes.

2.0 Existing Conditions

2.1 Traffic Surveys

2.1.1 Turning Movement Count (TMC)

TMC surveys were conducted on Tuesday 12 November 2024 at twelve key intersections, as outlined in **Section 1.5**. The data collected from these intersection surveys has been used to generate base year demand matrices, which serve as inputs for the base model.

Data was collected for light vehicles, heavy vehicles, buses, cyclists, and pedestrians at 15-minute intervals. Based on the survey volumes, the peak periods for modelling are summarised in **Table 2-1**.

Table 2-1 Survey and model duration

Peak	Survey duration	Peak period for modelling	Duration
AM peak	6.30–9.30am	6.30–8.30am	2 hours
PM peak	3.30–6.30pm	3.30–6.30pm	3 hours

Base year demand matrices were calculated for light and heavy vehicles for each 15-minute time interval.

2.1.2 Travel Time Survey

A floating car travel time survey was conducted for three hours during the morning peak and four hours during the evening peak on The Northern Road, from Bringelly Road to Peter Brock Drive. The survey included segments at each set of traffic signals and was carried out on the same day as the Turning Movement Count (TMC) survey.

The survey successfully collected data on approximately ten complete runs of the entire corridor in each direction within one hour, ensuring a representative sample of vehicle travel times.

2.2 Congestion Locations

Based on video footage and reported traffic volumes, there seems to be spare capacity along The Northern Road to accommodate future traffic growth in the region. At present, there are no particular congestion points that were observed from the video surveys.

3.0 Model Assumptions

3.1 Modelling Platform

The base models were developed and assessed using Aimsun 23.0.0. This version will be retained for all assessments related to the future options and mitigation measures study.

3.2 Time Period

The base year model has been developed for 2024, with future year modelling proposed for 2036 and 2041. The modelling period covers 2 hours during the AM peak (6.30–8.30am) and 3 hours during the PM peak (3.30–6.30pm). These timeframes represent typical commuter periods for both peaks, with additional time included to account for peak spreading in the future. In addition to the core 2 and 3-hour periods, the model also includes a 30-minute warm-up and cool-down period.

3.3 Assignment Type

A multistep assignment process is used in Aimsun to achieve replicable and practical traffic assignment.

3.3.1 Static Assignment

This is a first step that distributes trip volumes across the network based on road section costs, without simulating individual vehicles. It uses deterministic algorithms to assign flows, typically applied in wide-area models. Common methods include All or Nothing, Incremental, Equilibrium, and Stochastic Assignment, all of which calculate shortest paths and distribute traffic based on network costs. This approach is ideal for analysing overall network performance under steady-state conditions.

3.3.2 Dynamic User Equilibrium (DUE)

DUE ensures that travellers departing at the same time experience equal and minimal travel times for each origin-destination pair. It represents scenarios where travellers adjust routes based on real-time information or through iterative learning. In Aimsun Next, DUE is achieved using a heuristic approach that simulates this adaptive behaviour, iterating until no further travel time improvements are possible.

3.4 Vehicle Types

Light and heavy vehicles have been included in the base model. Public transport buses are included in the model, based on published timetabled data. However, it is noted that these services are infrequent and only access small portions of the modelled network. The characteristics of the vehicle types used in the model are detailed in **Table 3-1**.

Table 3-1 Vehicle types

Vehicle Name	Description	Usage	Vehicle length	Vehicle weight	Mean clearance
Car	Light passenger vehicle Austroads Class 1-2	Matrix	4.6m	1,202kg	1.00m
Truck	Small to medium trucks Austroads Class 3-10	Matrix	14m	10,000kg	1.50m
Bus	Public passenger bus	Fixed timing	12m	6,172kg	1.50m

3.5 Traffic Zones/Input

Traffic demand has been modelled using origin-destination (OD) matrices, which define trip start and end points through a set of zones (referred to as centroids in Aimsun terminology). These zones connect trips to the road network.

In the base year model, the network follows a tree-like structure with no circuitous/alternative routes, meaning there is no route choice. Zones have been defined at the road ends along the study area boundary, representing roads rather than specific geographic areas.

The base year model utilises OD matrices derived from survey data. Future-year demand is expected to be calculated using STFM models. While the zone structure is likely to remain largely the same, additional zones may be introduced to account for new developments and the associated demand.

3.6 Road Types

The road types and hierarchy adopted in the base model are summarised in **Table 3-2** and the characteristics of these road types are mentioned in **Table 3-2**.

Table 3-2 Road types used in the model

Road Name	Road Type	Lane Capacity (PCUs/hr)	Speed Limit (km/hr)	Jam density (veh/lane/km)
The Northern Road	Trunk	1,200	80	210
Bringelly Road	Tertiary / Primary	1,500	50	200
Dick Johnson Drive	Secondary	800	50	200
Brunsdon Road	Secondary	800	50	200
Peter Brock Drive	Secondary	800	60	200
Charles Mcintosh Parkway	Tertiary	700	50	200
Belmore Road	Residential	600	50	200

3.7 Speed Profiles

The study area contains streets/roads with posted speeds ranging from 50km/hr to 80km/hr.

3.8 Traffic Signals

Traffic signal data for all signals within the study area was obtained from TfNSW. The data, available at 15-minute intervals, was used to calculate phase timings for each signal across every 15-minute period. SCATS traffic signals were modelled in Aimsun using the actuated signal controller option, specifically using a Ring Barrier Control (RBC) type signal controller. The RBC controller uses detector actuation to call and/or extend phases, enabling a dynamic and responsive signal operation. By using detectors and the RBC controller, the model achieved a reasonably accurate replication of SCATS functionality within Aimsun.

It is noted that three of the signalised intersections (Lowes Creek Link Road, Marylands Link Road 3, Marylands Link Road 2) do not experience traffic on the side streets. These intersections predominantly serve the major north-south movements, with side street phases only triggered occasionally by vehicles entering from the side streets. Additionally, as The Northern Road is primarily designed for vehicular movements, pedestrians and cyclists were not modelled, nor were signal actuations for these road users considered, due to their low volumes in the study area.

3.9 Public Transport

Currently, there are no public transport buses operating along the entirety of The Northern Road corridor. A small number of school bus routes service the area, mainly along the Bringelly Road corridor. Overall, public transport provision across the majority of the study area remains minimal. Based on published timetabled data, existing public transport services have been incorporated into the base model.

The Northern Road corridor's infrastructure has been designed to accommodate future public transport improvements, including provisions for bus priority measures such as jump lanes at signalised intersections.

3.10 Demand Assumptions/Adjustment

The base year study area includes The Northern Road corridor and Bringelly Road. The modelled road network is structured as a tree-like system, meaning it does not include circuitous routes or closed loops. Consequently, there are no multiple paths for the same origin-destination (OD) pair. This network structure makes the demand matrices calculations straightforward.

The 15-minute survey data for light and heavy vehicles were input into volume network diagrams using spreadsheets, and the volumes were balanced. These diagrams were used to calculate traffic volumes from each end of the network to all remaining ends for all time intervals and vehicle types. The volume imbalances observed were relatively low, typically within a range of 50 vehicles between two adjacent intersections for total vehicles in a 15-minute interval.

The base year demands were developed using a turning count volume-weighted methodology. For any given OD pair, the demand is calculated using the following formula:

$$x_{ij} = \alpha_i \times \prod_{q=1}^{turns\ from\ i\ to\ j} turn\ proportion_q$$

Where:

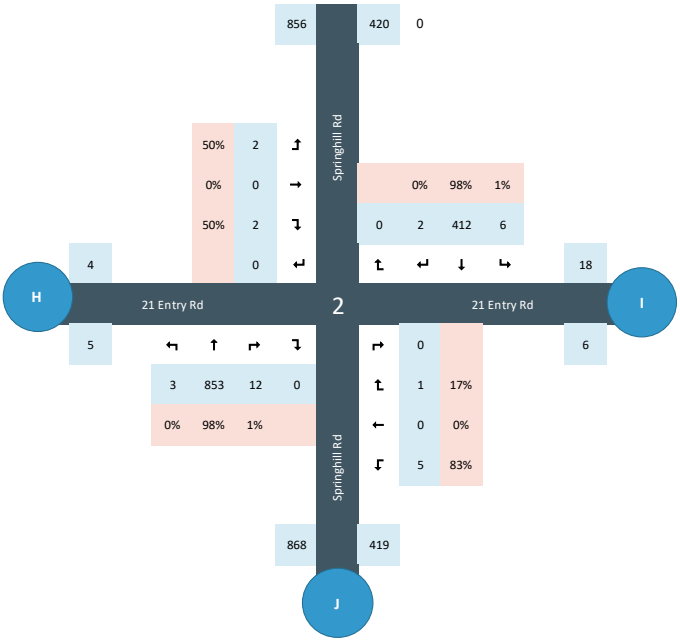
x_{ij} is the demand from origin *i* to destination *j*,

α_i is the origin demand for zone *i*, and

turn proportion $turn\ proportion_q$ represents the proportion of turns for each movement from *i* to *j*.

An example of this approach is illustrated in **Figure 3-1**. For instance, the demand from origin zone H to destination zone I is calculated as 4 (the origin demand for zone H) multiplied by 0% (the turning proportion from H to I), resulting in a demand of 0 from H to I.

Figure 3-1 Example demand calculation



Separate origin-destination (OD) matrices were calculated for light vehicles and heavy vehicles for each 15-minute period, based on the turning movement surveys. As separate matrices were developed for light and heavy vehicles for each of the eight 15-minute periods within the peak models, no additional proportioning or profiling was applied to the demand matrices.

3.11 Pedestrians and Cyclists

As The Northern Road is primarily designed for vehicular movements, pedestrians and cyclists were not explicitly included in the model. The majority of the area adjacent to The Northern Road is undeveloped, with no significant places of attraction or utility to encourage pedestrian activity along or across the corridor.

It is noted that a shared path exists on the eastern side of The Northern Road, which could be utilised by cyclists. While cyclists may have some interaction with vehicles when crossing side streets or The Northern Road itself, the observed volume of cyclists is very low. As a result, their impact on traffic operations is assumed to be negligible.

3.12 Traffic Profile

The turning movement count survey was conducted at 15-minute intervals, capturing data for both light and heavy vehicles. The demand matrices were estimated using these detailed 15-minute turning counts, segmented by vehicle type, to ensure precise traffic profiling. **Figure 3-2** and **Figure 3-3** illustrate the traffic profiles during the AM and PM peak period traffic profiles.

Figure 3-2 AM peak traffic volume profile

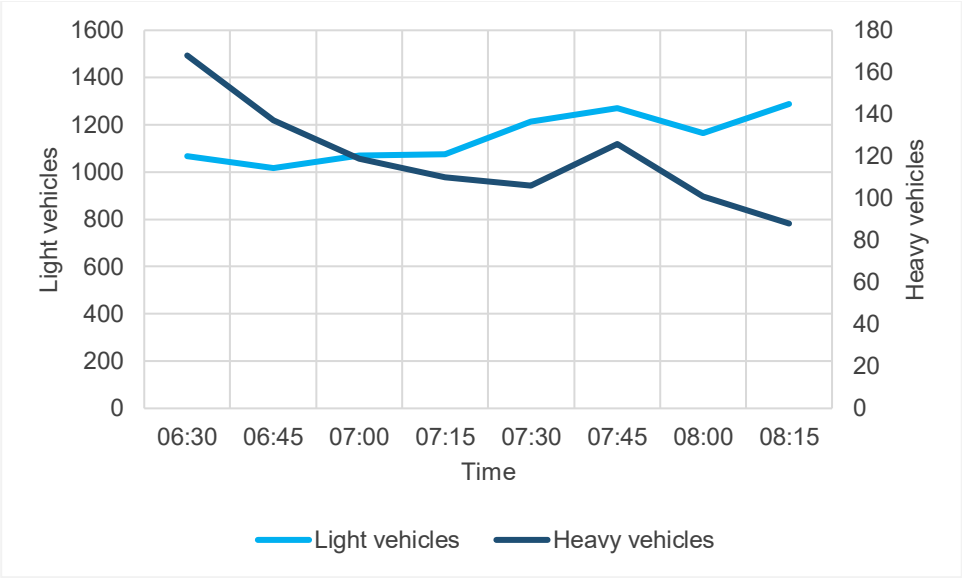
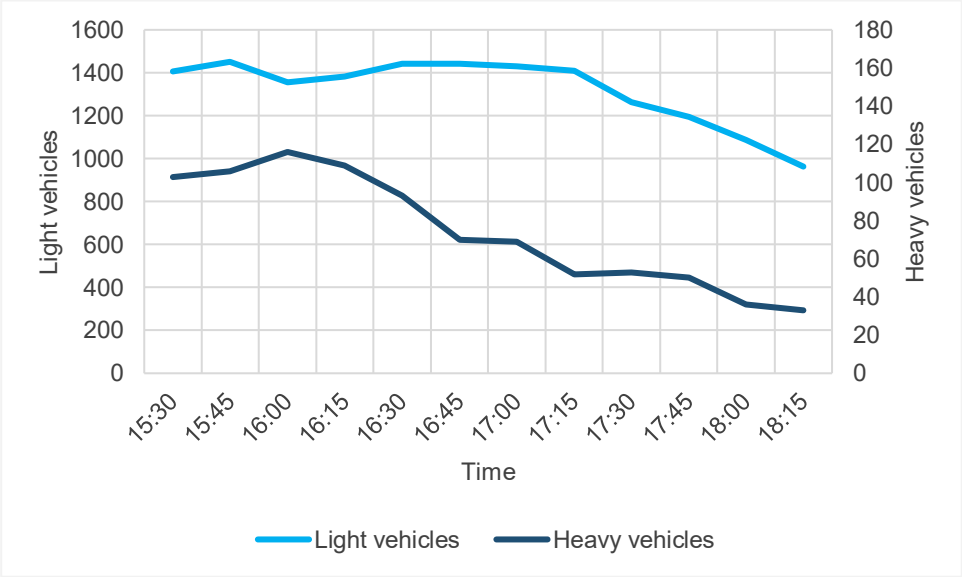


Figure 3-3 PM peak traffic volume profile



3.13 Calibration and Validation Targets

Consistent with the model scoping note, the calibration process used two hours for the morning peak and three hours for the afternoon peak. The Aimsun mesoscopic model for the study area, including the intersections shown in **Figure 1-1**, was calibrated and validated in accordance with the *Traffic Modelling Guidelines (RMS, 2013)*, specifically referencing the 'Highway Assignment Modelling' chapter.

The calibration targets to be met and demonstrated in the next chapter include:

– Turn volumes: Achieving the requirements of Table 10.3 of *Traffic Modelling Guidelines* and the R^2 criteria (shown in **Table 3-3**).

Table 3-3 Highway assignment modelling turn target calibration/validation criteria

Topic	Criteria
Link and Turn	85 per cent of individual turn volumes to have a GEH ≤ 5.0
	All individual turn volumes should have GEH ≤ 10
	Plots of observed vs. modelled hourly flows required for all observations Plots to include lines showing GEH = 5 tolerance limits R^2 value to be included with plots and to be > 0.9 Slope equation to be included with plots (intercept to be set to zero)
	All counts RMSE should be 30.0 or lower

Source: Table 10.3 from Traffic Modelling Guidelines, Roads and Maritime Services, version 1.0, February 2013

– Travel times: Meeting the calibration criteria outlined in Table 10.4 of Traffic Modelling Guidelines (shown in **Table 3-4**).

Table 3-4 Highway assignment modelling travel time target calibration/validation criteria

Topic	Criteria
Journey time average	Average modelled journey time to be within 15 per cent or one minute (whichever is greater) of average observed journey time for full length of route for 95 per cent of observed travel time routes. Travel times on each route should be cumulatively graphed by sector

Source: Table 10.4 from Traffic Modelling Guidelines, Roads and Maritime Services, version 1.0, February 2013

4.0 Model Calibration and Validation

The model was calibrated and validated to the criteria identified in **Section 3.13**. The following sections provide a summary of the level of calibration and validation achieved for the AM and PM base models.

4.1 Model Stability

Model stability is typically measured using the profile of vehicle hours/time travelled, measuring the total congestion in the model. If a particular seed run deviates significantly beyond the profile of other seed runs, it could mean that an element of the model produces “unstable” results – undermining the intent of repeatability in the model.

Vehicle Hours Travelled (VHT) with ten seed values for the AM and PM peak models indicate that nine of the ten seed values were stable and similar to the overall pattern, as shown in **Figure 4-1** and **Figure 4-2**. The figures also show that one of the seed values in each of the models is an outlier. A review of the model peak median VHT identified the seed value of 7771 for both the AM and PM peak models, for which all model results are extracted.

Figure 4-1 AM Peak VHT Stability

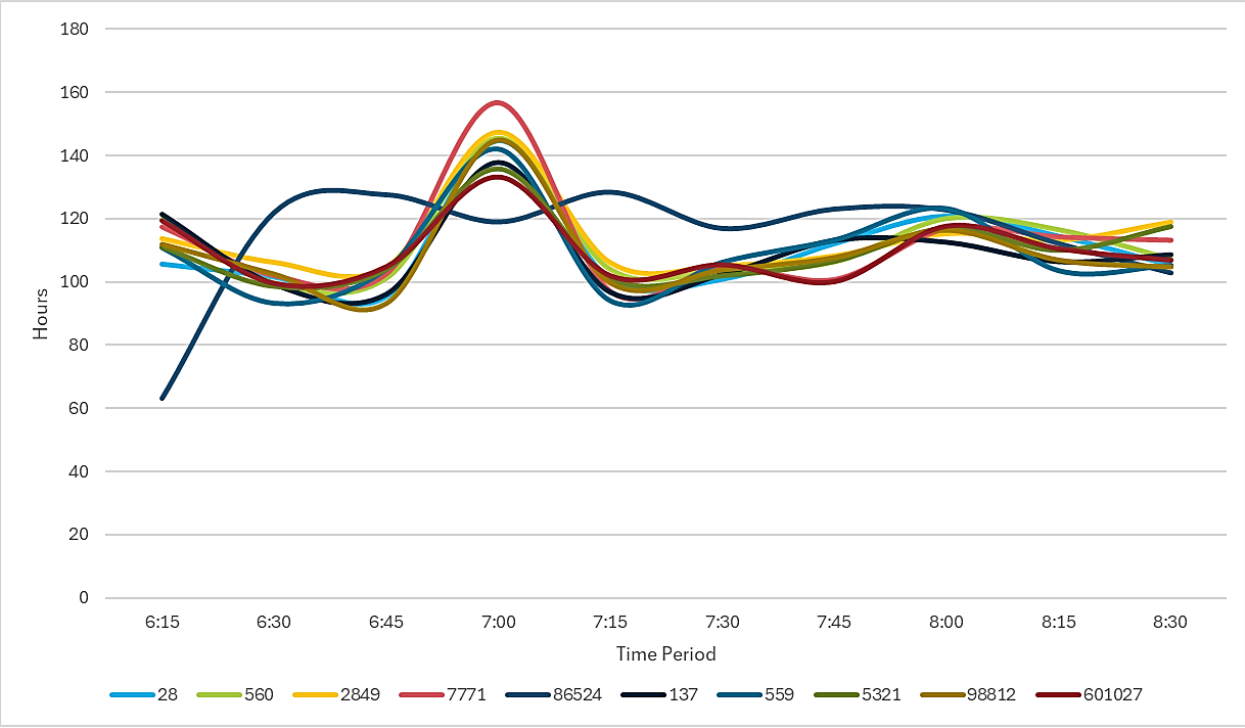
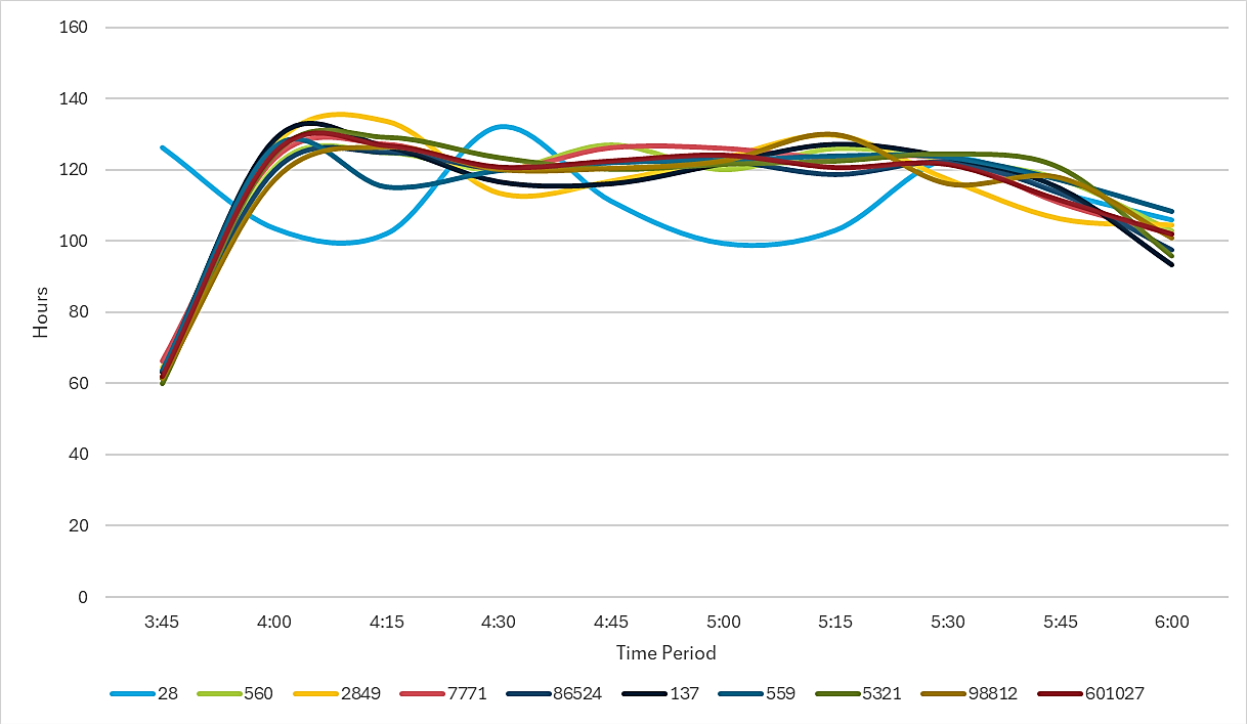


Figure 4-2 PM Peak VHT Stability



4.2 R^2 and Root Mean Square Error (RMSE) calibration

A comparison of the observed counts between the 2024 survey turn volumes and the modelled vehicles are provided in **Figure 4-3** to **Figure 4-12** for the AM and PM model peak hours. The R^2 values for all periods exceed the requirement of 0.95 in the guideline, so meet the calibration requirement.

In addition to the R^2 value calculations, the Root Mean Square Error (RMSE) values are calculated to statistically measure the correlation between the entire count data set and the predicted model volumes. The RMSE applies to the entire comparison data set and is expressed as a single value. The formula for RMSE is:

$$RMSE = \frac{\sqrt{\frac{\sum(V_o - V_m)^2}{C-1}}}{\frac{\sum V_o}{C}} \times 100$$

Where:

V_o is the observed flow in vehicles per hour

V_m is the modelled flow in vehicles per hour

c is the number of count locations in set

The *Traffic Modelling Guidelines* identifies a RMSE target value of 30.0 or lower. The RMSE values for the AM and PM modelled periods, all achieved a maximum value range of 7.9 and 24.0 for the AM and PM peak models, respectively.

Figure 4-3 Light vehicles R2 modelled versus count data, core area, 6.30-7.30am peak

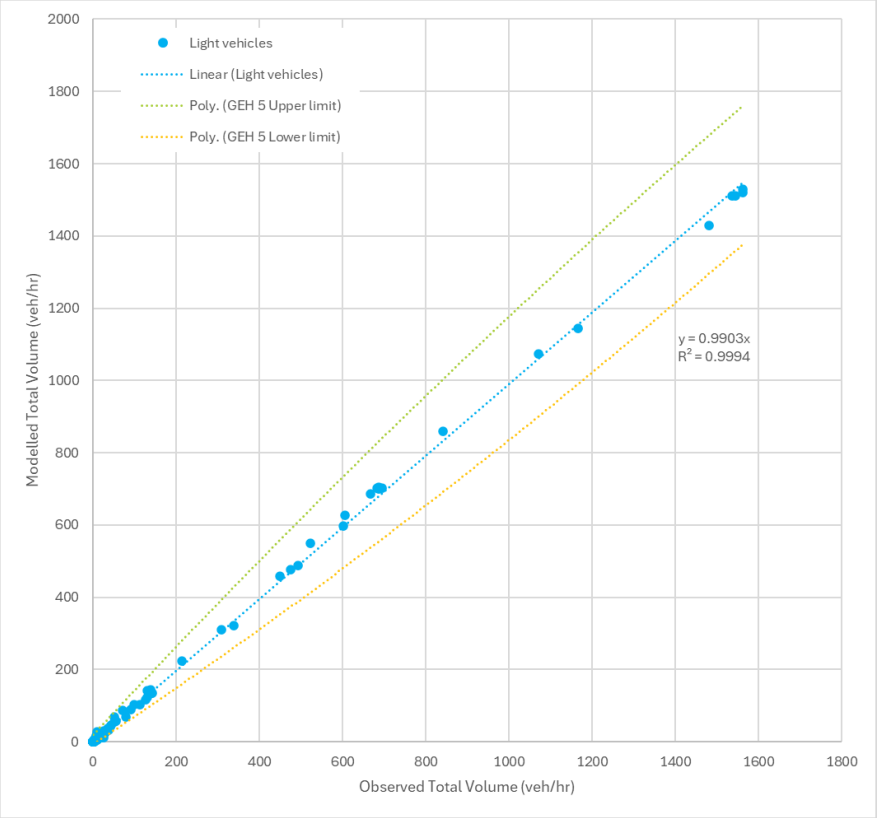


Figure 4-4 Heavy vehicles R2 modelled versus count data, core area, 6.30-7.30am peak

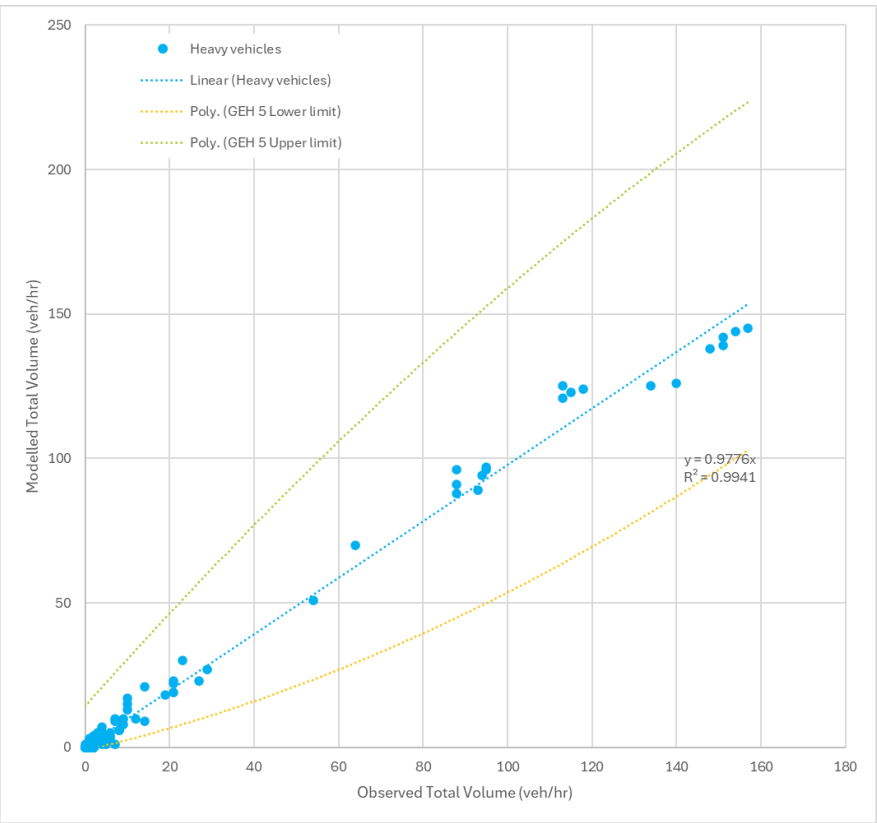


Figure 4-5 Light vehicles R2 modelled versus count data, core area, 7.30-8.30am peak

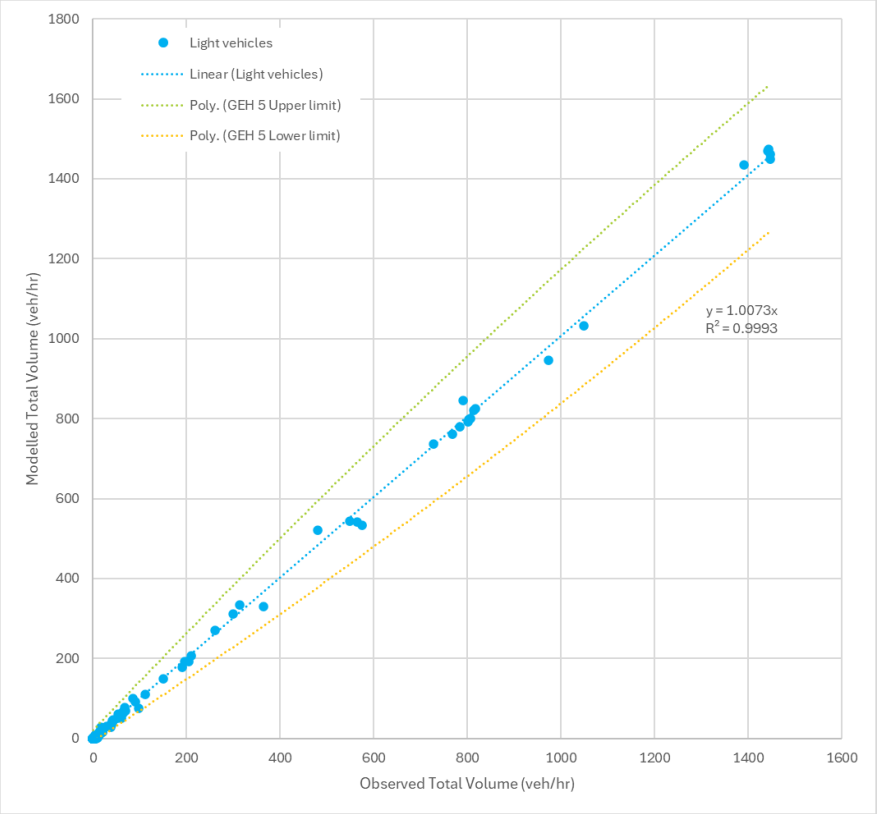


Figure 4-6 Heavy vehicles R2 modelled versus count data, core area, 7.30-8.30am peak

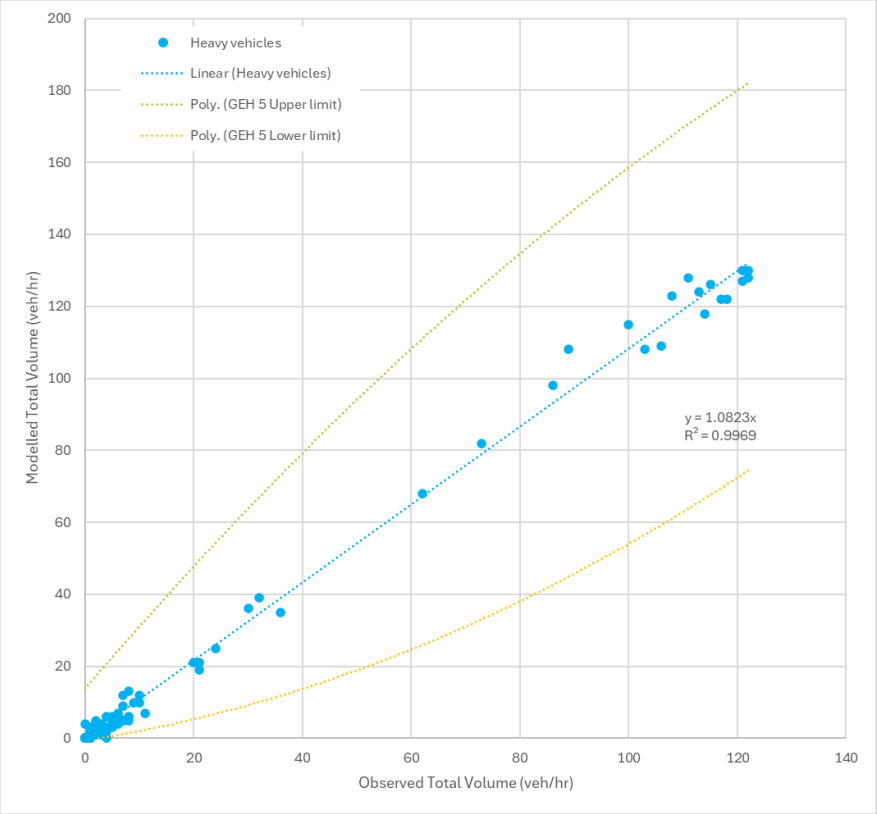


Figure 4-7 Light vehicles R2 modelled versus count data, core area, 3.30-4.30pm peak

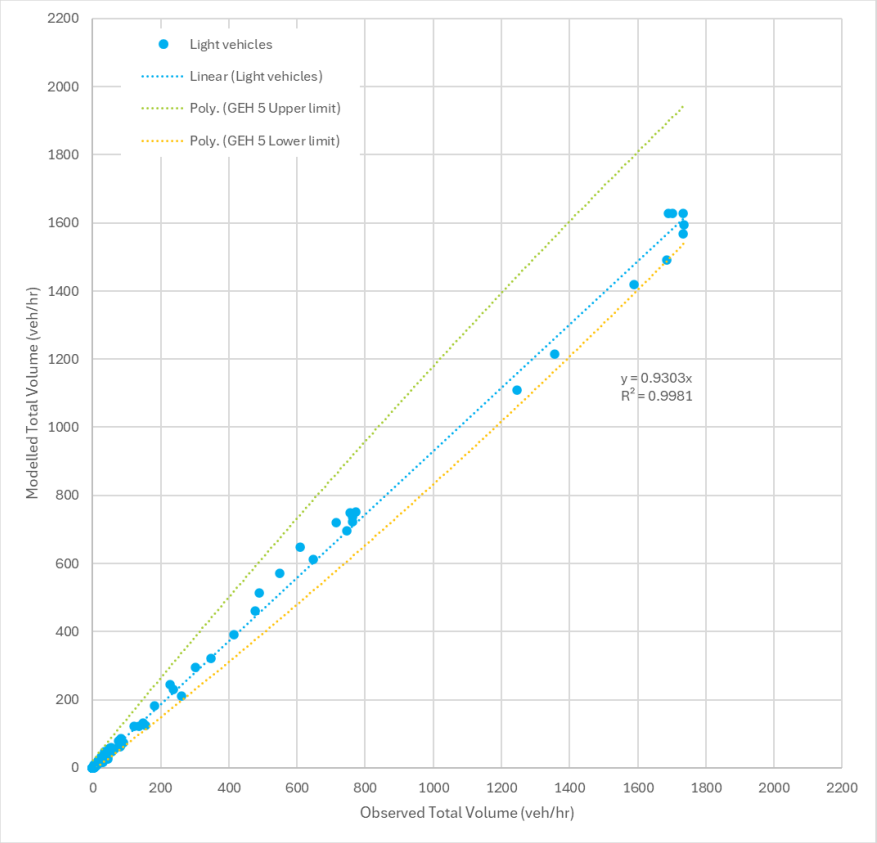


Figure 4-8 Heavy vehicles R2 modelled versus count data, core area, 3.30-4.30pm peak

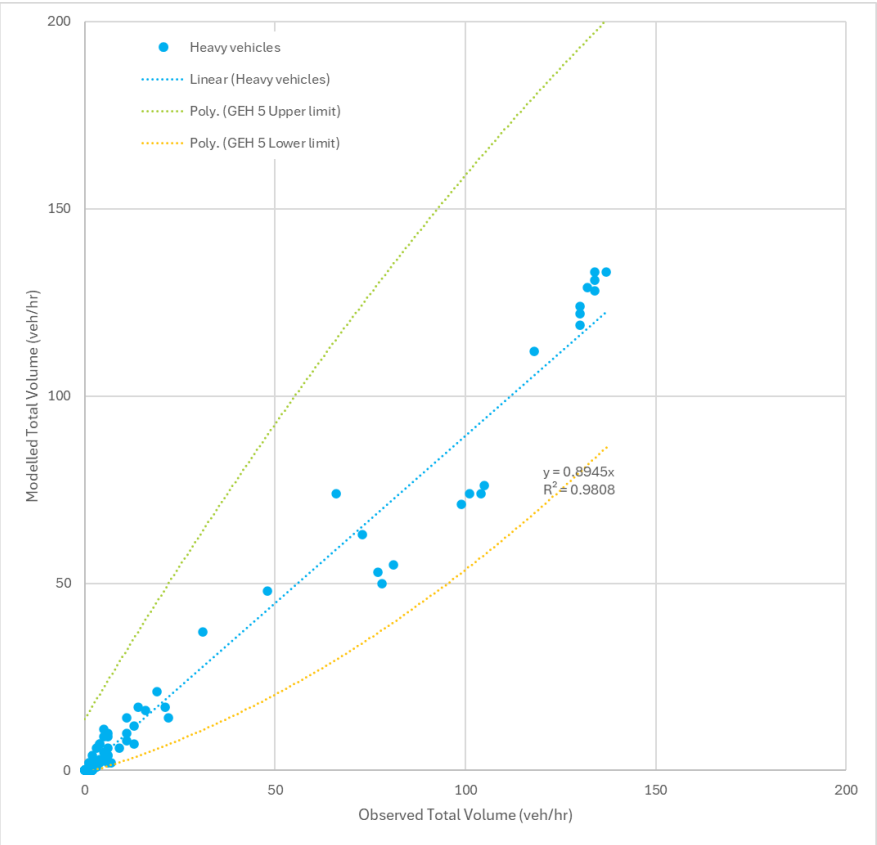


Figure 4-9 Light vehicles R2 modelled versus count data, core area, 4.30-5.30pm peak

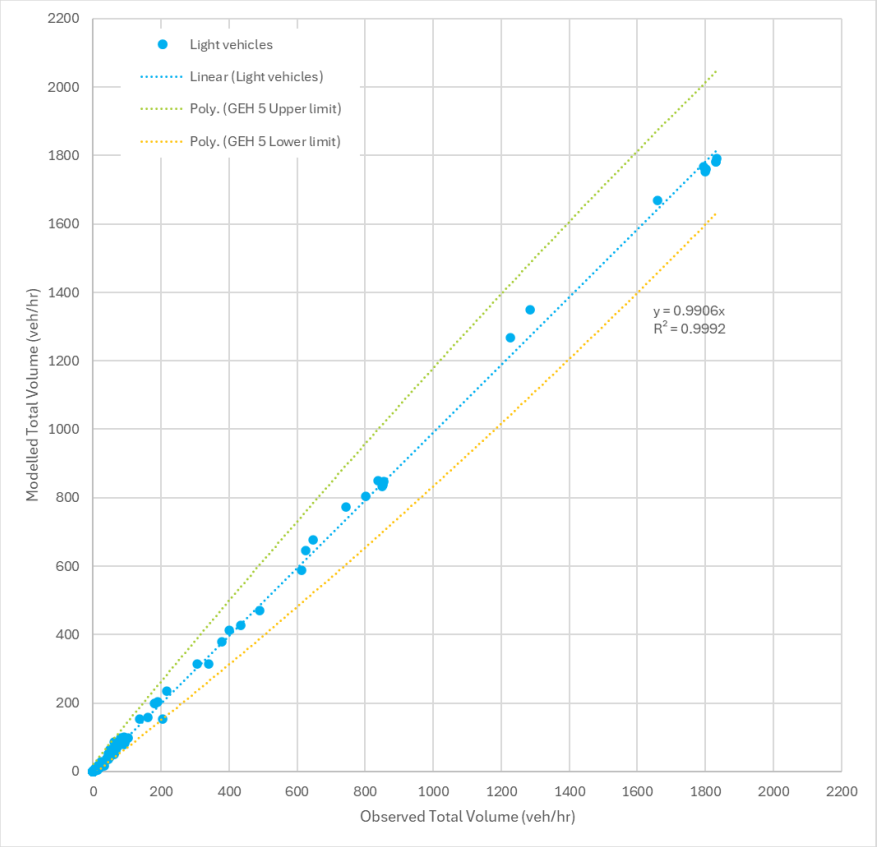


Figure 4-10 Heavy vehicles R2 modelled versus count data, core area, 4.30-5.30pm peak

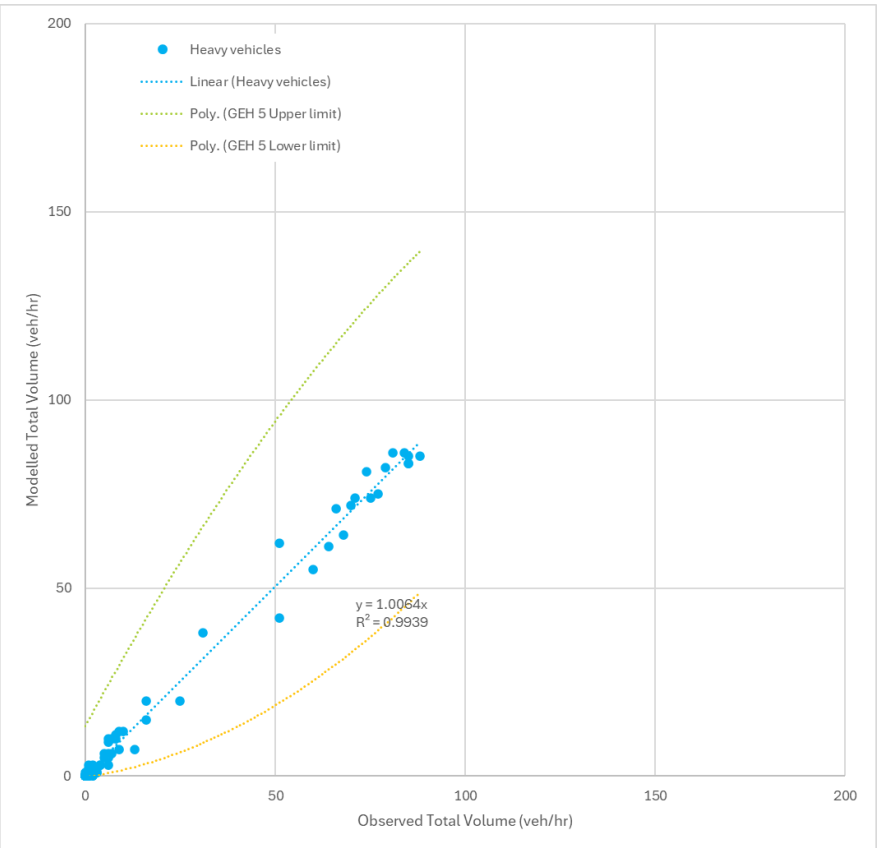


Figure 4-11 Light vehicles R2 modelled versus count data, core area, 5.30-6.30pm peak

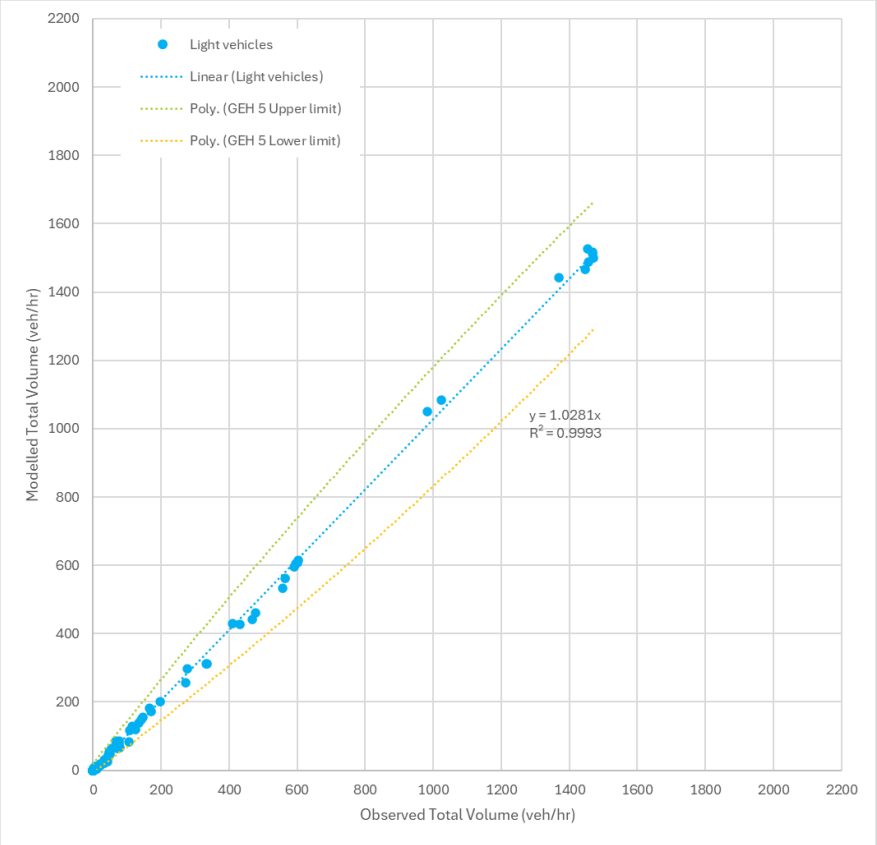
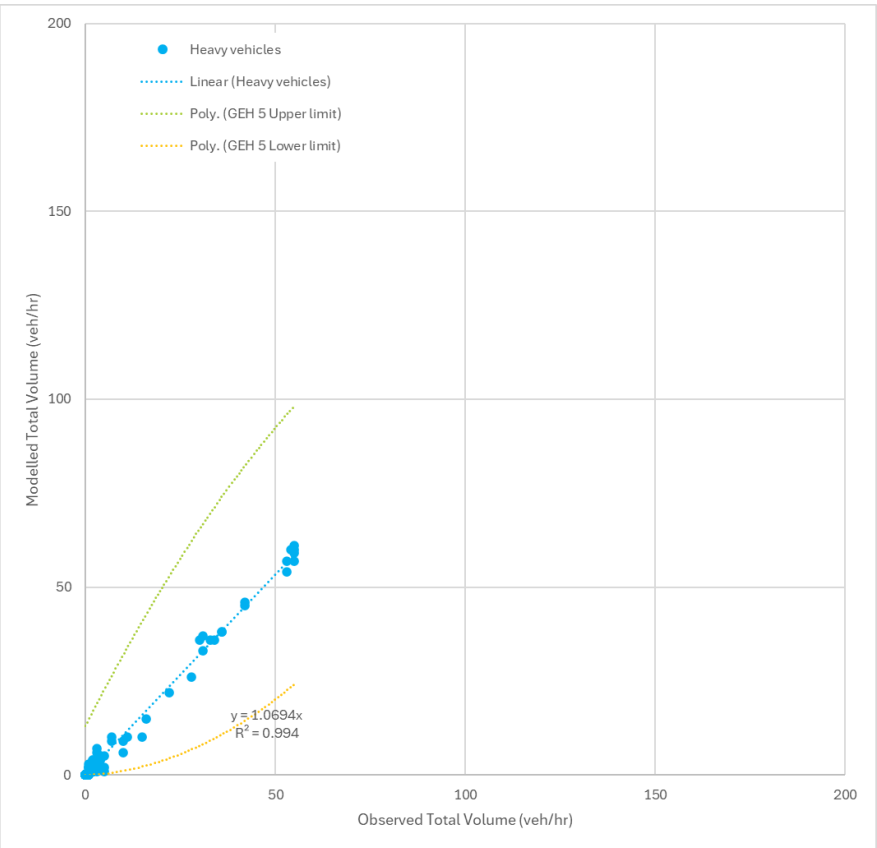


Figure 4-12 Heavy vehicles R2 modelled versus count data, core area, 5.30-6.30pm peak



4.3 Calibration Results

The scope of the modelling was to satisfy the 'Network-wide' criteria, which both the AM and PM models do, with 100% of all movements achieving GEH values of less than five during both two hours of the AM and three-hours of the PM peak hours for both light and heavy vehicles.

Detailed turn count comparisons for both the Network-wide and Core area calibration are provided in **Appendix A**.

4.4 Travel Time Validation

Travel time validation criteria of mesoscopic models generally target the modelled travel time to be within 15 per cent or one minute of the observed travel time for the length of a measured corridor, which in this case represents a total distance of approximately 7.85 kilometres between Bringelly Road and Peter Brock Drive. The traffic travel time comparison between the observed travel times from the survey data and modelled travel times are summarised in **Table 4-1** with a detailed breakdown in **Appendix B**.

The table shows that the travel times generally fall within the one-minute / 15 per cent criteria except for the southbound travel time between 3.30 to 4.30 pm. The surveyed southbound travel time reported between Bringelly Road and Bent Road exceeds 100 seconds between 3.36 – 4.12 pm, whereas all other periods report travel times of approximately one minute. Reviews of the intersection video footage of the southbound movements at the intersection of The Northern Road | Bent Road showed no abnormal queuing or delays of the southbound movements; as such, it is assumed that the surveyed travel times are reflective of the random arrival of the southbound movements to the signalised intersection. As a comparison test, discounting the outlier reported travel time shows that the modelled travel time satisfies the validation requirements.

Similarly, the reported northbound travel times between Dick Johnson Drive and Marylands Link Road 1 is consistently high for all reported travel periods, prior to the travel time comparison at the downstream intersection converging to a lesser difference. Reviews of signal timing at the intersection of Marylands Link Road 1 as well as video footage show no cause for the increased travel time between Dick Johnson Drive and Marylands Link Road 1. It is assumed that the reference point for the Marylands Link Road 1 was actually beyond the location of the intersection.

Table 4-1 Average travel time validation comparison

Time period	Northbound travel time (mm:ss)			Southbound travel time (mm:ss)		
	Surveyed	Modelled	Difference	Surveyed	Modelled	Difference
6.30-7.30am	7:33	7:36	0:03 (1%)	8:06	6:52	1:15 (15%)
7.30-8.30am	8:04	7:39	0:26 (5%)	7:16	6:59	0:17 (4%)
3.30-4.30pm	7:14	7:11	0:03 (1%)	9:10 8:18 (with abnormal travel time discounted)	7:34	1:36 (17%) 0:44 (9%)
4.30-5.30pm	7:38	7:18	0:21 (5%)	7:44	7:42	0:02 (0%)
5.30-6.30pm	7:27	7:08	0:19 (4%)	7:59	7:14	0:45 (9%)

The overall level of travel time differences is a good match. While further changes could be adopted to improve the travel time validation, these would require changes to traffic signal timing, which would require deviation from the traffic signal timings to achieve.

An hourly cumulative travel time comparison graph is shown in the following **Figure 4-13** to **Figure 4-22**.

Figure 4-13 Northbound travel time comparison 6.30-7.30am peak

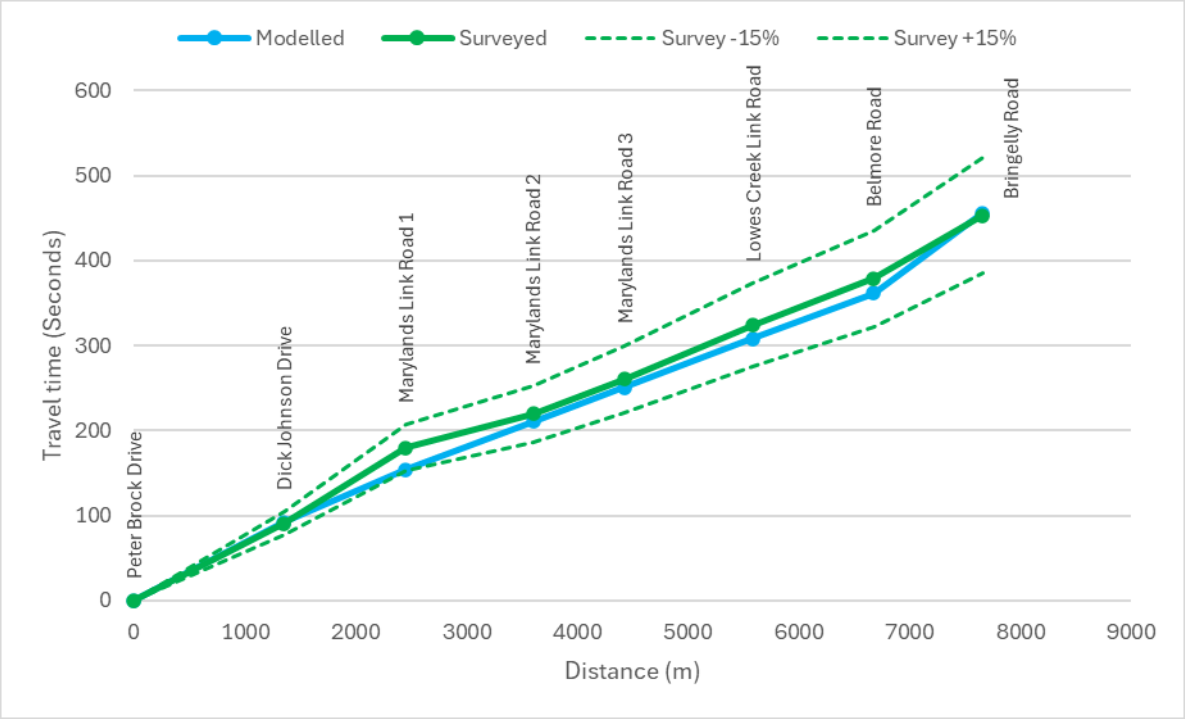


Figure 4-14 Southbound travel time comparison 6.30-7.30am peak

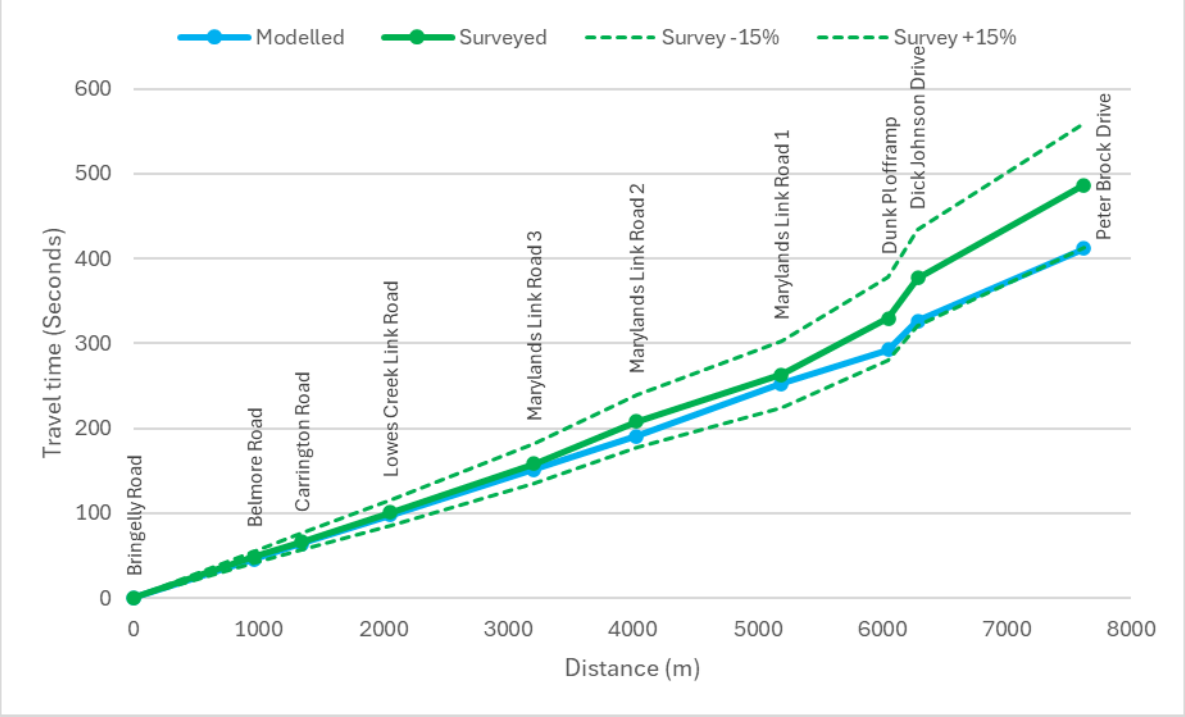


Figure 4-15 Northbound travel time comparison 7.30-8.30am peak

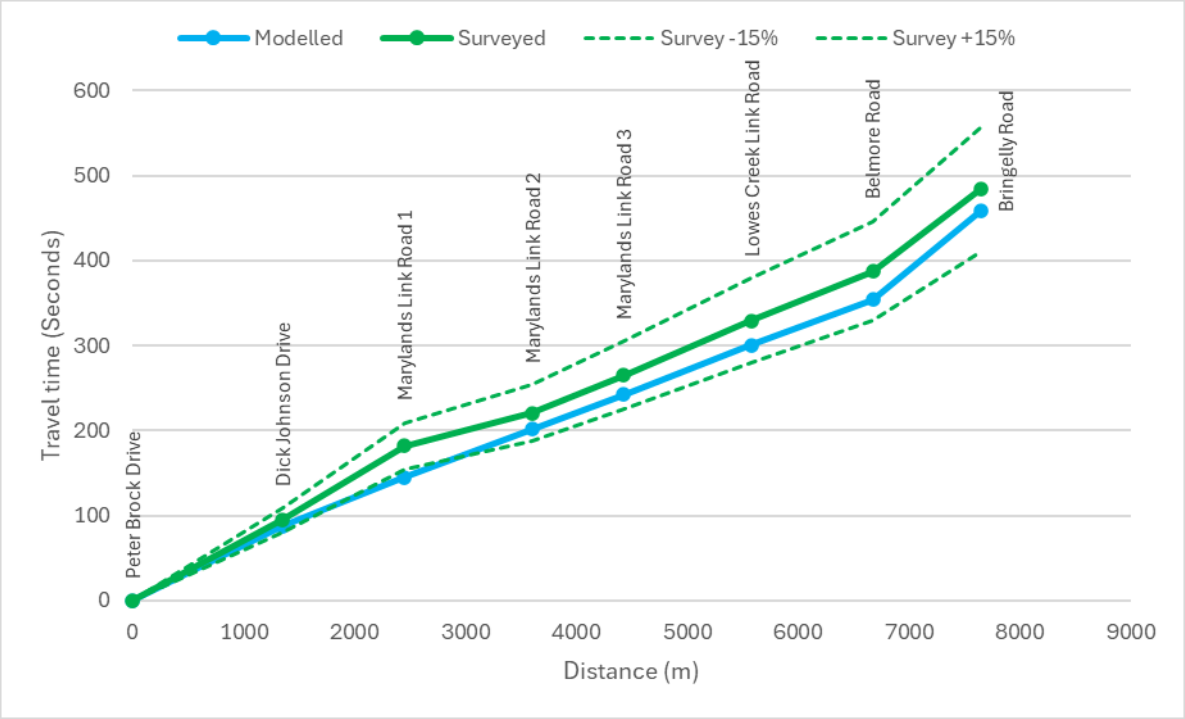


Figure 4-16 Southbound travel time comparison 7.30-8.30am peak

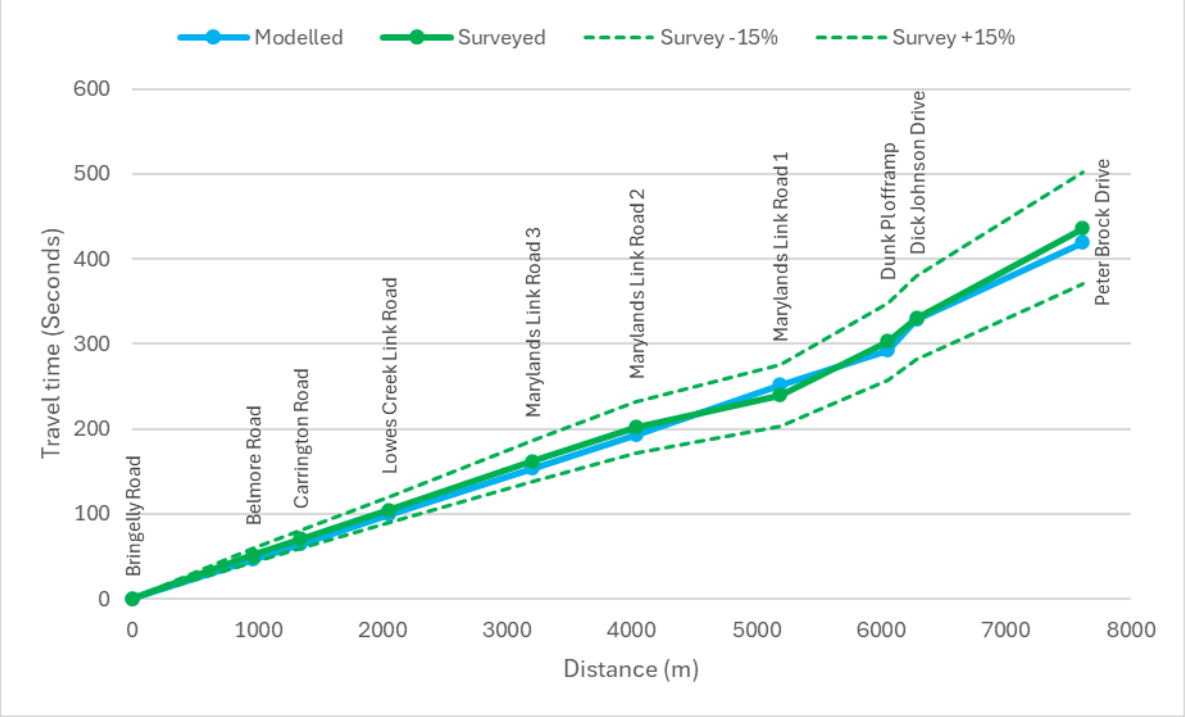


Figure 4-17 Northbound travel time comparison 3.30-4.30pm peak

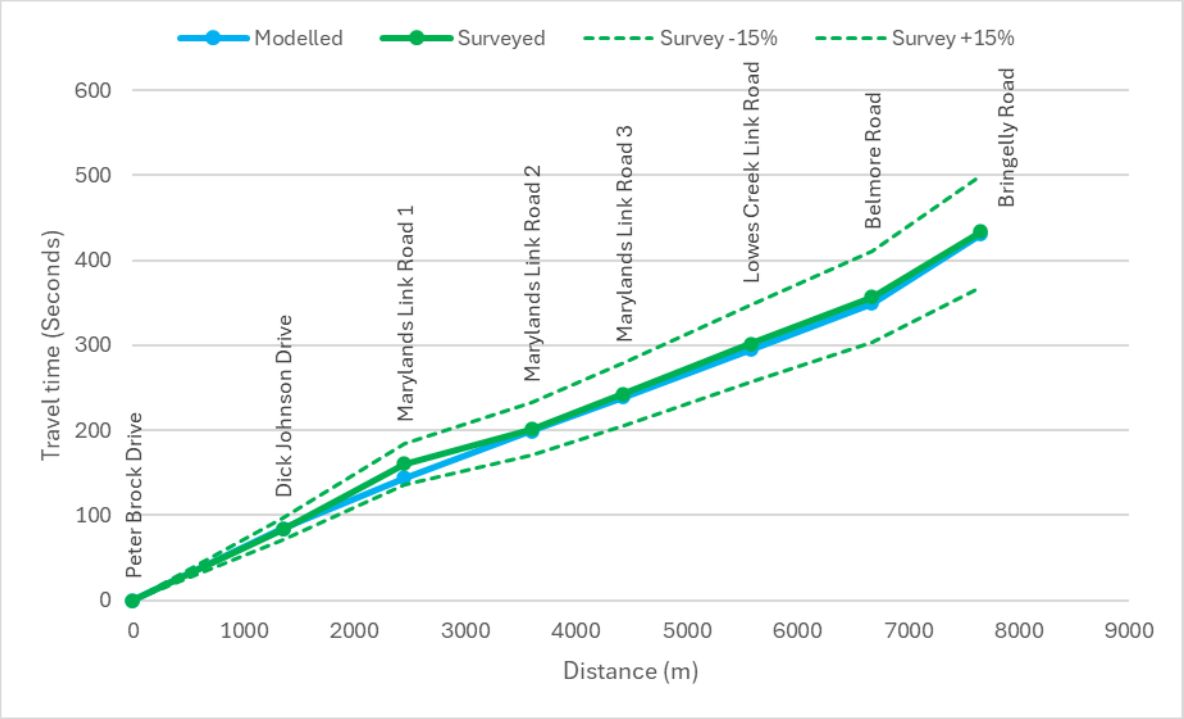


Figure 4-18 Southbound travel time comparison 3.30-4.30pm peak

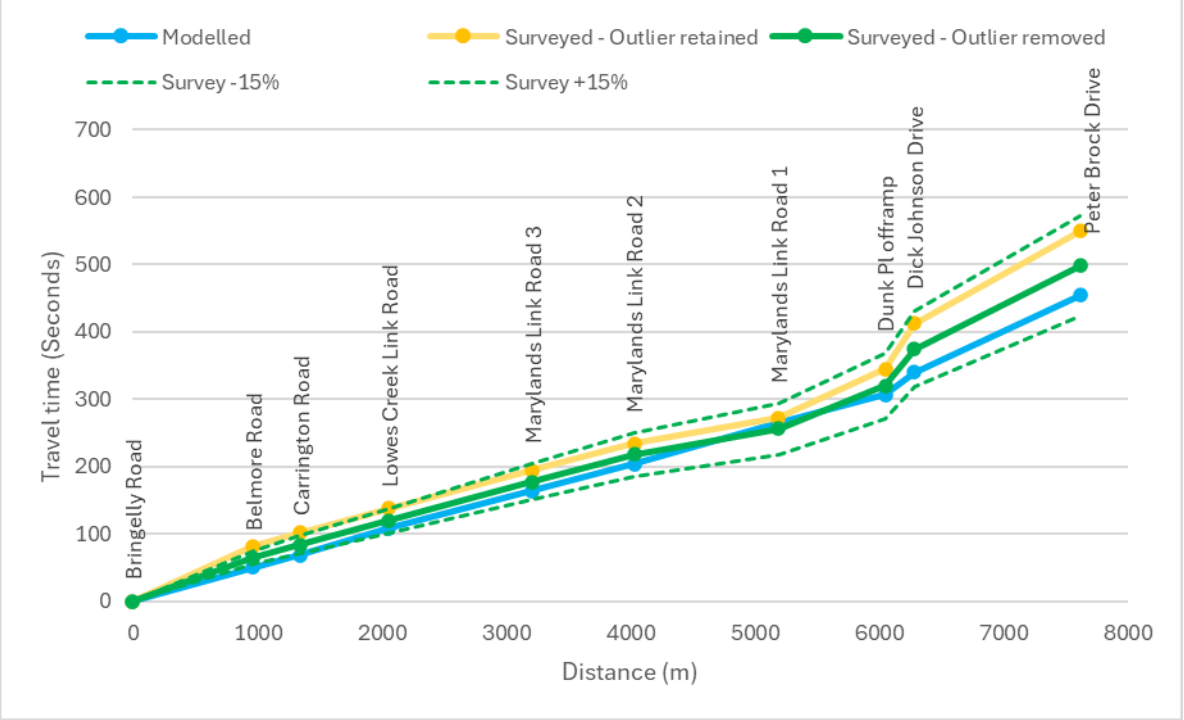


Figure 4-19 Northbound travel time comparison 4.30-5.30pm peak

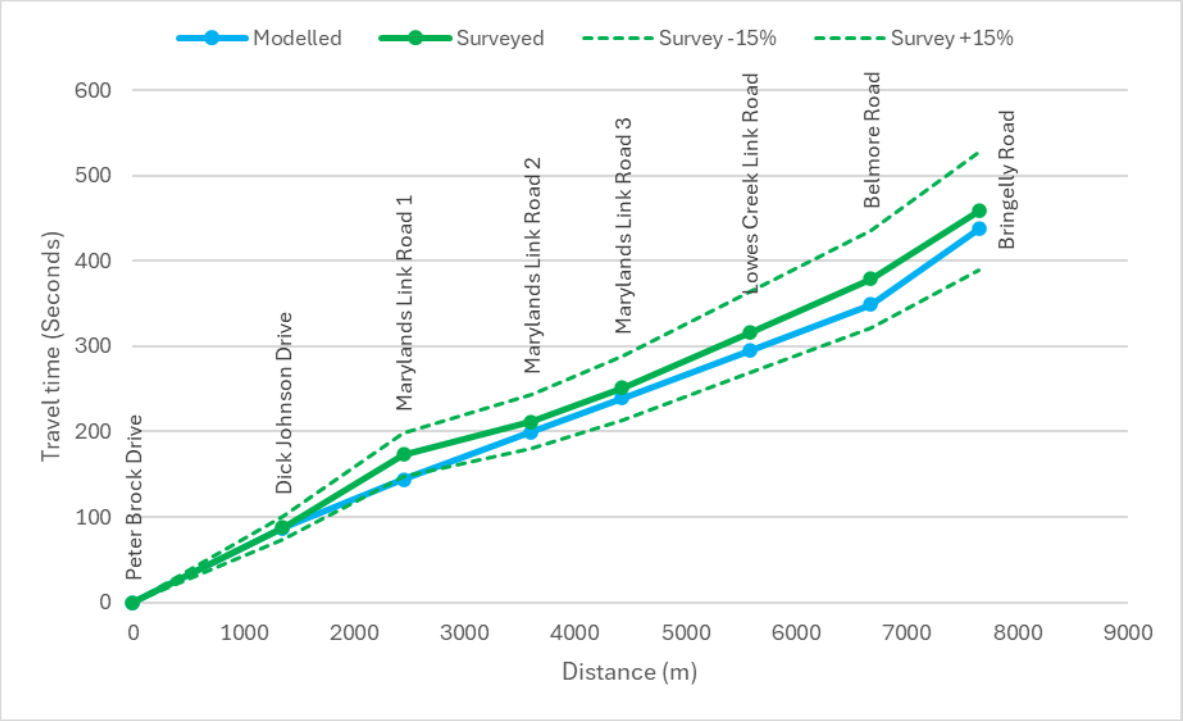


Figure 4-20 Southbound travel time comparison 4.30-5.30pm peak

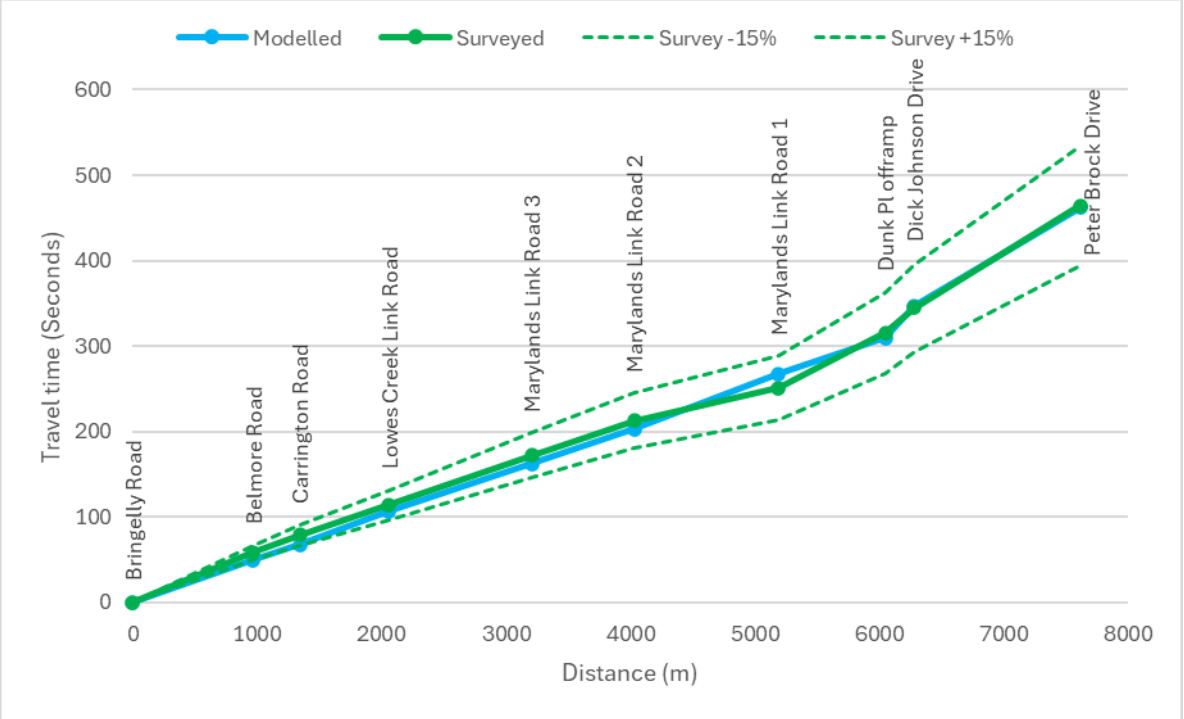


Figure 4-21 Northbound travel time comparison 5.30-6.30pm peak

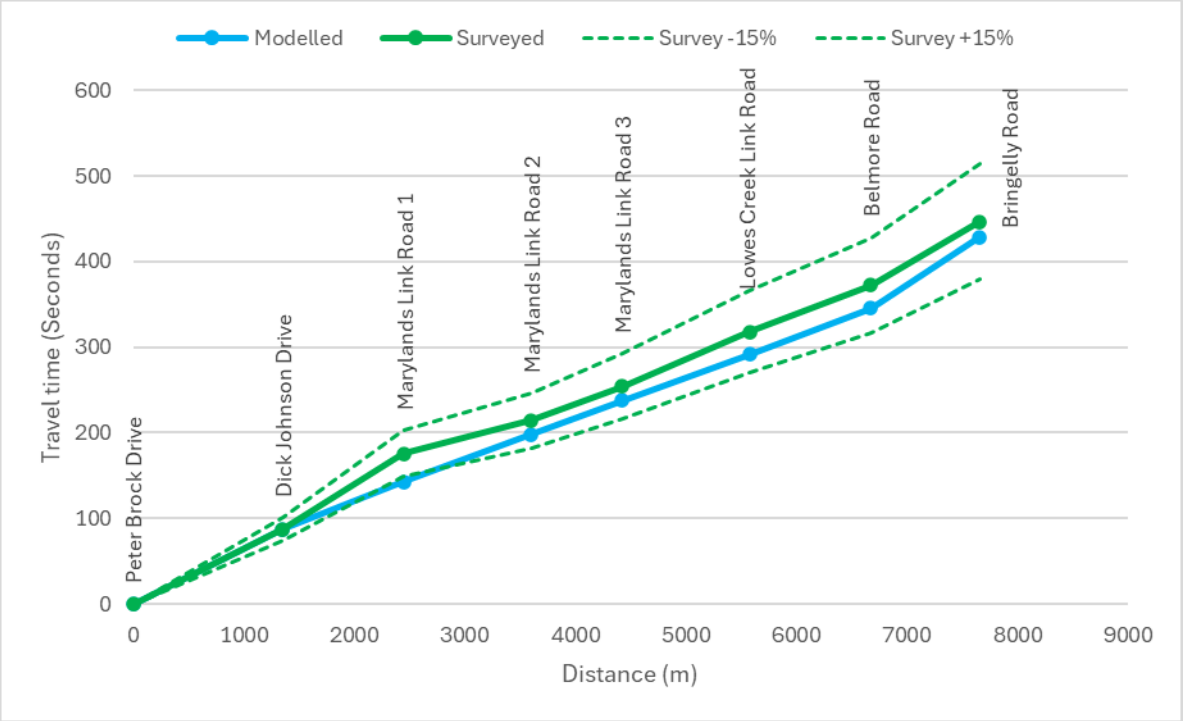
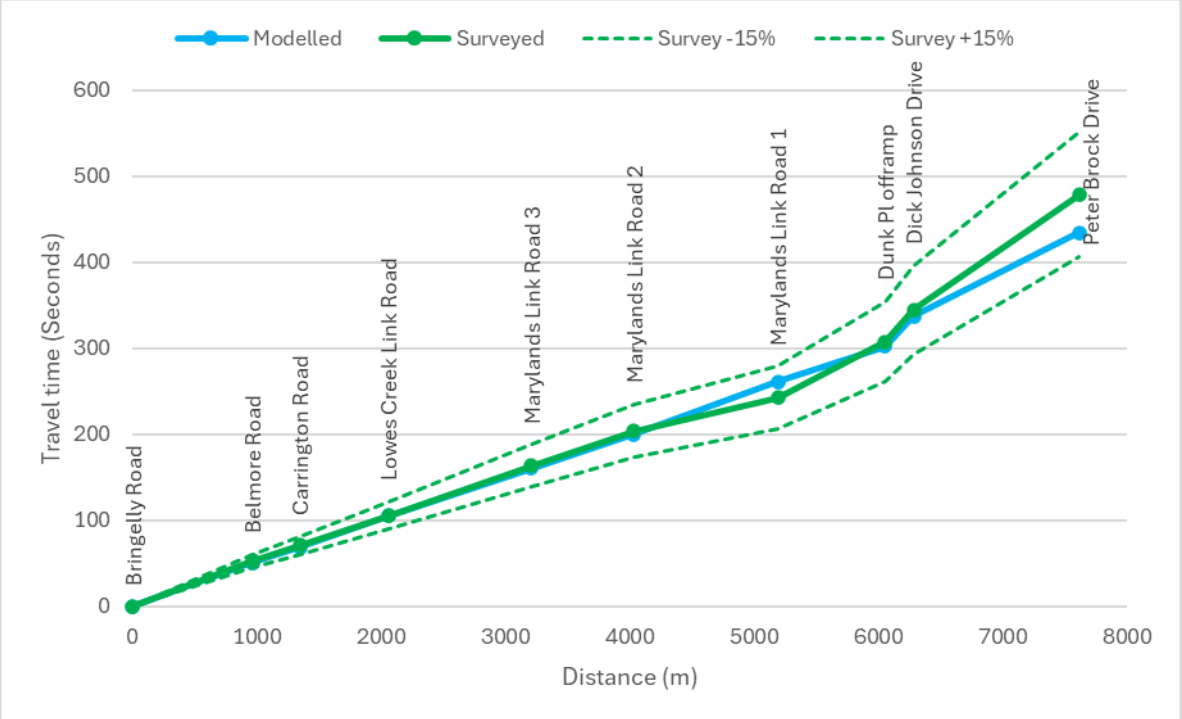


Figure 4-22 Southbound travel time comparison 5.30-6.30pm peak



5.0 Conclusion

The mesoscopic modelling of the existing road network adjacent to the planned Cobbitty Sub-Precinct 5, between Bringelly Road and Peter Brock Drive, has been created using AIMSUN Next mesoscopic tool. The model has been created, calibrated and validated for the AM and PM peak hours based on data collected during November 2024.

The calibration of the traffic counts for both the AM and PM peak models satisfies the TfNSW Modelling Guidelines (2013) for Network-wide criteria.

The validation of the traffic travel times has achieved the criteria in the TfNSW Modelling Guidelines (2013) of the modelled travel times to be within 15 per cent or one minute of the observed travel times for nine of the ten observed travel time periods. The outlying travel time comparison showed that the reported travel times from the survey were likely affected by the delays caused by successive arrivals to red phases. Based on the above, the Base Year 2024 models are considered fit-for-purpose in assessing the traffic impacts associated with the South Creek West Land Release area.

APPENDIX A

TURN CALIBRATION RESULTS

0

279449

6:30-7:30

				INPUT Data										Modelled										LV		HV	
				6:30		6:45		7:00		7:15				3		4		5		6				Difference	GEH	Difference	GEH
				LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	1	2	1	2	1	2	1	2	LV	HV				
3.Bringelly Rd & Wentworth Rd	North	Left	WentBring NE	1	0	0	0	1	0	1	0	**3**	**0**	2	0	0	0	1	0	2	0	**5**	**0**	-2	1.0	0	0.0
		Through	WentBring NS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	WentBring NW	0	0	0	0	2	2	0	2	**2**	**2**	0	0	0	0	0	0	2	0	**2**	**0**	0	0.0	2	2.0
	East	Left	WentBring ES	0	0	4	1	3	0	2	1	**9**	**2**	0	0	1	0	4	0	0	0	**5**	**0**	4	1.5	2	2.0
		Through	WentBring EW	11	3	19	3	14	8	12	7	**56**	**21**	5	9	14	3	21	5	17	5	**57**	**22**	-1	0.1	-1	0.2
		Right	WentBring EN	1	0	0	0	1	0	1	0	**3**	**0**	0	0	0	0	0	0	2	0	**2**	**0**	1	0.6	0	0.0
	South	Left	WentBring SW	0	0	0	0	0	0	1	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
		Through	WentBring SN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	WentBring SE	3	1	1	0	2	0	5	0	**11**	**1**	6	2	0	0	1	0	3	0	**10**	**2**	1	0.3	-1	0.8
	West	Left	WentBring WN	0	0	0	0	0	0	2	0	**2**	**0**	0	0	0	0	0	0	2	0	**2**	**0**	0	0.0	0	0.0
		Through	WentBring WE	19	3	10	6	17	3	25	9	**71**	**21**	22	4	10	4	17	5	37	10	**86**	**23**	-15	1.7	-2	0.4
		Right	WentBring WS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
1.The Northern Rd & Bringelly	North	Left	BrngNorth-NE	92	25	82	14	63	16	72	9	**309**	**64**	84	25	86	10	64	24	77	11	**311**	**70**	-2	0.1	-6	0.7
		Right	BrngNorth-NW	2	0	2	0	3	3	1	3	**8**	**6**	1	0	3	0	6	1	6	3	**16**	**4**	-8	2.3	2	0.9
	East	Left	BrngNorth-ES	25	7	27	11	24	4	36	5	**112**	**27**	21	7	28	7	21	3	34	6	**104**	**23**	8	0.8	4	0.8
		Through	BrngNorth-EW	4	2	13	2	12	4	6	2	**35**	**10**	3	9	12	3	10	3	11	2	**36**	**17**	-1	0.2	-7	1.9
		Right	BrngNorth-EN	167	19	107	15	101	7	100	13	**475**	**54**	147	18	115	18	114	8	101	7	**477**	**51**	-2	0.1	3	0.4
	South	Left	BrngNorth-SW	6	1	8	2	3	1	8	3	**25**	**7**	1	0	0	0	10	1	2	0	**13**	**1**	12	2.8	6	3.0
		Right	BrngNorth-SE	97	5	124	6	129	7	142	1	**492**	**19**	121	3	121	6	115	6	130	3	**487**	**18**	5	0.2	1	0.2
	West	Left	BrngNorth-WN	4	2	1	3	1	2	1	3	**7**	**10**	8	6	1	1	0	2	8	6	**17**	**15**	-10	2.9	-5	1.4
		Through	BrngNorth-WE	13	1	9	3	11	1	19	2	**52**	**7**	17	0	10	2	14	3	27	4	**68**	**9**	-16	2.1	-2	0.7
		Right	BrngNorth-WS	6	1	1	0	8	0	11	4	**26**	**5**	5	0	0	0	4	0	9	1	**18**	**1**	8	1.7	4	2.3
2.Bringelly Rd & Kelvin Park	North	Left	KelvBrng-NE	11	0	8	1	12	1	10	1	**41**	**3**	13	0	8	0	8	1	13	1	**42**	**2**	-1	0.2	1	0.6
		Right	KelvBrng-NW	7	0	4	1	4	1	6	1	**21**	**3**	3	0	1	1	7	0	9	3	**20**	**4**	1	0.2	-1	0.5
	East	Through	KelvBrng-EW	189	28	143	27	133	14	136	19	**601**	**88**	178	35	149	27	125	12	145	14	**597**	**88**	4	0.2	0	0.0
		Right	KelvBrng-EN	2	0	2	0	7	0	1	0	**12**	**0**	3	0	1	0	4	0	5	0	**13**	**0**	-1	0.3	0	0.0
	West	Left	KelvBrng-WN	1	0	4	0	4	2	3	0	**12**	**2**	0	0	2	0	4	1	4	0	**10**	**1**	2	0.6	1	0.8
		Through	KelvBrng-WE	201	31	211	23	199	22	230	12	**841**	**88**	205	28	214	17	200	32	241	19	**860**	**96**	-19	0.7	-8	0.8
4.The Northern Rd & Belmore Rd	North	Left	NthnBelm-NE	1	0	1	1	0	0	1	0	**3**	**1**	1	0	2	1	0	0	3	0	**6**	**1**	-3	1.4	0	0.0
		Through	NthnBelm-NS	191	52	162	44	164	33	165	28	**682**	**157**	193	40	157	45	158	28	195	32	**703**	**145**	-21	0.8	12	1.0
		Right	NthnBelm-NW	0	0	1	0	0	0	1	0	**2**	**0**	0	0	5	1	0	0	0	0	**5**	**1**	-3	1.6	-1	1.4
	East	Left	NthnBelm-ES	6	0	2	0	0	0	3	0	**11**	**0**	6	0	0	0	0	0	1	0	**7**	**0**	4	1.3	0	0.0
		Through	NthnBelm-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnBelm-EN	2	2	0	0	0	1	0	0	**2**	**3**	1	1	1	0	0	2	0	0	**2**	**3**	0	0.0	0	0.0
	South	Left	NthnBelm-SW	0	0	0	1	0	0	1	0	**1**	**1**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	1	1.4
		Through	NthnBelm-SN	350	29	352	32	401	31	433	21	**1536**	**113**	374	31	349	37	353	29	435	28	**1511**	**125**	25	0.6	-12	1.1
		Right	NthnBelm-SE	0	0	2	3	3	1	5	0	**10**	**4**	0	0	23	6	1	1	4	0	**28**	**7**	-18	4.1	-3	1.3
	West	Left	NthnBelm-WN	3	1	1	0	2	0	2	1	**8**	**2**	3	0	1	0	1	0	5	3	**10**	**3**	-2	0.7	-1	0.6
		Through	NthnBelm-WE	0	0	0	0	0	2	0	0	**0**	**2**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	2	2.0
		Right	NthnBelm-WS	1	1	0	1	2	0	1	0	**4**	**2**	1	0	0	0	0	0	0	0	**1**	**0**	3	1.9	2	2.0
5.The Northern Rd & Carrington	North	Left	NthnCarr-NE	3	3	3	2	1	0	1	0	**8**	**5**	2	1	3	1	2	0	0	0	**7**	**2**	1	0.4	3	1.6
		Through	NthnCarr-NS	195	50	161	43	165	33	168	28	**689**	**154**	198	40	156	44	155	27	194	33	**703**	**144**	-14	0.5	10	0.8
	East	Left	NthnCarr-ES	1	1	7	0	1	1	1	0	**10**	**2**	1	0	8	0	0	0	0	0	**9**	**0**	1	0.3	2	2.0
6.The Northern Rd & LCLR	North	Left	NthnLowe-NE	0	0	0	0	2	1	0	0	**2**	**1**	0	0	0	0	2	0	0	0	**2**	**0**	0	0.0	1	1.4
		Through	NthnLowe-NS	195	49	167	42	164	33	168	27	**694**	**151**	193	39	165	43	151	25	193	32	**702**	**139**	-8	0.3	12	1.0
		Right	NthnLowe-NW	1	2	1	1	0	0	1	1	**3**	**4**	4	0	0	3	0	0	3	2	**7**	**5**	-4	1.8	-1	0.5
	East	Left	NthnLowe-ES	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnLowe-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnLowe-EN	0	0	0	0	1	1	1	0	**2**	**1**	0	0	0	0	0	0	1	0	**1**	**0**	1	0.8	1	1.4
	South	Left	NthnLowe-SW	15	1	3	1	1	1	0	0	**19**	**3**	12	1	4	1	2	0	1	0	**19**	**2**	0	0.0	1	0.6
		Through	NthnLowe-SN	350	28	354	36	403	31	438	20	**1545**	**115**	367	32	341	33	378	33	425	25	**1511**	**123**	34	0.9	-8	0.7
		Right	NthnLowe-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	West	Left	NthnLowe-WN	0	1	0	0	0	0	0	1	**0**	**2**	0	3	0	0	0	0	1	1	**4**	**6**	-1	1.4	-2	1.2
		Through	NthnLowe-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnLowe-WS	1	0	1	0	0	0	0	1	**2**	**1**	1	0	1	0	0	0	1	1	**3**	**1**	-1	0.6	0	0.0
7.The Northern Rd & Marylands 3	North	Left	NthnMry3-NE	0	0	2	0	7	0	0	1	**9**	**1**	0	0	2	0	4	0	1	0	**7**	**0**	2	0.7	1	1.4
		Through	NthnMry3-NS	196	49	166	42	157	33	168	27	**687**	**151**	177	38	178	45	152	25	193	34	**700**	**142**	-13	0.5	9	0.7
		Right	NthnMry3-NW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	East	Left	NthnMry3-ES	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnMry3-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry3-EN	1	0	0	0	1	0	1	0	**3**	**0**	4	0	0	0	1	0	0	0	**5**	**0**	-2	1.0	0	0.0
	South	Left	NthnMry3-SW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnMry3-SN	364	29	357	37	403	32	437	20	**1561**	**118**	374	33	345	36	380	32	422	23	**1521**	**124**	40	1.0	-6	0.5
		Right	NthnMry3-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	West	Left	NthnMry3-WN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnMry3-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry3-WS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
8.The Northern Rd & Marylands 2	North	Left	NthnMry2-NE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnMry2-NS	196	49	166	41	157	31	168	27	**687**	**148**	179	40	183	40	151	24	192	34	**705**	**138**	-18	0.7	10	0.8
		Right	NthnMry2-NW	0	0	0	1	0	2	0	0	**0**	**3**	0	0	0	2	0	3	0	0	**0**	**5**	0	0.0	-2	1.0
	East	Left	NthnMry2-ES	0	0	0	0	0	1	0	0	**0**	**1**	0	0	0	0	0	1	0	0	**0**	**1**	0	0.0	0	0.0
		Through	NthnMry2-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry2-EN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	South	Left	NthnMry2-SW	1	2	2	1	8	0	0	1	**11**	**4**	3	1	0	1	4	1	3	2	**10**	**5**	1	0.3	-1	0.5
		Through	NthnMry2-SN	364	26	357	35	403	32	437	20	**1561**	**113**	380	31	343	35	376	32	430	23	**1529**	**121**	32	0.8	-8	0.7
		Right	NthnMry2-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	West	Left	NthnMry2-WN	0	3	0	2	0	0	0	0	**0**	**5**	0	3	0	0	0	0	0	0	**0**	**3**	0	0.0	2	1.0
		Through	NthnMry2-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry2-WS	0	1	0	1	2	2	1	2	**3**	**6**	0	0	0	1	1	1	4	1	**5**	**3**	-2	1.0	3	1.4
9.The Northern Rd & Marylands 1	North	Left	NthnMry1-NE	1	2	3	2	1	1	2	1	**7**	**6**	0	1	2	2	0	0	3	2	**5**	**5**	2	0.8	1	0.4
		Through	NthnMry1-NS	189	45	158	38	156	30	163	27	**666**	**140**	174	35	181	37	141	25	190	29	**686**	**126**	-20	0.8	14	1.2
		Right	NthnMry1-NW	6	3	5	2	2	3	4	1	**17**	**9**	7	3	8	1	3	4	6	2	**24**	**10**	-7	1.5	-1	0.3
	East	Left	NthnMry1-ES	1	0	0	0	0	1	1	0	**2**	**1**	0	0	0	0	0	0	0	0	**0**	**0**	2	2.0	1	1.4
		Through	NthnMry1-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry1-EN	0	0	0	0	0	0	1	0	**1**	**0**	0	0	0	0	0	0	2	0	**2**	**0**	-1	0.8	0	0.0
	South	Left	NthnMry1-SW	24	4	43	0	40	1	32	3	**139**	**8**	24	0	36	1	44	1	40	4	**144**	**6**	-5	0.4	2	0.8
		Through	NthnMry1-SN	346	20	345	36	388	21	401	17	**1480**	**94**	366	21	335	35	365	22	364	16	**1430**	**94**	50	1.3	0	0.0
		Right	NthnMry1-SE	4	2	3	2	2	3	1	3	**10**	**10**	7	4	4	2	2	3	5	4	**18**	**13**	-8	2.1	-3	0.9
	West	Left	NthnMry1-WN	19	8	14	0	23	11	35	4	**91**	**23**	17	13	18	0	13	12	41	5	**89**	**30**	2	0.2	-7	1.4
		Through	NthnMry1-WE	3	1	2	1	0	0	0	0	**5**	**2**	3	2	3	2	0	0	0	0	**6**	**4**	-1	0.4	-2	1.2
		Right	NthnMry1-WS	3	3	5	1	4	1	5	2	**17**	**7**	4	5	2	2	4	2	5	1	**15**	**10**	2	0.5	-3	1.0
10.The Northern Rd & Dunk Pl	North	Left	NthnDnk-NE	44	4	13	5	8	4	14	1	**79**	**14**	31	0	22	6	10	3	7	0	**70**	**9**	9	1.0	5	1.5
		Through	NthnDnk-NS	149	44	150	34	152	28	155	28	**606**	**134**	144	38	171	34	133	26	180	27	**628**	**125**	-22	0.9	9	0.8
11.The Northern & Dick Johnson	North	Left	NthnDick-NE	34	13	39	6	36	4	21	6	**130**	**29**	40	13	43	6	29	2	30	6	**142**	**27**	-12	1.0	2	0.4
		Through	NthnDick-NS	112	29	103	25	109	20	125	19	**449**	**93**	102	23	122	25	95	22	140	19	**459**	**89**	-10	0.5	4	0.4
		Right	NthnDick-NW	3	2	8	3	7	4	9	3	**27**	**12**	2	2	4	3	9	3	9	2	**24**	**10**	3	0.6	2	0.6
	East	Left	NthnDick-ES	22	1	26	3	32	1	19	4	**99**	**9**	23	3	27	2	35	1	18	2	**103**	**8**	-4	0.4	1	0.3
		Through	NthnDick-EW	4	1	4	1	10	1	12	1	**30**	**4**	2	0	3	0	10	2	11	2	**26**	**4**	4	0.8	0	0.0
		Right	NthnDick-EN	73	3	76	7	101	7	88	4	**338**	**21**	72	2	60	7	91	5	98	5	**321**	**19**	17	0.9	2	0.4
	South	Left	NthnDick-SW	4	2	7	0	4	0	6	1	**21**	**3**	2	1	5	1	3	0	9	3	**19**	**5**	2	0.4	-2	1.0
		Through	NthnDick-SN	267	22	286	31	296	18	316	17	**1165**	**88**	268	23	292	30	283	19	301	19	**1144**	**91**	21	0.6	-3	0.3
		Right	NthnDick-SE	12	5	20	1	8	0	11	2	**51**	**8**	9	4	19	1	14	0	14	1	**56**	**6**	-5	0.7	2	0.8
	West	Left	NthnDick-WN	34	1	29	0	33	0	30	2	**126**	**3**	29	3	20	0	39	0	29	1	**117**	**4**	9	0.8	-1	0.5
		Through	NthnDick-WE	4	1	4	0	7	0	5	1	**20**	**2**	4	1	4	0	7	0	5	1	**20**	**2**	0	0.0	0	0.0
		Right	NthnDick-WS	3	0	3	0	0	0	1	1	**7**	**1**	4	0	2	0	0	0	2	1	**8**	**1**	-1	0.4	0	0.0
12.The Northern & Peter Brock	North	Left	NthnPete-NE	5	1	10	1	5	0	4	2	**24**	**4**	0	1	5	1	2	0	5	0	**12**	**2**	12	2.8	2	1.2
		Through	NthnPete-NS	127	27	120	25	135	21	141	22	**523**	**95**	130	27	140	24	129	23	150	23	**549**	**97**	-26	1.1	-2	0.2
		Right	NthnPete-NW	5	2	2	2	1	0	0	0	**8**	**4**	2	1	3	0	1	0	0	0	**6**	**1**	2	0.8	3	1.9
	East	Left	NthnPete-ES	37	3	34	0	39	0	32	1	**142**	**4**	41	5	27	0	36	0	30	0	**134**	**5**	8	0.7	-1	0.5
		Through	NthnPete-EW	4	0	3	0	5	0	5	0	**17**	**0**	1	0	5	0	4	0	3	0	**13**	**0**	4	1.0	0	0.0
		Right	NthnPete-EN	32	1	31	0	32	1	35	2	**130**	**4**	27	0	29	0	29	3	39	1	**124**	**4**	6	0.5	0	0.0
	South	Left	NthnPete-SW	12	0	10	0	10	1	12	1	**44**	**2**	10	0	7	0	14	4	15	0	**46**	**4**	-2	0.3	-2	1.2
		Through	NthnPete-SN	243	28	276	32	266	17	285	18	**1070**	**95**	261	28	289	30	270	15	274	23	**1074**	**96**	-4	0.1	-1	0.1
		Right	NthnPete-SE	31	5	64	5	61	1	57	3	**213**	**14**	33	9	50	6	66	2	74	4	**223**	**21**	-10	0.7	-7	1.7
	West	Left	NthnPete-WN	8	0	6	0	10	0	13	0	**37**	**0**	7	0	6	0	8	0	11	0	**32**	**0**	5	0.9	0	0.0
		Through	NthnPete-WE	3	0	6	0	11	0	6	0	**26**	**0**	6	0	3	0	15	0	6	0	**30**	**0**	-4	0.8	0	0.0
		Right	NthnPete-WS	30	1	25	0	44	0	42	0	**141**	**1**	30	2	23	1	44	0	39	0	**136**	**3**	5	0.4	-2	1.4

0

279449

7:30-8:30

				INPUT Data										Modelled								LV		HV	
				7:30		7:45		8:00		8:15				7		8		9		10				Difference	GEH	Difference	GEH
				LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	1	2	1	2	1	2	1	2	LV	HV				
3.Bringelly Rd & Wentworth Rd	North	Left	WentBring NE	0	0	0	0	1	0	4	0	**5**	**0**	0	0	0	0	3	0	5	0	**8**	**0**	-3	1.2	0	0.0
		Through	WentBring NS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	WentBring NW	0	0	0	0	0	0	2	0	**2**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	2	2.0	0	0.0
	East	Left	WentBring ES	3	0	6	0	5	1	5	0	**19**	**1**	3	0	5	0	4	0	4	0	**16**	**0**	3	0.7	1	1.4
		Through	WentBring EW	12	7	15	4	18	3	19	6	**64**	**20**	13	7	14	5	21	3	19	6	**67**	**21**	-3	0.4	-1	0.2
		Right	WentBring EN	1	0	0	0	2	0	6	0	**9**	**0**	0	0	0	0	0	0	2	0	**2**	**0**	7	3.0	0	0.0
	South	Left	WentBring SW	1	0	0	0	0	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
		Through	WentBring SN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	WentBring SE	1	1	2	1	2	1	2	1	**7**	**4**	0	2	0	0	0	0	0	1	**0**	**3**	7	3.7	1	0.5
	West	Left	WentBring WN	0	0	0	0	0	0	2	0	**2**	**0**	0	0	0	0	0	0	2	0	**2**	**0**	0	0.0	0	0.0
		Through	WentBring WE	31	7	25	7	24	6	32	4	**112**	**24**	31	5	26	8	23	7	30	5	**110**	**25**	2	0.2	-1	0.2
		Right	WentBring WS	0	0	1	0	0	0	2	0	**3**	**0**	0	0	0	0	0	0	1	0	**1**	**0**	2	1.4	0	0.0
1.The Northern Rd & Bringelly	North	Left	BrngNorth-NE	73	8	69	10	70	7	48	7	**260**	**32**	70	15	85	14	66	5	50	5	**271**	**39**	-11	0.7	-7	1.2
		Right	BrngNorth-NW	4	3	6	4	2	2	2	2	**14**	**11**	2	2	8	4	0	1	0	0	**10**	**7**	4	1.2	4	1.3
	East	Left	BrngNorth-ES	38	11	47	7	60	8	60	10	**205**	**36**	34	17	47	2	49	4	62	12	**192**	**35**	13	0.9	1	0.2
		Through	BrngNorth-EW	7	3	9	0	13	2	12	3	**41**	**8**	7	5	8	0	16	2	10	6	**41**	**13**	0	0.0	-5	1.5
		Right	BrngNorth-EN	87	8	94	11	88	6	95	5	**364**	**30**	72	9	82	15	81	3	96	9	**331**	**36**	33	1.8	-6	1.0
	South	Left	BrngNorth-SW	5	1	6	0	10	0	16	1	**37**	**2**	6	1	3	0	12	0	13	0	**34**	**1**	3	0.5	1	0.8
		Right	BrngNorth-SE	153	7	144	3	105	5	78	6	**480**	**21**	154	4	139	5	140	5	89	5	**522**	**19**	-42	1.9	2	0.4
	West	Left	BrngNorth-WN	2	4	3	3	2	3	5	0	**12**	**10**	1	3	3	3	3	6	3	0	**10**	**12**	2	0.6	-2	0.6
		Through	BrngNorth-WE	20	2	17	3	15	2	18	3	**70**	**10**	20	3	16	3	18	1	15	3	**69**	**10**	1	0.1	0	0.0
		Right	BrngNorth-WS	10	2	7	2	10	2	15	2	**42**	**8**	10	0	7	3	7	0	16	3	**40**	**6**	2	0.3	2	0.8
2.Bringelly Rd & Kelvin Park	North	Left	KelvBrng-NE	8	0	5	0	15	1	10	0	**38**	**1**	7	0	10	0	10	3	7	0	**34**	**3**	4	0.7	-2	1.4
		Right	KelvBrng-NW	8	0	8	0	8	1	11	0	**35**	**1**	3	0	7	0	9	0	11	0	**30**	**0**	5	0.9	1	1.4
	East	Through	KelvBrng-EW	124	22	142	18	153	15	156	18	**575**	**73**	104	29	135	18	143	11	152	24	**534**	**82**	41	1.7	-9	1.0
		Right	KelvBrng-EN	3	0	2	1	5	0	5	1	**15**	**2**	2	0	3	2	4	0	9	0	**18**	**2**	-3	0.7	0	0.0
	West	Left	KelvBrng-WN	2	0	3	0	5	0	10	1	**20**	**1**	5	0	1	0	4	0	5	0	**15**	**0**	5	1.2	1	1.4
		Through	KelvBrng-WE	244	17	227	16	185	14	134	15	**790**	**62**	226	20	237	24	216	9	167	15	**846**	**68**	-56	2.0	-6	0.7
4.The Northern Rd & Belmore Rd	North	Left	NthnBelm-NE	1	0	1	0	0	0	2	0	**4**	**0**	2	0	0	0	0	0	5	0	**7**	**0**	-3	1.3	0	0.0
		Through	NthnBelm-NS	209	32	213	34	192	32	199	23	**813**	**121**	193	37	216	34	196	37	215	22	**820**	**130**	-7	0.2	-9	0.8
		Right	NthnBelm-NW	0	0	0	0	0	0	0	1	**0**	**1**	1	0	0	0	0	0	0	0	**1**	**0**	-1	1.4	1	1.4
	East	Left	NthnBelm-ES	1	0	1	1	0	0	2	0	**4**	**1**	2	0	1	0	0	0	0	0	**3**	**0**	1	0.5	1	1.4
		Through	NthnBelm-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnBelm-EN	0	1	1	0	0	0	2	0	**3**	**1**	0	1	0	0	0	0	0	0	**0**	**1**	3	2.4	0	0.0
	South	Left	NthnBelm-SW	0	0	0	0	1	1	1	0	**2**	**1**	0	0	0	0	0	0	1	0	**1**	**0**	1	0.8	1	1.4
		Through	NthnBelm-SN	394	25	406	37	318	28	323	27	**1441**	**117**	385	22	402	34	382	35	301	31	**1470**	**122**	-29	0.8	-5	0.5
		Right	NthnBelm-SE	2	0	5	1	5	0	2	0	**14**	**1**	3	0	3	1	8	0	2	0	**16**	**1**	-2	0.5	0	0.0
	West	Left	NthnBelm-WN	0	1	1	0	2	0	3	0	**6**	**1**	0	0	1	0	0	0	2	0	**3**	**0**	3	1.4	1	1.4
		Through	NthnBelm-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	4	**0**	**4**	0	0.0	-4	2.8
		Right	NthnBelm-WS	2	0	0	0	2	0	0	0	**4**	**0**	0	0	0	0	0	0	1	0	**1**	**0**	3	1.9	0	0.0
5.The Northern Rd & Carrington	North	Left	NthnCarr-NE	1	0	1	0	2	0	1	0	**5**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	5	3.2	0	0.0
		Through	NthnCarr-NS	211	32	213	35	192	32	200	23	**816**	**122**	197	36	219	35	196	37	212	22	**824**	**130**	-8	0.3	-8	0.7
	East	Left	NthnCarr-ES	5	1	3	0	2	0	3	2	**13**	**3**	1	1	3	0	2	0	1	0	**7**	**1**	6	1.9	2	1.4
6.The Northern Rd & LCLR	North	Left	NthnLowe-NE	1	1	11	0	4	1	4	0	**20**	**2**	2	0	7	0	8	2	5	0	**22**	**2**	-2	0.4	0	0.0
		Through	NthnLowe-NS	214	32	205	34	189	31	199	25	**807**	**122**	191	34	212	37	191	36	207	21	**801**	**128**	6	0.2	-6	0.5
		Right	NthnLowe-NW	1	0	0	1	1	0	0	0	**2**	**1**	0	1	0	0	4	0	0	0	**4**	**1**	-2	1.2	0	0.0
	East	Left	NthnLowe-ES	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnLowe-EW	0	0	0	0	0	1	0	0	**0**	**1**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	1	1.4
		Right	NthnLowe-EN	1	1	2	0	4	0	4	0	**11**	**1**	1	1	2	0	1	0	8	0	**12**	**1**	-1	0.3	0	0.0
	South	Left	NthnLowe-SW	0	0	0	0	1	0	3	0	**4**	**0**	0	0	0	0	0	0	4	0	**4**	**0**	0	0.0	0	0.0
		Through	NthnLowe-SN	394	24	409	38	320	29	321	27	**1444**	**118**	377	20	412	36	384	35	300	31	**1473**	**122**	-29	0.8	-4	0.4
		Right	NthnLowe-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	West	Left	NthnLowe-WN	1	0	0	0	0	0	1	0	**2**	**0**	0	0	0	0	0	0	1	0	**1**	**0**	1	0.8	0	0.0
		Through	NthnLowe-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnLowe-WS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
7.The Northern Rd & Marylands 3	North	Left	NthnMry3-NE	3	0	1	1	0	0	0	0	**4**	**1**	1	0	1	0	0	1	0	0	**2**	**1**	2	1.2	0	0.0
		Through	NthnMry3-NS	211	32	204	33	189	31	199	25	**803**	**121**	186	35	200	34	196	35	217	23	**799**	**127**	4	0.1	-6	0.5
		Right	NthnMry3-NW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	East	Left	NthnMry3-ES	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnMry3-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry3-EN	0	0	1	0	0	1	0	0	**1**	**1**	0	0	2	0	0	2	0	0	**2**	**2**	-1	0.8	-1	0.8
	South	Left	NthnMry3-SW	0	1	1	0	0	0	0	0	**1**	**1**	0	0	1	0	0	0	0	0	**1**	**0**	0	0.0	1	1.4
		Through	NthnMry3-SN	394	24	407	38	321	25	324	27	**1446**	**114**	360	21	441	38	355	33	306	26	**1462**	**118**	-16	0.4	-4	0.4
		Right	NthnMry3-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	West	Left	NthnMry3-WN	0	0	1	0	0	3	0	0	**1**	**3**	0	0	2	0	0	2	0	0	**2**	**2**	-1	0.8	1	0.6
		Through	NthnMry3-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry3-WS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
8.The Northern Rd & Marylands 2	North	Left	NthnMry2-NE	0	1	0	0	0	0	0	0	**0**	**1**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	1	1.4
		Through	NthnMry2-NS	211	29	204	32	188	30	198	22	**801**	**113**	180	33	204	36	201	36	206	19	**791**	**124**	10	0.4	-11	1.0
		Right	NthnMry2-NW	0	2	0	1	1	1	1	3	**2**	**7**	0	0	0	1	0	1	2	3	**2**	**5**	0	0.0	2	0.8
	East	Left	NthnMry2-ES	0	0	0	1	1	0	1	0	**2**	**1**	0	0	0	1	1	0	2	0	**3**	**1**	-1	0.6	0	0.0
		Through	NthnMry2-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry2-EN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	South	Left	NthnMry2-SW	0	1	2	1	2	2	1	0	**5**	**4**	0	0	0	1	5	0	2	1	**7**	**2**	-2	0.8	2	1.2
		Through	NthnMry2-SN	394	23	408	34	321	24	323	25	**1446**	**106**	359	21	447	32	366	31	278	25	**1450**	**109**	-4	0.1	-3	0.3
		Right	NthnMry2-SE	0	0	0	0	1	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
	West	Left	NthnMry2-WN	0	2	0	4	0	1	1	2	**1**	**9**	0	1	0	5	0	3	0	1	**0**	**10**	1	1.4	-1	0.3
		Through	NthnMry2-WE	0	0	0	0	1	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
		Right	NthnMry2-WS	0	0	0	2	0	0	0	1	**0**	**3**	0	0	0	2	0	0	0	2	**0**	**4**	0	0.0	-1	0.5
9.The Northern Rd & Marylands 1	North	Left	NthnMry1-NE	1	0	0	1	1	0	2	0	**4**	**1**	1	0	0	1	0	0	1	0	**2**	**1**	2	1.2	0	0.0
		Through	NthnMry1-NS	207	29	201	33	186	30	190	23	**784**	**115**	173	33	204	34	196	37	206	22	**779**	**126**	5	0.2	-11	1.0
		Right	NthnMry1-NW	3	0	3	1	2	0	7	0	**15**	**1**	3	1	3	2	2	0	6	0	**14**	**3**	1	0.3	-2	1.4
	East	Left	NthnMry1-ES	1	0	0	0	2	1	0	1	**3**	**2**	2	0	0	0	0	0	0	3	**2**	**3**	1	0.6	-1	0.6
		Through	NthnMry1-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry1-EN	0	0	1	1	1	0	0	0	**2**	**1**	0	0	0	0	0	0	0	0	**0**	**0**	2	2.0	1	1.4
	South	Left	NthnMry1-SW	20	0	11	2	13	2	8	1	**52**	**5**	19	0	14	0	11	3	7	1	**51**	**4**	1	0.1	1	0.5
		Through	NthnMry1-SN	380	22	382	34	317	23	311	24	**1390**	**103**	395	21	419	35	327	30	293	22	**1434**	**108**	-44	1.2	-5	0.5
		Right	NthnMry1-SE	3	2	1	1	0	2	1	2	**5**	**7**	4	3	0	1	1	4	0	1	**5**	**9**	0	0.0	-2	0.7
	West	Left	NthnMry1-WN	14	2	27	0	6	3	13	1	**60**	**6**	8	1	28	0	3	1	11	2	**50**	**4**	10	1.3	2	0.9
		Through	NthnMry1-WE	1	0	0	0	0	0	0	0	**1**	**0**	1	0	0	0	0	0	0	0	**1**	**0**	0	0.0	0	0.0
		Right	NthnMry1-WS	6	0	4	0	4	2	5	0	**19**	**2**	5	0	4	0	6	3	3	0	**18**	**3**	1	0.2	-1	0.6
10.The Northern Rd & Dunk Pl	North	Left	NthnDnk-NE	9	2	12	4	3	1	15	1	**39**	**8**	8	1	12	2	6	3	9	0	**35**	**6**	4	0.7	2	0.8
		Through	NthnDnk-NS	205	27	193	29	189	32	180	23	**767**	**111**	168	35	195	31	200	34	198	28	**761**	**128**	6	0.2	-17	1.6
11.The Northern & Dick Johnson	North	Left	NthnDick-NE	47	1	55	1	43	4	45	1	**190**	**7**	33	5	51	1	50	5	45	1	**179**	**12**	11	0.8	-5	1.6
		Through	NthnDick-NS	150	25	130	27	139	26	129	22	**548**	**100**	128	29	129	30	148	26	139	30	**544**	**115**	4	0.2	-15	1.4
		Right	NthnDick-NW	8	1	8	1	7	2	6	0	**29**	**4**	8	0	9	0	5	0	8	0	**30**	**0**	-1	0.2	4	2.8
	East	Left	NthnDick-ES	57	1	34	1	58	2	60	1	**209**	**5**	57	2	15	0	55	1	79	2	**206**	**5**	3	0.2	0	0.0
		Through	NthnDick-EW	10	2	11	1	17	0	16	1	**54**	**4**	12	3	15	2	7	0	27	1	**61**	**6**	-7	0.9	-2	0.9
		Right	NthnDick-EN	84	3	87	6	79	3	63	9	**313**	**21**	95	3	98	4	78	4	64	10	**335**	**21**	-22	1.2	0	0.0
	South	Left	NthnDick-SW	6	2	6	0	3	0	5	0	**20**	**2**	4	4	5	1	4	0	2	0	**15**	**5**	5	1.2	-3	1.6
		Through	NthnDick-SN	293	21	285	25	223	22	247	18	**1048**	**86**	285	20	300	28	243	34	204	16	**1032**	**98**	16	0.5	-12	1.3
		Right	NthnDick-SE	17	1	26	1	19	1	35	4	**97**	**7**	10	0	22	2	21	0	23	3	**76**	**5**	21	2.3	2	0.8
	West	Left	NthnDick-WN	26	0	22	6	28	2	10	0	**86**	**8**	32	0	27	5	26	0	15	0	**100**	**5**	-14	1.5	3	1.2
		Through	NthnDick-WE	20	1	15	0	16	0	13	0	**64**	**1**	26	1	13	0	15	0	10	0	**64**	**1**	0	0.0	0	0.0
		Right	NthnDick-WS	1	4	4	1	5	1	7	0	**17**	**6**	1	4	7	1	11	1	9	0	**28**	**6**	-11	2.3	0	0.0
12.The Northern & Peter Brock	North	Left	NthnPete-NE	14	0	7	0	10	1	12	0	**43**	**1**	16	1	9	0	11	1	10	1	**46**	**3**	-3	0.4	-2	1.4
		Through	NthnPete-NS	194	30	160	29	190	27	184	22	**728**	**108**	162	34	156	32	200	26	218	31	**736**	**123**	-8	0.3	-15	1.4
		Right	NthnPete-NW	0	0	1	0	2	1	0	1	**3**	**2**	0	0	0	0	1	0	2	2	**3**	**2**	0	0.0	0	0.0
	East	Left	NthnPete-ES	62	0	75	4	75	0	88	0	**300**	**4**	60	0	77	6	77	0	98	0	**312**	**6**	-12	0.7	-2	0.9
		Through	NthnPete-EW	5	0	9	1	14	0	10	0	**38**	**1**	0	0	7	0	10	0	12	0	**29**	**0**	9	1.6	1	1.4
		Right	NthnPete-EN	44	1	47	0	37	1	23	3	**151**	**5**	53	0	42	0	39	1	16	2	**150**	**3**	1	0.1	2	1.0
	South	Left	NthnPete-SW	14	0	20	3	20	3	14	0	**68**	**6**	20	0	19	3	21	4	17	0	**77**	**7**	-9	1.1	-1	0.4
		Through	NthnPete-SN	261	23	260	26	196	22	256	18	**973**	**89**	225	25	280	30	205	32	236	21	**946**	**108**	27	0.9	-19	1.9
		Right	NthnPete-SE	99	1	127	1	123	0	215	3	**564**	**5**	98	0	126	1	98	0	220	5	**542**	**6**	22	0.9	-1	0.4
	West	Left	NthnPete-WN	11	0	10	0	12	0	8	1	**41**	**1**	12	0	6	0	14	0	12	1	**44**	**1**	-3	0.5	0	0.0
		Through	NthnPete-WE	20	1	30	0	20	0	20	0	**90**	**1**	22	1	26	0	20	0	24	0	**92**	**1**	-2	0.2	0	0.0
		Right	NthnPete-WS	53	1	57	1	38	0	48	0	**196**	**2**	43	0	61	3	39	0	49	0	**192**	**3**	4	0.3	-1	0.6

0

279453

				15:30-16:30																											
				INPUT Data										Modelled												LV		HV			
				15:30		15:45		16:00		16:15				1		2		3		4											
				LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	1	2	1	2	1	2	1	2	LV	HV			Difference	GEH	Difference	GEH		
3.Bringelly Rd & Wentworth Rd	North	Left	WentBring NE	1	0	1	0	3	0	2	0	**7**	**0**	1	0	0	0	2	0	0	0	**3**	**0**	4	1.8	0	0.0				
		Through	WentBring NS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Right	WentBring NW	0	0	2	0	0	0	0	0	**2**	**0**	0	0	3	0	0	0	0	0	**3**	**0**	-1	0.6	0	0.0				
	East	Left	WentBring ES	7	1	20	0	18	0	11	3	**56**	**4**	4	1	17	0	17	0	10	6	**48**	**7**	8	1.1	-3	1.3				
		Through	WentBring EW	18	2	16	4	25	7	21	6	**80**	**19**	13	0	10	3	19	10	21	8	**63**	**21**	17	2.0	-2	0.4				
		Right	WentBring EN	0	0	3	0	2	1	0	0	**5**	**1**	0	0	0	0	0	0	0	0	**0**	**0**	5	3.2	1	1.4				
	South	Left	WentBring SW	3	0	3	0	0	0	3	1	**9**	**1**	1	0	2	0	0	0	1	0	**4**	**0**	5	2.0	1	1.4				
		Through	WentBring SN	0	0	1	0	0	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0				
		Right	WentBring SE	10	1	13	0	12	0	9	1	**44**	**2**	5	0	7	0	7	0	8	0	**27**	**0**	17	2.9	2	2.0				
	West	Left	WentBring WN	0	0	1	0	0	0	0	0	**1**	**0**	0	0	2	0	0	0	0	0	**2**	**0**	-1	0.8	0	0.0				
		Through	WentBring WE	25	3	20	2	27	2	18	4	**90**	**11**	21	6	17	2	24	0	13	6	**75**	**14**	15	1.7	-3	0.8				
		Right	WentBring WS	1	0	2	0	1	0	1	1	**5**	**1**	0	0	0	0	5	0	0	1	**5**	**1**	0	0.0	0	0.0				
1.The Northern Rd & Bringelly	North	Left	BrngNorth-NE	126	12	111	14	112	8	128	14	**477**	**48**	104	12	132	17	106	8	118	11	**460**	**48**	17	0.8	0	0.0				
		Right	BrngNorth-NW	1	1	6	0	6	3	5	2	**18**	**6**	1	0	6	0	4	2	8	7	**19**	**9**	-1	0.2	-3	1.1				
	East	Left	BrngNorth-ES	85	3	139	4	82	11	108	3	**414**	**21**	79	4	139	0	77	10	97	3	**392**	**17**	22	1.1	4	0.9				
		Through	BrngNorth-EW	14	2	17	3	27	3	25	6	**83**	**14**	14	1	14	3	21	6	18	7	**67**	**17**	16	1.8	-3	0.8				
		Right	BrngNorth-EN	78	5	78	6	70	15	76	5	**302**	**31**	55	7	91	7	71	16	77	7	**294**	**37**	8	0.5	-6	1.0				
	South	Left	BrngNorth-SW	10	0	16	1	12	2	2	1	**40**	**4**	2	0	7	0	11	2	5	0	**25**	**2**	15	2.6	2	1.2				
		Right	BrngNorth-SE	42	6	44	9	27	7	22	0	**135**	**22**	32	1	34	5	35	8	21	0	**122**	**14**	13	1.1	8	1.9				
	West	Left	BrngNorth-WN	4	3	9	1	11	0	7	2	**31**	**6**	1	4	2	2	9	0	4	4	**16**	**10**	15	3.1	-4	1.4				
		Through	BrngNorth-WE	20	1	15	1	19	2	11	2	**65**	**6**	15	1	14	1	14	0	11	0	**54**	**2**	11	1.4	4	2.0				
		Right	BrngNorth-WS	12	0	10	0	12	0	11	1	**45**	**1**	9	0	7	0	12	0	5	1	**33**	**1**	12	1.9	0	0.0				
2.Bringelly Rd & Kelvin Park	North	Left	KelvBrng-NE	5	0	9	0	3	0	10	0	**27**	**0**	3	0	6	0	3	0	6	0	**18**	**0**	9	1.9	0	0.0				
		Right	KelvBrng-NW	3	0	10	0	8	0	6	0	**27**	**0**	0	0	13	0	2	0	2	0	**17**	**0**	10	2.1	0	0.0				
	East	Through	KelvBrng-EW	174	10	224	13	171	29	203	14	**772**	**66**	154	13	236	11	158	33	203	17	**751**	**74**	21	0.8	-8	1.0				
		Right	KelvBrng-EN	11	1	8	1	7	0	11	0	**37**	**2**	15	0	10	1	4	0	13	0	**42**	**1**	-5	0.8	1	0.8				
	West	Left	KelvBrng-WN	5	0	8	2	11	1	6	0	**30**	**3**	1	0	9	1	11	0	3	0	**24**	**1**	6	1.2	2	1.4				
		Through	KelvBrng-WE	183	19	162	22	147	16	155	16	**647**	**73**	143	14	162	21	160	17	146	11	**611**	**63**	36	1.4	10	1.2				
4.The Northern Rd & Belmore Rd	North	Left	NthnBelm-NE	3	0	3	1	2	0	2	0	**10**	**1**	3	0	3	1	1	0	1	0	**8**	**1**	2	0.7	0	0.0				
		Through	NthnBelm-NS	414	28	443	39	405	42	429	23	**1691**	**132**	351	21	459	39	401	44	417	25	**1628**	**129**	63	1.5	3	0.3				
		Right	NthnBelm-NW	0	1	4	0	2	0	1	0	**7**	**1**	0	0	5	0	4	0	0	0	**9**	**0**	-2	0.7	1	1.4				
	East	Left	NthnBelm-ES	0	0	4	2	2	0	2	0	**8**	**2**	0	0	3	4	2	0	2	0	**7**	**4**	1	0.4	-2	1.2				
		Through	NthnBelm-EW	2	0	0	0	0	0	0	0	**2**	**0**	2	0	0	0	0	0	0	0	**2**	**0**	0	0.0	0	0.0				
		Right	NthnBelm-EN	0	0	1	0	1	0	1	0	**3**	**0**	0	0	1	0	1	0	1	0	**3**	**0**	0	0.0	0	0.0				
	South	Left	NthnBelm-SW	1	0	1	1	2	0	5	0	**9**	**1**	2	0	0	1	3	0	0	0	**5**	**1**	4	1.5	0	0.0				
		Through	NthnBelm-SN	192	28	202	25	187	27	164	21	**745**	**101**	122	16	173	13	222	24	178	21	**695**	**74**	50	1.9	27	2.9				
		Right	NthnBelm-SE	3	0	2	2	5	2	5	0	**15**	**4**	2	0	3	1	2	1	5	1	**12**	**3**	3	0.8	1	0.5				
	West	Left	NthnBelm-WN	1	0	1	0	1	0	0	0	**3**	**0**	1	0	1	0	2	0	0	0	**4**	**0**	-1	0.5	0	0.0				
		Through	NthnBelm-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Right	NthnBelm-WS	1	0	0	0	1	0	3	0	**5**	**0**	0	0	0	0	0	0	3	0	**3**	**0**	2	1.0	0	0.0				
5.The Northern Rd & Carrington	North	Left	NthnCarr-NE	1	0	0	0	0	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0				
		Through	NthnCarr-NS	414	28	447	41	408	42	434	23	**1703**	**134**	333	19	473	43	400	46	422	25	**1628**	**133**	75	1.8	1	0.1				
	East	Left	NthnCarr-ES	12	0	5	0	6	0	12	0	**35**	**0**	9	0	4	0	5	0	8	0	**26**	**0**	9	1.6	0	0.0				
6.The Northern Rd & LCLR	North	Left	NthnLowe-NE	0	0	1	0	0	0	2	0	**3**	**0**	0	0	2	0	0	0	0	0	**2**	**0**	1	0.6	0	0.0				
		Through	NthnLowe-NS	425	28	451	41	414	42	444	23	**1734**	**134**	341	19	441	36	423	53	424	23	**1629**	**131**	105	2.6	3	0.3				
		Right	NthnLowe-NW	1	0	0	0	0	0	0	0	**1**	**0**	1	0	0	0	0	0	0	0	**1**	**0**	0	0.0	0	0.0				
	East	Left	NthnLowe-ES	1	0	0	0	0	0	0	0	**1**	**0**	3	0	0	0	0	0	0	0	**3**	**0**	-2	1.4	0	0.0				
		Through	NthnLowe-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Right	NthnLowe-EN	0	0	1	0	0	0	2	0	**3**	**0**	0	0	1	0	0	0	2	0	**3**	**0**	0	0.0	0	0.0				
	South	Left	NthnLowe-SW	3	0	0	1	0	0	0	1	**3**	**2**	5	0	3	0	0	0	0	0	**8**	**0**	-5	2.1	2	2.0				
		Through	NthnLowe-SN	196	28	202	28	194	29	172	20	**764**	**105**	134	17	183	15	223	26	182	18	**722**	**76**	42	1.5	29	3.0				
		Right	NthnLowe-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
	West	Left	NthnLowe-WN	0	0	2	0	0	0	0	1	**2**	**1**	0	0	1	0	0	0	0	2	**1**	**2**	1	0.8	-1	0.8				
		Through	NthnLowe-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Right	NthnLowe-WS	2	0	2	0	1	2	0	3	**5**	**5**	1	0	2	0	2	3	0	2	**5**	**5**	0	0.0	0	0.0				
7.The Northern Rd & Marylands 3	North	Left	NthnMry3-NE	0	0	1	0	0	0	1	1	**2**	**1**	0	0	1	0	0	0	0	0	**1**	**0**	1	0.8	1	1.4				
		Through	NthnMry3-NS	427	28	452	41	414	43	443	25	**1736**	**137**	321	16	449	38	414	55	411	24	**1595**	**133**	141	3.5	4	0.3				
		Right	NthnMry3-NW	1	0	0	0	1	1	0	0	**2**	**1**	0	0	0	0	0	1	0	0	**0**	**1**	2	2.0	0	0.0				
	East	Left	NthnMry3-ES	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Through	NthnMry3-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Right	NthnMry3-EN	0	0	1	1	0	0	1	1	**2**	**2**	0	0	1	0	0	0	1	0	**2**	**0**	0	0.0	2	2.0				
	South	Left	NthnMry3-SW	0	0	0	0	1	0	0	0	**1**	**0**	0	0	0	0	2	0	0	0	**2**	**0**	-1	0.8	0	0.0				
		Through	NthnMry3-SN	198	28	201	28	192	28	171	20	**762**	**104**	163	18	184	16	213	23	177	17	**737**	**74**	25	0.9	30	3.2				
		Right	NthnMry3-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
	West	Left	NthnMry3-WN	1	0	0	0	2	1	0	0	**3**	**1**	0	0	0	0	4	2	0	0	**4**	**2**	-1	0.5	-1	0.8				
		Through	NthnMry3-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Right	NthnMry3-WS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
8.The Northern Rd & Marylands 2	North	Left	NthnMry2-NE	2	0	0	0	0	0	0	0	**2**	**0**	3	0	0	0	0	0	0	0	**3**	**0**	-1	0.6	0	0.0				
		Through	NthnMry2-NS	425	27	452	41	413	42	443	24	**1733**	**134**	289	15	454	36	424	57	402	20	**1569**	**128**	164	4.0	6	0.5				
		Right	NthnMry2-NW	0	1	0	0	1	1	0	1	**1**	**3**	0	0	0	0	0	1	1	0	**1**	**1**	0	0.0	2	1.4				
	East	Left	NthnMry2-ES	0	0	1	0	0	0	0	0	**1**	**0**	0	0	2	0	0	0	0	0	**2**	**0**	-1	0.8	0	0.0				
		Through	NthnMry2-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Right	NthnMry2-EN	0	0	1	0	0	0	0	0	**1**	**0**	0	0	1	0	0	0	0	0	**1**	**0**	0	0.0	0	0.0				
	South	Left	NthnMry2-SW	1	0	0	0	0	0	0	0	**1**	**0**	1	0	0	0	0	0	0	0	**1**	**0**	0	0.0	0	0.0				
		Through	NthnMry2-SN	198	26	200	28	187	26	170	19	**755**	**99**	171	15	189	16	216	26	174	14	**750**	**71**	5	0.2	28	3.0				
		Right	NthnMry2-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
	West	Left	NthnMry2-WN	0	2	0	0	6	2	1	1	**7**	**5**	0	3	0	0	1	0	0	0	**1**	**3**	6	3.0	2	1.0				
		Through	NthnMry2-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Right	NthnMry2-WS	4	2	5	0	1	0	0	0	**10**	**2**	1	0	4	0	1	0	0	0	**6**	**0**	4	1.4	2	2.0				
9.The Northern Rd & Marylands 1	North	Left	NthnMry1-NE	0	0	26	0	0	0	0	0	**26**	**0**	0	0	25	0	9	0	0	0	**34**	**0**	-8	1.5	0	0.0				
		Through	NthnMry1-NS	418	29	423	39	407	38	436	24	**1684**	**130**	258	14	430	31	395	58	407	19	**1490**	**122**	194	4.9	8	0.7				
		Right	NthnMry1-NW	11	0	9	2	7	4	7	0	**34**	**6**	5	0	5	3	8	0	11	1	**29**	**4**	5	0.9	2	0.9				
	East	Left	NthnMry1-ES	1	0	1	0	0	0	4	6	**6**	**6**	0	0	0	0	0	0	5	4	**5**	**4**	1	0.4	2	0.9				
		Through	NthnMry1-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Right	NthnMry1-EN	2	1	2	1	0	1	1	2	**5**	**5**	2	0	1	1	0	5	1	5	**4**	**11**	1	0.5	-6	2.1				
	South	Left	NthnMry1-SW	11	3	13	2	11	2	19	2	**54**	**9**	9	1	16	2	9	2	22	1	**56**	**6**	-2	0.3	3	1.1				
		Through	NthnMry1-SN	187	22	186	26	182	23	160	10	**715**	**81**	174	16	172	11	216	23	159	5	**721**	**55**	-6	0.2	26	3.2				
		Right	NthnMry1-SE	1	0	0	0	0	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0				
	West	Left	NthnMry1-WN	10	3	12	1	5	2	9	7	**36**	**13**	8	2	6	2	11	0	9	3	**34**	**7**	2	0.3	6	1.9				
		Through	NthnMry1-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0				
		Right	NthnMry1-WS	11	1	18	0	9	0	16	0	**54**	**1**	15	1	26	0	7	0	12	0	**60**	**1**	-6	0.8	0	0.0				
10.The Northern Rd & Dunk Pl	North	Left	NthnDnk-NE	44	0	39	1	37	1	35	5	**155**	**7**	26	0	40	0	25	0	34	2	**125**	**2**	30	2.5	5	2.4				
		Through	NthnDnk-NS	386	30	403	38	379	37	421	25	**1589**	**130**	232	14	419	30	374	58	395	22	**1420**	**124**	169	4.4	6	0.5				
11.The Northern & Dick Johnson	North	Left	NthnDick-NE	68	4	67	3	63	3	63	1	**261**	**11**	34	2	63	1	66	4	47	1	**210**	**8**	51	3.3	3	1.0				
		Through	NthnDick-NS	303	26	315	35	298	34	329	23	**1245**	**118**	164	11	343	26	288	52	314	23	**1109**	**112**	136	4.0	6	0.6				
		Right	NthnDick-NW	15	0	21	0	18	0	29	1	**83**	**1**	8	0	19	0	25	0	18	1	**70**	**1**	13	1.5	0	0.0				
	East	Left	NthnDick-ES	71	5	62	2	58	3	45	6	**236**	**16**	65	5	59	1	59	6	47	4	**230**	**16**	6	0.4	0	0.0				
		Through	NthnDick-EW	21	0	21	0	23	1	22	0	**87**	**1**	13	0	21	0	17	0	22	0	**73**	**0**	14	1.6	1	1.4				
		Right	NthnDick-EN	51	3	45	3	53	5	33	0	**182**	**11**	46	3	39	2	63	5	33	0	**181**	**10**	1	0.1	1	0.3				
	South	Left	NthnDick-SW	10	0	17	0	9	0	8	0	**44**	**0**	10	0	14	0	15	0	10	0	**49**	**0**	-5	0.7	0	0.0				
		Through	NthnDick-SN	139	21	141	25	133	20	137	12	**550**	**78**	137	13	154	13	143	18	137	6	**571**	**50**	-21	0.9	28	3.5				
		Right	NthnDick-SE	24	0	26	0	14	1	18	0	**82**	**1**	28	0	28	0	17	0	14	0	**87**	**0**	-5	0.5	1	1.4				
	West	Left	NthnDick-WN	9	1	13	0	7	0	9	0	**38**	**1**	8	1	8	0	10	0	6	0	**32**	**1**	6	1.0	0	0.0				
		Through	NthnDick-WE	13	0	14	2	26	1	22	0	**75**	**3**	11	0	15	2	25	0	29	0	**80**	**2**	-5	0.6	1	0.6				
		Right	NthnDick-WS	8	1	8	0	10	0	8	0	**34**	**1**	14	0	10	0	10	0	13	0	**47**	**0**	-13	2.0	1	1.4				
12.The Northern & Peter Brock	North	Left	NthnPete-NE	41	0	28	1	39	1	39	2	**147**	**4**	28	0	31	0	36	5	37	2	**132**	**7**	15	1.3	-3	1.3				
		Through	NthnPete-NS	340	31	356	36	320	36	339	27	**1355**	**130**	181	13	364	23	331	50	338	33	**1214**	**119**	141	3.9	11	1.0				
		Right	NthnPete-NW	1	1	1	0	7	0	4	0	**13**	**1**	0	0	1	0	3	0	4	0	**8**	**0**	5	1.5	1	1.4				
	East	Left	NthnPete-ES	73	3	71	1	109	0	94	2	**347**	**6**	78	3	54	1	98	1	92	1	**322**	**6**	25	1.4	0	0.0				
		Through	NthnPete-EW	25	1	16	0	17	0	21	1	**79**	**2**	22	0	10	0	14	0	18	0	**64**	**0**	15	1.8	2	2.0				
		Right	NthnPete-EN	12	0	20	1	9	0	8	0	**49**	**1**	12	0	22	0	15	0	9	0	**58**	**0**	-9	1.2	1	1.4				
	South	Left	NthnPete-SW	63	1	80	0	48	0	36	2	**227**	**3**	59	2	88	0	60	0	37	4	**244**	**6**	-17	1.1	-3	1.4				
		Through	NthnPete-SN	156	21	163	23	145	21	146	12	**610**	**77**	178	14	165	13	165	18	141	8	**649**	**53**	-39	1.6	24	3.0				
		Right	NthnPete-SE	130	3	132	2	102	3	125	5	**489**	**13**	130	4	129	4	97	0	157	4	**513**	**12**	-24	1.1	1	0.3				
	West	Left	NthnPete-WN	5	0	1	1	2	0	9	0	**17**	**1**	7	0	0	0	1	0	12	0	**20**	**0**	-3	0.7	1	1.4				
		Through	NthnPete-WE	8	0	13	0	14	1	13	0	**48**	**1**	6	0	13	0	14	1	19	0	**52**	**1**	-4	0.6	0	0.0				
		Right	NthnPete-WS	34	1	23	0	34	0	30	4	**121**	**5**	36	3	22	0	28	0	35	6	**121**	**9**	0	0.0	-4	1.5				

0

279453

16:30-17:30

				INPUT Data										Modelled								LV		HV	
				16:30		16:45		17:00		17:15				5		6		7		8					
				LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	1	2	1	2	1	2	1	2	LV	HV	Difference	GEH	Difference	GEH
3.Bringelly Rd & Wentworth Rd	North	Left	WentBring NE	0	0	1	0	0	0	1	0	**2**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	2	2.0	0	0.0
		Through	WentBring NS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	WentBring NW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	East	Left	WentBring ES	9	1	16	1	15	0	5	0	**45**	**2**	9	1	19	1	17	0	8	0	**53**	**2**	-8	1.1	0	0.0
		Through	WentBring EW	15	2	26	5	31	0	19	2	**91**	**9**	11	4	30	3	21	1	38	4	**100**	**12**	-9	0.9	-3	0.9
		Right	WentBring EN	0	0	1	0	0	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
	South	Left	WentBring SW	0	0	0	0	2	0	1	0	**3**	**0**	0	0	0	0	0	0	2	0	**2**	**0**	1	0.6	0	0.0
		Through	WentBring SN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	WentBring SE	11	1	16	0	22	1	7	0	**56**	**2**	13	0	13	0	20	2	6	0	**52**	**2**	4	0.5	0	0.0
	West	Left	WentBring WN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	WentBring WE	24	6	20	4	31	2	19	1	**94**	**13**	27	5	17	1	23	1	17	0	**84**	**7**	10	1.1	6	1.9
		Right	WentBring WS	0	0	0	0	1	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
1.The Northern Rd & Bringelly	North	Left	BrngNorth-NE	97	12	107	4	110	9	119	6	**433**	**31**	80	12	130	7	103	12	114	7	**427**	**38**	6	0.3	-7	1.2
		Right	BrngNorth-NW	3	1	4	3	8	0	2	0	**17**	**4**	6	1	3	2	5	0	4	0	**18**	**3**	-1	0.2	1	0.5
	East	Left	BrngNorth-ES	98	4	95	4	93	2	92	6	**378**	**16**	120	2	78	6	97	0	84	7	**379**	**15**	-1	0.1	1	0.3
		Through	BrngNorth-EW	14	2	30	2	22	0	15	2	**81**	**6**	13	4	40	2	20	0	26	4	**99**	**10**	-18	1.9	-4	1.4
		Right	BrngNorth-EN	81	9	83	9	83	5	60	2	**307**	**25**	64	6	91	8	88	4	70	2	**313**	**20**	-6	0.3	5	1.1
	South	Left	BrngNorth-SW	7	0	9	1	16	0	7	0	**39**	**1**	1	0	7	0	14	1	15	0	**37**	**1**	2	0.3	0	0.0
		Through	BrngNorth-SE	33	6	43	4	41	3	43	3	**160**	**16**	35	6	43	7	27	2	52	5	**157**	**20**	3	0.2	-4	0.9
	West	Left	BrngNorth-WN	5	2	7	1	12	0	1	0	**25**	**3**	8	1	8	0	9	0	2	0	**27**	**1**	-2	0.4	2	1.4
		Through	BrngNorth-WE	18	2	17	1	19	2	12	0	**66**	**5**	19	3	18	0	18	2	5	1	**60**	**6**	6	0.8	-1	0.4
		Right	BrngNorth-WS	12	2	13	2	22	1	14	1	**61**	**6**	12	2	6	1	15	0	18	0	**51**	**3**	10	1.3	3	1.4
2.Bringelly Rd & Kelvin Park	North	Left	KelvBrng-NE	3	0	1	0	6	0	8	0	**18**	**0**	2	0	1	0	6	0	8	0	**17**	**0**	1	0.2	0	0.0
		Right	KelvBrng-NW	3	0	7	0	8	0	4	0	**22**	**0**	2	0	5	0	4	0	2	0	**13**	**0**	9	2.2	0	0.0
	East	Through	KelvBrng-EW	190	19	201	15	190	7	163	10	**744**	**51**	193	9	206	16	196	5	177	12	**772**	**42**	-28	1.0	9	1.3
		Right	KelvBrng-EN	6	1	5	0	6	0	7	0	**24**	**1**	11	1	8	0	5	0	4	0	**28**	**1**	-4	0.8	0	0.0
	West	Left	KelvBrng-WN	9	1	15	0	12	1	11	0	**47**	**2**	10	1	16	0	11	0	15	0	**52**	**1**	-5	0.7	1	0.8
		Through	KelvBrng-WE	139	20	152	9	158	13	163	9	**612**	**51**	122	20	176	14	138	16	151	12	**587**	**62**	25	1.0	-11	1.5
4.The Northern Rd & Belmore Rd	North	Left	NthnBelm-NE	2	0	1	0	1	3	1	3	**5**	**6**	2	0	1	0	0	2	1	3	**4**	**5**	1	0.5	1	0.4
		Through	NthnBelm-NS	456	30	467	23	417	17	455	18	**1795**	**88**	444	28	461	26	428	13	435	18	**1768**	**85**	27	0.6	3	0.3
		Right	NthnBelm-NW	0	0	0	0	1	1	0	1	**1**	**2**	1	0	0	0	0	0	0	2	**1**	**2**	0	0.0	0	0.0
	East	Left	NthnBelm-ES	0	0	2	0	0	0	0	0	**2**	**0**	0	0	1	0	0	0	0	0	**1**	**0**	1	0.8	0	0.0
		Through	NthnBelm-EW	0	0	1	0	0	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
		Right	NthnBelm-EN	0	0	1	0	0	0	0	2	**1**	**2**	0	0	2	0	0	0	0	0	**2**	**0**	-1	0.8	2	2.0
	South	Left	NthnBelm-SW	2	0	3	0	3	0	5	0	**13**	**0**	0	0	0	0	2	0	2	0	**4**	**0**	9	3.1	0	0.0
		Through	NthnBelm-SN	199	16	216	18	214	19	209	13	**838**	**66**	204	16	227	21	193	19	225	15	**849**	**71**	-11	0.4	-5	0.6
		Right	NthnBelm-SE	4	0	2	0	6	1	1	0	**13**	**1**	4	0	0	0	4	0	0	3	**8**	**3**	5	1.5	-2	1.4
	West	Left	NthnBelm-WN	0	0	0	0	1	0	1	0	**2**	**0**	0	0	0	0	1	0	0	0	**1**	**0**	1	0.8	0	0.0
		Through	NthnBelm-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnBelm-WS	1	0	1	0	4	0	5	0	**11**	**0**	1	0	0	0	0	0	4	0	**5**	**0**	6	2.1	0	0.0
5.The Northern Rd & Carrington	North	Left	NthnCarr-NE	0	2	1	1	1	0	4	0	**6**	**3**	0	1	0	1	1	0	8	0	**9**	**2**	-3	1.1	1	0.6
		Through	NthnCarr-NS	457	28	469	22	420	17	456	18	**1802**	**85**	444	26	459	26	427	13	431	18	**1761**	**83**	41	1.0	2	0.2
	East	Left	NthnCarr-ES	11	1	10	0	8	0	3	0	**32**	**1**	6	1	6	0	3	0	1	0	**16**	**1**	16	3.3	0	0.0
6.The Northern Rd & LCLR	North	Left	NthnLowe-NE	1	1	1	0	0	0	0	0	**2**	**1**	0	1	1	0	0	0	0	0	**1**	**1**	1	0.8	0	0.0
		Through	NthnLowe-NS	466	28	478	22	428	17	459	18	**1831**	**85**	462	26	457	27	430	13	432	17	**1781**	**83**	50	1.2	2	0.2
		Right	NthnLowe-NW	1	0	0	0	0	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
	East	Left	NthnLowe-ES	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnLowe-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnLowe-EN	1	1	1	0	0	0	0	0	**2**	**1**	2	0	0	0	1	0	0	0	**3**	**0**	-1	0.6	1	1.4
	South	Left	NthnLowe-SW	0	0	1	0	1	0	0	0	**2**	**0**	0	0	1	0	0	0	1	0	**2**	**0**	0	0.0	0	0.0
		Through	NthnLowe-SN	203	24	216	18	220	20	215	13	**854**	**75**	195	16	238	23	206	17	208	18	**847**	**74**	7	0.2	1	0.1
		Right	NthnLowe-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	West	Left	NthnLowe-WN	1	0	4	0	3	0	0	0	**8**	**0**	1	0	0	0	3	0	0	0	**4**	**0**	4	1.6	0	0.0
		Through	NthnLowe-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnLowe-WS	0	0	3	0	5	0	0	0	**8**	**0**	0	1	2	0	3	0	0	0	**5**	**1**	3	1.2	-1	1.4
7.The Northern Rd & Marylands 3	North	Left	NthnMry3-NE	2	0	1	0	1	0	1	0	**5**	**0**	2	0	1	0	0	0	0	0	**3**	**0**	2	1.0	0	0.0
		Through	NthnMry3-NS	464	28	480	22	432	17	458	18	**1834**	**85**	471	28	455	26	439	15	427	16	**1792**	**85**	42	1.0	0	0.0
		Right	NthnMry3-NW	0	0	0	0	0	0	0	0	**0**	**0**	2	0	0	0	0	0	0	0	**2**	**0**	-2	2.0	0	0.0
	East	Left	NthnMry3-ES	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnMry3-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry3-EN	1	0	2	0	0	0	0	0	**3**	**0**	0	0	1	0	1	0	0	0	**2**	**0**	1	0.6	0	0.0
	South	Left	NthnMry3-SW	0	0	0	0	0	0	1	0	**1**	**0**	0	0	0	0	0	0	1	0	**1**	**0**	0	0.0	0	0.0
		Through	NthnMry3-SN	202	20	215	18	221	20	215	13	**853**	**71**	197	17	231	22	208	18	201	17	**837**	**74**	16	0.6	-3	0.4
		Right	NthnMry3-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	West	Left	NthnMry3-WN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnMry3-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry3-WS	0	0	0	0	0	0	1	0	**1**	**0**	0	0	0	0	0	0	1	0	**1**	**0**	0	0.0	0	0.0
8.The Northern Rd & Marylands 2	North	Left	NthnMry2-NE	4	0	0	0	0	0	0	0	**4**	**0**	3	0	2	0	0	0	0	0	**5**	**0**	-1	0.5	0	0.0
		Through	NthnMry2-NS	460	28	480	22	432	17	458	17	**1830**	**84**	471	29	448	27	452	16	411	14	**1782**	**86**	48	1.1	-2	0.2
		Right	NthnMry2-NW	0	0	0	0	0	0	1	1	**1**	**1**	0	1	0	0	0	0	0	0	**0**	**1**	1	1.4	0	0.0
	East	Left	NthnMry2-ES	0	0	0	0	1	0	1	0	**2**	**0**	0	0	0	0	2	0	1	0	**3**	**0**	-1	0.6	0	0.0
		Through	NthnMry2-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry2-EN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	South	Left	NthnMry2-SW	1	0	0	0	0	0	0	0	**1**	**0**	1	0	0	0	0	0	0	0	**1**	**0**	0	0.0	0	0.0
		Through	NthnMry2-SN	202	26	214	18	219	20	214	13	**849**	**77**	196	19	234	20	205	24	199	12	**834**	**75**	15	0.5	2	0.2
		Right	NthnMry2-SE	0	0	0	0	1	0	0	0	**1**	**0**	0	0	0	0	2	0	0	0	**2**	**0**	-1	0.8	0	0.0
	West	Left	NthnMry2-WN	0	0	1	0	2	0	2	0	**5**	**0**	0	0	0	0	1	0	2	0	**3**	**0**	2	1.0	0	0.0
		Through	NthnMry2-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry2-WS	3	0	1	0	2	0	3	0	**9**	**0**	2	0	2	0	1	0	7	0	**12**	**0**	-3	0.9	0	0.0
9.The Northern Rd & Marylands 1	North	Left	NthnMry1-NE	0	0	0	0	0	0	2	0	**2**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	2	2.0	0	0.0
		Through	NthnMry1-NS	448	28	473	21	429	17	449	15	**1799**	**81**	439	25	433	31	469	17	413	13	**1754**	**86**	45	1.1	-5	0.5
		Right	NthnMry1-NW	15	0	8	1	6	0	11	2	**40**	**3**	16	0	11	1	5	0	3	0	**35**	**1**	5	0.8	2	1.4
	East	Left	NthnMry1-ES	2	0	6	0	4	1	3	0	**15**	**1**	3	0	4	0	3	1	3	0	**13**	**1**	2	0.5	0	0.0
		Through	NthnMry1-EW	0	1	1	0	0	0	1	0	**2**	**1**	0	1	1	1	0	0	2	0	**3**	**2**	-1	0.6	-1	0.8
		Right	NthnMry1-EN	1	0	3	0	1	0	0	0	**5**	**0**	0	0	3	0	1	0	0	0	**4**	**0**	1	0.5	0	0.0
	South	Left	NthnMry1-SW	20	2	14	2	19	0	10	2	**63**	**6**	30	3	19	1	19	0	17	2	**85**	**6**	-22	2.6	0	0.0
		Through	NthnMry1-SN	189	21	198	14	209	20	206	13	**802**	**68**	200	15	214	16	194	23	197	10	**805**	**64**	-3	0.1	4	0.5
		Right	NthnMry1-SE	0	0	0	0	1	0	0	1	**1**	**1**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	1	1.4
	West	Left	NthnMry1-WN	13	2	13	4	10	0	8	0	**44**	**6**	8	2	14	7	8	0	5	0	**35**	**9**	9	1.4	-3	1.1
		Through	NthnMry1-WE	0	0	0	1	0	0	0	0	**0**	**1**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	1	1.4
		Right	NthnMry1-WS	15	5	14	1	9	1	13	0	**51**	**7**	15	3	17	2	11	1	21	0	**64**	**6**	-13	1.7	1	0.4
10.The Northern Rd & Dunk Pl	North	Left	NthnDnk-NE	62	1	48	2	38	6	57	1	**205**	**10**	43	0	46	5	32	5	32	2	**153**	**12**	52	3.9	-2	0.6
		Through	NthnDnk-NS	403	32	445	20	404	13	408	14	**1660**	**79**	407	29	407	27	452	13	403	13	**1669**	**82**	-9	0.2	-3	0.3
11.The Northern & Dick Johnson	North	Left	NthnDick-NE	78	2	74	3	87	2	100	1	**339**	**8**	67	0	68	4	69	1	109	5	**313**	**10**	26	1.4	-2	0.7
		Through	NthnDick-NS	305	29	346	17	293	11	282	13	**1226**	**70**	342	31	303	23	350	11	273	7	**1268**	**72**	-42	1.2	-2	0.2
		Right	NthnDick-NW	20	2	25	0	24	0	26	0	**95**	**2**	19	0	22	1	27	0	23	0	**91**	**1**	4	0.4	1	0.8
	East	Left	NthnDick-ES	51	2	57	2	60	3	49	1	**217**	**8**	52	3	67	3	73	4	43	1	**235**	**11**	-18	1.2	-3	1.0
		Through	NthnDick-EW	32	0	32	0	21	0	18	0	**103**	**0**	33	0	32	0	17	0	17	0	**99**	**0**	4	0.4	0	0.0
		Right	NthnDick-EN	44	1	45	2	57	1	45	3	**191**	**7**	50	0	51	2	63	2	40	6	**204**	**10**	-13	0.9	-3	1.0
	South	Left	NthnDick-SW	5	1	10	0	12	0	5	0	**32**	**1**	2	1	7	0	13	0	4	0	**26**	**1**	6	1.1	0	0.0
		Through	NthnDick-SN	152	20	155	13	158	19	159	12	**624**	**64**	171	20	168	14	144	20	162	7	**645**	**61**	-21	0.8	3	0.4
		Right	NthnDick-SE	22	0	15	1	22	0	12	0	**71**	**1**	28	0	15	0	22	0	13	0	**78**	**0**	-7	0.8	1	1.4
	West	Left	NthnDick-WN	13	0	12	1	14	0	12	1	**51**	**2**	12	0	14	0	14	0	12	0	**52**	**0**	-1	0.1	2	2.0
		Through	NthnDick-WE	19	1	16	0	15	1	11	0	**61**	**2**	17	2	16	0	16	1	8	0	**57**	**3**	4	0.5	-1	0.6
		Right	NthnDick-WS	9	0	9	0	14	0	12	0	**44**	**0**	7	0	11	0	11	0	15	0	**44**	**0**	0	0.0	0	0.0
12.The Northern & Peter Brock	North	Left	NthnPete-NE	64	2	49	1	30	1	38	0	**181**	**4**	74	0	47	1	37	2	40	0	**198**	**3**	-17	1.2	1	0.5
		Through	NthnPete-NS	299	29	357	18	329	13	299	14	**1284**	**74**	309	33	342	25	387	12	312	11	**1350**	**81**	-66	1.8	-7	0.8
		Right	NthnPete-NW	2	0	6	0	8	0	6	0	**22**	**0**	0	0	2	0	6	0	4	0	**12**	**0**	10	2.4	0	0.0
	East	Left	NthnPete-ES	107	0	85	0	110	1	98	0	**400**	**1**	106	0	98	0	114	0	95	0	**413**	**0**	-13	0.6	1	1.4
		Through	NthnPete-EW	30	0	19	0	17	0	25	0	**91**	**0**	21	0	19	0	17	0	23	0	**80**	**0**	11	1.2	0	0.0
		Right	NthnPete-EN	25	2	19	0	16	2	12	1	**72**	**5**	28	2	14	0	19	2	11	1	**72**	**5**	0	0.0	0	0.0
	South	Left	NthnPete-SW	41	0	48	0	50	0	44	0	**183**	**0**	38	0	56	0	56	0	48	0	**198**	**0**	-15	1.1	0	0.0
		Through	NthnPete-SN	154	18	157	14	173	17	163	11	**647**	**60**	171	17	173	14	167	18	165	6	**676**	**55**	-29	1.1	5	0.7
		Right	NthnPete-SE	142	2	107	2	97	5	143	0	**489**	**9**	142	0	96	0	92	6	140	1	**470**	**7**	19	0.9	2	0.7
	West	Left	NthnPete-WN	0	0	4	0	3	0	1	0	**8**	**0**	1	0	2	0	3	0	3	0	**9**	**0**	-1	0.3	0	0.0
		Through	NthnPete-WE	12	0	12	0	11	0	14	0	**49**	**0**	11	0	11	0	7	0	13	0	**42**	**0**	7	1.0	0	0.0
		Right	NthnPete-WS	29	0	35	0	33	0	40	1	**137**	**1**	34	0	46	0	35	0	38	1	**153**	**1**	-16	1.3	0	0.0

0

279453

17:30-18:30

				INPUT Data										Modelled								LV		HV	
				17:30		17:45		18:00		18:15				9		10		11		12				Difference	GEH	Difference	GEH
				LV	HV	LV	HV	LV	HV	LV	HV			1	2	1	2	1	2	1	2	LV	HV				
3.Bringelly Rd & Wentworth Rd	North	Left	WentBring NE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	WentBring NS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	WentBring NW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	East	Left	WentBring ES	4	0	6	0	2	0	1	0	**13**	**0**	1	0	7	0	2	0	1	0	**11**	**0**	2	0.6	0	0.0
		Through	WentBring EW	25	3	15	2	23	1	16	1	**79**	**7**	16	3	19	2	15	3	16	2	**66**	**10**	13	1.5	-3	1.0
		Right	WentBring EN	0	0	1	0	0	0	0	0	**1**	**0**	0	0	0	0	0	0	1	0	**1**	**0**	0	0.0	0	0.0
	South	Left	WentBring SW	4	0	1	0	1	0	2	0	**8**	**0**	6	0	1	0	1	0	2	0	**10**	**0**	-2	0.7	0	0.0
		Through	WentBring SN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	WentBring SE	4	0	4	0	3	0	0	0	**11**	**0**	5	0	3	0	4	0	0	0	**12**	**0**	-1	0.3	0	0.0
	West	Left	WentBring WN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	WentBring WE	16	3	18	4	19	0	23	3	**76**	**10**	20	1	15	4	15	0	26	1	**76**	**6**	0	0.0	4	1.4
		Right	WentBring WS	1	0	1	0	0	0	0	0	**2**	**0**	0	0	0	0	0	0	1	0	**1**	**0**	1	0.8	0	0.0
1.The Northern Rd & Bringelly	North	Left	BrngNorth-NE	97	4	100	7	75	4	60	1	**332**	**16**	97	4	101	6	52	3	62	2	**312**	**15**	20	1.1	1	0.3
		Right	BrngNorth-NW	3	2	3	2	6	0	0	0	**12**	**4**	0	1	5	2	5	1	0	0	**10**	**4**	2	0.6	0	0.0
	East	Left	BrngNorth-ES	103	4	78	2	84	0	69	4	**334**	**10**	91	3	64	6	91	0	65	0	**311**	**9**	23	1.3	1	0.3
		Through	BrngNorth-EW	14	1	11	0	14	1	10	1	**49**	**3**	17	2	12	0	7	2	12	3	**48**	**7**	1	0.1	-4	1.8
		Right	BrngNorth-EN	69	4	61	5	31	3	37	3	**198**	**15**	58	2	75	3	34	0	33	5	**200**	**10**	-2	0.1	5	1.4
	South	Left	BrngNorth-SW	12	0	8	0	5	0	7	0	**32**	**0**	1	0	8	0	5	0	6	0	**20**	**0**	12	2.4	0	0.0
		Right	BrngNorth-SE	34	0	29	1	34	2	27	1	**124**	**4**	33	1	28	1	30	0	28	3	**119**	**5**	5	0.5	-1	0.5
	West	Left	BrngNorth-WN	4	1	1	2	1	0	0	2	**6**	**5**	9	0	1	1	2	0	0	0	**12**	**1**	-6	2.0	4	2.3
		Through	BrngNorth-WE	12	1	10	2	13	0	11	1	**46**	**4**	15	1	4	3	9	0	16	1	**44**	**5**	2	0.3	-1	0.5
		Right	BrngNorth-WS	4	1	11	0	8	0	12	0	**35**	**1**	1	0	11	0	9	0	10	0	**31**	**0**	4	0.7	1	1.4
2.Bringelly Rd & Kelvin Park	North	Left	KelvBrng-NE	4	0	6	0	6	0	5	0	**21**	**0**	7	0	2	0	3	0	5	0	**17**	**0**	4	0.9	0	0.0
		Right	KelvBrng-NW	8	0	3	0	7	0	5	0	**23**	**0**	11	0	0	0	5	0	1	0	**17**	**0**	6	1.3	0	0.0
	East	Through	KelvBrng-EW	178	9	147	7	122	4	111	8	**558**	**28**	157	8	148	8	122	2	107	8	**534**	**26**	24	1.0	2	0.4
		Right	KelvBrng-EN	9	0	13	1	9	0	11	0	**42**	**1**	4	0	5	1	5	0	11	0	**25**	**1**	17	2.9	0	0.0
	West	Left	KelvBrng-WN	7	2	8	0	10	0	10	0	**35**	**2**	10	4	3	0	5	0	7	0	**25**	**4**	10	1.8	-2	1.2
		Through	KelvBrng-WE	136	3	131	10	112	6	88	3	**467**	**22**	141	3	130	10	86	3	85	6	**442**	**22**	25	1.2	0	0.0
4.The Northern Rd & Belmore Rd	North	Left	NthnBelm-NE	1	2	1	0	1	0	1	0	**4**	**2**	1	3	0	0	2	0	1	0	**4**	**3**	0	0.0	-1	0.6
		Through	NthnBelm-NS	428	18	371	12	346	13	301	12	**1446**	**55**	433	21	341	11	368	11	324	14	**1466**	**57**	-20	0.5	-2	0.3
		Right	NthnBelm-NW	1	0	3	0	0	0	0	1	**4**	**1**	1	0	3	0	0	0	0	0	**4**	**0**	0	0.0	1	1.4
	East	Left	NthnBelm-ES	3	0	1	1	2	0	2	0	**8**	**1**	4	0	0	2	2	0	0	0	**6**	**2**	2	0.8	-1	0.8
		Through	NthnBelm-EW	0	0	0	0	0	0	2	0	**2**	**0**	0	0	0	0	0	0	2	0	**2**	**0**	0	0.0	0	0.0
		Right	NthnBelm-EN	2	0	2	0	1	2	0	0	**5**	**2**	0	0	2	0	3	1	0	0	**5**	**1**	0	0.0	1	0.8
	South	Left	NthnBelm-SW	0	0	2	0	0	0	1	0	**3**	**0**	2	0	0	0	2	0	0	0	**4**	**0**	-1	0.5	0	0.0
		Through	NthnBelm-SN	170	11	155	8	140	6	126	9	**591**	**34**	177	9	145	9	139	7	134	11	**595**	**36**	-4	0.2	-2	0.3
		Right	NthnBelm-SE	2	0	1	1	3	1	4	0	**10**	**2**	3	0	1	0	2	0	5	1	**11**	**1**	-1	0.3	1	0.8
	West	Left	NthnBelm-WN	0	0	1	0	0	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
		Through	NthnBelm-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnBelm-WS	1	0	1	0	1	0	3	0	**6**	**0**	0	0	0	0	3	0	5	0	**8**	**0**	-2	0.8	0	0.0
5.The Northern Rd & Carrington	North	Left	NthnCarr-NE	1	0	2	0	0	1	0	0	**3**	**1**	3	0	0	0	0	0	0	0	**3**	**0**	0	0.0	1	1.4
		Through	NthnCarr-NS	431	18	371	13	349	12	306	12	**1457**	**55**	435	21	351	12	355	11	348	15	**1489**	**59**	-32	0.8	-4	0.5
	East	Left	NthnCarr-ES	2	0	4	0	4	0	4	0	**14**	**0**	1	0	5	0	2	0	1	0	**9**	**0**	5	1.5	0	0.0
6.The Northern Rd & LCLR	North	Left	NthnLowe-NE	0	0	0	0	1	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
		Through	NthnLowe-NS	433	18	375	13	352	12	310	12	**1470**	**55**	438	21	363	14	365	11	334	15	**1500**	**61**	-30	0.8	-6	0.8
		Right	NthnLowe-NW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	East	Left	NthnLowe-ES	0	0	0	0	1	0	0	0	**1**	**0**	0	0	0	0	3	0	0	0	**3**	**0**	-2	1.4	0	0.0
		Through	NthnLowe-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnLowe-EN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	South	Left	NthnLowe-SW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnLowe-SN	172	11	158	9	143	7	131	9	**604**	**36**	191	9	145	10	136	7	143	12	**615**	**38**	-11	0.4	-2	0.3
		Right	NthnLowe-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	West	Left	NthnLowe-WN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnLowe-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnLowe-WS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
7.The Northern Rd & Marylands 3	North	Left	NthnMry3-NE	1	0	0	0	1	0	0	0	**2**	**0**	2	0	0	0	0	0	0	0	**2**	**0**	0	0.0	0	0.0
		Through	NthnMry3-NS	432	18	375	13	352	12	310	12	**1469**	**55**	445	20	368	15	355	12	345	13	**1513**	**60**	-44	1.1	-5	0.7
		Right	NthnMry3-NW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	East	Left	NthnMry3-ES	0	0	0	0	1	0	0	0	**1**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	1	1.4	0	0.0
		Through	NthnMry3-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry3-EN	0	0	1	0	1	0	0	0	**2**	**0**	0	0	1	0	4	0	0	0	**5**	**0**	-3	1.6	0	0.0
	South	Left	NthnMry3-SW	0	0	0	0	0	0	1	0	**1**	**0**	1	0	0	0	0	0	1	0	**2**	**0**	-1	0.8	0	0.0
		Through	NthnMry3-SN	172	11	157	9	142	7	130	9	**601**	**36**	190	9	148	11	137	6	132	12	**607**	**38**	-6	0.2	-2	0.3
		Right	NthnMry3-SE	0	0	1	0	0	0	0	0	**1**	**0**	0	0	3	0	1	0	0	0	**4**	**0**	-3	1.9	0	0.0
	West	Left	NthnMry3-WN	0	0	0	0	0	0	1	0	**1**	**0**	0	0	0	0	0	0	1	0	**1**	**0**	0	0.0	0	0.0
		Through	NthnMry3-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry3-WS	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
8.The Northern Rd & Marylands 2	North	Left	NthnMry2-NE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnMry2-NS	432	17	374	13	353	12	310	12	**1469**	**54**	449	20	376	15	341	11	351	14	**1517**	**60**	-48	1.2	-6	0.8
		Right	NthnMry2-NW	0	1	1	0	0	0	0	0	**1**	**1**	1	2	0	0	2	0	0	0	**3**	**2**	-2	1.4	-1	0.8
	East	Left	NthnMry2-ES	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnMry2-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry2-EN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	South	Left	NthnMry2-SW	0	0	0	1	13	0	0	0	**13**	**1**	0	0	0	0	7	0	2	0	**9**	**0**	4	1.2	1	1.4
		Through	NthnMry2-SN	172	11	155	8	140	5	130	9	**597**	**33**	199	9	132	9	140	6	135	12	**606**	**36**	-9	0.4	-3	0.5
		Right	NthnMry2-SE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	West	Left	NthnMry2-WN	0	0	3	1	2	2	1	0	**6**	**3**	0	0	4	1	0	0	0	0	**4**	**1**	2	0.9	2	1.4
		Through	NthnMry2-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry2-WS	2	0	1	1	1	0	0	0	**4**	**1**	2	0	0	1	1	0	0	0	**3**	**1**	1	0.5	0	0.0
9.The Northern Rd & Marylands 1	North	Left	NthnMry1-NE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Through	NthnMry1-NS	426	15	371	14	350	12	306	12	**1453**	**53**	437	16	391	17	338	10	361	14	**1527**	**57**	-74	1.9	-4	0.5
		Right	NthnMry1-NW	8	2	4	0	4	0	4	0	**20**	**2**	6	4	3	0	1	0	3	0	**13**	**4**	7	1.7	-2	1.2
	East	Left	NthnMry1-ES	0	0	1	0	1	0	2	0	**4**	**0**	0	0	1	0	1	0	1	0	**3**	**0**	1	0.5	0	0.0
		Through	NthnMry1-EW	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry1-EN	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
	South	Left	NthnMry1-SW	8	1	16	0	14	1	10	1	**48**	**3**	13	2	20	0	13	1	8	3	**54**	**6**	-6	0.8	-3	1.4
		Through	NthnMry1-SN	165	9	142	8	146	5	112	9	**565**	**31**	181	7	125	10	141	4	115	12	**562**	**33**	3	0.1	-2	0.4
		Right	NthnMry1-SE	0	1	0	0	0	0	2	0	**2**	**1**	0	0	0	1	0	0	2	0	**2**	**1**	0	0.0	0	0.0
	West	Left	NthnMry1-WN	7	2	13	1	7	0	18	0	**45**	**3**	8	2	12	1	8	0	15	0	**43**	**3**	2	0.3	0	0.0
		Through	NthnMry1-WE	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	**0**	**0**	0	0.0	0	0.0
		Right	NthnMry1-WS	14	0	14	3	9	1	10	1	**47**	**5**	12	0	14	1	8	0	13	1	**47**	**2**	0	0.0	3	1.6
10.The Northern Rd & Dunk Pl	North	Left	NthnDnk-NE	38	0	28	1	39	3	29	1	**134**	**5**	39	0	32	1	30	2	37	2	**138**	**5**	-4	0.3	0	0.0
		Through	NthnDnk-NS	402	15	358	16	321	10	289	12	**1370**	**53**	417	16	368	16	315	8	341	14	**1441**	**54**	-71	1.9	-1	0.1
11.The Northern & Dick Johnson	North	Left	NthnDick-NE	76	3	60	3	80	3	62	2	**278**	**11**	84	3	61	1	67	3	85	3	**297**	**10**	-19	1.1	1	0.3
		Through	NthnDick-NS	300	12	270	13	212	7	201	10	**983**	**42**	306	14	288	16	218	4	238	12	**1050**	**46**	-67	2.1	-4	0.6
		Right	NthnDick-NW	26	0	28	0	29	0	26	0	**109**	**0**	33	0	26	0	18	0	39	0	**116**	**0**	-7	0.7	0	0.0
	East	Left	NthnDick-ES	48	2	43	0	41	1	38	0	**170**	**3**	49	2	46	0	40	0	38	0	**173**	**2**	-3	0.2	1	0.6
		Through	NthnDick-EW	21	0	16	0	24	0	16	0	**77**	**0**	30	0	16	0	26	0	14	0	**86**	**0**	-9	1.0	0	0.0
		Right	NthnDick-EN	41	0	31	1	43	1	31	2	**146**	**4**	41	0	27	1	52	3	35	0	**155**	**4**	-9	0.7	0	0.0
	South	Left	NthnDick-SW	13	0	8	0	9	0	13	0	**43**	**0**	8	0	9	0	7	0	14	0	**38**	**0**	5	0.8	0	0.0
		Through	NthnDick-SN	124	11	115	7	106	5	87	8	**432**	**31**	139	8	113	10	86	2	89	17	**427**	**37**	5	0.2	-6	1.0
		Right	NthnDick-SE	16	1	17	0	9	0	25	0	**67**	**1**	30	1	14	0	8	0	33	0	**85**	**1**	-18	2.1	0	0.0
	West	Left	NthnDick-WN	8	0	12	0	11	0	6	0	**37**	**0**	6	0	5	0	15	0	3	0	**29**	**0**	8	1.4	0	0.0
		Through	NthnDick-WE	20	0	10	0	23	0	18	0	**71**	**0**	15	0	9	0	25	0	14	0	**63**	**0**	8	1.0	0	0.0
		Right	NthnDick-WS	8	0	4	0	11	0	10	0	**33**	**0**	9	0	8	0	4	0	9	0	**30**	**0**	3	0.5	0	0.0
12.The Northern & Peter Brock	North	Left	NthnPete-NE	37	1	49	0	28	0	27	1	**141**	**2**	41	0	45	0	34	0	29	1	**149**	**1**	-8	0.7	1	0.8
		Through	NthnPete-NS	311	13	264	13	235	8	213	8	**1023**	**42**	292	15	305	17	253	5	233	8	**1083**	**45**	-60	1.8	-3	0.5
		Right	NthnPete-NW	8	0	4	0	1	0	9	1	**22**	**1**	7	0	2	0	4	0	2	1	**15**	**1**	7	1.6	0	0.0
	East	Left	NthnPete-ES	82	1	65	0	62	0	63	0	**272**	**1**	68	2	67	0	60	0	62	0	**257**	**2**	15	0.9	-1	0.8
		Through	NthnPete-EW	18	0	45	1	24	0	18	0	**105**	**1**	16	0	35	0	16	1	16	0	**83**	**1**	22	2.3	0	0.0
		Right	NthnPete-EN	15	0	11	1	13	0	15	1	**54**	**2**	19	0	7	0	16	0	21	1	**63**	**1**	-9	1.2	1	0.8
	South	Left	NthnPete-SW	43	0	52	0	33	0	38	0	**166**	**0**	44	0	66	0	27	0	44	0	**181**	**0**	-15	1.1	0	0.0
		Through	NthnPete-SN	133	12	127	6	108	5	109	7	**477**	**30**	135	8	137	10	84	3	105	15	**461**	**36**	16	0.7	-6	1.0
		Right	NthnPete-SE	96	1	121	2	111	3	83	1	**411**	**7**	106	0	134	3	98	4	92	2	**430**	**9**	-19	0.9	-2	0.7
	West	Left	NthnPete-WN	5	0	2	0	3	0	1	0	**11**	**0**	1	0	1	0	2	0	0	0	**4**	**0**	7	2.6	0	0.0
		Through	NthnPete-WE	10	0	10	1	16	0	8	0	**44**	**1**	8	0	10	2	15	1	10	0	**43**	**3**	1	0.2	-2	1.4
		Right	NthnPete-WS	37	2	21	0	30	0	28	0	**116**	**2**	49	3	29	0	21	0	29	0	**128**	**3**	-12	1.1	-1	0.6

APPENDIX B

TRAVEL TIME CALIBRATION RESULTS

		1-2	2-4	4-5	5-6	6-7	7-9	9-10	10-9	9-8	8-7	7-6	6-5	5-4	4-3	3-2	2-1
6:30	6:45	00:01:28	*00:01:14*	00:00:38	00:00:41	00:01:02	*00:00:54*	00:01:09	00:00:46	00:00:18	00:00:34	00:00:57	00:00:49	00:00:54	00:01:01	00:00:38	00:01:46
6:45	7:00	00:01:27	*00:01:37*	00:00:42	00:00:39	00:01:03	*00:00:53*	00:01:30	00:00:47	00:00:18	00:00:36	00:00:59	00:00:50	00:00:57	00:01:00	00:01:00	00:01:47
7:00	7:15	00:01:24	*00:01:35*	00:00:41	00:00:42	00:01:00	*00:00:55*	00:00:59	00:00:51	00:00:18	00:00:35	00:00:56	00:00:40	00:00:38	00:01:08	00:01:03	00:01:55
7:15	7:30	00:01:45	*00:01:29*	00:00:39	00:00:42	00:01:08	*00:00:58*	00:01:18	00:00:51	00:00:18	00:00:35	00:00:58	00:00:40	00:00:39	00:01:16	00:00:28	00:02:55
7:30	7:45	00:01:49	*00:01:18*	00:00:38	00:00:39	00:01:12	*00:00:59*	00:01:36	00:00:47	00:00:18	00:00:35	00:00:58	00:00:40	00:00:37	00:01:08	00:00:38	00:02:31
7:45	8:00	00:01:31	*00:01:31*	00:00:39	00:00:39	00:01:00	*00:00:55*	00:01:48	00:00:55	00:00:20	00:00:36	00:00:57	00:00:40	00:00:39	00:01:00	00:00:40	00:01:42
8:00	8:15	00:01:34	*00:01:35*	00:00:40	00:00:54	00:01:02	*00:00:57*	00:01:45	00:00:53	00:00:19	00:00:35	00:00:57	00:00:38	00:00:39	00:01:03	00:00:17	00:01:20
8:15	8:30	00:01:26	*00:01:24*	00:00:37	00:00:47	00:01:02	*00:00:59*	00:01:21	00:00:50	00:00:19	00:00:33	00:00:57	00:00:40	00:00:38	00:01:01	00:00:16	00:01:28

		1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-9	9-8	8-7	7-6	6-5	5-4	4-3	3-2	2-1	NB	SB
6:30	6:36	00:01:18	00:00:14	00:00:57	00:00:36	00:00:41	00:01:00	00:00:36	00:00:18	00:00:58	00:00:47	00:00:18	00:00:32	00:00:58	00:00:38	00:00:37	00:01:01	00:00:22	00:01:37	00:06:38	00:06:50
6:36	6:42	00:01:24	00:00:17	00:01:00	00:00:42	00:00:41	00:01:02	00:00:34	00:00:20	00:01:11	00:00:44	00:00:17	00:00:34	00:00:59	00:00:43	00:01:04	00:00:58	00:00:32	00:01:54	00:07:10	00:07:45
6:42	6:48	00:01:42	00:00:21	00:01:28	00:00:36	00:00:42	00:01:06	00:00:36	00:00:19	00:01:19	00:00:48	00:00:17	00:00:35	00:00:56	00:01:05	00:01:01	00:01:03	00:01:01	00:01:47	00:08:10	00:08:33
6:48	6:54	00:01:34	00:00:20	00:01:28	00:00:40	00:00:38	00:01:05	00:00:34	00:00:18	00:01:25	00:00:48	00:00:17	00:00:36	00:00:57	00:00:58	00:00:52	00:01:00	00:01:01	00:01:58	00:08:03	00:08:27
6:54	7:00	00:01:20	00:00:22	00:01:16	00:00:43	00:00:40	00:01:01	00:00:35	00:00:19	00:01:35	00:00:46	00:00:18	00:00:35	00:01:00	00:00:43	00:01:01	00:00:59	00:00:59	00:01:36	00:07:50	00:07:57
7:00	7:06	00:01:26	00:00:20	00:01:18	00:00:43	00:00:40	00:01:02	00:00:37	00:00:20	00:00:58	00:00:47	00:00:17	00:00:34	00:00:56	00:00:39	00:00:37	00:01:02	00:01:06	00:01:48	00:07:24	00:07:46
7:06	7:12	00:01:14	00:00:18	00:01:15	00:00:40	00:00:45	00:01:00	00:00:36	00:00:18	00:01:00	00:00:54	00:00:18	00:00:36	00:00:57	00:00:40	00:00:39	00:01:17	00:00:59	00:01:29	00:07:05	00:07:49
7:12	7:18	00:01:31	00:00:19	00:01:13	00:00:39	00:00:41	00:00:59	00:00:35	00:00:19	00:00:59	00:00:52	00:00:17	00:00:36	00:00:55	00:00:42	00:00:38	00:01:07	00:01:04	00:02:29	00:07:16	00:08:41
7:18	7:24	00:01:29	00:00:19	00:01:02	00:00:38	00:00:39	00:01:15	00:00:43	00:00:17	00:01:33	00:00:49	00:00:17	00:00:34	00:00:55	00:00:42	00:00:41	00:01:15	00:00:34	**00:03:02**	00:07:55	00:08:48
7:24	7:30	00:02:00	00:00:18	00:01:18	00:00:41	00:00:44	00:01:02	00:00:36	00:00:18	00:01:04	00:00:52	00:00:19	00:00:35	00:01:00	00:00:39	00:00:37	00:01:18	00:00:23	00:02:48	00:08:02	00:08:31
7:30	7:36	00:01:50	00:00:17	00:00:55	00:00:37	00:00:38	00:01:17	00:00:39	00:00:18	00:01:30	00:00:48	00:00:18	00:00:35	00:01:00	00:00:39	00:00:36	00:01:01	00:00:44	00:02:30	00:08:01	00:08:12
7:36	7:42	00:01:50	00:00:20	00:01:01	00:00:37	00:00:40	00:01:15	00:00:40	00:00:19	00:01:26	00:00:47	00:00:18	00:00:35	00:00:58	00:00:40	00:00:36	00:01:23	00:00:37	00:02:07	00:08:08	00:08:01
7:42	7:48	00:01:48	00:00:20	00:01:01	00:00:40	00:00:39	00:01:05	00:00:43	00:00:18	00:01:53	00:00:47	00:00:18	00:00:34	00:00:57	00:00:40	00:00:37	00:01:02	00:00:31	00:02:57	00:08:26	00:08:24
7:48	7:54	00:01:34	00:00:20	00:01:08	00:00:39	00:00:39	00:00:58	00:00:38	00:00:18	00:01:35	00:00:57	00:00:18	00:00:36	00:00:59	00:00:41	00:00:39	00:00:58	00:00:57	00:02:04	00:07:51	00:08:09
7:54	8:00	00:01:28	00:00:19	00:01:14	00:00:38	00:00:39	00:01:02	00:00:36	00:00:19	00:02:00	00:00:53	00:00:21	00:00:35	00:00:55	00:00:40	00:00:38	00:01:01	00:00:23	00:01:21	00:08:15	00:06:47
8:00	8:06	00:01:42	00:00:20	00:01:12	00:00:42	00:00:53	00:01:02	00:00:36	00:00:22	00:02:04	00:00:54	00:00:18	00:00:36	00:00:55	00:00:37	00:00:39	00:01:03	00:00:19	00:01:20	00:08:53	00:06:41
8:06	8:12	00:01:27	00:00:26	00:01:11	00:00:38	00:00:55	00:01:01	00:00:34	00:00:21	00:01:26	00:00:52	00:00:20	00:00:33	00:00:59	00:00:40	00:00:40	00:01:03	00:00:14	00:01:21	00:08:00	00:06:42
8:12	8:18	00:01:26	00:00:26	00:00:56	00:00:38	00:00:44	00:01:02	00:00:36	00:00:24	00:01:32	00:00:54	00:00:20	00:00:33	00:00:56	00:00:39	00:00:37	00:01:00	00:00:16	00:01:33	00:07:43	00:06:49
8:18	8:24	00:01:28	00:00:23	00:00:58	00:00:37	00:00:52	00:01:00	00:00:36	00:00:23	00:01:14	00:00:48	00:00:20	00:00:34	00:00:58	00:00:40	00:00:40	00:01:03	00:00:16	00:01:21	00:07:31	00:06:39
8:24	8:30	00:01:25	00:00:27	00:01:01	00:00:36	00:00:46	00:01:05	00:00:38	00:00:40	00:01:16	00:00:48	00:00:18	00:00:33	00:00:58	00:00:40	00:00:37	00:01:01	00:00:17	00:01:29	00:07:55	00:06:41

The Northern Road crosses with

1	-34.006317	Peter Brock Drive	-34.006317, 150.723538
2	-33.995037	Dick Johnson Drive	-33.995037, 150.726056
3	-33.993244	Dunk Pl offramp	-33.993244, 150.728327
4	-33.983619	Marylands Link Road 1	-33.983619, 150.733443
5	-33.976708	Marylands Link Road 2	-33.976708, 150.735486
6	-33.969460	Marylands Link Road 3	-33.969460, 150.737483
7	-33.958669	Lowes Creek Link Road	-33.958669, 150.738503
8	-33.952185	Carrington Road	-33.952185, 150.739436
9	-33.948911	Belmore Road	-33.948911, 150.738577
10	-33.940384	Bringelly Road	-33.940384, 150.735110

		1-2	2-4	4-5	5-6	6-7	7-9	9-10	10-9	9-8	8-7	7-6	6-5	5-4	4-3	3-2	2-1
15:30	15:45	00:01:34	*00:01:14*	00:00:38	00:00:40	00:01:00	*00:00:57*	00:01:15	00:01:24	00:00:19	00:00:36	00:00:58	00:00:39	00:00:39	00:01:16	00:00:55	00:03:01
15:45	16:00	00:01:24	*00:01:18*	00:00:40	00:00:40	00:00:59	*00:00:55*	00:01:27	00:01:36	00:00:22	00:00:36	00:00:56	00:00:39	00:00:37	00:01:13	00:01:12	00:02:54
16:00	16:15	00:01:25	*00:01:18*	00:00:41	00:00:41	00:00:58	*00:00:55*	00:01:21	00:01:22	00:00:19	00:00:36	00:00:58	00:00:41	00:00:38	00:01:18	00:01:19	00:02:30
16:15	16:30	00:01:11	*00:01:17*	00:00:45	00:00:42	00:01:00	*00:00:53*	00:01:07	00:01:05	00:00:20	00:00:36	00:00:57	00:00:40	00:00:39	00:01:04	00:01:06	00:02:04
16:30	16:45	00:01:19	*00:01:13*	00:00:40	00:00:41	00:00:59	*00:00:55*	00:01:15	00:01:05	00:00:21	00:00:35	00:00:57	00:00:41	00:00:38	00:01:02	00:00:30	00:01:44
16:45	17:00	00:01:35	*00:01:21*	00:00:37	00:00:39	00:01:04	*00:01:05*	00:01:22	00:01:00	00:00:22	00:00:35	00:00:59	00:00:40	00:00:39	00:01:08	00:00:15	00:01:48
17:00	17:15	00:01:19	*00:01:28*	00:00:40	00:00:40	00:01:15	*00:01:11*	00:01:11	00:00:57	00:00:20	00:00:36	00:00:58	00:00:40	00:00:38	00:01:07	00:00:27	00:02:05
17:15	17:30	00:01:36	*00:01:42*	00:00:38	00:00:39	00:01:00	*00:01:01*	00:01:30	00:00:52	00:00:18	00:00:36	00:00:58	00:00:41	00:00:39	00:00:59	00:00:46	00:02:21
17:30	17:45	00:01:16	*00:01:24*	00:00:39	00:00:41	00:01:04	*00:00:55*	00:01:26	00:00:54	00:00:18	00:00:34	00:00:59	00:00:41	00:00:38	00:01:04	00:00:42	00:02:29
17:45	18:00	00:01:27	*00:01:25*	00:00:39	00:00:39	00:01:04	*00:00:56*	00:01:18	00:00:53	00:00:19	00:00:34	00:00:57	00:00:42	00:00:39	00:01:07	00:00:38	00:02:39
18:00	18:15	00:01:35	*00:01:30*	00:00:39	00:00:40	00:01:06	*00:00:54*	00:01:14	00:00:52	00:00:19	00:00:35	00:00:59	00:00:42	00:00:38	00:01:08	00:00:36	00:02:19
18:15	18:30	00:01:33	*00:01:35*	00:00:38	00:00:39	00:00:59	*00:00:53*	00:01:01	00:00:52	00:00:18	00:00:36	00:00:56	00:00:38	00:00:39	00:01:01	00:00:31	00:01:31

		1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-9	9-8	8-7	7-6	6-5	5-4	4-3	3-2	2-1
15:30	15:36	00:02:09	00:00:15	00:00:58	00:00:37	00:00:38	00:01:01	00:00:36	00:00:19	00:01:02	00:00:50	00:00:18	00:00:35	00:00:56	00:00:37	00:00:40	00:01:14	00:00:33	00:03:04
15:36	15:42	00:01:10	00:00:14	00:00:59	00:00:38	00:00:41	00:00:59	00:00:34	00:00:22	00:01:14	00:01:43	00:00:18	00:00:38	00:01:02	00:00:39	00:00:39	00:01:14	00:01:19	00:03:06
15:42	15:48	00:01:24	00:00:15	00:01:01	00:00:39	00:00:41	00:01:01	00:00:36	00:00:23	00:01:29	00:01:40	00:00:22	00:00:35	00:00:55	00:00:41	00:00:38	00:01:20	00:00:52	00:02:54
15:48	15:54	00:01:21	00:00:16	00:01:03	00:00:39	00:00:39	00:00:58	00:00:36	00:00:18	00:01:25	00:01:34	00:00:23	00:00:37	00:00:57	00:00:39	00:00:38	00:01:13	00:01:10	00:02:54
15:54	16:00	00:01:27	00:00:18	00:00:59	00:00:41	00:00:41	00:00:59	00:00:34	00:00:21	00:01:29	00:01:37	00:00:22	00:00:34	00:00:55	00:00:38	00:00:36	00:01:13	00:01:13	00:02:53
16:00	16:06	00:01:31	00:00:17	00:01:00	00:00:39	00:00:40	00:00:58	00:00:36	00:00:21	00:01:22	00:01:36	00:00:20	00:00:36	00:01:00	00:00:42	00:00:36	00:01:20	00:01:22	00:02:29
16:06	16:12	00:01:33	00:00:18	00:01:04	00:00:37	00:00:40	00:00:57	00:00:34	00:00:19	00:01:17	00:01:41	00:00:21	00:00:37	00:00:57	00:00:42	00:00:36	00:01:20	00:01:19	00:02:32
16:12	16:18	00:01:11	00:00:16	00:01:00	00:00:47	00:00:43	00:00:59	00:00:37	00:00:20	00:01:23	00:00:50	00:00:17	00:00:34	00:00:56	00:00:39	00:00:40	00:01:13	00:01:17	00:02:29
16:18	16:24	00:01:14	00:00:19	00:01:01	00:00:43	00:00:44	00:00:59	00:00:35	00:00:19	00:01:09	00:00:59	00:00:18	00:00:36	00:00:57	00:00:39	00:00:37	00:01:03	00:01:16	00:02:05
16:24	16:30	00:01:09	00:00:14	00:01:00	00:00:47	00:00:41	00:01:01	00:00:35	00:00:18	00:01:05	00:01:10	00:00:22	00:00:37	00:00:56	00:00:41	00:00:41	00:01:05	00:00:55	00:02:03
16:30	16:36	00:01:12	00:00:16	00:00:57	00:00:43	00:00:43	00:00:58	00:00:38	00:00:19	00:01:03	00:01:07	00:00:19	00:00:35	00:00:57	00:00:41	00:00:37	00:00:59	00:01:00	00:01:44
16:36	16:42	00:01:11	00:00:18	00:00:56	00:00:40	00:00:40	00:00:59	00:00:37	00:00:17	00:01:25	00:01:04	00:00:22	00:00:34	00:00:55	00:00:39	00:00:37	00:01:03	00:00:15	00:01:37
16:42	16:48	00:01:33	00:00:16	00:00:56	00:00:37	00:00:39	00:01:00	00:00:33	00:00:19	00:01:18	00:01:05	00:00:23	00:00:36	00:00:58	00:00:42	00:00:39	00:01:04	00:00:15	00:01:49
16:48	16:54	00:01:29	00:00:15	00:01:10	00:00:36	00:00:38	00:01:05	00:00:37	00:00:18	00:01:19	00:00:58	00:00:24	00:00:36	00:01:01	00:00:41	00:00:41	00:01:11	00:00:14	00:01:41
16:54	17:00	00:01:41	00:00:17	00:01:00	00:00:38	00:00:39	00:01:03	00:00:33	00:00:41	00:01:25	00:01:02	00:00:21	00:00:35	00:00:56	00:00:39	00:00:37	00:01:05	00:00:15	00:01:54
17:00	17:06	00:01:14	00:00:14	00:01:08	00:00:38	00:00:38	00:01:19	00:00:36	00:00:25	00:01:15	00:01:01	00:00:20	00:00:37	00:00:56	00:00:43	00:00:37	00:01:07	00:00:45	00:02:19
17:06	17:12	00:01:20	00:00:15	00:01:14	00:00:40	00:00:39	00:01:23	00:00:36	00:00:41	00:01:03	00:00:59	00:00:23	00:00:35	00:01:01	00:00:39	00:00:38	00:01:10	00:00:16	00:02:01
17:12	17:18	00:01:24	00:00:15	00:01:17	00:00:41	00:00:43	00:01:03	00:00:35	00:00:41	00:01:14	00:00:50	00:00:17	00:00:35	00:00:57	00:00:38	00:00:40	00:01:03	00:00:20	00:01:56
17:18	17:24	00:01:33	00:00:19	00:01:20	00:00:37	00:00:39	00:01:00	00:00:38	00:00:31	00:01:31	00:00:53	00:00:18	00:00:36	00:00:56	00:00:41	00:00:38	00:00:59	00:00:46	00:02:07
17:24	17:30	00:01:38	00:00:18	00:01:27	00:00:38	00:00:39	00:01:00	00:00:34	00:00:19	00:01:29	00:00:51	00:00:18	00:00:37	00:01:00	00:00:41	00:00:40	00:00:59	00:00:45	00:02:35
17:30	17:36	00:01:23	00:00:17	00:01:25	00:00:39	00:00:42	00:00:59	00:00:39	00:00:17	00:01:22	00:00:52	00:00:17	00:00:34	00:01:01	00:00:42	00:00:37	00:01:01	00:00:46	00:02:32
17:36	17:42	00:01:14	00:00:19	00:01:01	00:00:42	00:00:43	00:01:01	00:00:37	00:00:19	00:01:23	00:00:56	00:00:17	00:00:34	00:00:56	00:00:39	00:00:37	00:01:05	00:00:43	00:02:27
17:42	17:48	00:01:11	00:00:14	00:00:56	00:00:37	00:00:39	00:01:12	00:00:34	00:00:18	00:01:33	00:00:53	00:00:19	00:00:35	00:01:00	00:00:41	00:00:41	00:01:05	00:00:37	00:02:28
17:48	17:54	00:01:39	00:00:18	00:01:04	00:00:40	00:00:39	00:01:00	00:00:37	00:00:19	00:01:21	00:00:52	00:00:19	00:00:34	00:00:58	00:00:44	00:00:40	00:01:08	00:00:45	00:02:38
17:54	18:00	00:01:14	00:00:17	00:01:11	00:00:39	00:00:39	00:01:08	00:00:37	00:00:19	00:01:15	00:00:53	00:00:18	00:00:34	00:00:56	00:00:40	00:00:38	00:01:07	00:00:31	00:02:39
18:00	18:06	00:01:35	00:00:18	00:01:06	00:00:40	00:00:42	00:01:18	00:00:38	00:00:17	00:01:18	00:00:52	00:00:19	00:00:37	00:01:00	00:00:43	00:00:37	00:01:12	00:00:30	00:02:23
18:06	18:12	00:01:27	00:00:17	00:01:07	00:00:37	00:00:38	00:01:02	00:00:33	00:00:19	00:01:11	00:00:54	00:00:19	00:00:35	00:00:56	00:00:40	00:00:36	00:01:03	00:00:45	00:02:36
18:12	18:18	00:01:44	00:00:16	00:01:25	00:00:39	00:00:41	00:01:00	00:00:36	00:00:19	00:01:13	00:00:49	00:00:17	00:00:34	00:01:01	00:00:42	00:00:41	00:01:09	00:00:34	00:01:56
18:18	18:24	00:01:41	00:00:18	00:01:14	00:00:38	00:00:39	00:00:59	00:00:34	00:00:18	00:01:01	00:00:52	00:00:18	00:00:36	00:00:55	00:00:39	00:00:40	00:00:59	00:00:42	00:01:41
18:24	18:30	00:01:24	00:00:16	00:01:22	00:00:38	00:00:38	00:00:59	00:00:36	00:00:19	00:01:01	00:00:52	00:00:17	00:00:35	00:00:58	00:00:37	00:00:39	00:01:02	00:00:21	00:01:20

AM peak travel time comparison

			Modelled 6:30-7:30		7:30-8:30		Surveyed 6:30-7:30				
Northbound				0		0		0		0	
1	Peter Brock Drive	2 Dick Johnson Drive	92	92	88	88	91	91	95	95	
2	Dick Johnson Drive	3 Dunk Pl offramp	61	154	57	145	89	180	87	182	
4	Marylands Link Road 1	5 Marylands Link Road 2	57	211	57	202	40	219	38	221	
5	Marylands Link Road 2	6 Marylands Link Road 3	40	251	40	242	41	260	45	265	
6	Marylands Link Road 3	7 Lowes Creek Link Road	57	308	59	301	64	324	64	329	
7	Lowes Creek Link Road	8 Carrington Road	54	361	54	354	55	379	58	387	
9	Belmore Road	10 Bringelly Road	94	456	104	459	74	453	97	484	
				07:36		07:39		07:33		08:04	
								00:03	1%	00:26	5%
Southbound				0		0		0		0	
10	Bringelly Road	9 Belmore Road	46	46	47	47	49	49	51	51	
9	Belmore Road	8 Carrington Road	18	63	18	64	18	66	19	70	
8	Carrington Road	7 Lowes Creek Link Road	35	98	35	99	35	101	35	105	
7	Lowes Creek Link Road	6 Marylands Link Road 3	54	152	54	154	57	158	57	162	
6	Marylands Link Road 3	5 Marylands Link Road 2	39	191	39	193	49	208	39	202	
5	Marylands Link Road 2	4 Marylands Link Road 1	62	252	59	252	55	263	38	240	
4	Marylands Link Road 1	3 Dunk Pl offramp	40	293	40	293	66	329	63	303	
3	Dunk Pl offramp	2 Dick Johnson Drive	33	326	36	329	48	377	28	331	
2	Dick Johnson Drive	1 Peter Brock Drive	85	412	90	419	109	486	106	436	
				06:52		06:59		08:06		07:16	
								01:15	15%	00:17	4%

PM peak travel time comparison - outlier retained

			Modelled						Surveyed					
			15:30-16:30		16:30-17:30		17:30-18:30		15:30-16:30		16:30-17:30		17:30-18:30	
Northbound				0		0		0		0		0		0
1	Peter Brock Drive	2 Dick Johnson Drive	85	85	87	87	87	87	84	84	87	87	88	88
2	Dick Johnson Drive	3 Dunk Pl offramp	59	144	57	144	55	142	77	161	86	173	88	176
4	Marylands Link Road 1	5 Marylands Link Road 2	55	199	55	199	55	198	41	202	39	212	39	215
5	Marylands Link Road 2	6 Marylands Link Road 3	40	239	40	239	40	238	41	243	40	251	40	254
6	Marylands Link Road 3	7 Lowes Creek Link Road	56	295	56	295	54	292	59	302	65	316	63	318
7	Lowes Creek Link Road	8 Carrington Road	54	349	54	349	54	345	55	357	63	379	54	372
9	Belmore Road	10 Bringelly Road	81	431	88	438	83	428	77	434	79	458	75	447
				07:11		07:18		07:08		07:14		07:38		07:27
										00:03	1%	00:21	5%	00:19	4%
Southbound				0		0		0		0		0		0
10	Bringelly Road	9 Belmore Road	51	51	50	50	51	51	82	82	58	58	52	52
9	Belmore Road	8 Carrington Road	18	69	18	68	18	69	20	102	20	79	18	71
8	Carrington Road	7 Lowes Creek Link Road	41	109	39	106	37	105	36	138	36	114	35	105
7	Lowes Creek Link Road	6 Marylands Link Road 3	55	164	56	162	55	160	57	195	58	172	58	163
6	Marylands Link Road 3	5 Marylands Link Road 2	40	204	41	203	40	200	40	234	40	213	41	204
5	Marylands Link Road 2	4 Marylands Link Road 1	62	266	65	268	61	261	38	272	38	251	39	243
4	Marylands Link Road 1	3 Dunk Pl offramp	41	307	42	309	41	302	73	345	64	315	65	308
3	Dunk Pl offramp	2 Dick Johnson Drive	33	340	38	347	35	337	68	413	29	345	37	345
2	Dick Johnson Drive	1 Peter Brock Drive	114	454	115	462	97	434	137	550	119	464	134	479
				07:34		07:42		07:14		09:10		07:44		07:59
										01:36	17%	00:02	0%	00:45	9%

PM peak travel time comparison - outlier removed

		Modelled						Surveyed						
		15:30-16:30		16:30-17:30		17:30-18:30		15:30-16:30		16:30-17:30		17:30-18:30		
Northbound			0		0		0		0		0		0	
1 Peter Brock Drive	2 Dick Johnson Drive	85	85	87	87	87	87	84	84	87	87	88	88	
2 Dick Johnson Drive	3 Dunk Pl offramp	59	144	57	144	55	142	77	161	86	173	88	176	
4 Marylands Link Road 1	5 Marylands Link Road 2	55	199	55	199	55	198	41	202	39	212	39	215	
5 Marylands Link Road 2	6 Marylands Link Road 3	40	239	40	239	40	238	41	243	40	251	40	254	
6 Marylands Link Road 3	7 Lowes Creek Link Road	56	295	56	295	54	292	59	302	65	316	63	318	
7 Lowes Creek Link Road	8 Carrington Road	54	349	54	349	54	345	55	357	63	379	54	372	
9 Belmore Road	10 Bringelly Road	81	431	88	438	83	428	77	434	79	458	75	447	
			07:11		07:18		07:08		07:14		07:38		07:27	
									00:03	1%	00:21	5%	00:19	4%
Southbound			0		0		0		0		0		0	
10 Bringelly Road	9 Belmore Road	51	51	50	50	51	51	65	65	58	58	52	52	
9 Belmore Road	8 Carrington Road	18	69	18	68	18	69	20	84	20	79	18	71	
8 Carrington Road	7 Lowes Creek Link Road	41	109	39	106	37	105	36	120	36	114	35	105	
7 Lowes Creek Link Road	6 Marylands Link Road 3	55	164	56	162	55	160	57	177	58	172	58	163	
6 Marylands Link Road 3	5 Marylands Link Road 2	40	204	41	203	40	200	41	218	40	213	41	204	
5 Marylands Link Road 2	4 Marylands Link Road 1	62	266	65	268	61	261	38	256	38	251	39	243	
4 Marylands Link Road 1	3 Dunk Pl offramp	41	307	42	309	41	302	64	320	64	315	65	308	
3 Dunk Pl offramp	2 Dick Johnson Drive	33	340	38	347	35	337	55	375	29	345	37	345	
2 Dick Johnson Drive	1 Peter Brock Drive	114	454	115	462	97	434	124	498	119	464	134	479	
			07:34		07:42		07:14		08:18		07:44		07:59	
									00:44	9%	00:02	0%	00:45	9%

Thoughtful Transport Solutions

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APPENDIX C

SIDRA MOVEMENT SUMMARIES

USER REPORT FOR SITE

Project: SCT_00731 Belmore Precinct_MDL_Sidra_v1.0

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Template: SCT Default Site Outputs

Site: 101 [Bringelly_Kelvin Park (Site Folder: 50% AM with Bus Lanes)]

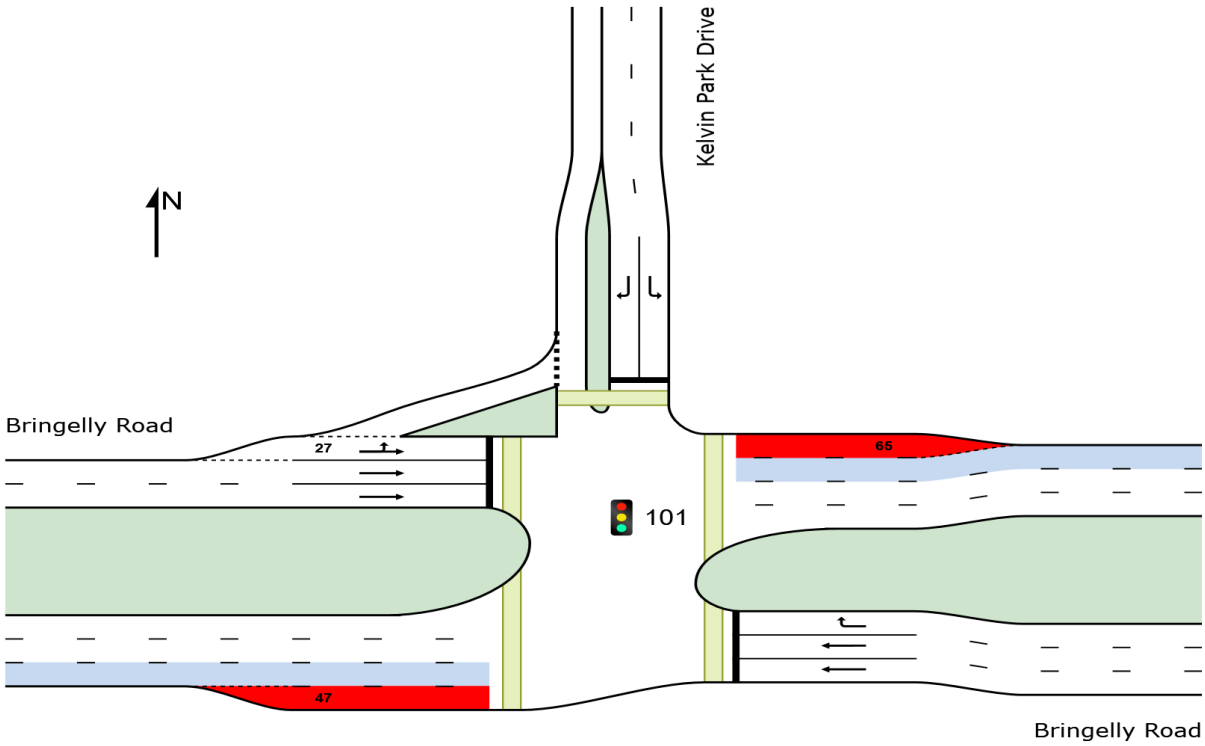
Peak Hour: 6.30AM-7.30AM

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bringelly Road															
5	T1	All MCs	706	10.4	706	10.4	0.240	3.4	LOS A	5.6	42.7	0.26	0.23	0.26	56.4
6	R2	All MCs	7	0.0	7	0.0	* 0.093	78.4	LOS F	0.5	3.6	0.99	0.66	0.99	25.2
Approach			714	10.3	714	10.3	0.240	4.1	LOS A	5.6	42.7	0.26	0.23	0.26	55.6
North: Kelvin Park Drive															
7	L2	All MCs	32	6.7	32	6.7	0.092	54.5	LOS D	1.8	13.1	0.86	0.71	0.86	29.4
9	R2	All MCs	28	0.0	28	0.0	* 0.238	74.2	LOS F	1.9	13.5	0.98	0.72	0.98	23.7
Approach			60	3.5	60	3.5	0.238	63.8	LOS E	1.9	13.5	0.92	0.72	0.92	26.6
West: Bringelly Road															
10	L2	All MCs	59	3.6	59	3.6	0.037	10.8	LOS A	0.3	1.9	0.12	0.58	0.12	47.7
11	T1	All MCs	1138	9.7	1138	9.7	* 0.443	10.6	LOS A	16.0	121.4	0.44	0.40	0.44	51.8
Approach			1197	9.4	1197	9.4	0.443	10.7	LOS A	16.0	121.4	0.43	0.41	0.43	49.6
All Vehicles			1971	9.6	1971	9.6	0.443	9.9	LOS A	16.0	121.4	0.38	0.36	0.38	50.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

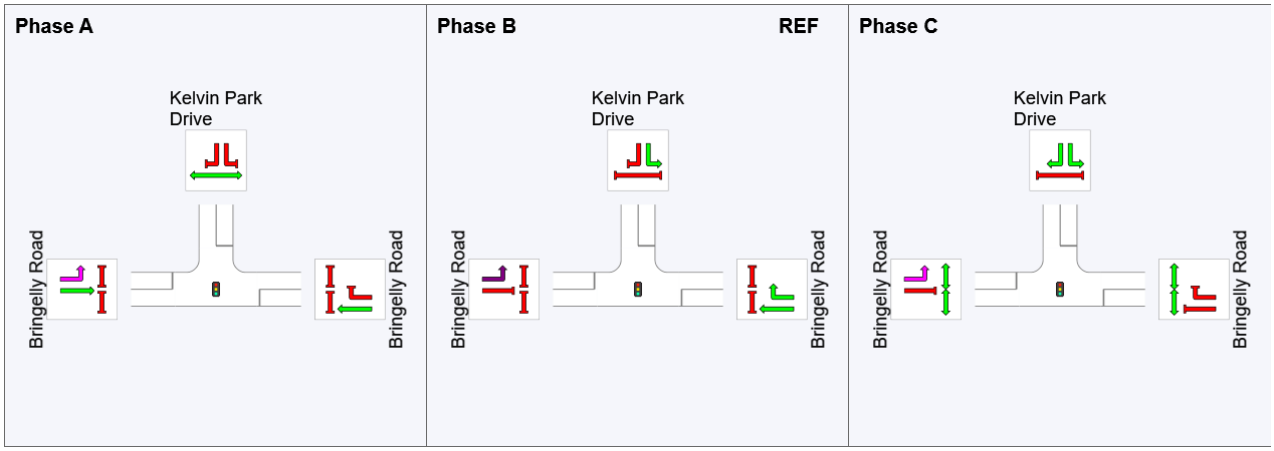
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

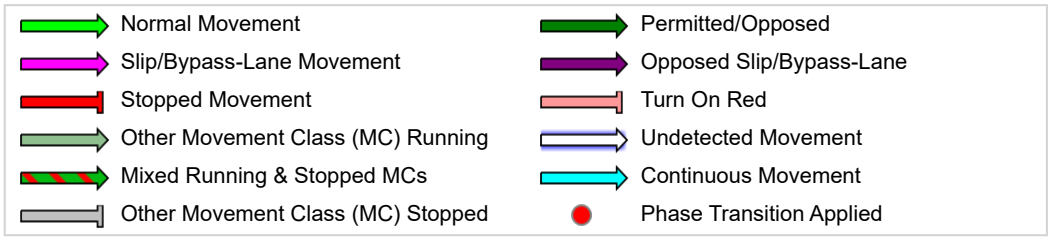
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Bringelly Road												
P21	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P22	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: Kelvin Park Drive												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Bringelly Road												
P41	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P42	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		250	263	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	33	0	12
Green Time (sec)	101	6	15
Phase Time (sec)	107	12	21
Phase Split	76%	9%	15%
Phase Frequency (%)	100.0	100.0	100.0

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

Site: 01 [TNR_Bringelly (Site Folder: 50% AM with Bus Lanes)]

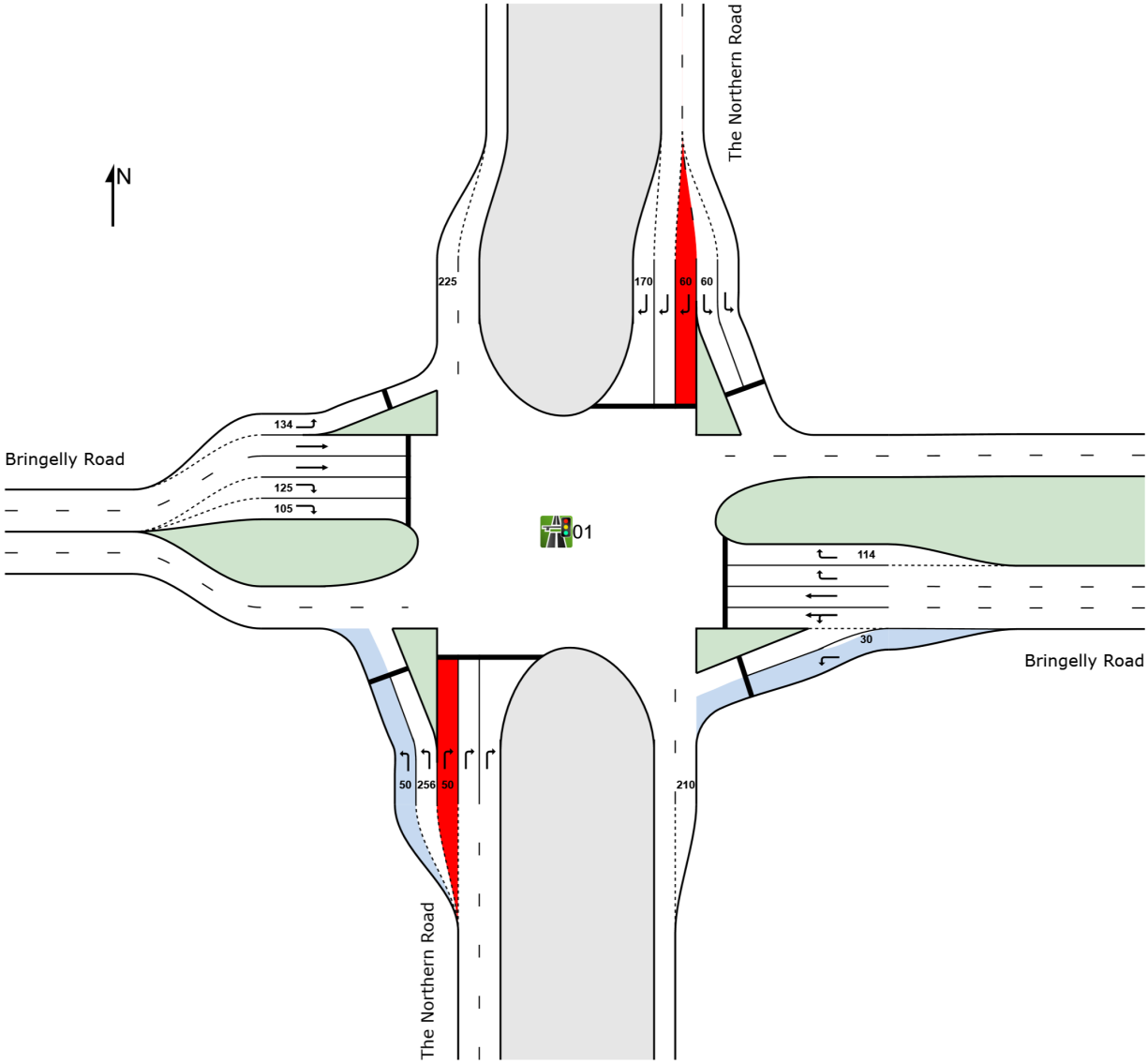
Peak: 5.30PM-6.30PM

Site Category: (None)
Single Point Interchange (Signals) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Three-Phase Leading Right Turns
Input Phase Sequence: 1, 2, 3, 4
Output Phase Sequence: 1, 2, 3, 4
Reference Phase: Phase 4

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	2	0.0	2	0.0	0.010	73.7	LOS F	0.1	0.5	0.96	0.59	0.96	29.9
3	R2	All MCs	818	11.6	818	11.6	* 0.476	37.4	LOS C	18.4	133.1	0.73	0.77	0.73	42.8
Approach			820	11.6	820	11.6	0.476	37.5	LOS C	18.4	133.1	0.73	0.77	0.73	41.4
East: Bringelly Road															
4	L2	All MCs	100	12.6	100	12.6	0.071	8.0	LOS A	1.2	9.3	0.19	0.60	0.19	63.5
5	T1	All MCs	159	11.9	159	11.9	0.140	36.6	LOS C	3.8	29.6	0.75	0.60	0.75	31.6
6	R2	All MCs	483	8.5	483	8.5	* 0.471	49.4	LOS D	13.5	101.4	0.87	0.80	0.87	33.4
Approach			742	9.8	742	9.8	0.471	41.1	LOS C	13.5	101.4	0.76	0.73	0.76	36.5
North: The Northern Road															
7	L2	All MCs	307	19.5	307	19.5	0.322	47.3	LOS D	8.2	66.8	0.83	0.78	0.83	30.9
9	R2	All MCs	113	58.9	113	58.9	0.127	31.4	LOS C	2.5	32.1	0.59	0.68	0.59	39.1
Approach			420	30.1	420	30.1	0.322	43.0	LOS D	8.2	66.8	0.76	0.75	0.76	32.6
West: Bringelly Road															
10	L2	All MCs	14	46.2	14	46.2	0.017	18.9	LOS B	0.4	3.6	0.43	0.62	0.43	41.1
11	T1	All MCs	133	14.3	133	14.3	* 0.473	69.3	LOS E	4.5	35.5	1.00	0.76	1.00	22.2
12	R2	All MCs	26	8.0	26	8.0	0.131	76.0	LOS F	0.9	6.7	0.98	0.68	0.98	33.5
Approach			173	15.9	173	15.9	0.473	66.4	LOS E	4.5	35.5	0.95	0.74	0.95	25.3
All Vehicles			2155	14.9	2155	14.9	0.476	42.1	LOS C	18.4	133.1	0.76	0.75	0.76	37.0

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

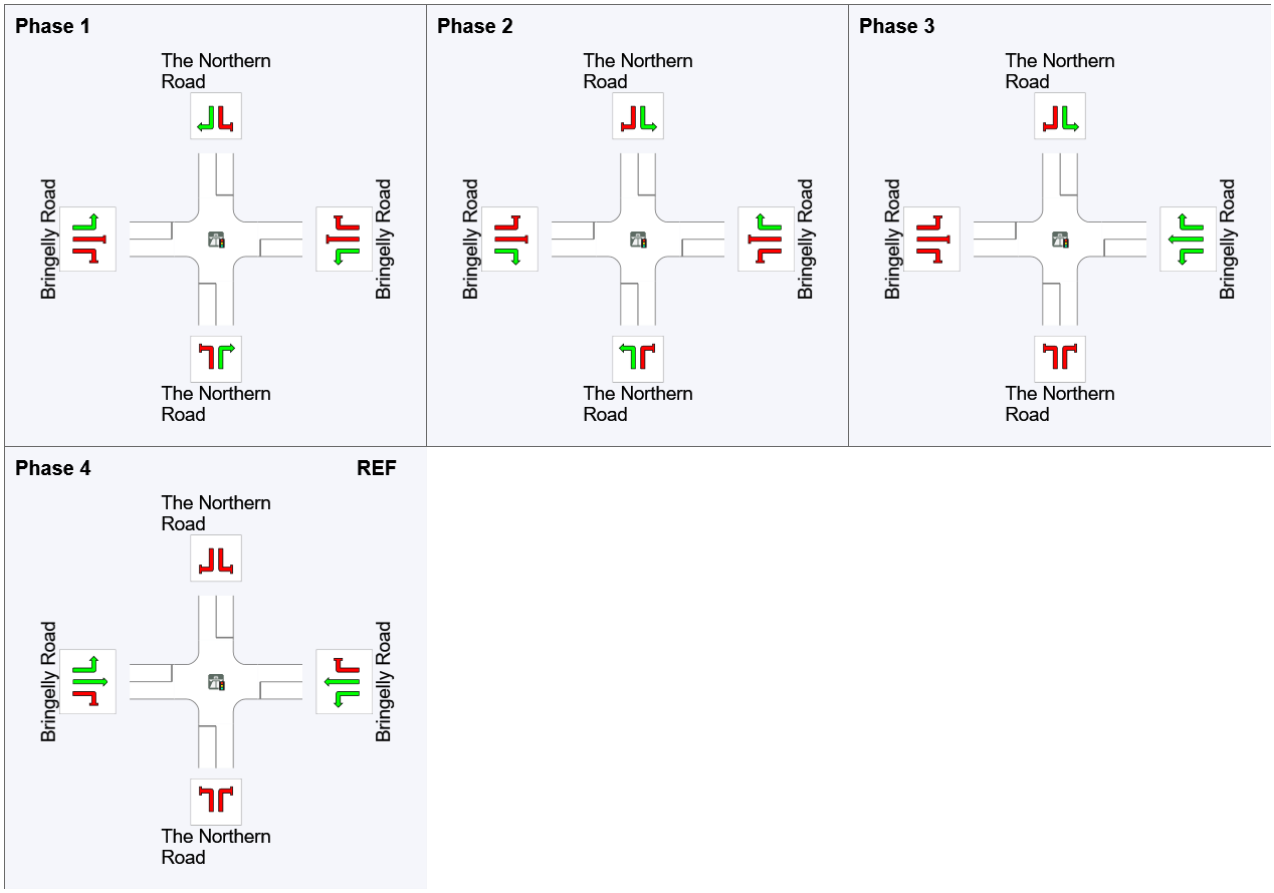
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

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

Phase Timing Summary

Phase	1	2	3	4
Phase Change Time (sec)	19	91	107	0
Green Time (sec)	64	8	25	11
Phase Time (sec)	72	16	33	19
Phase Split	51%	11%	24%	14%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

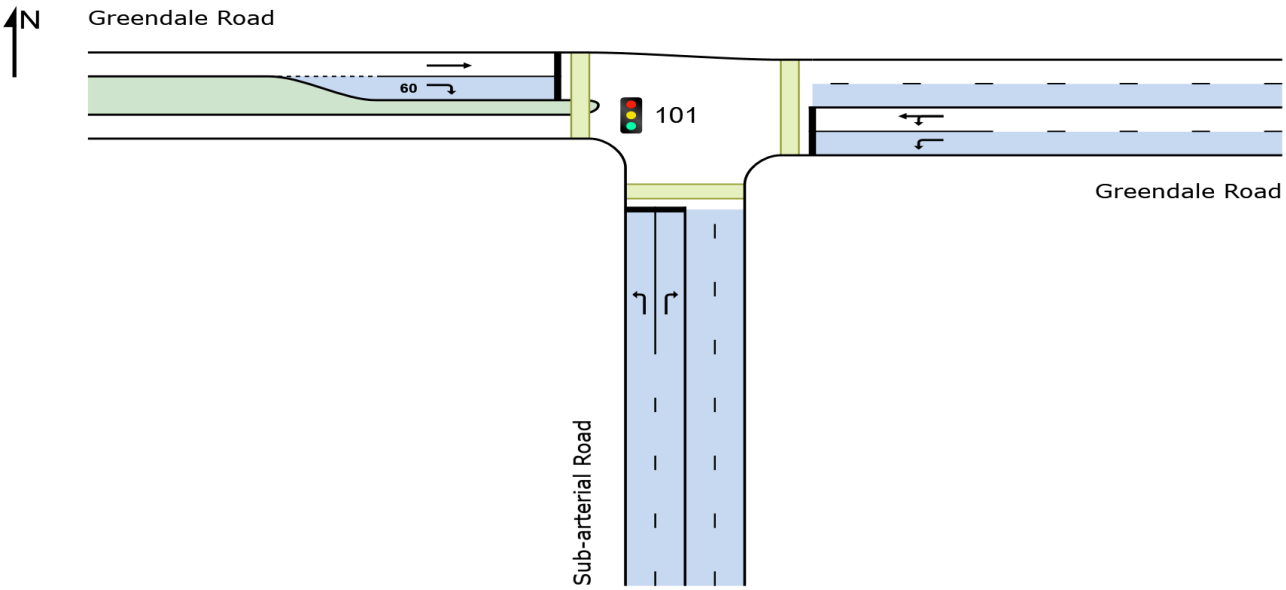
Site: 101 [Greendale Road_New Collector Road (Site Folder: 50% AM with Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sub-arterial Road															
1	L2	All MCs	26	4.0	26	4.0	0.030	23.7	LOS B	0.9	6.5	0.54	0.65	0.54	37.0
3	R2	All MCs	81	2.6	81	2.6	*0.122	35.9	LOS C	3.6	25.9	0.70	0.72	0.70	33.0
Approach			107	2.9	107	2.9	0.122	32.9	LOS C	3.6	25.9	0.66	0.70	0.66	33.9
East: Greendale Road															
4	L2	All MCs	151	8.4	151	8.4	0.108	8.1	LOS A	2.3	16.9	0.24	0.60	0.24	44.0
5	T1	All MCs	78	33.8	78	33.8	*0.122	28.1	LOS B	3.3	29.8	0.66	0.53	0.66	36.1
Approach			228	17.1	228	17.1	0.122	14.9	LOS B	3.3	29.8	0.39	0.58	0.39	40.9
West: Greendale Road															
11	T1	All MCs	115	17.4	115	17.4	0.119	15.9	LOS B	3.7	29.6	0.51	0.42	0.51	41.1
12	R2	All MCs	20	15.8	20	15.8	*0.112	66.7	LOS E	1.3	10.0	0.94	0.71	0.94	25.7
Approach			135	17.2	135	17.2	0.119	23.5	LOS B	3.7	29.6	0.57	0.46	0.57	37.7
All Vehicles			471	13.9	471	13.9	0.122	21.5	LOS B	3.7	29.8	0.50	0.57	0.50	38.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

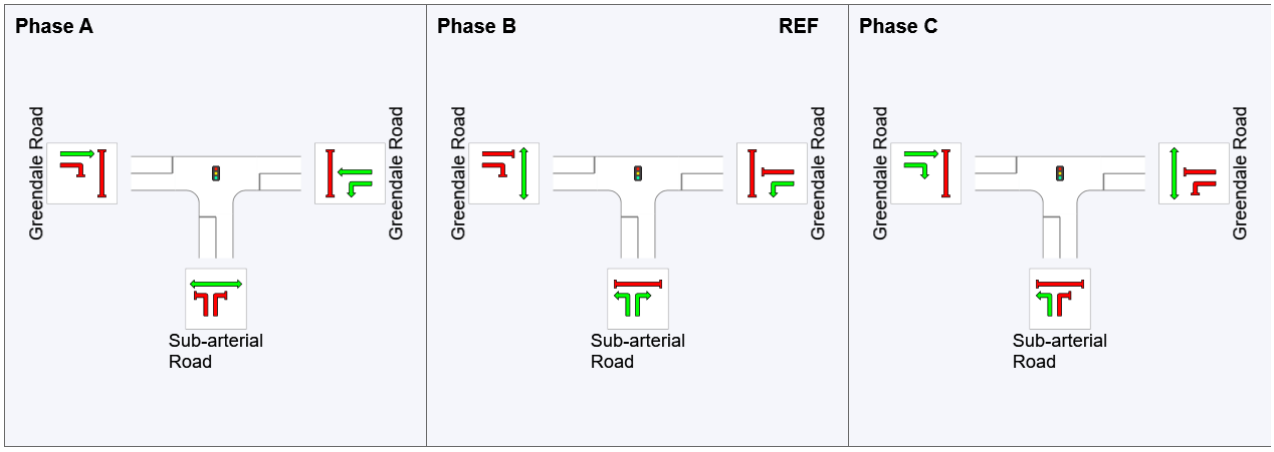
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

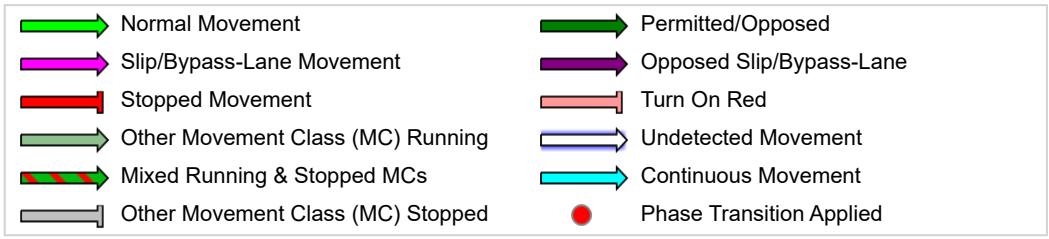
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sub-arterial Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Greendale Road												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Greendale Road												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		150	158	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	78	0	57
Green Time (sec)	56	51	15
Phase Time (sec)	62	57	21
Phase Split	44%	41%	15%
Phase Frequency (%)	100.0	100.0	100.0

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

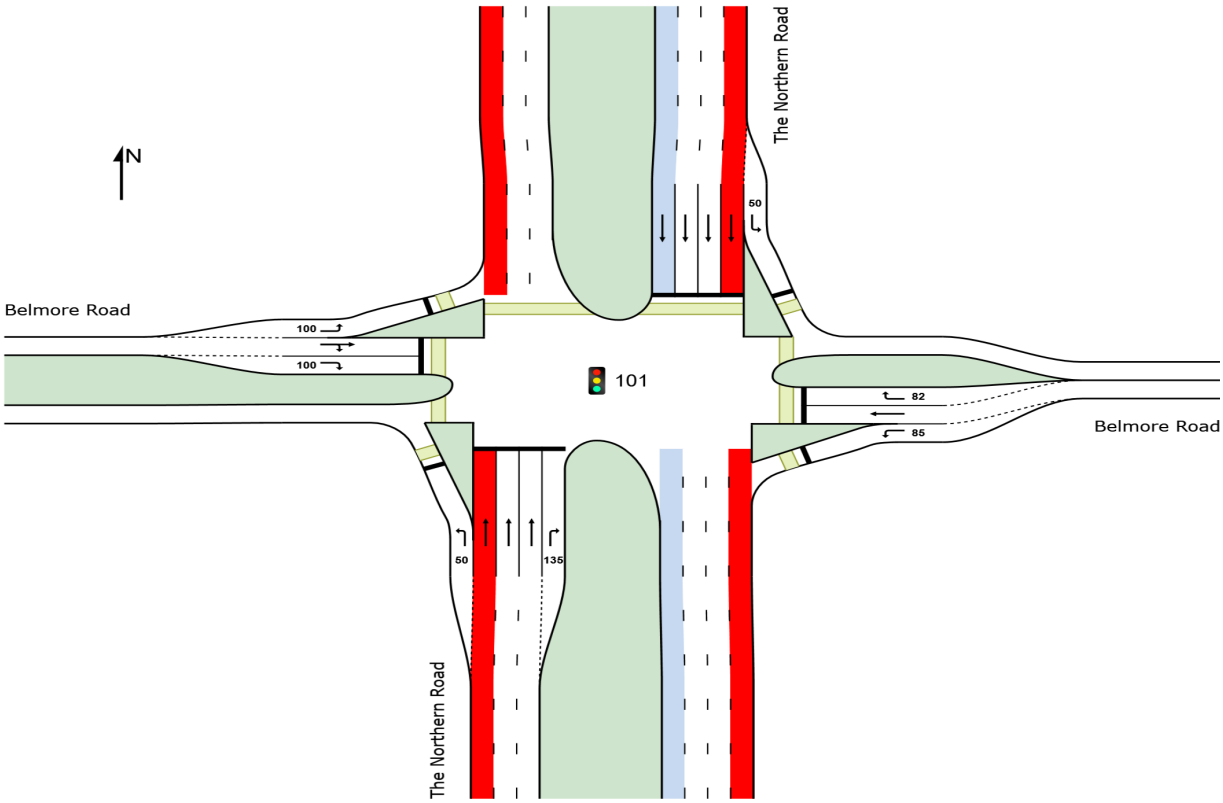
Site: 101 [TNR_Belmore (Site Folder: 50% AM with Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B*, C, D*
Output Phase Sequence: A, B*, C, D*
Reference Phase: Phase A
(* Variable Phase)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	19	0.0	19	0.0	0.012	29.1	LOS C	0.1	0.9	0.16	0.63	0.16	50.6
2	T1	All MCs	1964	9.6	1964	9.6	* 0.897	49.7	LOS D	61.4	453.9	0.94	0.91	1.00	51.4
3	R2	All MCs	5	0.0	5	0.0	0.066	91.8	LOS F	0.4	2.5	0.98	0.65	0.98	24.2
Approach			1988	9.5	1988	9.5	0.897	49.6	LOS D	61.4	453.9	0.93	0.90	0.99	44.0
East: Belmore Road															
4	L2	All MCs	1	0.0	1	0.0	0.001	7.9	LOS A	0.0	0.1	0.23	0.57	0.23	50.4
5	T1	All MCs	3	0.0	3	0.0	* 0.032	70.1	LOS E	0.2	1.5	0.97	0.61	0.97	28.3
6	R2	All MCs	1	100.0	1	100.0	0.019	78.5	LOS F	0.1	0.9	0.97	0.60	0.97	31.1
Approach			5	20.0	5	20.0	0.032	59.3	LOS E	0.2	1.5	0.82	0.60	0.82	31.3
North: The Northern Road															
7	L2	All MCs	2	0.0	2	0.0	0.001	9.7	LOS A	0.0	0.1	0.16	0.62	0.16	59.3
8	T1	All MCs	941	16.8	941	16.8	0.331	23.6	LOS B	12.0	92.0	0.65	0.56	0.65	58.0
Approach			943	16.7	943	16.7	0.331	23.5	LOS B	12.0	92.0	0.65	0.56	0.65	57.7
West: Belmore Road															
10	L2	All MCs	387	4.6	387	4.6	* 0.662	46.4	LOS D	20.0	145.4	0.92	1.01	0.92	41.8
11	T1	All MCs	12	36.4	12	36.4	0.188	47.8	LOS D	4.4	33.5	0.83	0.72	0.83	30.5
12	R2	All MCs	156	4.7	156	4.7	0.188	50.1	LOS D	4.5	33.5	0.83	0.73	0.83	30.3
Approach			555	5.3	555	5.3	0.662	47.5	LOS D	20.0	145.4	0.89	0.92	0.89	37.8
All Vehicles			3492	10.8	3492	10.8	0.897	42.2	LOS C	61.4	453.9	0.85	0.81	0.88	45.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

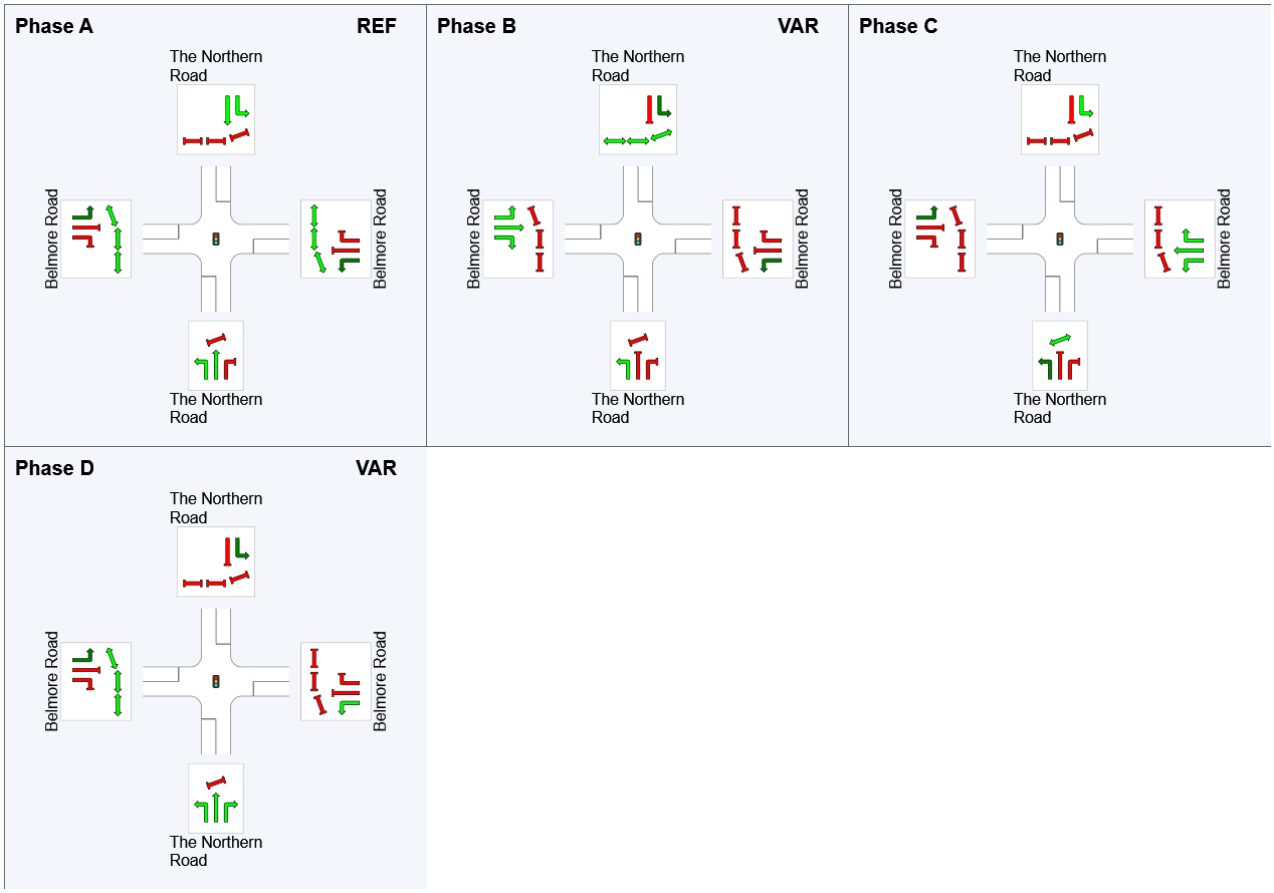
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P1B	Slip/ Bypass	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92
East: Belmore Road												
P21	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P22	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												
P31	Stage 1	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92

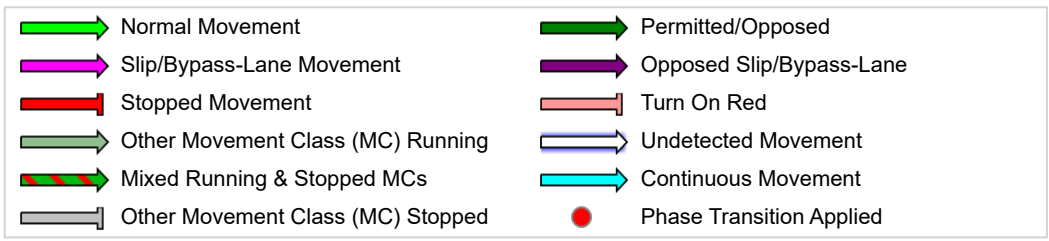
P32	Stage 2	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92
P3B	Slip/ Bypass	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92
West: Belmore Road												
P41	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P42	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		340	358	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	74	115	128
Green Time (sec)	68	35	7	6
Phase Time (sec)	74	41	13	12
Phase Split	53%	29%	9%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

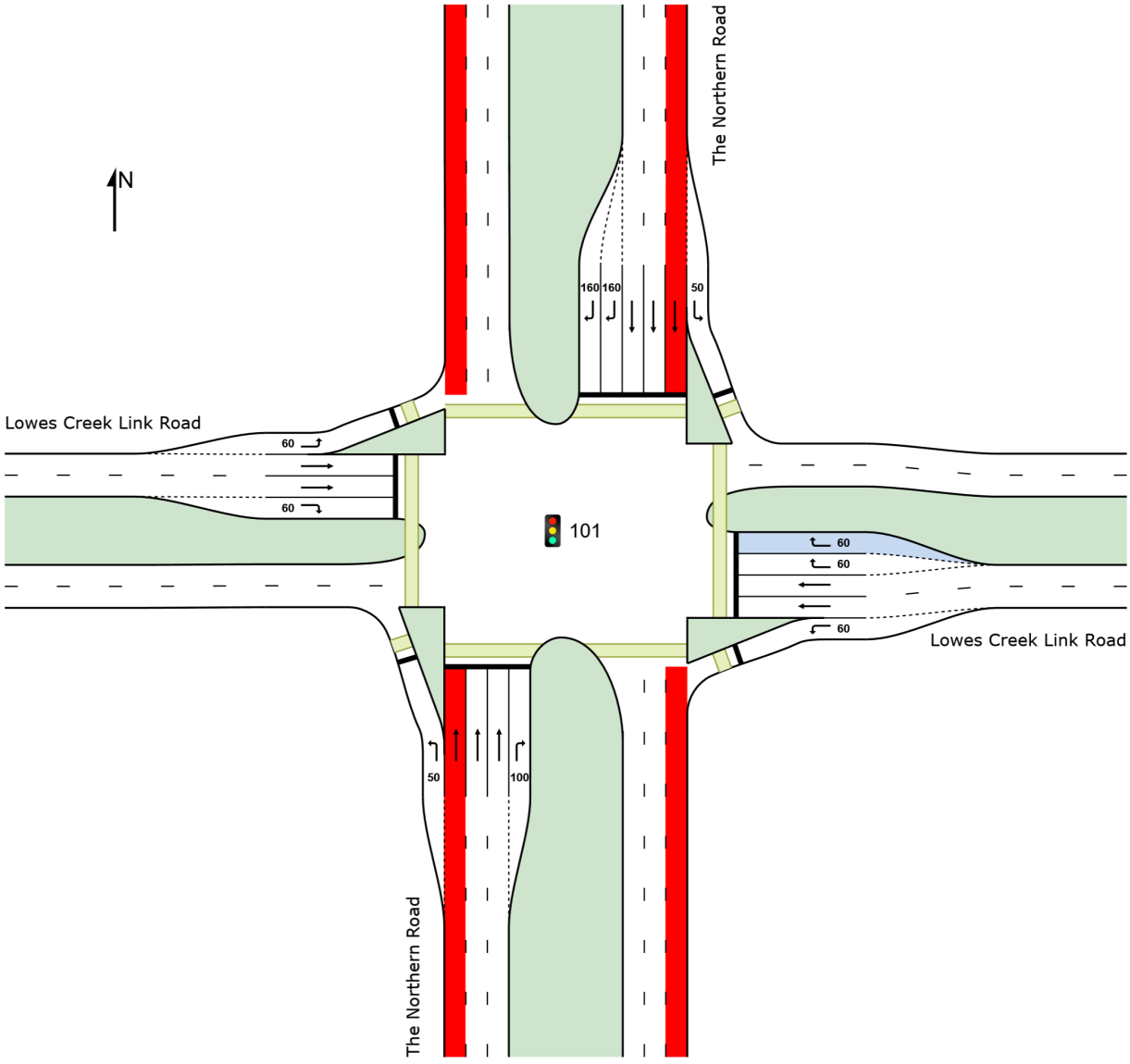
Site: 101 [TNR_Lowes Creek Link (Site Folder: 50% AM with Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import (2) (phase reduction applied)
Input Phase Sequence: A, B, C, D, c1
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	58	3.6	58	3.6	0.050	17.4	LOS B	1.4	10.4	0.40	0.68	0.40	56.2
2	T1	All MCs	1567	10.4	1567	10.4	*0.713	27.1	LOS B	36.8	272.3	0.78	0.71	0.78	59.9
3	R2	All MCs	1	0.0	1	0.0	0.009	82.6	LOS F	0.1	0.5	0.95	0.59	0.95	37.1
Approach			1626	10.2	1626	10.2	0.713	26.8	LOS B	36.8	272.3	0.77	0.71	0.77	57.4
East: Lowes Creek Link Road															
4	L2	All MCs	1	0.0	1	0.0	0.003	55.2	LOS D	0.1	0.4	0.85	0.59	0.85	40.8
5	T1	All MCs	5	0.0	5	0.0	0.010	56.8	LOS E	0.2	1.1	0.89	0.57	0.89	28.5
6	R2	All MCs	160	10.5	160	10.5	0.648	76.7	LOS F	5.7	43.2	1.00	0.82	1.07	23.2
Approach			166	10.1	166	10.1	0.648	76.0	LOS F	5.7	43.2	1.00	0.81	1.06	23.5
North: The Northern Road															
7	L2	All MCs	157	6.7	157	6.7	0.139	18.1	LOS B	4.2	30.8	0.42	0.71	0.42	43.0
8	T1	All MCs	818	18.3	818	18.3	0.368	17.5	LOS B	13.9	106.7	0.58	0.51	0.58	63.8
9	R2	All MCs	78	6.8	78	6.8	*0.342	78.6	LOS F	2.7	19.8	0.99	0.74	0.99	23.6
Approach			1053	15.7	1053	15.7	0.368	22.1	LOS B	13.9	106.7	0.59	0.56	0.59	56.8
West: Lowes Creek Link Road															
10	L2	All MCs	225	1.9	225	1.9	0.717	65.4	LOS E	15.0	106.4	1.00	0.85	1.04	25.2
11	T1	All MCs	2	0.0	2	0.0	0.004	56.4	LOS D	0.1	0.4	0.89	0.53	0.89	28.6
12	R2	All MCs	93	1.1	93	1.1	*0.704	77.4	LOS F	6.6	46.6	1.00	0.85	1.11	35.8
Approach			320	1.6	320	1.6	0.717	68.8	LOS E	15.0	106.4	1.00	0.85	1.06	29.1
All Vehicles			3165	11.1	3165	11.1	0.717	32.0	LOS C	36.8	272.3	0.74	0.68	0.75	50.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

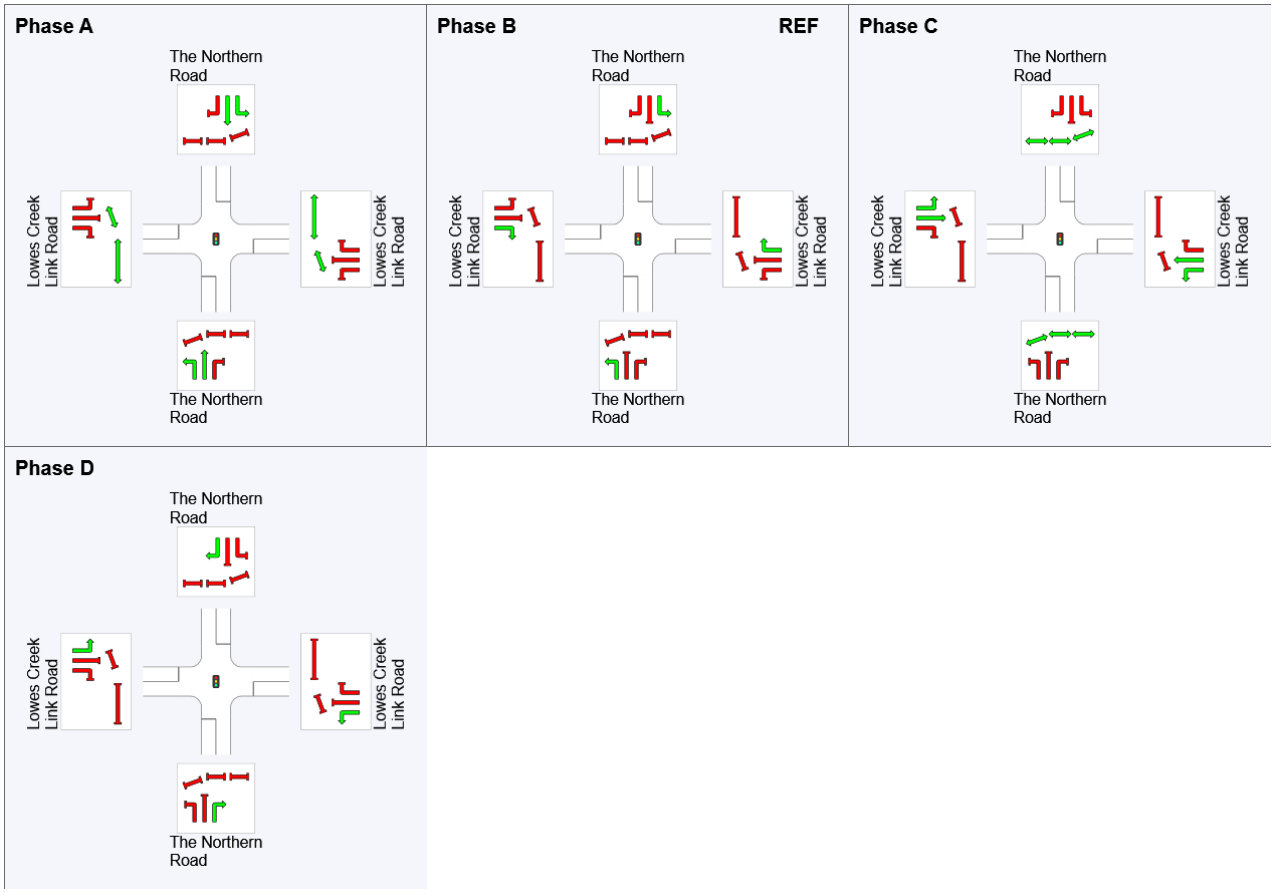
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Lowes Creek Link Road												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

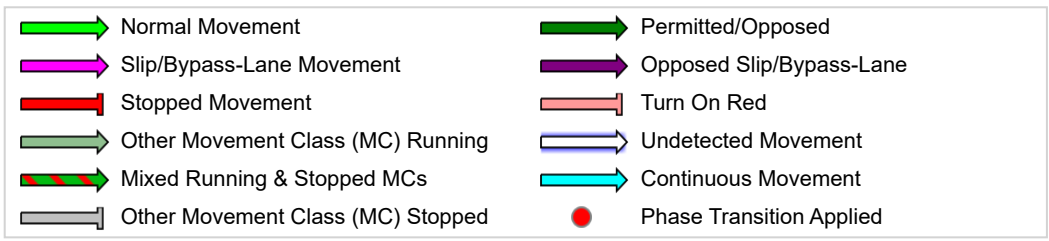
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Lowes Creek Link Road												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	55	0	16	40
Green Time (sec)	79	10	18	9
Phase Time (sec)	85	16	24	15
Phase Split	61%	11%	17%	11%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

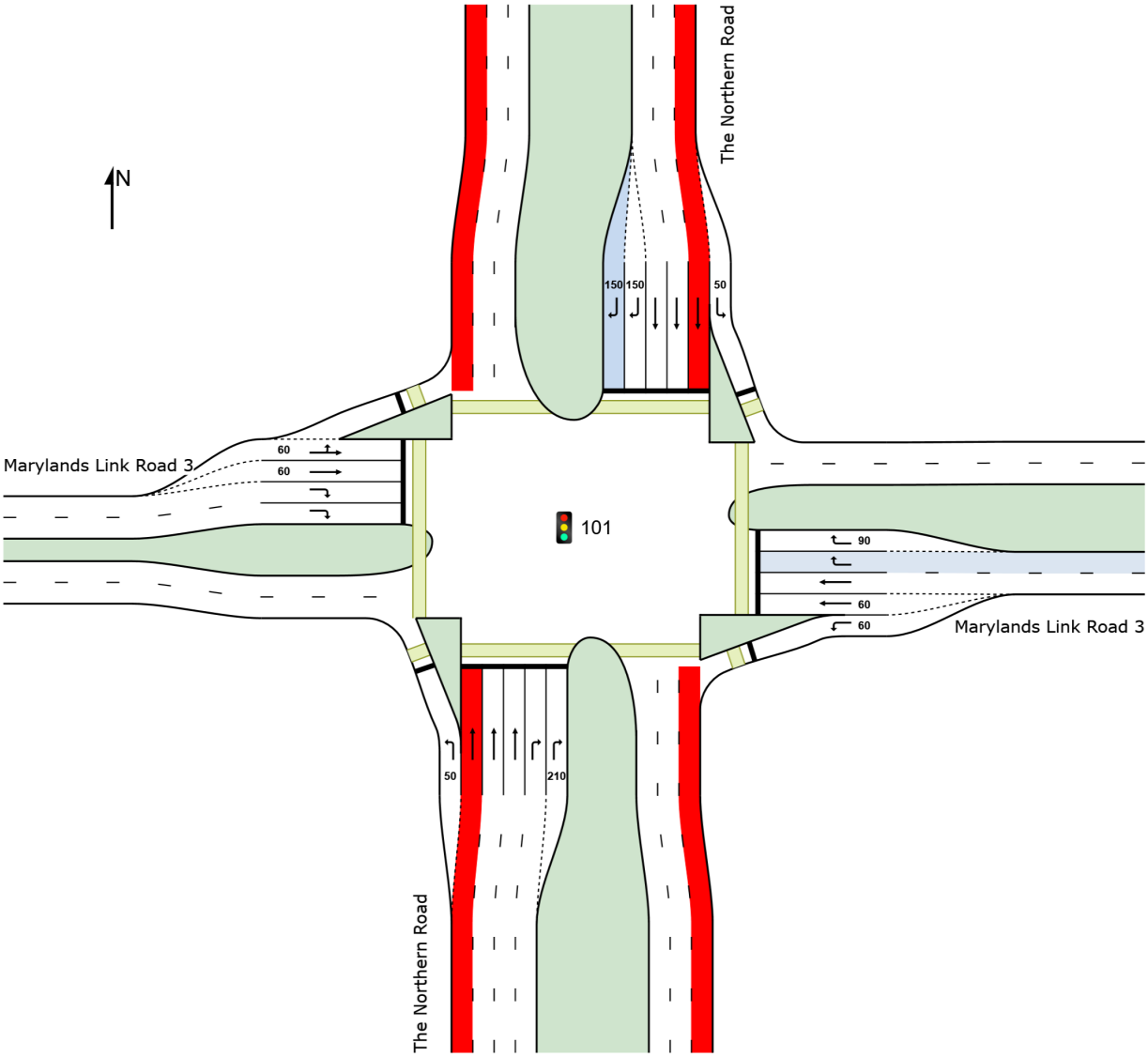
Site: 101 [TNR_Marylands Link 3 (Site Folder: 50% AM with Bus Lanes)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
7	L2	All MCs	35	24.2	35	24.2	0.050	31.7	LOS C	1.3	11.3	0.60	0.70	0.60	43.1
8	T1	All MCs	1281	10.8	1281	10.8	* 0.679	29.5	LOS C	31.7	233.4	0.82	0.74	0.82	59.4
9	R2	All MCs	46	2.3	46	2.3	0.296	82.3	LOS F	1.6	11.7	1.00	0.71	1.00	29.1
Approach			1362	10.9	1362	10.9	0.679	31.3	LOS C	31.7	233.4	0.82	0.74	0.82	57.7
East: Marylands Link Road 3															
10	L2	All MCs	47	2.2	47	2.2	0.158	58.8	LOS E	2.8	19.9	0.89	0.73	0.89	33.1
11	T1	All MCs	51	12.5	51	12.5	0.061	45.0	LOS D	1.3	10.4	0.81	0.60	0.81	31.3
12	R2	All MCs	173	11.6	173	11.6	* 0.640	75.5	LOS F	6.0	46.6	1.00	0.82	1.06	36.0
Approach			271	10.1	271	10.1	0.640	66.9	LOS E	6.0	46.6	0.95	0.76	0.98	34.9
North: The Northern Road															
1	L2	All MCs	123	6.0	123	6.0	0.159	32.7	LOS C	5.0	36.8	0.64	0.75	0.64	49.2
2	T1	All MCs	746	18.2	746	18.2	0.391	24.5	LOS B	14.7	112.4	0.68	0.59	0.68	62.1
3	R2	All MCs	45	18.6	45	18.6	* 0.322	83.3	LOS F	1.6	13.1	1.00	0.71	1.00	35.2
Approach			915	16.6	915	16.6	0.391	28.5	LOS C	14.7	112.4	0.69	0.62	0.69	58.2
West: Marylands Link Road 3															
4	L2	All MCs	198	3.7	198	3.7	* 0.666	64.8	LOS E	12.9	93.4	0.99	0.83	1.00	38.3
5	T1	All MCs	95	7.8	95	7.8	0.223	47.1	LOS D	5.2	39.2	0.85	0.68	0.85	30.8
6	R2	All MCs	65	0.0	65	0.0	0.224	71.4	LOS F	2.2	15.1	0.97	0.72	0.97	30.7
Approach			358	4.1	358	4.1	0.666	61.3	LOS E	12.9	93.4	0.95	0.77	0.96	35.2
All Vehicles			2905	11.8	2905	11.8	0.679	37.4	LOS C	31.7	233.4	0.81	0.71	0.81	51.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

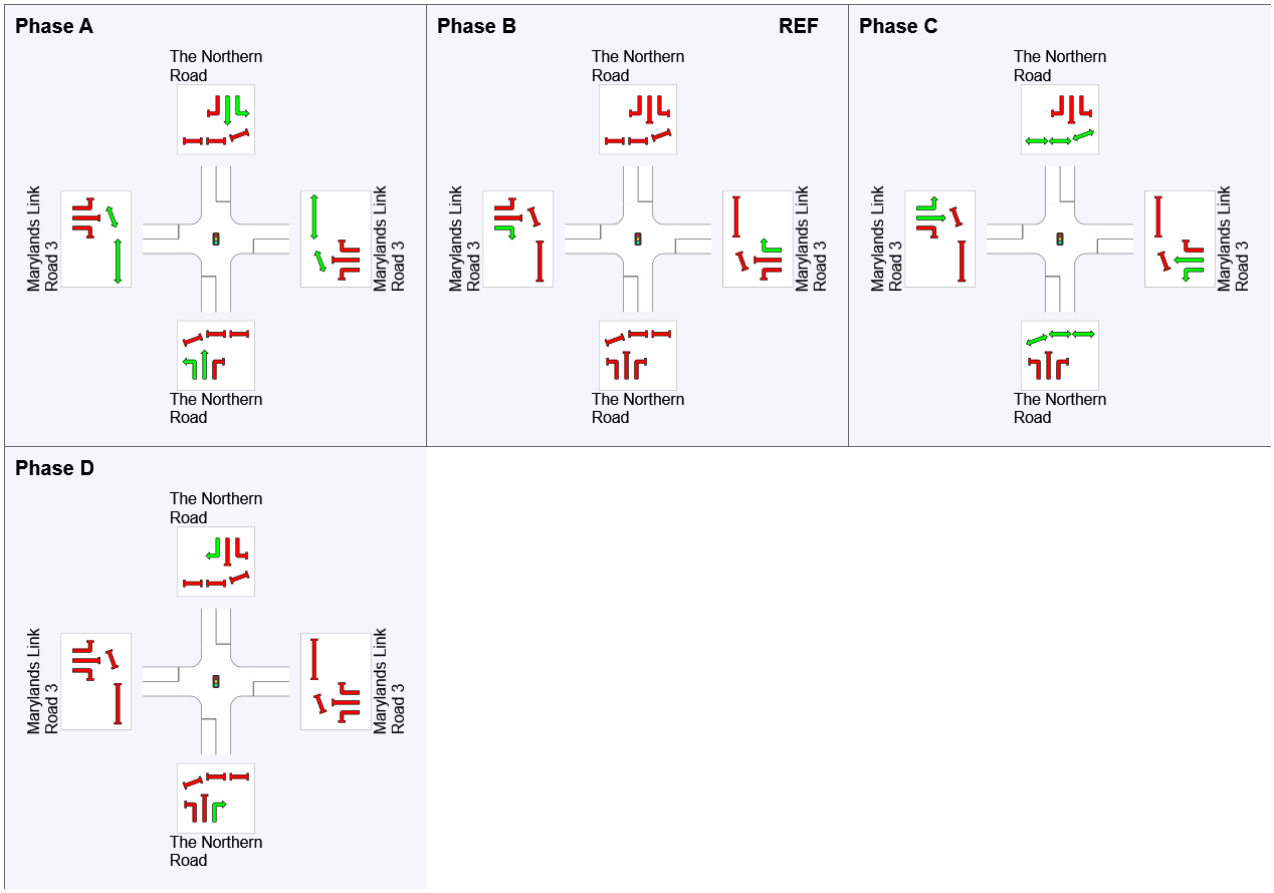
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link Road 3												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

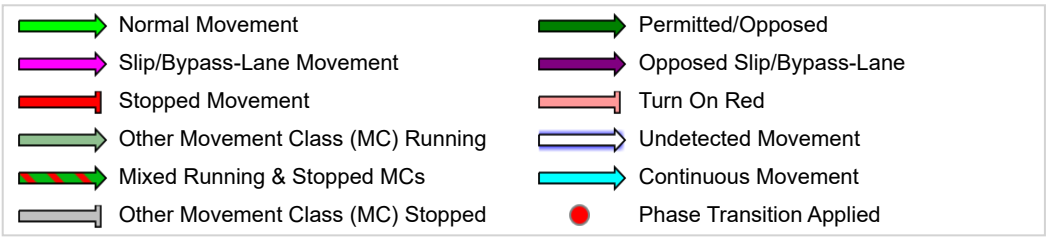
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link Road 3												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	67	0	17	55
Green Time (sec)	67	11	32	6
Phase Time (sec)	73	17	38	12
Phase Split	52%	12%	27%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

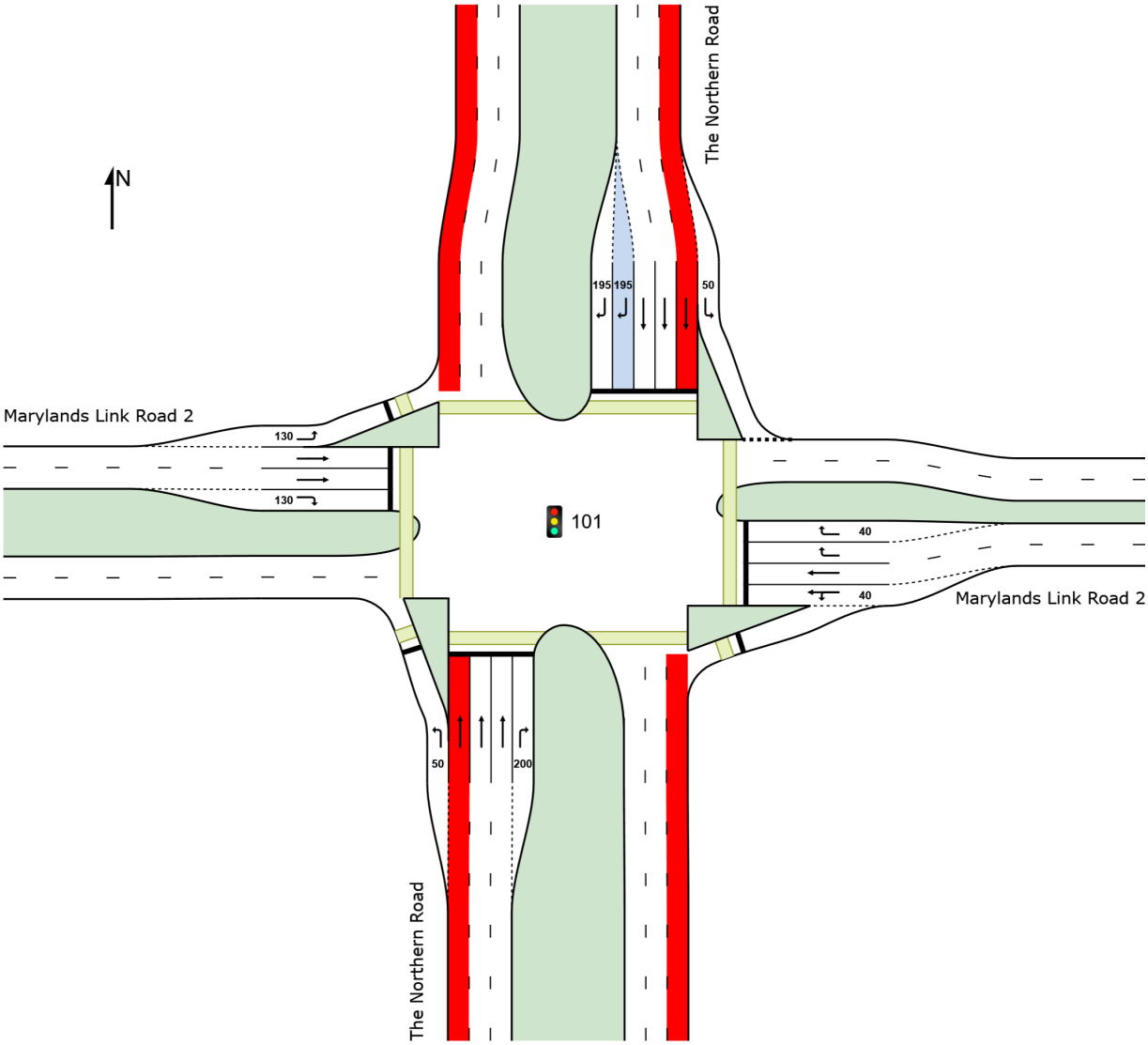
Site: 101 [TNR_Marylands Link 2 (Site Folder: 50% AM with Bus Lanes)]

AM Peak: 6.30AM-7.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	33	6.5	33	6.5	0.037	26.6	LOS B	1.1	8.3	0.54	0.69	0.54	51.5
2	T1	All MCs	1118	11.7	1118	11.7	* 0.526	21.9	LOS B	22.9	168.7	0.69	0.61	0.69	63.5
3	R2	All MCs	18	17.6	18	17.6	0.190	79.2	LOS F	1.2	9.9	0.98	0.70	0.98	35.8
Approach			1168	11.6	1168	11.6	0.526	22.9	LOS B	22.9	168.7	0.69	0.62	0.69	62.5
East: Marylands Link Road 2															
4	L2	All MCs	1	0.0	1	0.0	0.027	60.3	LOS E	0.5	3.8	0.84	0.59	0.84	42.4
5	T1	All MCs	19	0.0	19	0.0	0.027	48.3	LOS D	0.5	3.8	0.84	0.58	0.84	30.3
6	R2	All MCs	27	26.9	27	26.9	* 0.205	79.0	LOS F	1.0	8.3	0.99	0.69	0.99	27.5
Approach			47	15.6	47	15.6	0.205	66.3	LOS E	1.0	8.3	0.93	0.64	0.93	28.8
North: The Northern Road															
7	L2	All MCs	89	1.2	89	1.2	0.059	8.1	LOS A	0.5	3.8	0.16	0.64	0.16	56.2
8	T1	All MCs	799	24.5	799	24.5	0.393	19.9	LOS B	14.5	117.3	0.62	0.55	0.62	64.7
9	R2	All MCs	101	10.4	101	10.4	* 0.511	81.2	LOS F	3.6	27.2	1.00	0.76	1.00	29.3
Approach			989	21.0	989	21.0	0.511	25.1	LOS B	14.5	117.3	0.62	0.58	0.62	59.0
West: Marylands Link Road 2															
10	L2	All MCs	140	7.5	140	7.5	* 0.530	64.8	LOS E	9.0	67.0	0.97	0.80	0.97	31.2
11	T1	All MCs	37	0.0	37	0.0	0.049	49.1	LOS D	1.0	7.1	0.84	0.61	0.84	30.3
12	R2	All MCs	4	0.0	4	0.0	0.053	76.4	LOS F	0.3	2.0	0.98	0.64	0.98	35.8
Approach			181	5.8	181	5.8	0.530	61.9	LOS E	9.0	67.0	0.95	0.76	0.95	31.2
All Vehicles			2386	15.1	2386	15.1	0.530	27.6	LOS B	22.9	168.7	0.68	0.61	0.68	57.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

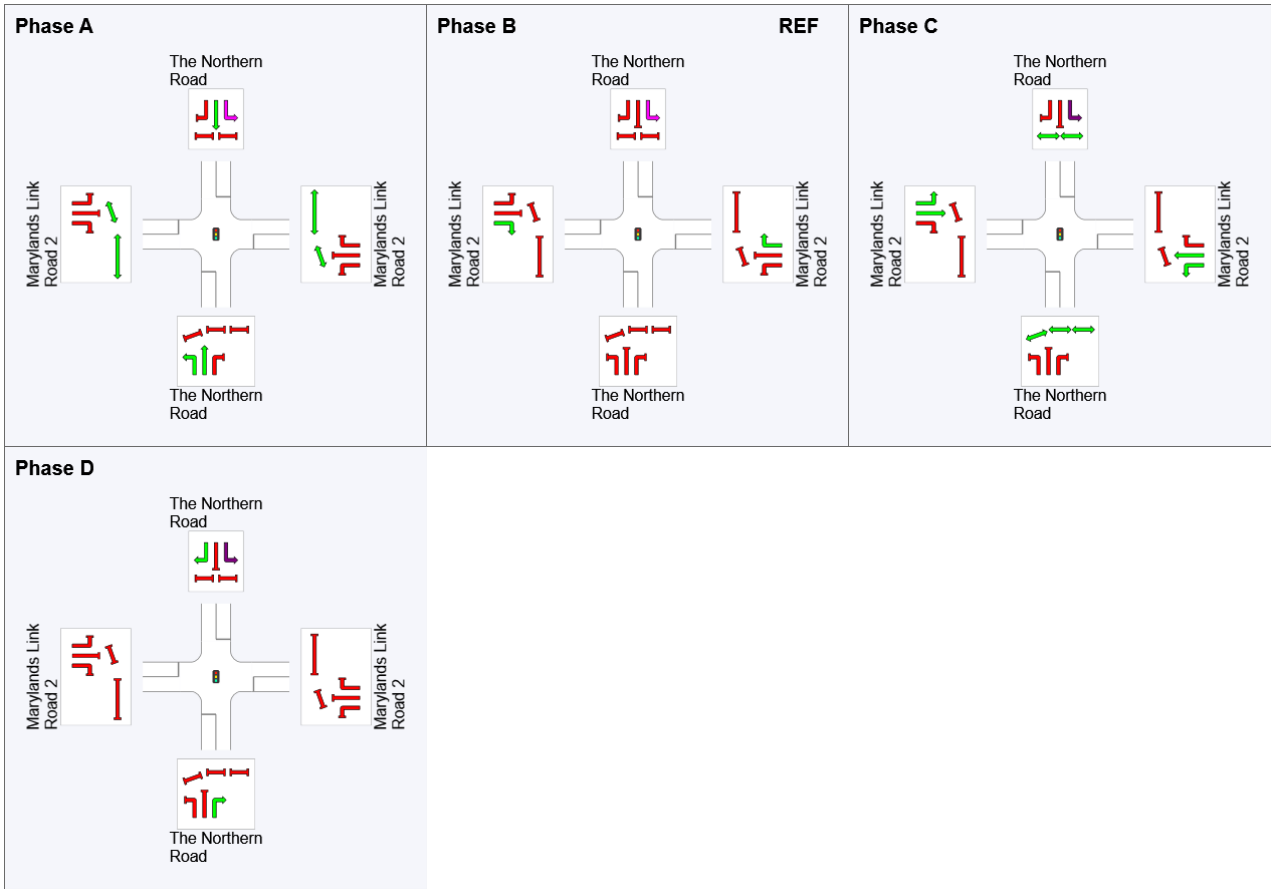
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link Road 2												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

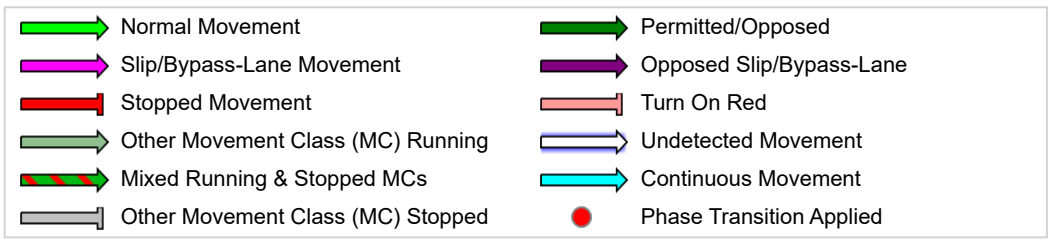
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link Road 2												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		450	474	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	59	0	12	45
Green Time (sec)	75	6	27	8
Phase Time (sec)	81	12	33	14
Phase Split	58%	9%	24%	10%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

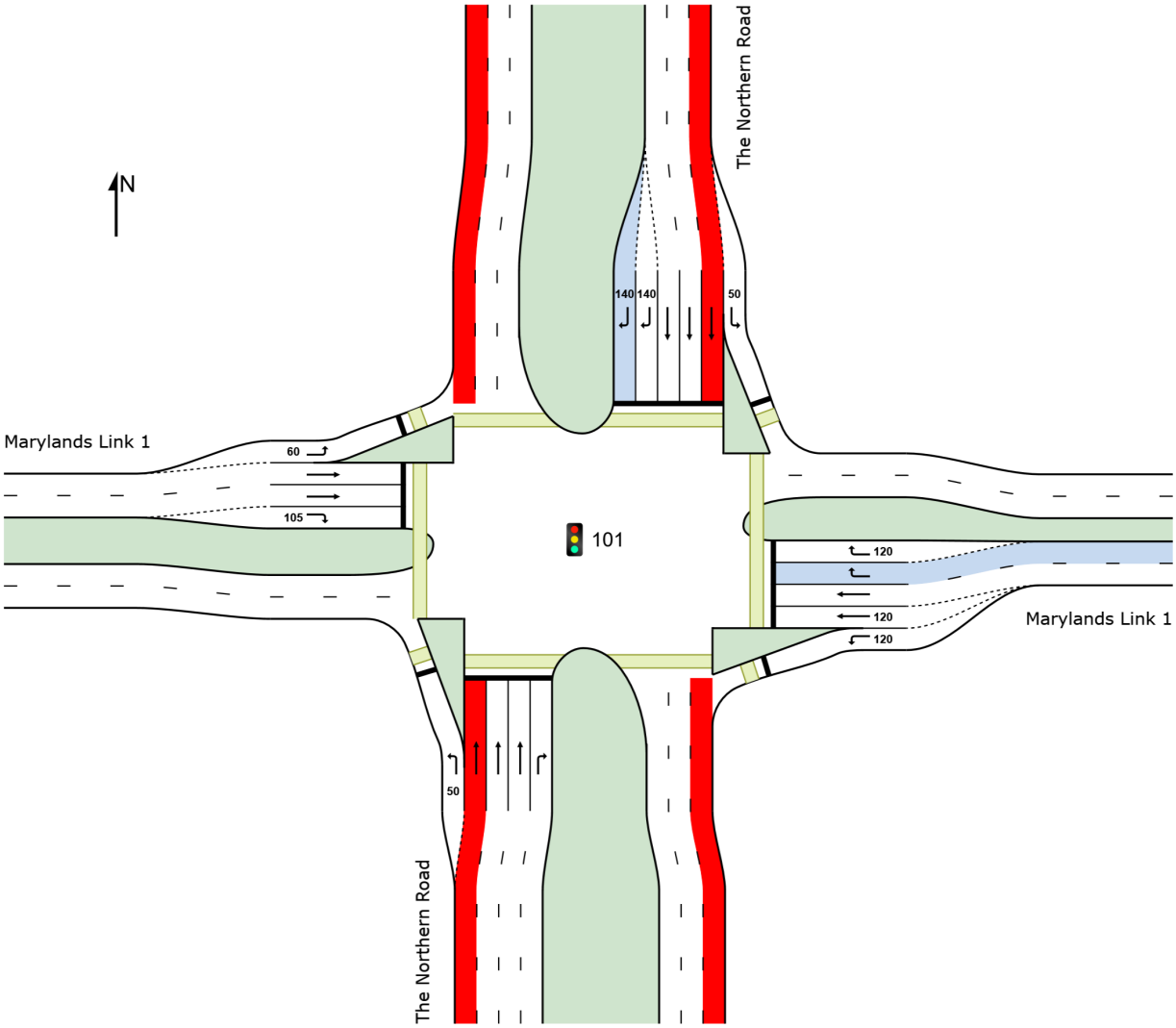
Site: 101 [TNR_Marylands Link 1 (Site Folder: 50% AM with Bus Lanes)]

6.30AM-7.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	74	22.9	74	22.9	0.161	47.7	LOS D	3.7	31.4	0.79	0.75	0.79	39.4
2	T1	All MCs	749	16.0	749	16.0	* 0.564	41.0	LOS C	19.2	143.9	0.87	0.75	0.87	55.1
3	R2	All MCs	149	10.6	149	10.6	* 0.577	68.7	LOS E	9.7	74.0	0.98	0.81	0.98	34.1
Approach			973	15.7	973	15.7	0.577	45.7	LOS D	19.2	143.9	0.88	0.76	0.88	50.5
East: Marylands Link 1															
4	L2	All MCs	88	13.1	88	13.1	* 0.561	72.7	LOS F	6.0	46.8	1.00	0.78	1.00	31.8
5	T1	All MCs	53	10.0	53	10.0	0.091	54.4	LOS D	1.5	11.7	0.89	0.65	0.89	29.0
6	R2	All MCs	394	4.5	394	4.5	* 0.567	59.8	LOS E	12.3	89.5	0.96	0.81	0.96	39.5
Approach			535	6.5	535	6.5	0.567	61.4	LOS E	12.3	89.5	0.96	0.79	0.96	37.4
North: The Northern Road															
7	L2	All MCs	181	23.8	181	23.8	0.399	51.1	LOS D	10.0	84.1	0.85	0.80	0.85	42.6
8	T1	All MCs	636	23.7	636	23.7	0.491	39.8	LOS C	15.6	123.2	0.84	0.72	0.84	55.6
9	R2	All MCs	17	37.5	17	37.5	0.038	63.3	LOS E	0.5	4.6	0.88	0.67	0.88	39.6
Approach			834	24.0	834	24.0	0.491	42.8	LOS D	15.6	123.2	0.85	0.74	0.85	52.2
West: Marylands Link 1															
10	L2	All MCs	19	5.6	19	5.6	0.114	68.6	LOS E	1.2	8.9	0.95	0.70	0.95	37.1
11	T1	All MCs	149	10.6	149	10.6	0.261	56.4	LOS D	4.5	34.6	0.92	0.72	0.92	28.6
12	R2	All MCs	53	8.0	53	8.0	0.155	54.9	LOS D	3.0	22.4	0.87	0.72	0.87	36.5
Approach			221	9.5	221	9.5	0.261	57.1	LOS E	4.5	34.6	0.91	0.72	0.91	31.4
All Vehicles			2562	15.9	2562	15.9	0.577	49.0	LOS D	19.2	143.9	0.89	0.75	0.89	46.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

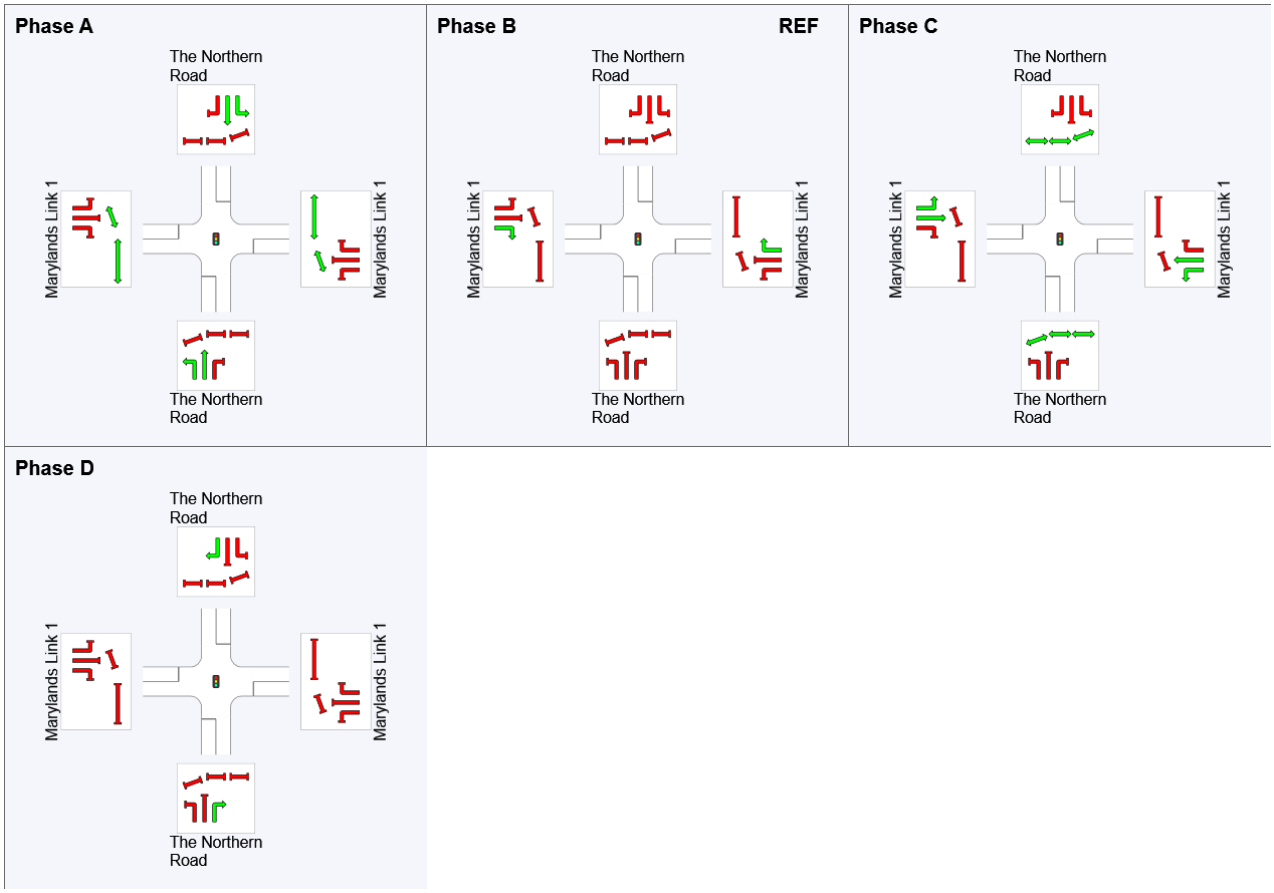
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link 1												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

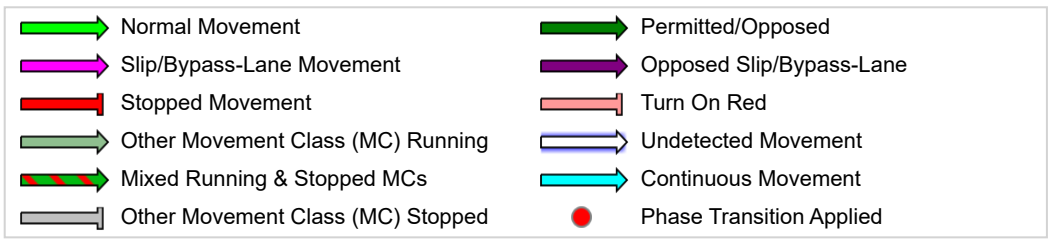
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link 1												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	88	0	33	61
Green Time (sec)	46	27	22	21
Phase Time (sec)	52	33	28	27
Phase Split	37%	24%	20%	19%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

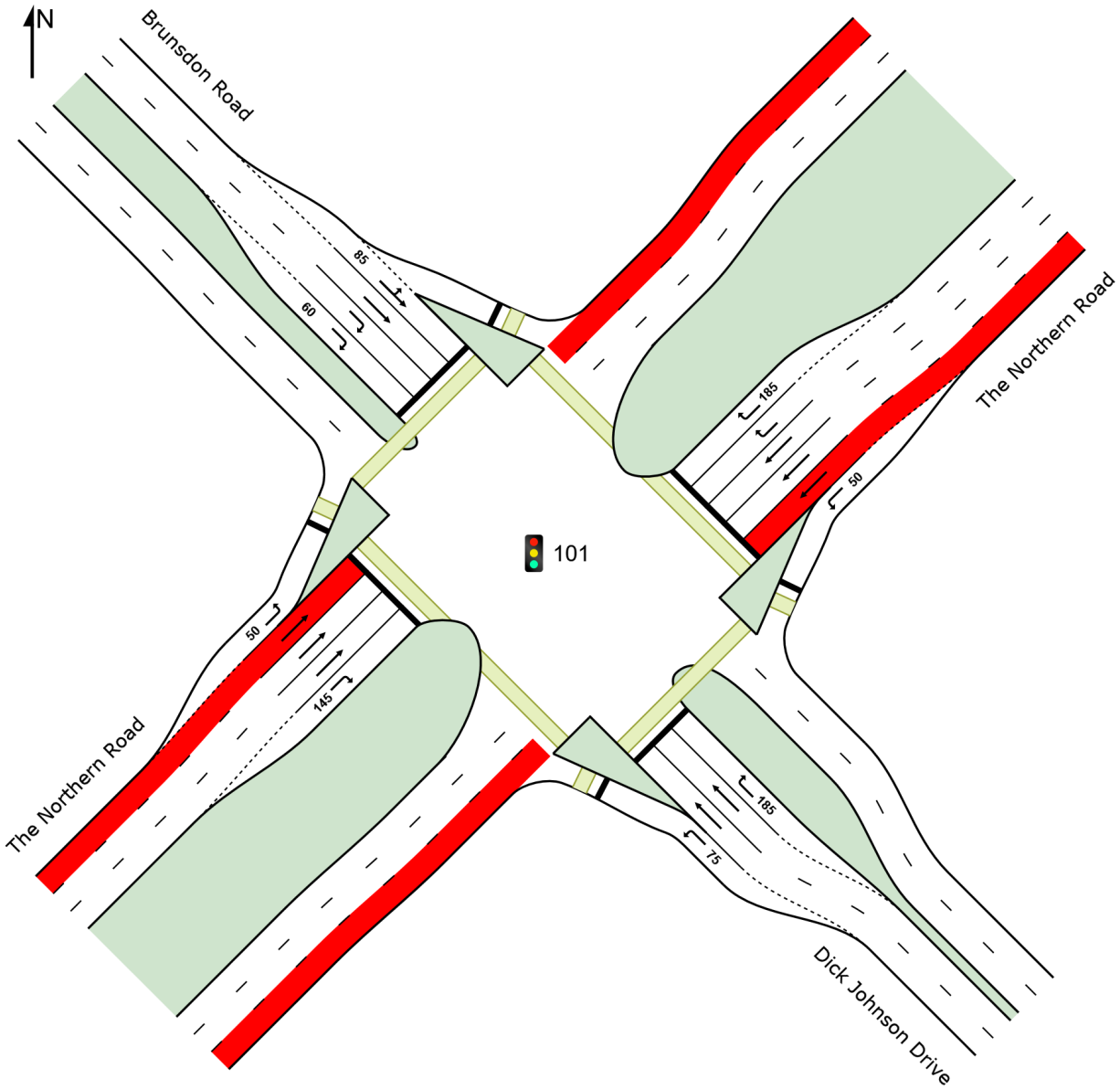
Site: 101 [TNR_Dick Johnson Dr_Brunson Rd (Site Folder: 50% AM with Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Dick Johnson Drive															
4	L2	All MCs	1	0.0	1	0.0	0.009	71.2	LOS F	0.1	0.5	0.95	0.59	0.95	38.1
5	T1	All MCs	53	6.0	53	6.0	0.109	58.5	LOS E	1.6	11.8	0.92	0.67	0.92	28.1
6	R2	All MCs	1	0.0	1	0.0	0.003	53.9	LOS D	0.1	0.4	0.84	0.58	0.84	31.7
Approach			55	5.8	55	5.8	0.109	58.7	LOS E	1.6	11.8	0.92	0.66	0.92	28.5
NorthEast: The Northern Road															
7	L2	All MCs	1	0.0	1	0.0	0.001	30.4	LOS C	0.0	0.3	0.58	0.61	0.58	40.3
8	T1	All MCs	638	18.3	638	18.3	0.327	26.0	LOS B	11.9	90.1	0.65	0.66	0.65	51.5
9	R2	All MCs	7	0.0	7	0.0	0.046	79.8	LOS F	0.3	1.8	0.98	0.63	0.98	26.5
Approach			646	18.1	646	18.1	0.327	26.6	LOS B	11.9	90.1	0.66	0.66	0.66	51.1
NorthWest: Brunsdon Road															
10	L2	All MCs	1	0.0	1	0.0	0.170	72.6	LOS F	2.4	17.9	0.93	0.69	0.93	30.1
11	T1	All MCs	79	6.7	79	6.7	*0.170	59.1	LOS E	2.5	18.6	0.93	0.69	0.93	28.0
12	R2	All MCs	309	4.1	309	4.1	*0.480	60.4	LOS E	9.6	69.6	0.95	0.80	0.95	40.8
Approach			389	4.6	389	4.6	0.480	60.2	LOS E	9.6	69.6	0.94	0.78	0.94	38.5
SouthWest: The Northern Road															
1	L2	All MCs	333	6.6	333	6.6	*0.449	43.5	LOS D	15.7	116.2	0.75	0.81	0.75	48.8
2	T1	All MCs	940	13.2	940	13.2	0.491	26.5	LOS B	20.1	148.9	0.72	0.64	0.72	60.6
3	R2	All MCs	6	66.7	6	66.7	*0.117	83.6	LOS F	0.4	4.9	0.99	0.66	0.99	36.4
Approach			1279	11.8	1279	11.8	0.491	31.2	LOS C	20.1	148.9	0.73	0.68	0.73	55.9
All Vehicles			2369	12.2	2369	12.2	0.491	35.3	LOS C	20.1	148.9	0.75	0.69	0.75	50.4

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

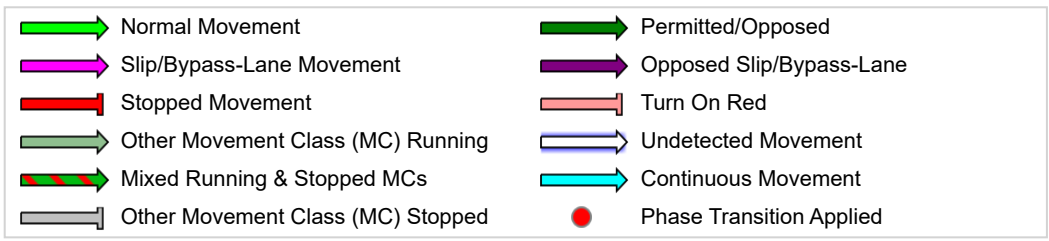
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Dick Johnson Drive												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
NorthEast: The Northern Road												
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
NorthWest: Brunsdon Road												

P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
SouthWest: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence

REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	67	0	31	55
Green Time (sec)	67	25	18	6
Phase Time (sec)	73	31	24	12
Phase Split	52%	22%	17%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

Site: 101 [Bringelly_Kelvin Park (Site Folder: 50% PM with Bus Lanes)]

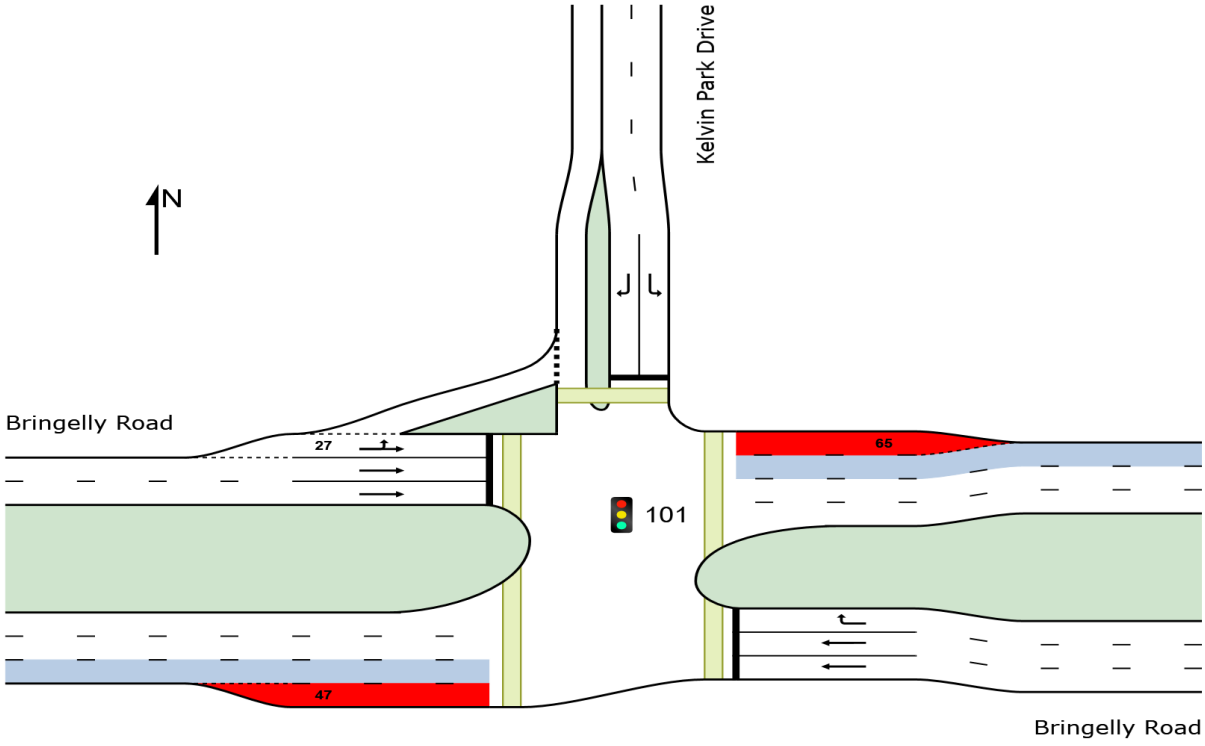
Peak Hour: 5.30PM-6.30PM

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bringelly Road															
5	T1	All MCs	1255	2.7	1255	2.7	*0.424	5.7	LOS A	14.2	101.5	0.37	0.34	0.37	54.2
6	R2	All MCs	17	0.0	17	0.0	0.038	49.4	LOS D	0.9	6.1	0.80	0.68	0.80	31.4
Approach			1272	2.6	1272	2.6	0.424	6.3	LOS A	14.2	101.5	0.37	0.34	0.37	53.6
North: Kelvin Park Drive															
7	L2	All MCs	17	0.0	17	0.0	0.022	29.3	LOS C	0.7	4.6	0.61	0.65	0.61	36.9
9	R2	All MCs	79	0.0	79	0.0	*0.425	70.0	LOS E	5.2	36.5	0.98	0.77	0.98	24.5
Approach			96	0.0	96	0.0	0.425	62.8	LOS E	5.2	36.5	0.92	0.75	0.92	26.2
West: Bringelly Road															
10	L2	All MCs	17	0.0	17	0.0	0.011	6.0	LOS A	0.1	0.5	0.11	0.57	0.11	47.8
11	T1	All MCs	73	2.9	73	2.9	0.038	19.2	LOS B	1.2	8.9	0.54	0.41	0.54	44.0
Approach			89	2.4	89	2.4	0.038	16.7	LOS B	1.2	8.9	0.46	0.44	0.46	44.7
All Vehicles			1457	2.5	1457	2.5	0.425	10.6	LOS A	14.2	101.5	0.41	0.37	0.41	49.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

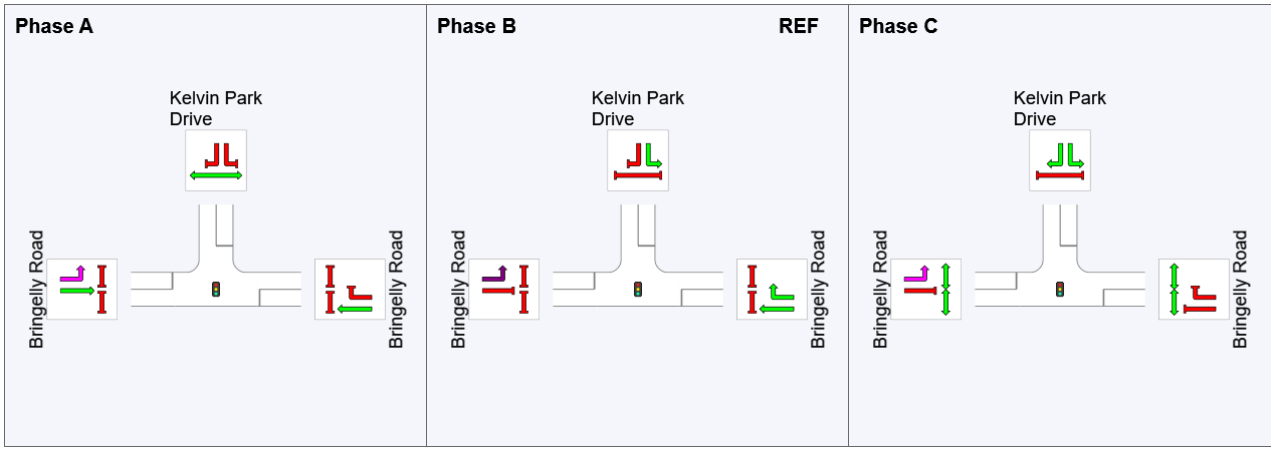
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

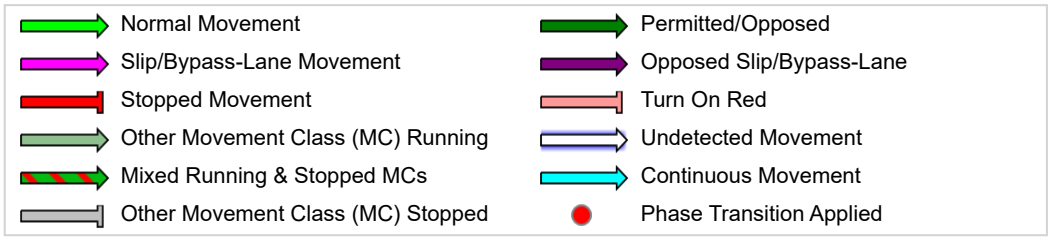
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Bringelly Road												
P21	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P22	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: Kelvin Park Drive												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Bringelly Road												
P41	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P42	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		250	263	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	65	0	39
Green Time (sec)	69	33	20
Phase Time (sec)	75	39	26
Phase Split	54%	28%	19%
Phase Frequency (%)	100.0	100.0	100.0

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

Site: 01 [TNR_Bringelly (Site Folder: 50% PM with Bus Lanes)]

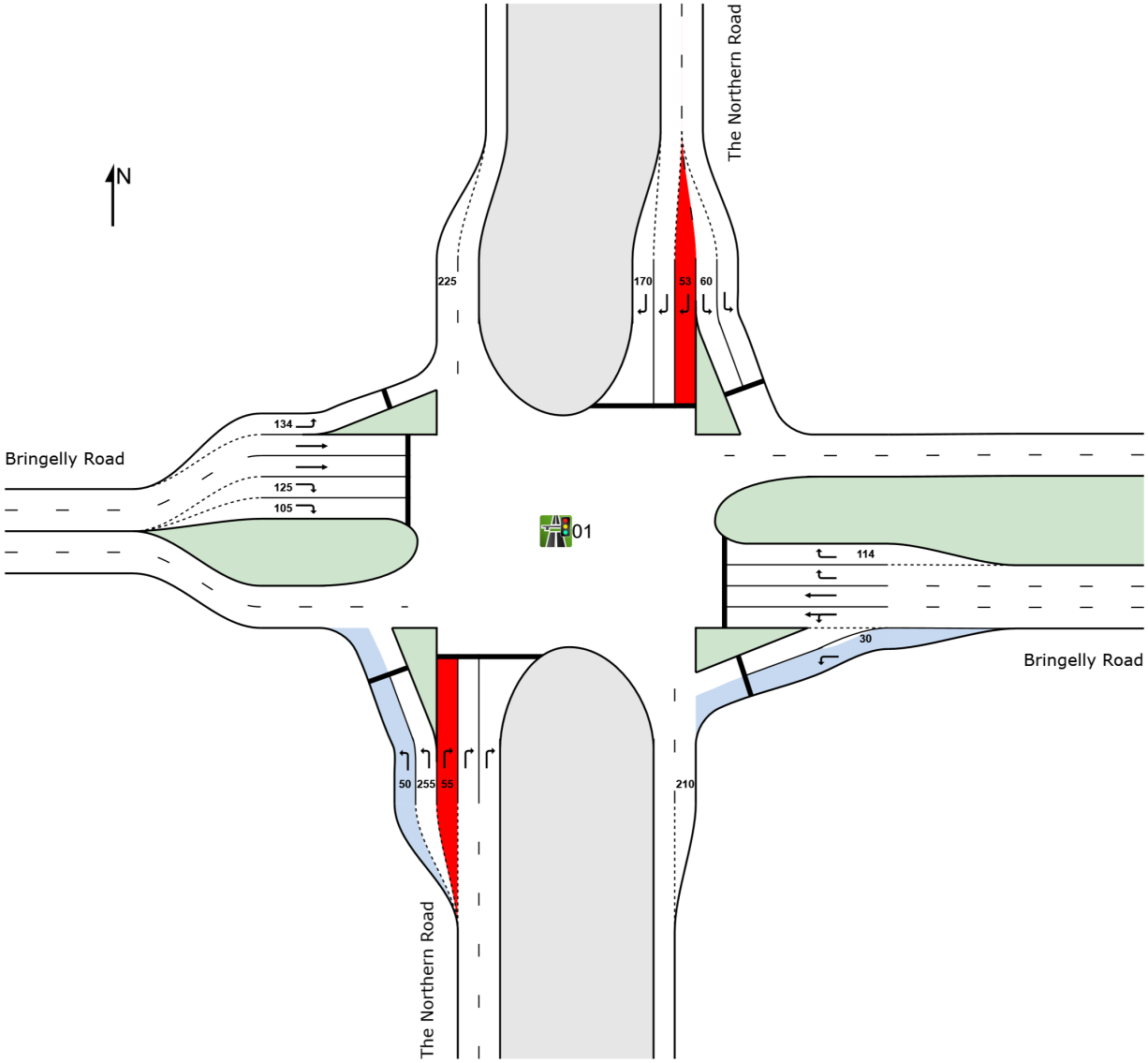
Peak: 5.30PM-6.30PM

Site Category: (None)
Single Point Interchange (Signals) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Three-Phase Leading Right Turns
Input Phase Sequence: 1, 2, 3, 4
Output Phase Sequence: 1, 2, 3, 4
Reference Phase: Phase 4

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV %]	Arrival Flows [Total veh/h	HV %]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	67	4.7	67	4.7	0.292	76.0	LOS F	2.3	16.7	0.99	0.73	0.99	29.3
3	R2	All MCs	283	27.1	283	27.1	0.255	52.9	LOS D	6.1	45.8	0.85	0.76	0.85	37.7
Approach			351	22.8	351	22.8	0.292	57.3	LOS E	6.1	45.8	0.88	0.75	0.88	35.8
East: Bringelly Road															
4	L2	All MCs	574	1.7	574	1.7	0.368	12.8	LOS A	9.5	67.5	0.31	0.72	0.31	65.7
5	T1	All MCs	555	2.1	555	2.1	* 0.368	23.6	LOS B	14.6	104.2	0.63	0.59	0.63	39.5
6	R2	All MCs	206	5.6	206	5.6	0.144	33.9	LOS C	4.4	32.3	0.67	0.70	0.67	39.8
Approach			1335	2.4	1335	2.4	0.368	20.6	LOS B	14.6	104.2	0.50	0.66	0.50	50.0
North: The Northern Road															
7	L2	All MCs	293	8.6	293	8.6	0.209	34.8	LOS C	6.4	48.4	0.69	0.74	0.69	35.2
9	R2	All MCs	381	17.7	381	17.7	* 0.356	53.6	LOS D	9.0	63.6	0.87	0.78	0.87	28.8
Approach			674	13.8	674	13.8	0.356	45.4	LOS D	9.0	63.6	0.79	0.76	0.79	31.4
West: Bringelly Road															
10	L2	All MCs	64	3.3	64	3.3	0.073	26.0	LOS B	2.3	16.4	0.56	0.68	0.56	42.3
11	T1	All MCs	151	3.5	151	3.5	0.213	52.1	LOS D	4.4	31.5	0.89	0.69	0.89	26.4
12	R2	All MCs	76	4.2	76	4.2	* 0.327	76.2	LOS F	2.6	18.8	0.99	0.73	0.99	33.8
Approach			291	3.6	291	3.6	0.327	52.6	LOS D	4.4	31.5	0.84	0.70	0.84	31.4
All Vehicles			2649	8.1	2649	8.1	0.368	35.3	LOS C	14.6	104.2	0.66	0.71	0.66	39.8

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

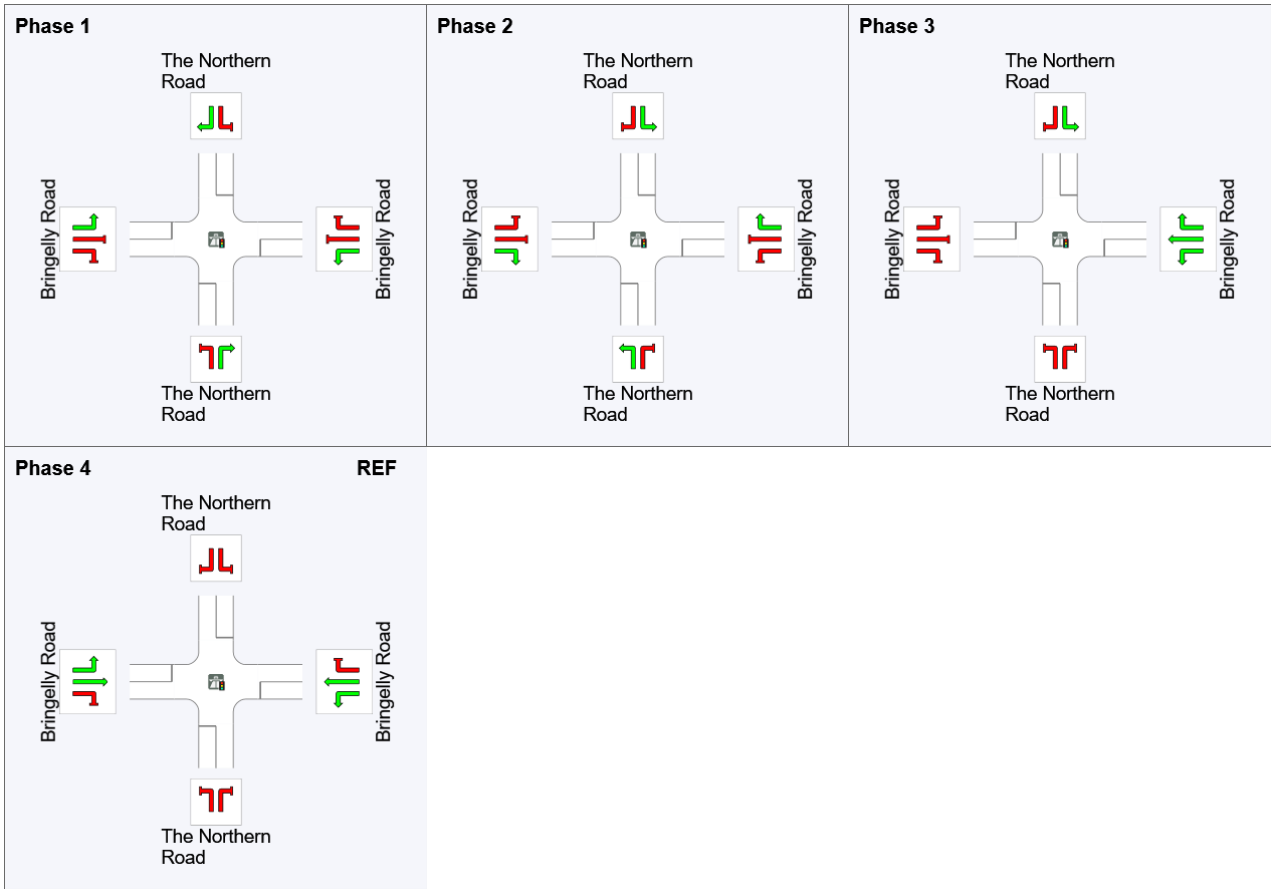
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

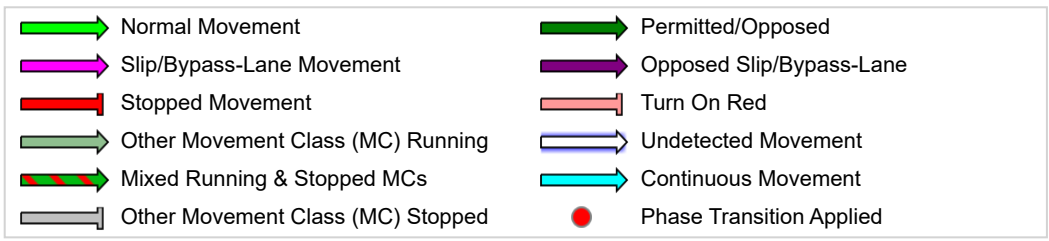
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	1	2	3	4
Phase Change Time (sec)	34	76	93	0
Green Time (sec)	34	9	39	26
Phase Time (sec)	42	17	47	34
Phase Split	30%	12%	34%	24%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

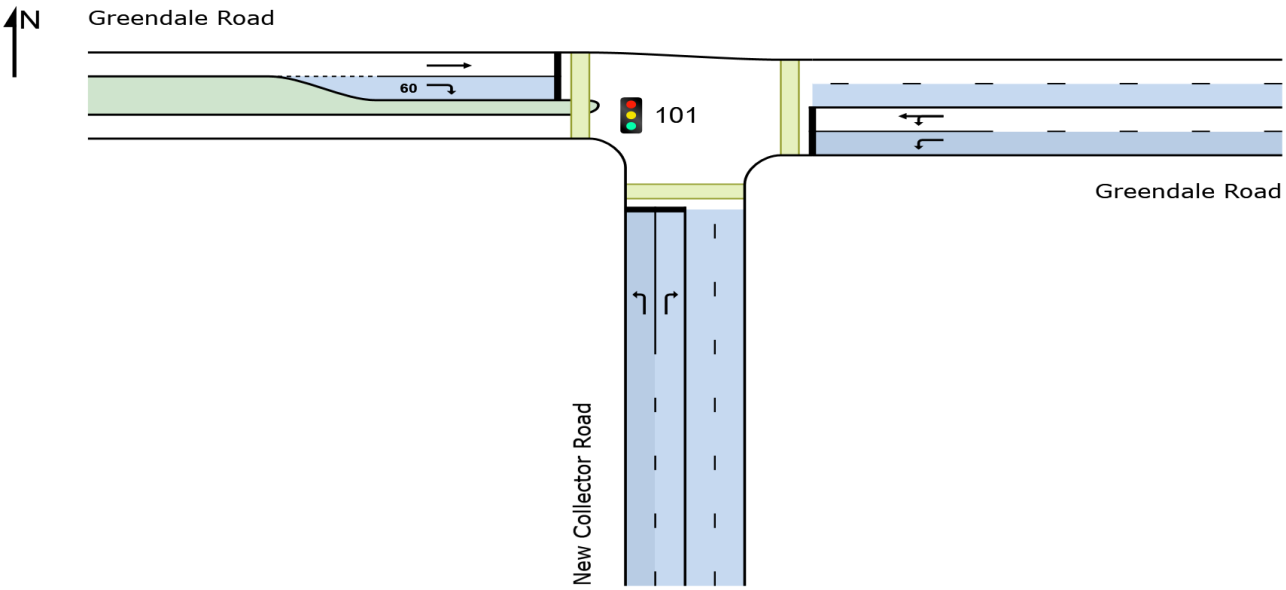
Site: 101 [Greendale Road_New Collector Road (Site Folder: 50% PM with Bus Lanes)]

Peak: 5.30PM-6.30PM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: New Collector Road															
1	L2	All MCs	23	0.0	23	0.0	0.040	39.7	LOS C	1.1	7.5	0.72	0.68	0.72	31.9
3	R2	All MCs	113	0.0	113	0.0	* 0.327	58.1	LOS E	6.7	47.0	0.91	0.78	0.91	27.5
Approach			136	0.0	136	0.0	0.327	54.9	LOS D	6.7	47.0	0.88	0.76	0.88	28.1
East: Greendale Road															
4	L2	All MCs	681	0.5	681	0.5	0.334	9.7	LOS A	12.2	88.5	0.38	0.64	0.38	42.2
5	T1	All MCs	163	9.7	163	9.7	* 0.334	25.6	LOS B	12.2	88.5	0.55	0.61	0.55	40.2
Approach			844	2.2	844	2.2	0.334	12.8	LOS A	12.2	88.5	0.41	0.63	0.41	41.8
West: Greendale Road															
11	T1	All MCs	128	6.6	128	6.6	0.094	5.8	LOS A	2.5	18.3	0.31	0.26	0.31	46.3
12	R2	All MCs	31	0.0	31	0.0	* 0.153	66.7	LOS E	1.9	13.5	0.94	0.72	0.94	25.8
Approach			159	5.3	159	5.3	0.153	17.5	LOS B	2.5	18.3	0.43	0.35	0.43	40.2
All Vehicles			1139	2.4	1139	2.4	0.334	18.5	LOS B	12.2	88.5	0.47	0.61	0.47	39.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

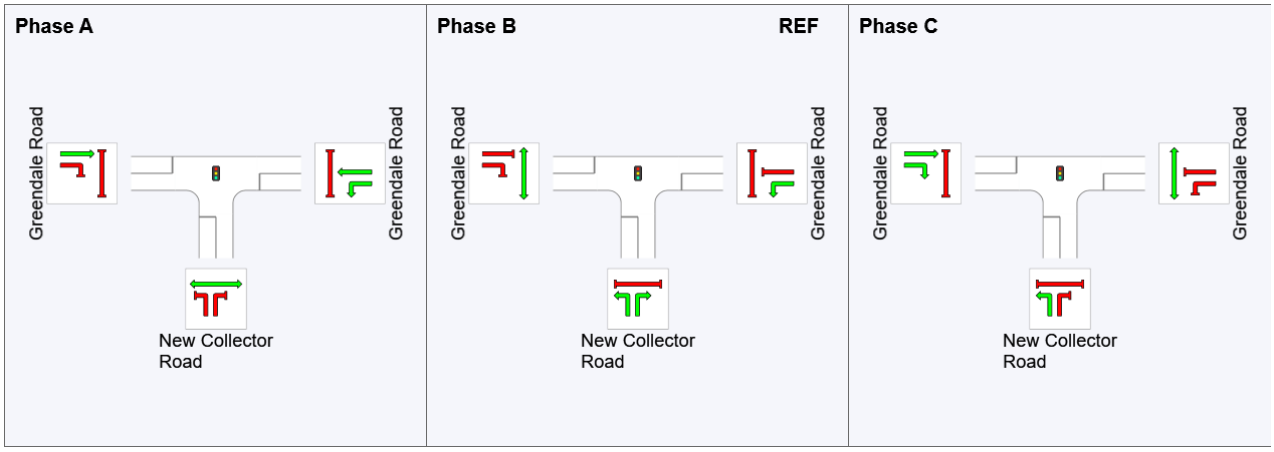
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

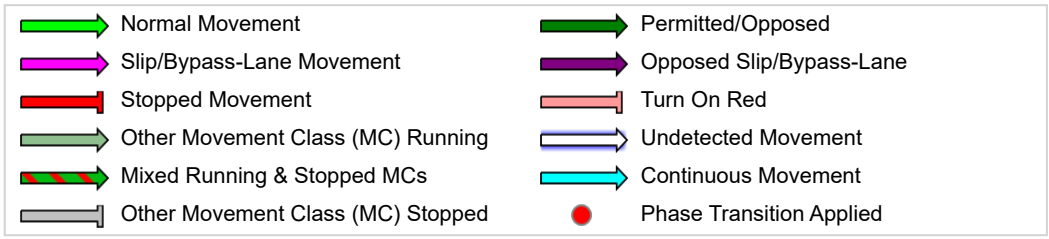
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: New Collector Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Greendale Road												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Greendale Road												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		150	158	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	53	0	32
Green Time (sec)	81	26	15
Phase Time (sec)	87	32	21
Phase Split	62%	23%	15%
Phase Frequency (%)	100.0	100.0	100.0

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

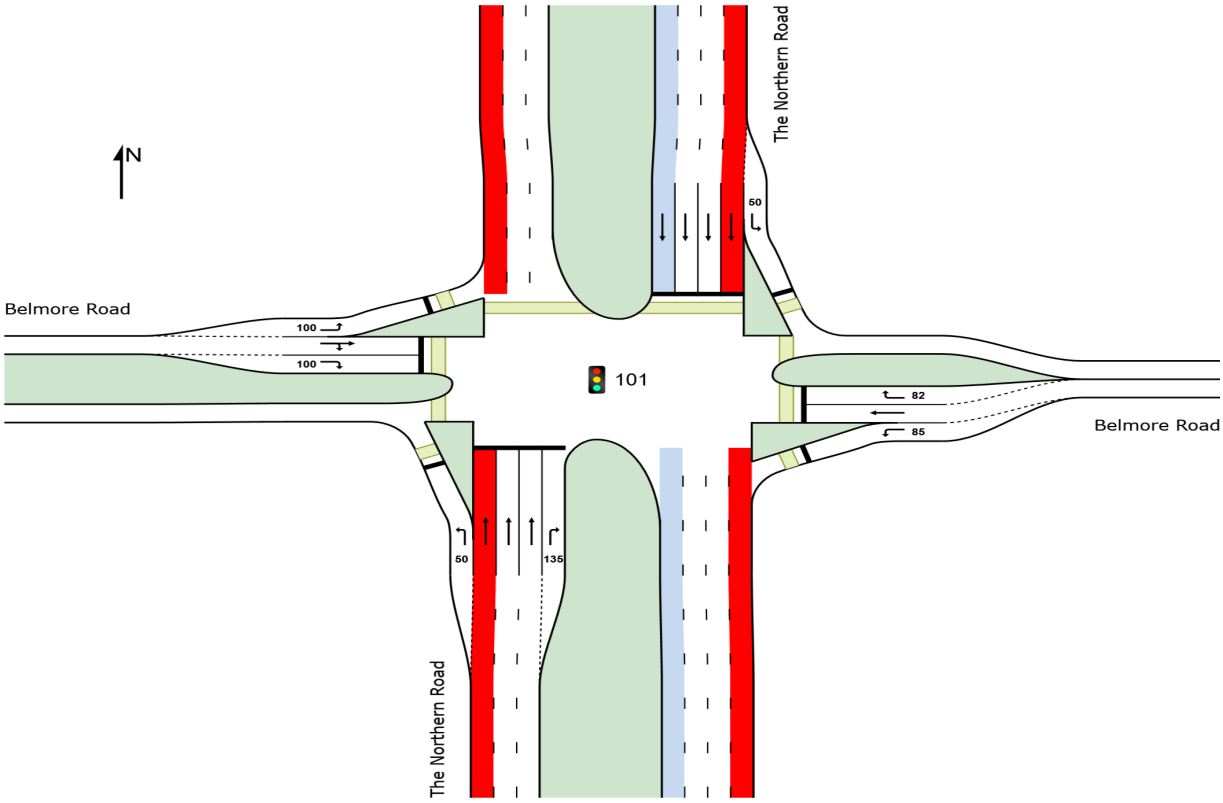
Site: 101 [TNR_Belmore (Site Folder: 50% PM with Bus Lanes)]

Peak: 5.30PM-6.30PM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	60	0.0	60	0.0	0.038	10.0	LOS A	0.4	3.1	0.16	0.64	0.16	50.6
2	T1	All MCs	1145	11.1	1145	11.1	0.412	9.6	LOS A	15.0	110.6	0.44	0.40	0.44	70.0
3	R2	All MCs	5	20.0	5	20.0	* 0.076	81.2	LOS F	0.4	3.0	0.98	0.65	0.98	24.0
Approach			1211	10.6	1211	10.6	0.412	9.9	LOS A	15.0	110.6	0.43	0.41	0.43	67.9
East: Belmore Road															
4	L2	All MCs	1	0.0	1	0.0	0.002	13.2	LOS A	0.0	0.2	0.39	0.58	0.39	46.6
5	T1	All MCs	13	0.0	13	0.0	* 0.113	69.9	LOS E	0.8	5.9	0.98	0.67	0.98	28.4
6	R2	All MCs	1	0.0	1	0.0	0.010	73.6	LOS F	0.1	0.5	0.96	0.59	0.96	32.7
Approach			15	0.0	15	0.0	0.113	66.1	LOS E	0.8	5.9	0.93	0.66	0.93	29.5
North: The Northern Road															
7	L2	All MCs	11	70.0	11	70.0	0.010	19.9	LOS B	0.1	0.8	0.16	0.61	0.16	58.4
8	T1	All MCs	2355	6.1	2355	6.1	* 0.648	20.9	LOS B	32.5	234.5	0.68	0.62	0.68	62.2
Approach			2365	6.4	2365	6.4	0.648	20.9	LOS B	32.5	234.5	0.68	0.62	0.68	59.6
West: Belmore Road															
10	L2	All MCs	40	2.6	40	2.6	0.079	7.5	LOS A	0.5	3.3	0.29	0.58	0.29	57.8
11	T1	All MCs	2	0.0	2	0.0	* 0.240	63.0	LOS E	3.0	21.4	0.95	0.74	0.95	26.4
12	R2	All MCs	93	1.1	93	1.1	0.240	67.2	LOS E	3.0	21.4	0.95	0.74	0.95	26.0
Approach			135	1.6	135	1.6	0.240	49.4	LOS D	3.0	21.4	0.76	0.69	0.76	33.5
All Vehicles			3725	7.6	3725	7.6	0.648	18.5	LOS B	32.5	234.5	0.60	0.56	0.60	60.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

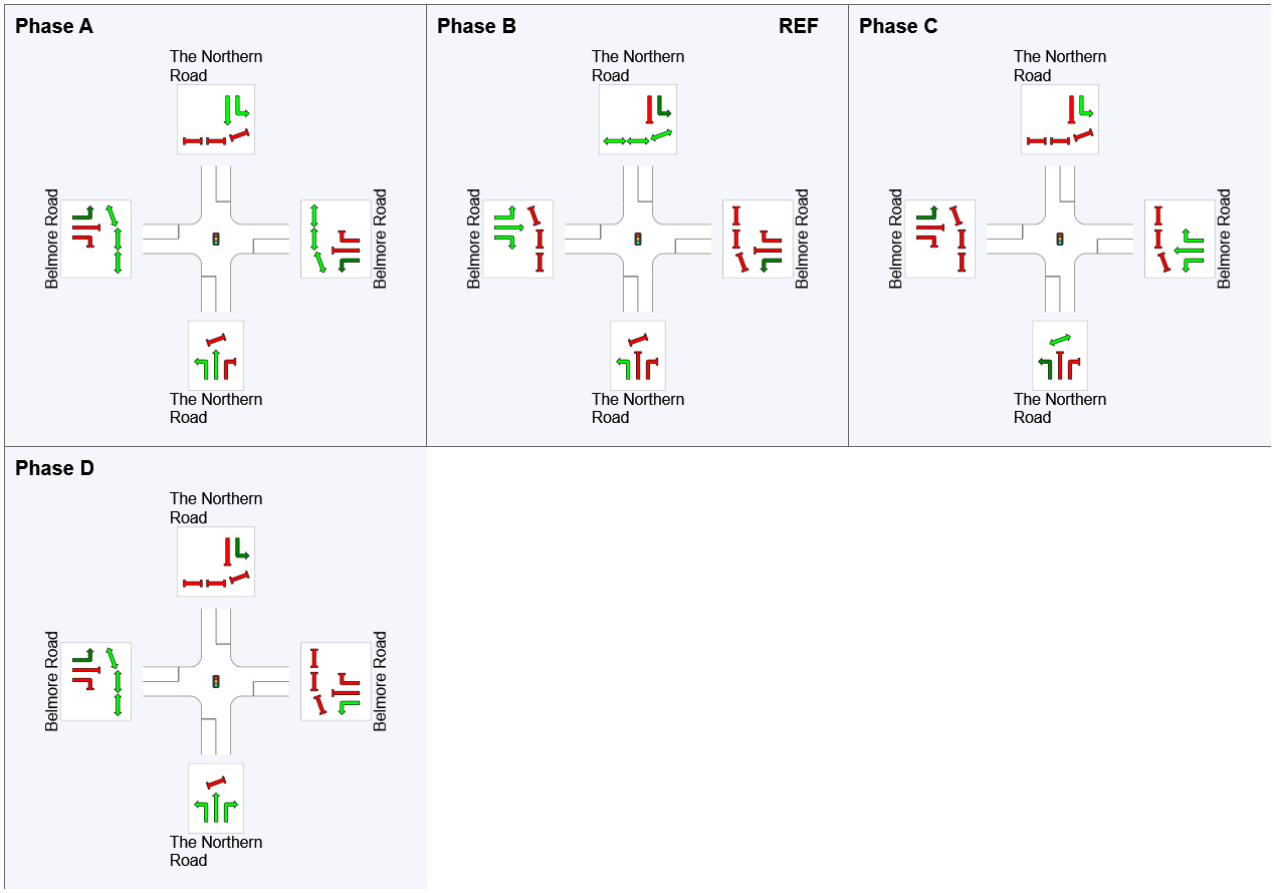
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Belmore Road												
P21	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P22	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

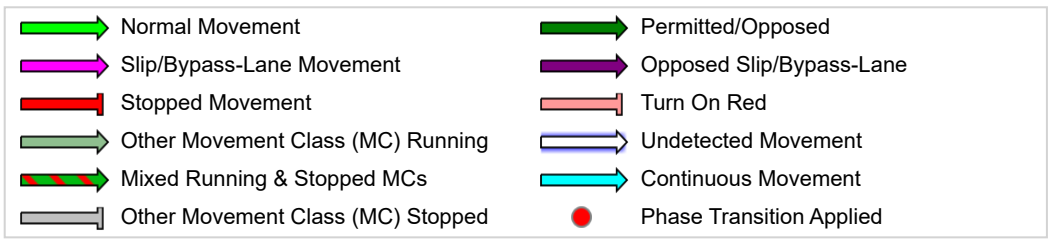
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Belmore Road												
P41	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P42	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	47	0	21	35
Green Time (sec)	87	15	8	6
Phase Time (sec)	93	21	14	12
Phase Split	66%	15%	10%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

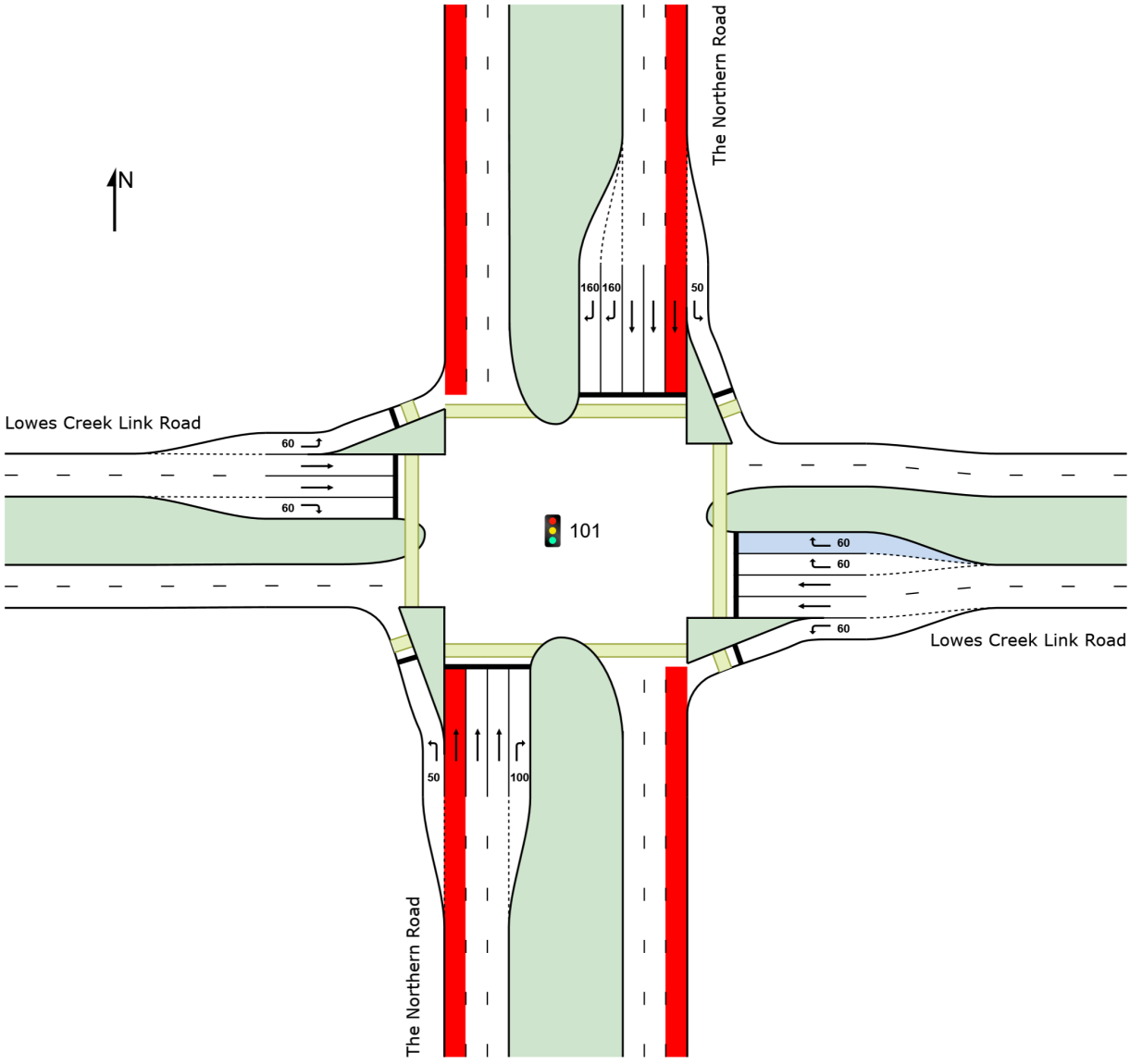
Site: 101 [TNR_Lowes Creek Link (Site Folder: 50% PM with Bus Lanes)]

Peak: 4.30PM-5.30PM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D, c1
Output Phase Sequence: A, B, C, D, c1
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	163	0.0	163	0.0	0.151	22.0	LOS B	5.1	35.6	0.50	0.73	0.50	53.8
2	T1	All MCs	960	15.5	960	15.5	0.468	22.1	LOS B	19.0	144.2	0.67	0.59	0.67	60.6
3	R2	All MCs	1	0.0	1	0.0	*0.013	78.8	LOS F	0.1	0.5	0.97	0.59	0.97	36.2
Approach			1124	13.2	1124	13.2	0.468	22.2	LOS B	19.0	144.2	0.65	0.61	0.65	59.4
East: Lowes Creek Link Road															
4	L2	All MCs	1	0.0	1	0.0	0.004	58.0	LOS E	0.1	0.4	0.87	0.59	0.87	40.1
5	T1	All MCs	2	0.0	2	0.0	0.004	56.4	LOS D	0.1	0.4	0.89	0.53	0.89	28.6
6	R2	All MCs	168	4.4	168	4.4	*0.935	94.3	LOS F	6.8	49.4	1.00	1.04	1.52	20.6
Approach			172	4.3	172	4.3	0.935	93.6	LOS F	6.8	49.4	1.00	1.03	1.51	20.8
North: The Northern Road															
7	L2	All MCs	195	5.9	195	5.9	0.156	14.8	LOS B	4.4	32.0	0.36	0.70	0.36	45.0
8	T1	All MCs	2280	7.3	2280	7.3	*0.986	66.1	LOS E	96.5	702.2	0.98	1.14	1.21	42.6
9	R2	All MCs	225	0.0	225	0.0	0.472	75.7	LOS F	7.3	51.0	0.97	0.79	0.97	25.3
Approach			2700	6.6	2700	6.6	0.986	63.2	LOS E	96.5	702.2	0.94	1.08	1.13	39.6
West: Lowes Creek Link Road															
10	L2	All MCs	100	1.1	100	1.1	0.230	50.9	LOS D	5.5	38.9	0.85	0.75	0.85	28.6
11	T1	All MCs	12	0.0	12	0.0	0.023	57.1	LOS E	0.3	2.4	0.90	0.60	0.90	28.4
12	R2	All MCs	12	0.0	12	0.0	0.125	75.8	LOS F	0.8	5.5	0.98	0.68	0.98	36.1
Approach			123	0.9	123	0.9	0.230	53.8	LOS D	5.5	38.9	0.87	0.73	0.87	29.6
All Vehicles			4119	8.1	4119	8.1	0.986	53.0	LOS D	96.5	702.2	0.86	0.94	1.01	42.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

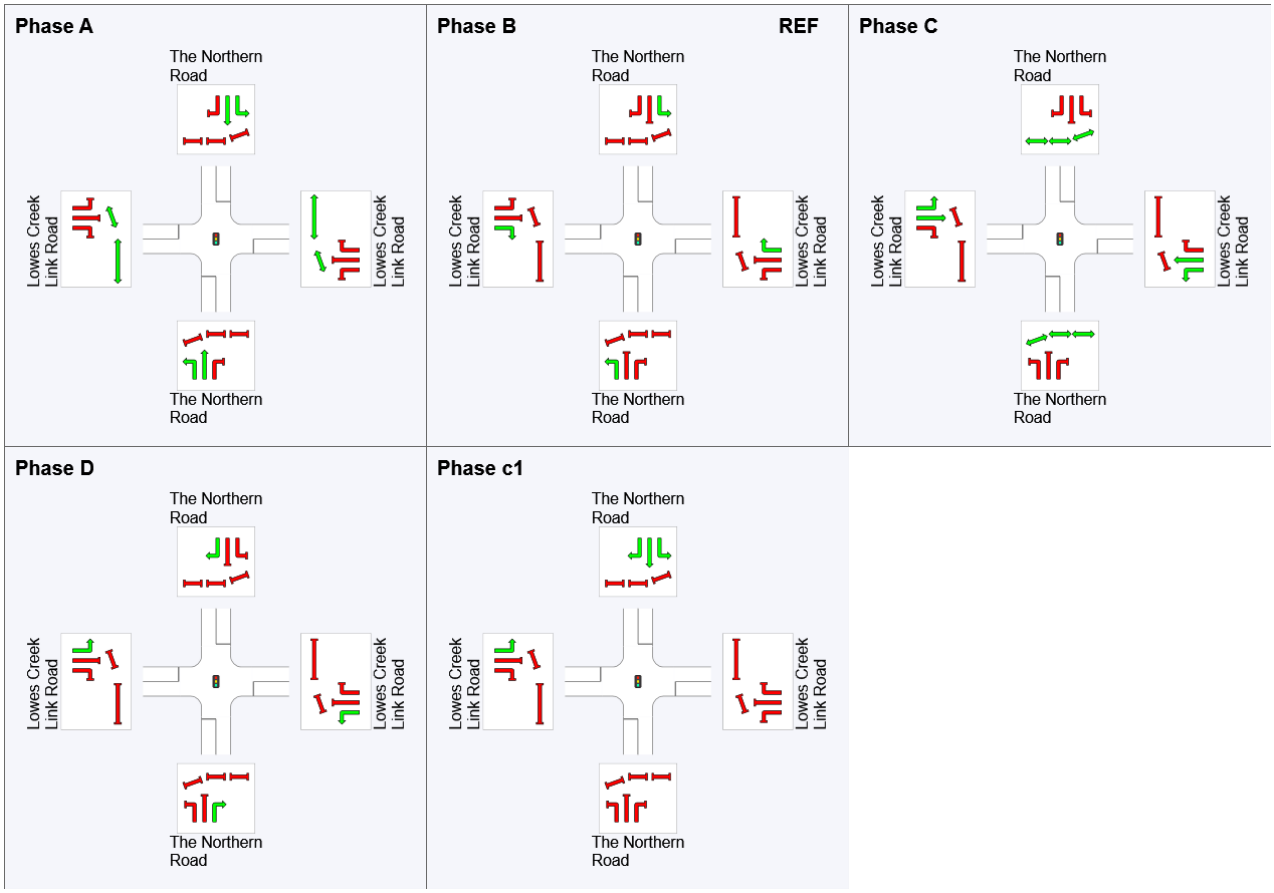
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Lowes Creek Link Road												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

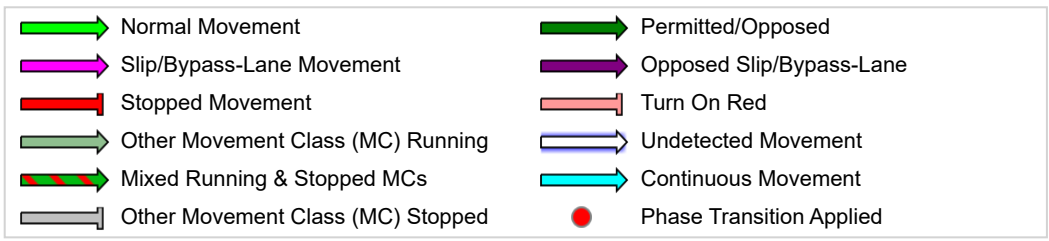
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Lowes Creek Link Road												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D	c1
Phase Change Time (sec)	61	0	13	37	49
Green Time (sec)	73	7	18	6	6
Phase Time (sec)	79	13	24	12	12
Phase Split	56%	9%	17%	9%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

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

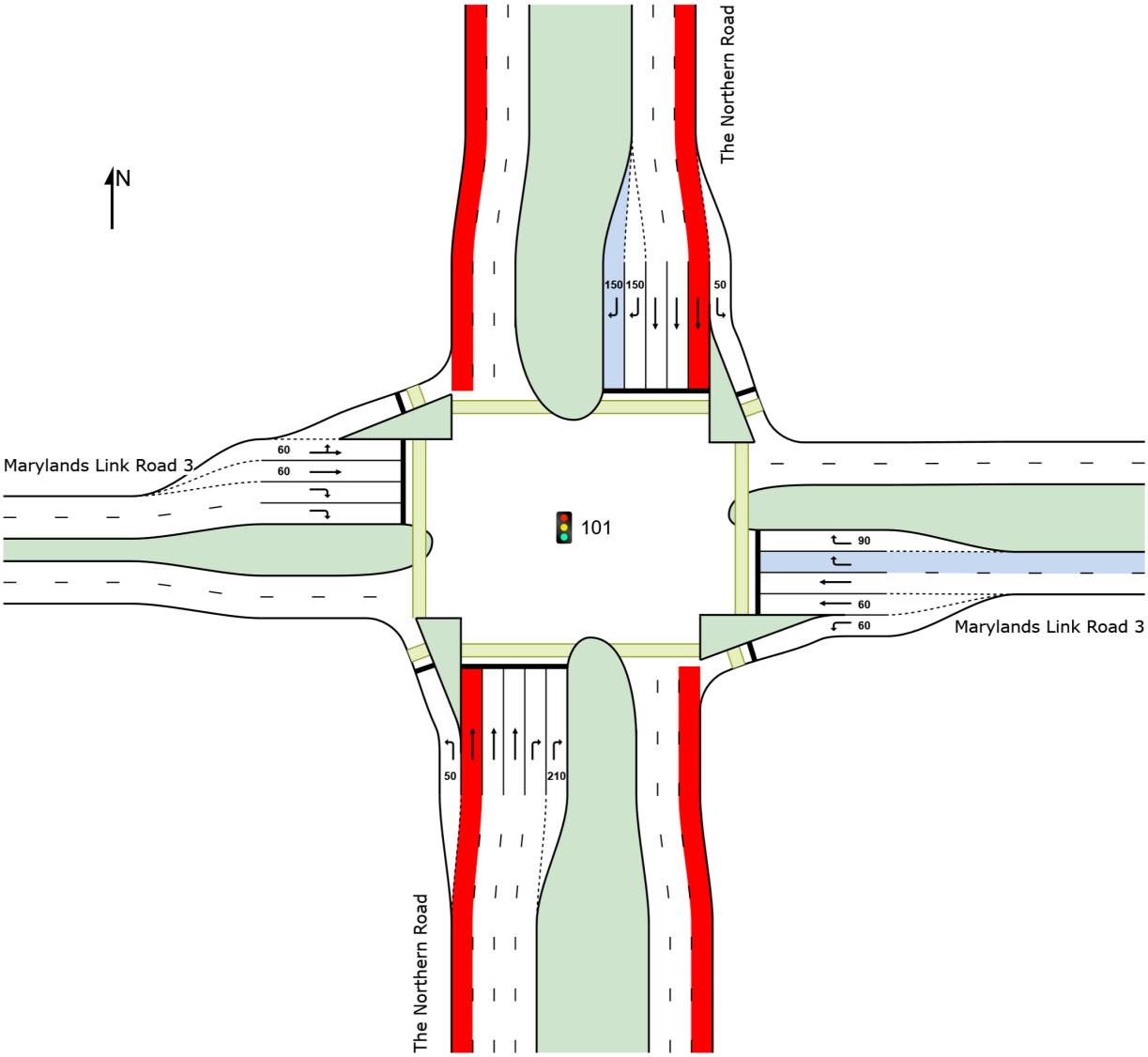
Site: 101 [TNR_Marylands Link 3 (Site Folder: 50% PM with Bus Lanes)]

Peak: 5.30PM-6.30PM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
7	L2	All MCs	165	0.0	165	0.0	0.173	26.4	LOS B	5.9	41.2	0.57	0.74	0.57	45.5
8	T1	All MCs	969	12.8	969	12.8	0.435	18.9	LOS B	17.7	131.3	0.62	0.55	0.62	65.5
9	R2	All MCs	43	0.0	43	0.0	0.203	78.6	LOS F	1.5	10.3	0.99	0.71	0.99	29.8
Approach			1178	10.5	1178	10.5	0.435	22.1	LOS B	17.7	131.3	0.63	0.58	0.63	61.1
East: Marylands Link Road 3															
10	L2	All MCs	151	1.4	151	1.4	* 0.882	83.6	LOS F	11.5	81.2	1.00	1.00	1.31	27.9
11	T1	All MCs	192	0.0	192	0.0	0.313	56.8	LOS E	5.9	41.0	0.93	0.73	0.93	28.5
12	R2	All MCs	187	1.7	187	1.7	* 0.893	87.8	LOS F	7.3	51.6	1.00	1.00	1.40	33.8
Approach			529	1.0	529	1.0	0.893	75.4	LOS F	11.5	81.2	0.97	0.90	1.20	30.5
North: The Northern Road															
1	L2	All MCs	77	5.5	77	5.5	0.084	25.5	LOS B	2.6	19.0	0.53	0.71	0.53	52.2
2	T1	All MCs	1963	6.9	1963	6.9	* 0.912	43.0	LOS D	65.2	471.1	0.96	0.95	1.04	55.1
3	R2	All MCs	196	0.0	196	0.0	* 0.922	99.7	LOS F	7.8	54.4	1.00	0.96	1.46	33.0
Approach			2236	6.3	2236	6.3	0.922	47.4	LOS D	65.2	471.1	0.95	0.94	1.06	50.5
West: Marylands Link Road 3															
4	L2	All MCs	42	0.0	42	0.0	0.244	69.7	LOS E	2.7	19.2	0.97	0.74	0.97	37.2
5	T1	All MCs	60	0.0	60	0.0	0.196	55.5	LOS D	3.6	25.1	0.91	0.70	0.91	28.8
6	R2	All MCs	92	0.0	92	0.0	0.431	76.6	LOS F	3.2	22.3	1.00	0.74	1.00	29.6
Approach			194	0.0	194	0.0	0.431	68.6	LOS E	3.6	25.1	0.96	0.73	0.96	31.2
All Vehicles			4137	6.5	4137	6.5	0.922	44.8	LOS D	65.2	471.1	0.86	0.82	0.95	48.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

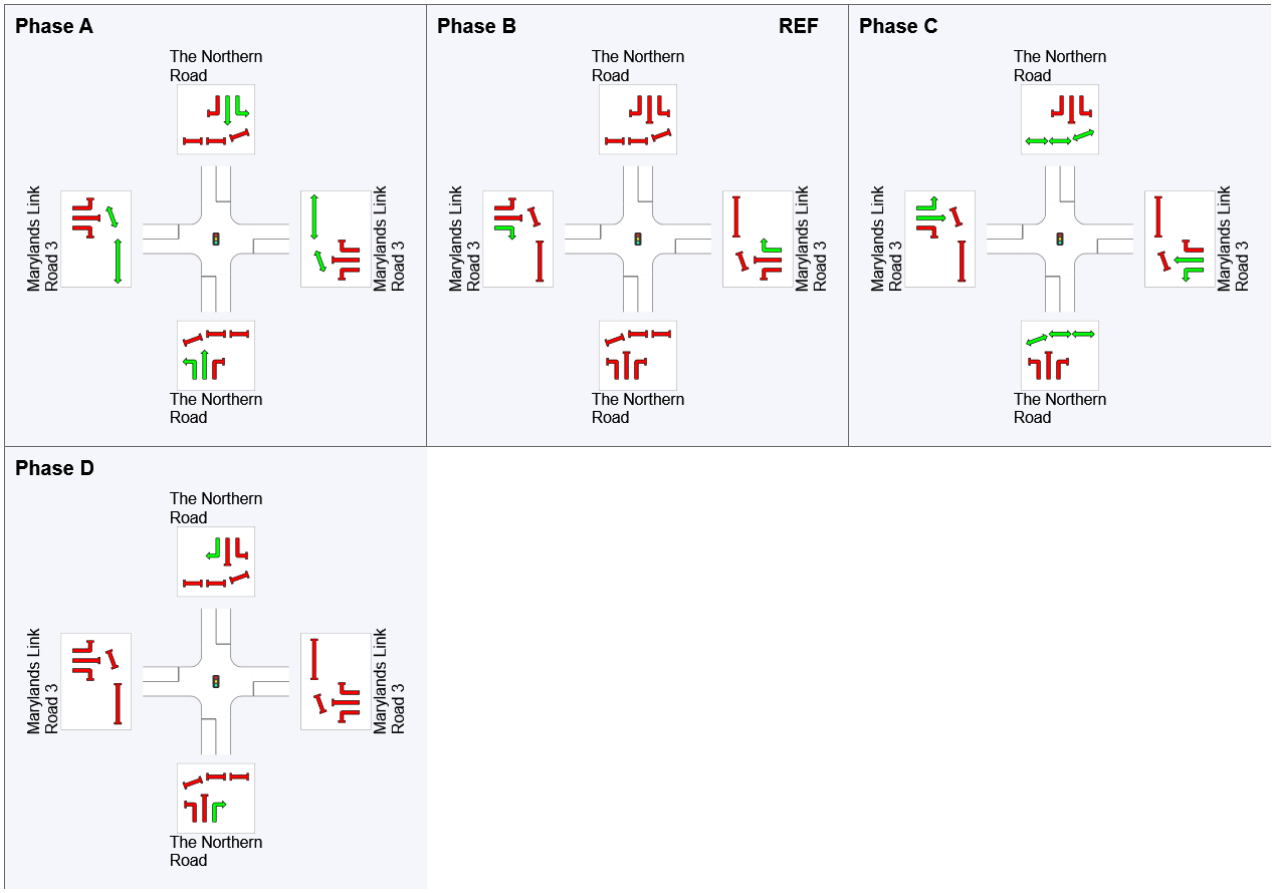
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link Road 3												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

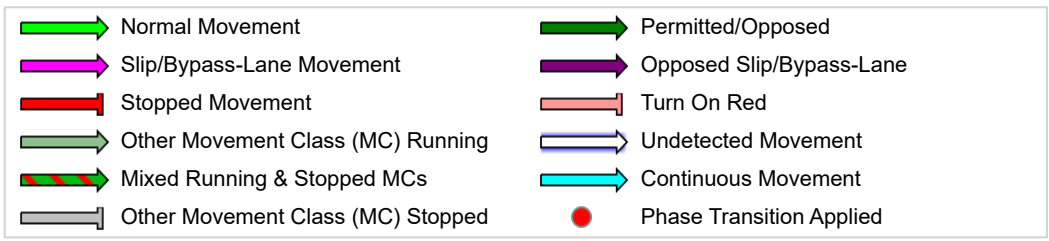
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link Road 3												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	56	0	14	42
Green Time (sec)	78	8	22	8
Phase Time (sec)	84	14	28	14
Phase Split	60%	10%	20%	10%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

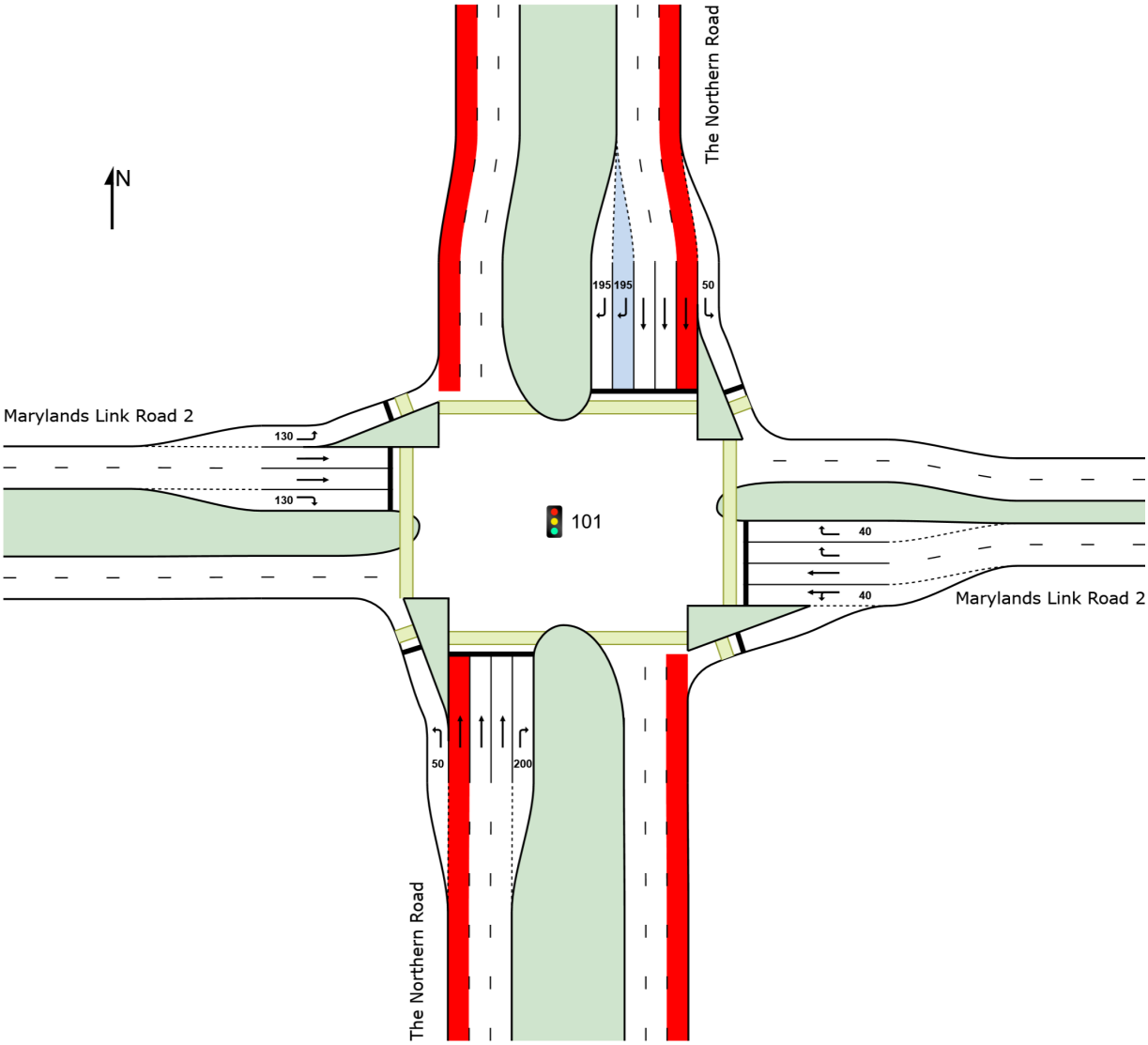
Site: 101 [TNR_Marylands Link 2 (Site Folder: 50% PM with Bus Lanes)]

AM Peak: 5.30PM-6.30PM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	56	0.0	56	0.0	0.064	28.4	LOS B	2.0	14.2	0.57	0.71	0.57	50.7
2	T1	All MCs	1046	11.7	1046	11.7	0.509	23.3	LOS B	21.7	159.7	0.70	0.62	0.70	62.6
3	R2	All MCs	3	0.0	3	0.0	0.013	64.7	LOS E	0.2	1.3	0.89	0.64	0.89	39.2
Approach			1105	11.0	1105	11.0	0.509	23.7	LOS B	21.7	159.7	0.69	0.63	0.69	61.9
East: Marylands Link Road 2															
4	L2	All MCs	12	0.0	12	0.0	0.186	68.5	LOS E	3.1	21.8	0.92	0.71	0.92	39.8
5	T1	All MCs	92	0.0	92	0.0	0.186	56.5	LOS D	3.1	21.9	0.92	0.70	0.92	28.3
6	R2	All MCs	45	0.0	45	0.0	*0.284	78.5	LOS F	1.6	11.2	1.00	0.71	1.00	29.3
Approach			148	0.0	148	0.0	0.284	64.1	LOS E	3.1	21.9	0.94	0.70	0.94	29.6
North: The Northern Road															
7	L2	All MCs	17	0.0	17	0.0	0.019	27.9	LOS B	0.6	4.2	0.55	0.68	0.55	44.8
8	T1	All MCs	1795	7.3	1795	7.3	*0.894	40.3	LOS C	57.8	418.4	0.96	0.93	1.03	54.6
9	R2	All MCs	409	1.3	409	1.3	*0.865	83.2	LOS F	15.2	107.9	1.00	0.96	1.23	29.2
Approach			2221	6.2	2221	6.2	0.894	48.1	LOS D	57.8	418.4	0.97	0.94	1.06	48.5
West: Marylands Link Road 2															
10	L2	All MCs	122	0.0	122	0.0	*0.837	81.4	LOS F	9.1	63.4	1.00	0.95	1.25	28.4
11	T1	All MCs	23	0.0	23	0.0	0.042	55.5	LOS D	0.7	4.8	0.89	0.62	0.89	28.8
12	R2	All MCs	1	0.0	1	0.0	0.013	75.3	LOS F	0.1	0.5	0.97	0.58	0.97	36.0
Approach			146	0.0	146	0.0	0.837	77.3	LOS F	9.1	63.4	0.98	0.90	1.19	28.5
All Vehicles			3621	7.2	3621	7.2	0.894	42.5	LOS D	57.8	418.4	0.88	0.83	0.95	50.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

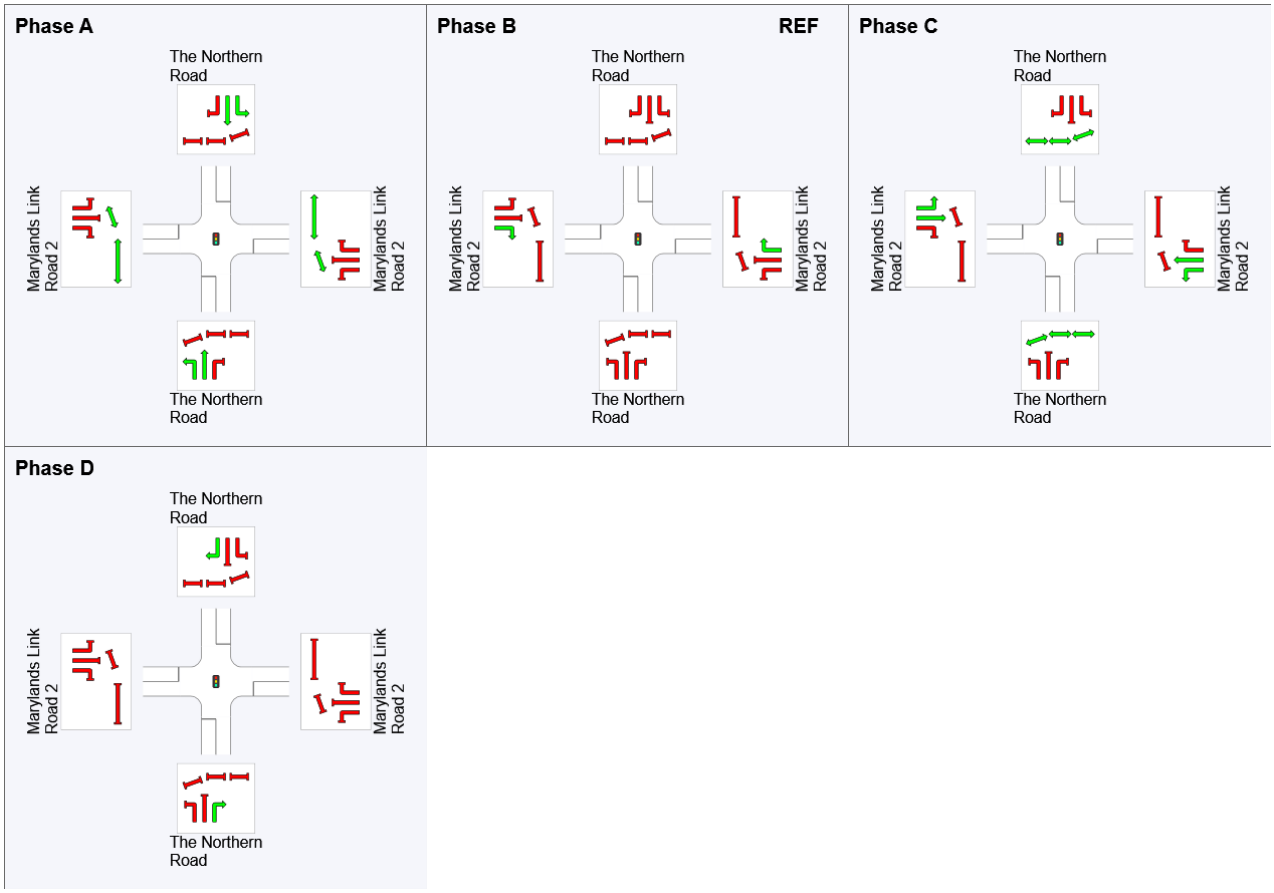
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link Road 2												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

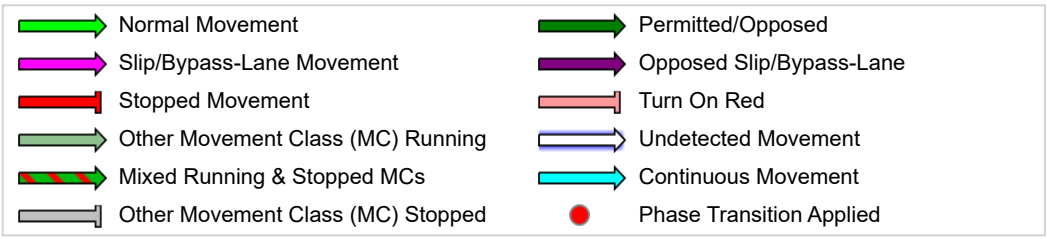
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link Road 2												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	62	0	12	38
Green Time (sec)	72	6	20	18
Phase Time (sec)	78	12	26	24
Phase Split	56%	9%	19%	17%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

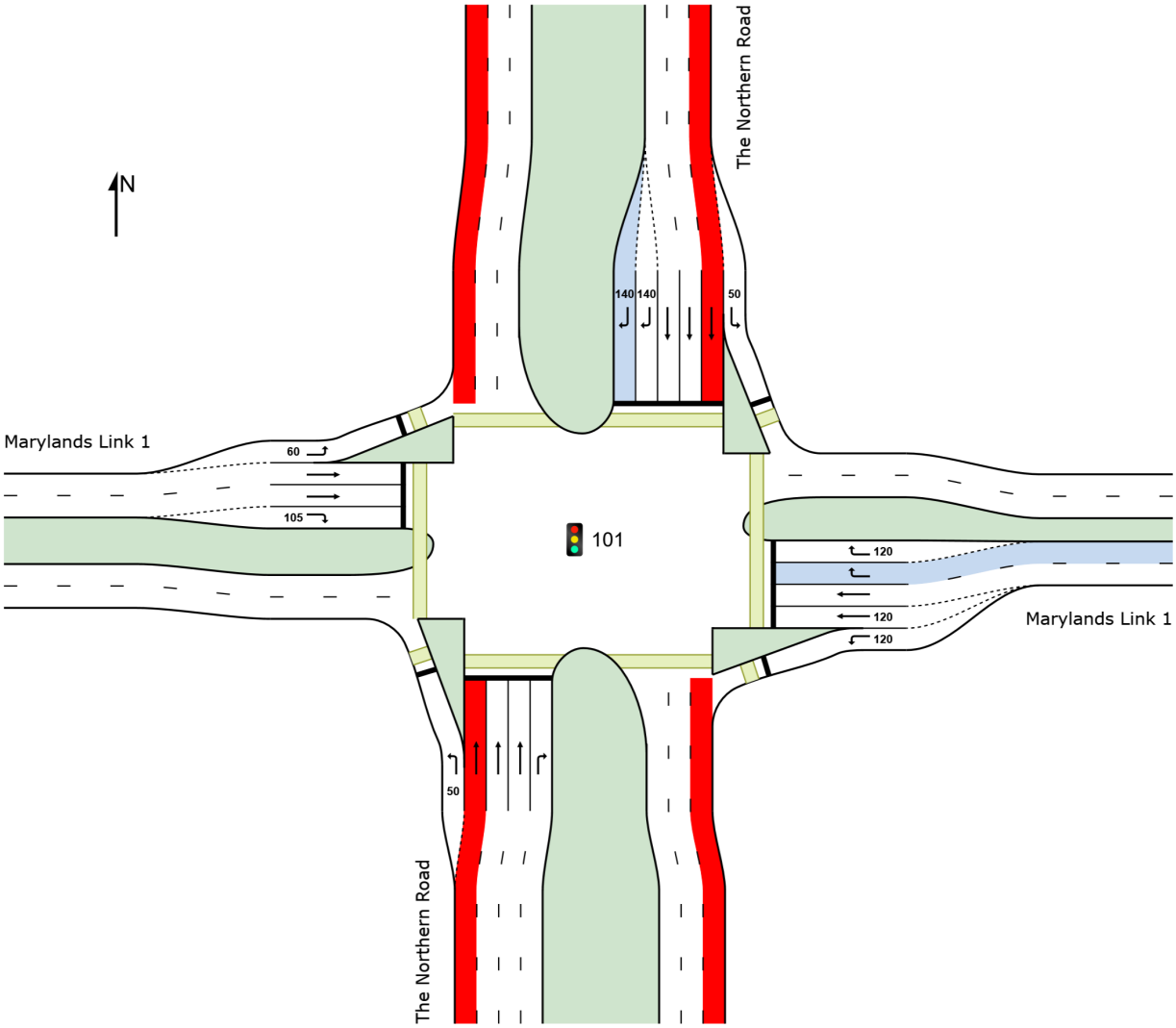
Site: 101 [TNR_Marylands Link 1 (Site Folder: 50% PM with Bus Lanes)]

Peak: 4.30PM-5.30PM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	188	3.4	188	3.4	0.255	36.4	LOS C	8.4	60.4	0.70	0.77	0.70	43.4
2	T1	All MCs	643	17.0	643	17.0	0.348	26.3	LOS B	12.7	95.0	0.69	0.59	0.69	62.0
3	R2	All MCs	122	6.0	122	6.0	* 0.739	79.1	LOS F	8.7	63.7	1.00	0.86	1.12	31.8
Approach			954	12.9	954	12.9	0.739	35.1	LOS C	12.7	95.0	0.73	0.66	0.75	53.6
East: Marylands Link 1															
4	L2	All MCs	145	12.3	145	12.3	* 0.745	73.6	LOS F	10.2	78.9	1.00	0.88	1.11	31.7
5	T1	All MCs	243	1.7	243	1.7	0.353	54.6	LOS D	7.3	52.0	0.92	0.74	0.92	29.0
6	R2	All MCs	281	3.0	281	3.0	* 0.721	72.9	LOS F	9.8	70.2	1.00	0.87	1.09	36.5
Approach			669	4.6	669	4.6	0.745	66.4	LOS E	10.2	78.9	0.97	0.83	1.03	33.1
North: The Northern Road															
7	L2	All MCs	380	2.5	380	2.5	0.562	53.0	LOS D	19.7	141.0	0.82	0.83	0.82	45.8
8	T1	All MCs	1267	11.7	1267	11.7	* 0.718	33.5	LOS C	33.0	245.0	0.86	0.78	0.86	58.7
9	R2	All MCs	102	2.1	102	2.1	0.300	73.6	LOS F	3.4	23.9	0.97	0.75	0.97	37.1
Approach			1749	9.1	1749	9.1	0.718	40.1	LOS C	33.0	245.0	0.86	0.79	0.86	52.9
West: Marylands Link 1															
10	L2	All MCs	51	22.9	51	22.9	0.277	67.4	LOS E	3.2	27.2	0.95	0.75	0.95	36.9
11	T1	All MCs	116	1.8	116	1.8	0.168	52.4	LOS D	3.4	23.8	0.88	0.68	0.88	29.5
12	R2	All MCs	118	4.5	118	4.5	0.611	70.7	LOS F	8.0	57.8	1.00	0.80	1.01	32.8
Approach			284	6.7	284	6.7	0.611	62.7	LOS E	8.0	57.8	0.94	0.74	0.95	32.4
All Vehicles			3657	9.1	3657	9.1	0.745	45.3	LOS D	33.0	245.0	0.85	0.76	0.87	47.2

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

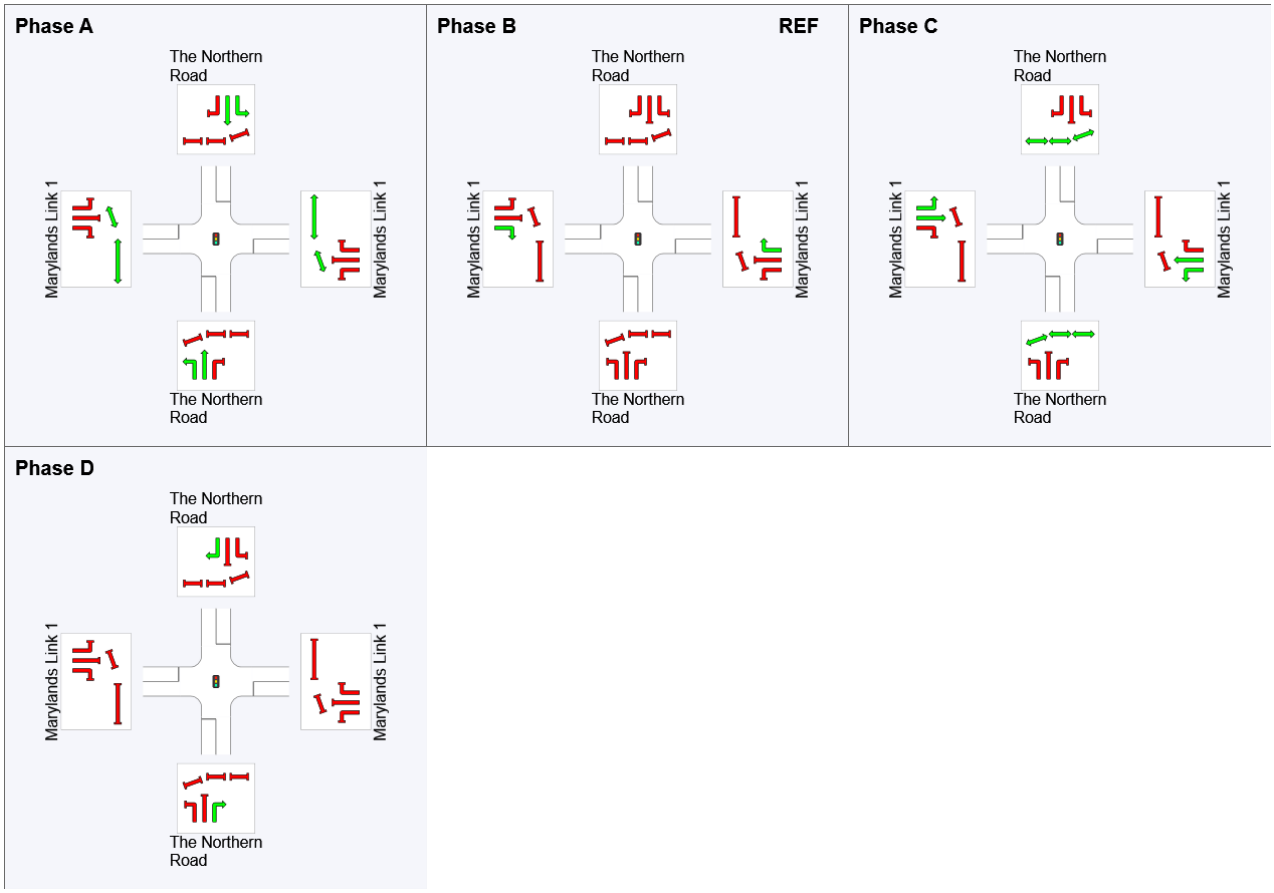
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link 1												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

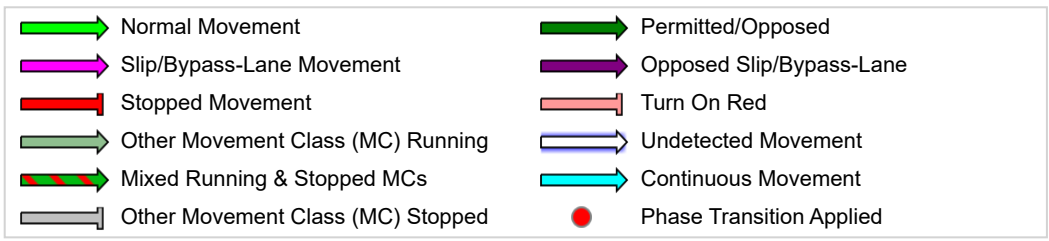
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link 1												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	71	0	21	52
Green Time (sec)	63	15	25	13
Phase Time (sec)	69	21	31	19
Phase Split	49%	15%	22%	14%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

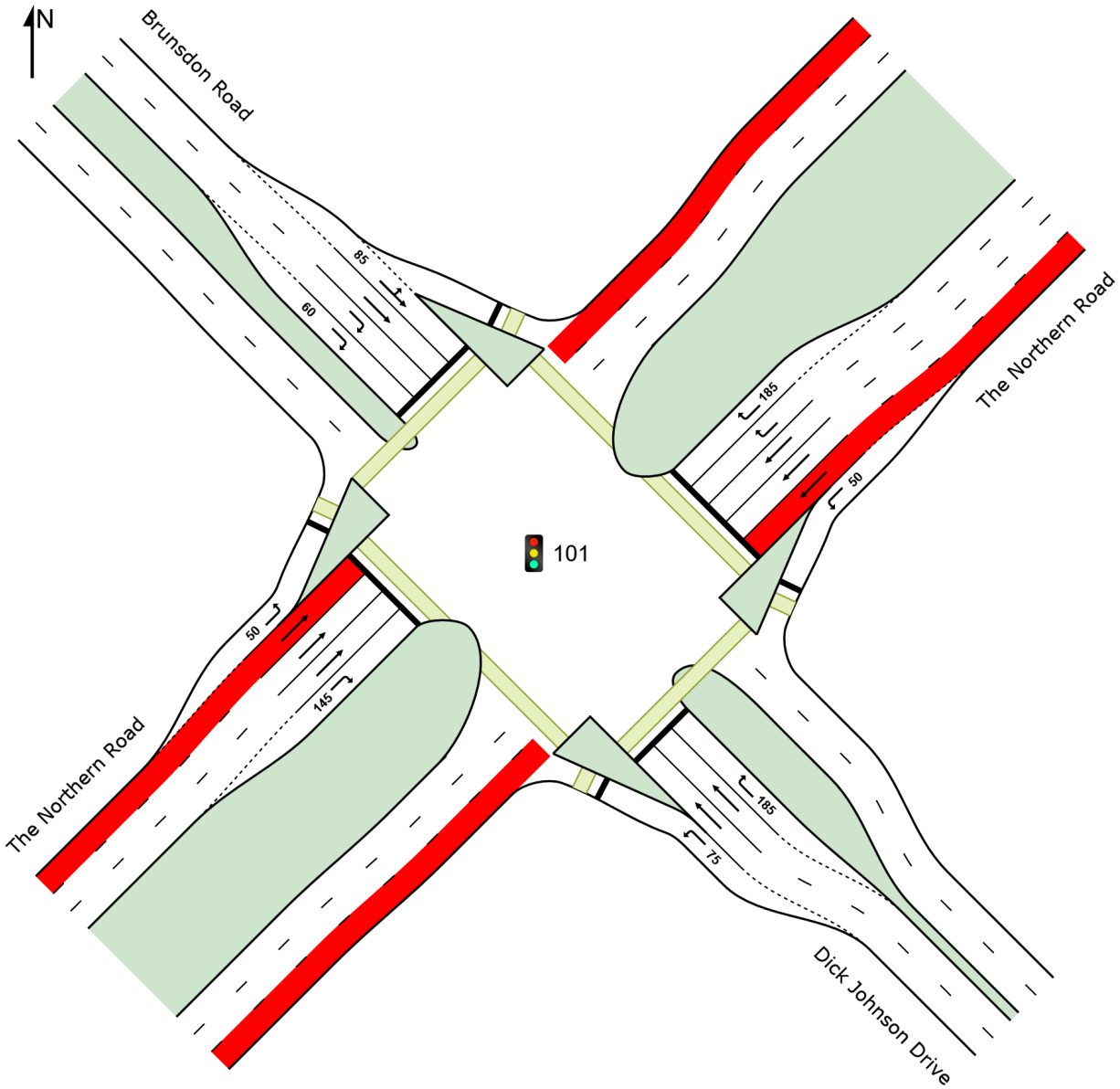
Site: 101 [TNR_Dick Johnson Dr_Brunson Rd (Site Folder: 50% PM with Bus Lanes)]

Peak: 4.30PM-5.30PM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Dick Johnson Drive															
4	L2	All MCs	1	0.0	1	0.0	0.009	71.2	LOS F	0.1	0.5	0.95	0.59	0.95	38.1
5	T1	All MCs	197	5.3	197	5.3	*0.406	61.5	LOS E	6.3	46.1	0.96	0.76	0.96	27.5
6	R2	All MCs	1	0.0	1	0.0	0.013	75.2	LOS F	0.1	0.5	0.97	0.58	0.97	26.9
Approach			199	5.3	199	5.3	0.406	61.7	LOS E	6.3	46.1	0.96	0.76	0.96	27.6
NorthEast: The Northern Road															
7	L2	All MCs	1	0.0	1	0.0	0.001	20.5	LOS B	0.0	0.2	0.44	0.62	0.44	45.2
8	T1	All MCs	1418	12.0	1418	12.0	*0.594	19.4	LOS B	27.5	205.7	0.65	0.69	0.65	54.3
9	R2	All MCs	44	2.4	44	2.4	*0.282	82.2	LOS F	1.6	11.1	1.00	0.71	1.00	26.0
Approach			1463	11.7	1463	11.7	0.594	21.3	LOS B	27.5	205.7	0.66	0.69	0.66	53.3
NorthWest: Brunsdon Road															
10	L2	All MCs	1	0.0	1	0.0	0.198	72.9	LOS F	2.9	21.0	0.93	0.70	0.93	30.1
11	T1	All MCs	94	4.5	94	4.5	0.198	59.4	LOS E	3.0	21.6	0.93	0.70	0.93	27.9
12	R2	All MCs	59	3.6	59	3.6	*0.380	79.3	LOS F	2.1	15.1	1.00	0.72	1.00	36.5
Approach			154	4.1	154	4.1	0.380	67.1	LOS E	3.0	21.6	0.96	0.71	0.96	31.8
SouthWest: The Northern Road															
1	L2	All MCs	324	1.0	324	1.0	0.308	23.7	LOS B	11.3	79.5	0.56	0.76	0.56	54.2
2	T1	All MCs	952	13.3	952	13.3	0.388	14.2	LOS A	15.0	111.5	0.54	0.48	0.54	68.1
3	R2	All MCs	1	0.0	1	0.0	0.013	78.8	LOS F	0.1	0.5	0.97	0.59	0.97	37.4
Approach			1277	10.1	1277	10.1	0.388	16.7	LOS B	15.0	111.5	0.54	0.55	0.54	63.9
All Vehicles			3093	10.2	3093	10.2	0.594	24.3	LOS B	27.5	205.7	0.65	0.64	0.65	53.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

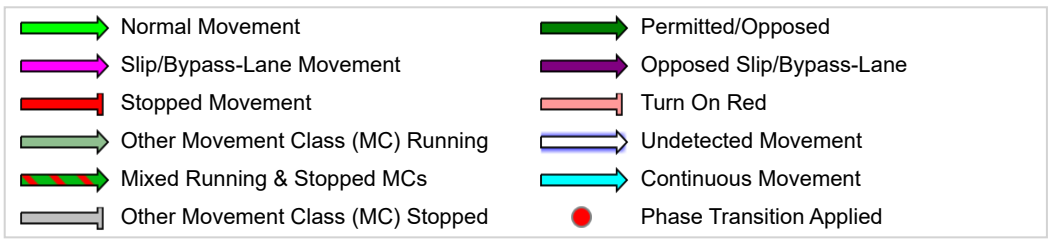
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Dick Johnson Drive												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
NorthEast: The Northern Road												
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
NorthWest: Brunsdon Road												

P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
SouthWest: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence

REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	48	0	12	36
Green Time (sec)	86	6	18	6
Phase Time (sec)	92	12	24	12
Phase Split	66%	9%	17%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

Site: 101 [Bringelly_Kelvin Park (Site Folder: 100% AM without Bus Lanes)]

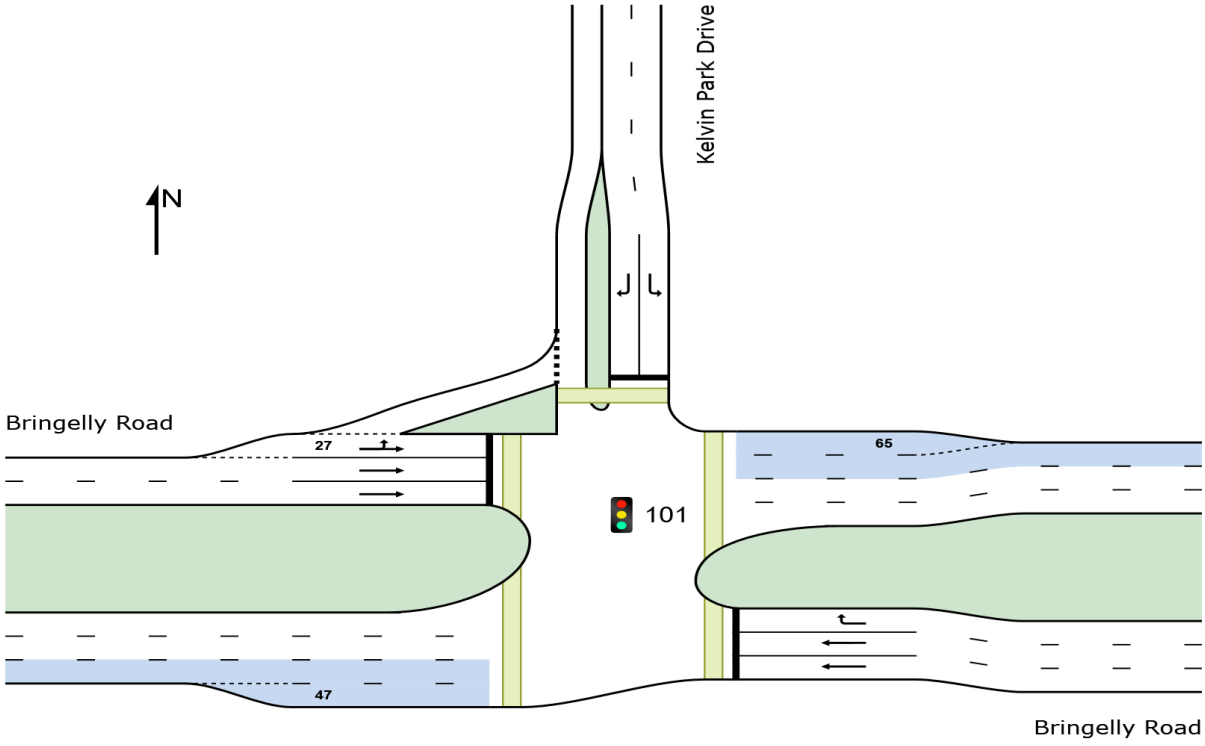
Peak Hour: 6.30AM-7.30AM

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bringelly Road															
5	T1	All MCs	888	10.4	888	10.4	* 0.312	4.7	LOS A	8.6	65.8	0.32	0.28	0.32	55.1
6	R2	All MCs	7	0.0	7	0.0	0.013	40.2	LOS C	0.3	2.4	0.71	0.64	0.71	34.0
Approach			896	10.3	896	10.3	0.312	5.0	LOS A	8.6	65.8	0.32	0.29	0.32	54.7
North: Kelvin Park Drive															
7	L2	All MCs	32	6.7	32	6.7	0.036	23.8	LOS B	1.1	8.0	0.54	0.65	0.54	39.0
9	R2	All MCs	52	0.0	52	0.0	* 0.299	70.0	LOS E	3.4	23.7	0.97	0.75	0.97	24.5
Approach			83	2.5	83	2.5	0.299	52.5	LOS D	3.4	23.7	0.81	0.71	0.81	28.8
West: Bringelly Road															
10	L2	All MCs	1	0.0	1	0.0	0.001	6.0	LOS A	0.0	0.0	0.11	0.56	0.11	47.8
11	T1	All MCs	1	0.0	1	0.0	0.001	24.2	LOS B	0.0	0.1	0.59	0.35	0.59	41.2
Approach			2	0.0	2	0.0	0.001	15.1	LOS B	0.0	0.1	0.35	0.45	0.35	44.3
All Vehicles			981	9.7	981	9.7	0.312	9.1	LOS A	8.6	65.8	0.36	0.32	0.36	50.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

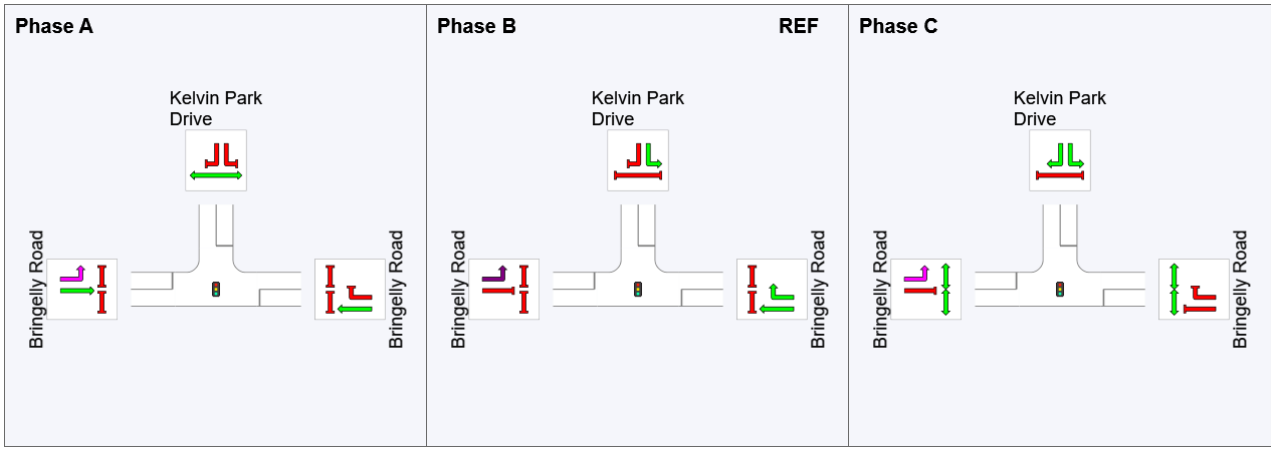
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

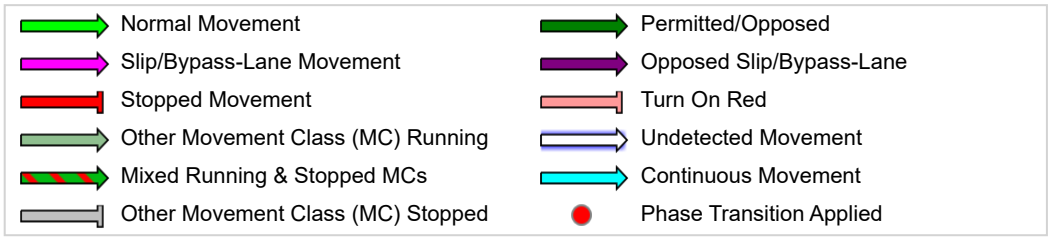
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Bringelly Road												
P21	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P22	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: Kelvin Park Drive												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Bringelly Road												
P41	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P42	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		250	263	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	75	0	50
Green Time (sec)	59	44	19
Phase Time (sec)	65	50	25
Phase Split	46%	36%	18%
Phase Frequency (%)	100.0	100.0	100.0

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

Site: 01 [TNR_Bringelly (Site Folder: 100% AM without Bus Lanes)]

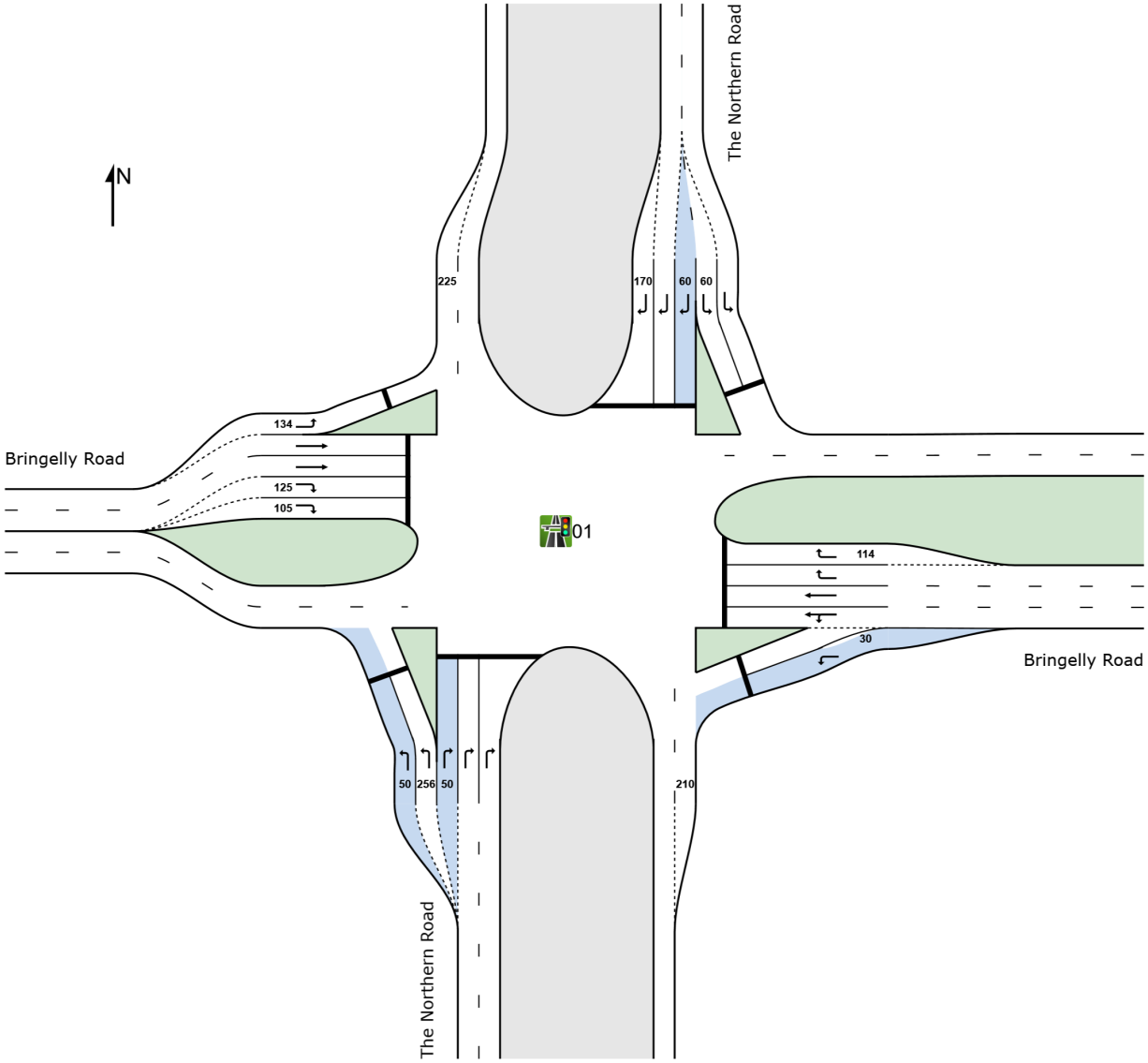
Peak: 5.30PM-6.30PM

Site Category: (None)
Single Point Interchange (Signals) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Three-Phase Leading Right Turns
Input Phase Sequence: 1, 2, 3, 4
Output Phase Sequence: 1, 2, 3, 4
Reference Phase: Phase 4

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	7	0.0	7	0.0	0.046	77.7	LOS F	0.3	1.8	0.98	0.63	0.98	29.1
3	R2	All MCs	740	4.6	740	4.6	* 0.574	52.7	LOS D	19.1	138.8	0.87	0.81	0.87	38.0
Approach			747	4.5	747	4.5	0.574	53.0	LOS D	19.1	138.8	0.87	0.81	0.87	36.2
East: Bringelly Road															
4	L2	All MCs	163	7.7	163	7.7	0.110	7.7	LOS A	1.9	13.9	0.18	0.60	0.18	65.6
5	T1	All MCs	296	12.8	296	12.8	0.180	23.7	LOS B	5.9	45.5	0.63	0.52	0.63	38.0
6	R2	All MCs	480	8.6	480	8.6	* 0.565	56.1	LOS D	14.4	108.5	0.93	0.82	0.93	31.3
Approach			939	9.8	939	9.8	0.565	37.5	LOS C	14.4	108.5	0.71	0.69	0.71	37.9
North: The Northern Road															
7	L2	All MCs	307	19.5	307	19.5	0.388	53.7	LOS D	8.8	72.0	0.88	0.79	0.88	29.1
9	R2	All MCs	127	11.6	127	11.6	0.100	40.1	LOS C	2.6	20.2	0.72	0.69	0.72	31.9
Approach			435	17.2	435	17.2	0.388	49.7	LOS D	8.8	72.0	0.84	0.76	0.84	29.8
West: Bringelly Road															
10	L2	All MCs	40	28.9	40	28.9	0.040	16.1	LOS B	1.0	8.5	0.38	0.63	0.38	45.5
11	T1	All MCs	544	6.4	544	6.4	* 0.565	48.6	LOS D	16.2	119.3	0.92	0.79	0.92	27.4
12	R2	All MCs	23	0.0	23	0.0	0.145	78.8	LOS F	0.8	5.6	0.99	0.68	0.99	33.8
Approach			607	7.6	607	7.6	0.565	47.6	LOS D	16.2	119.3	0.89	0.77	0.89	28.6
All Vehicles			2728	9.0	2728	9.0	0.574	45.9	LOS D	19.1	138.8	0.81	0.75	0.81	34.2

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

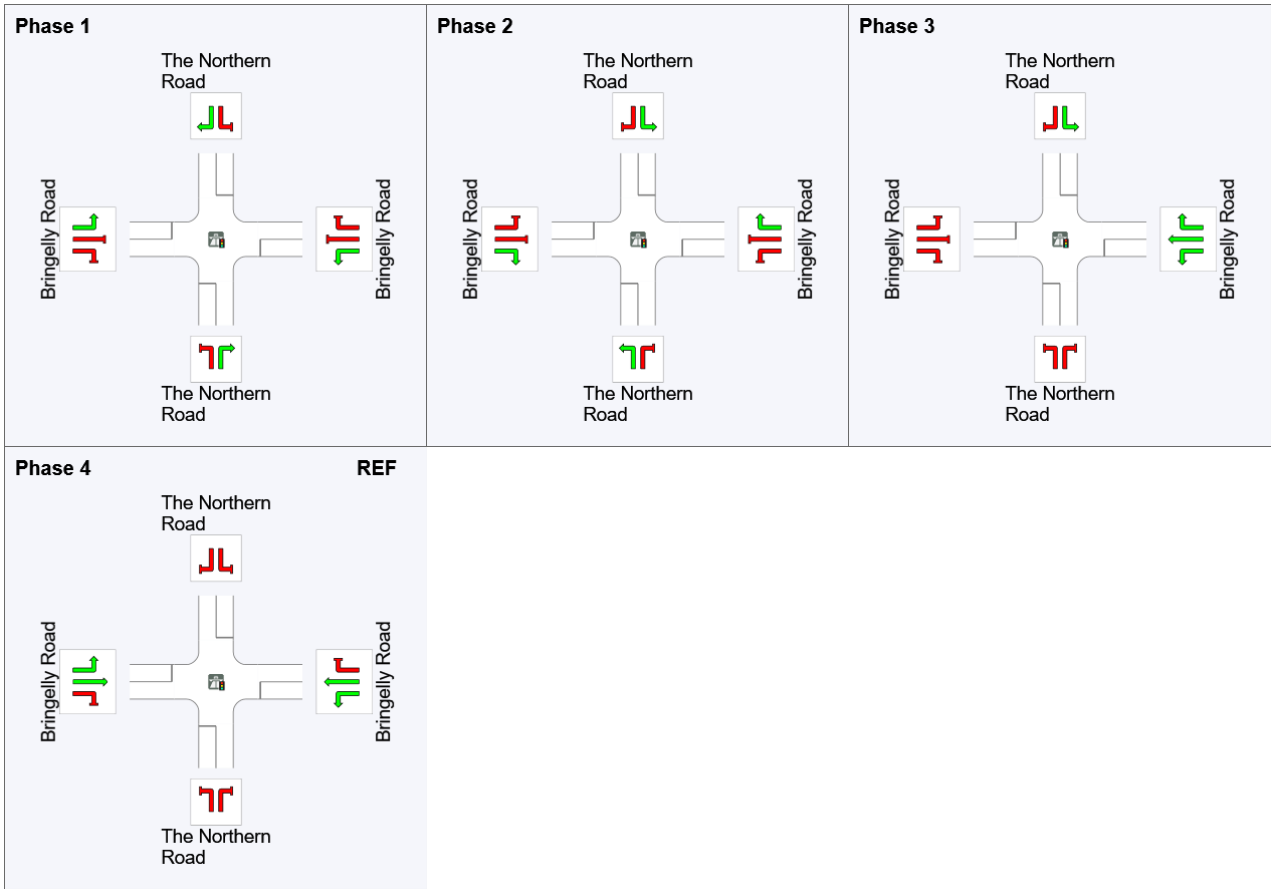
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

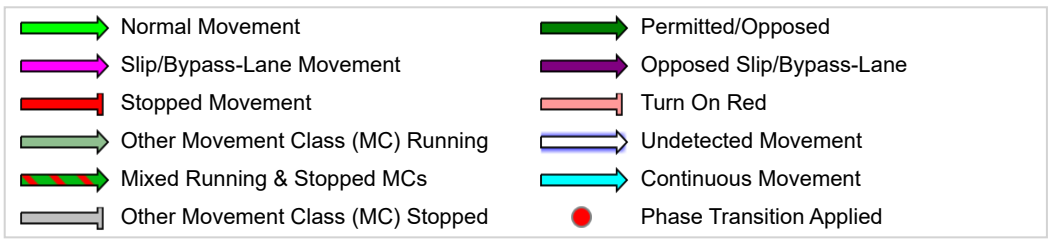
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	1	2	3	4
Phase Change Time (sec)	44	98	112	0
Green Time (sec)	46	6	20	36
Phase Time (sec)	54	14	28	44
Phase Split	39%	10%	20%	31%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

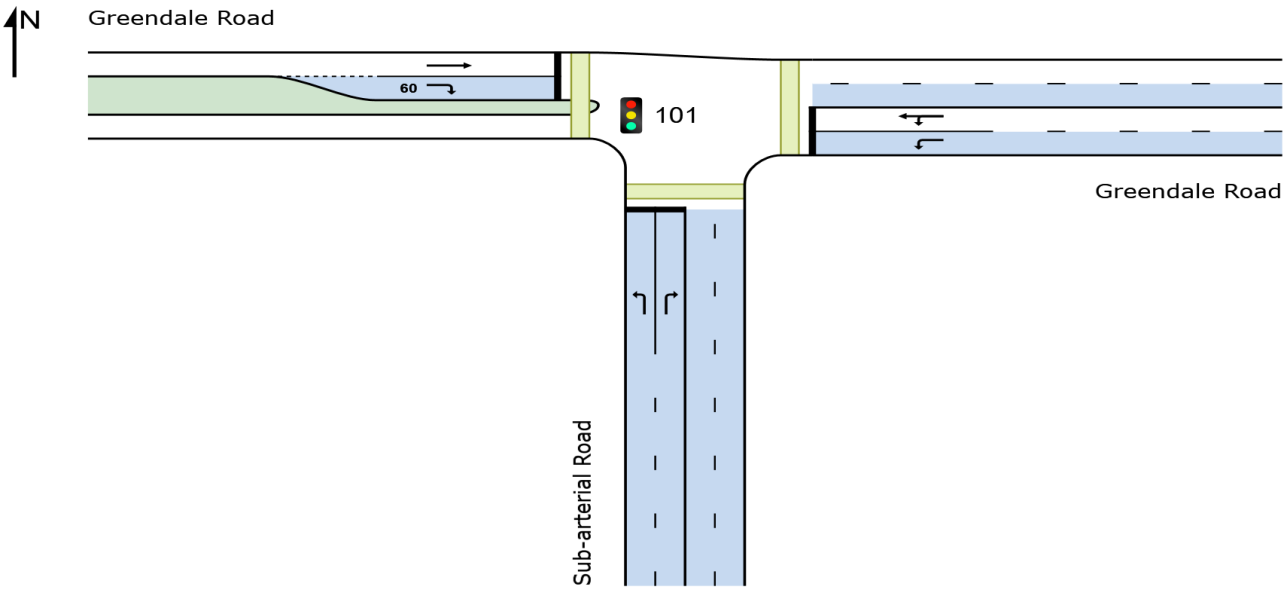
Site: 101 [Greendale Road_New Collector Road (Site Folder: 100% AM without Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sub-arterial Road															
1	L2	All MCs	55	1.9	55	1.9	0.038	8.0	LOS A	0.8	5.7	0.23	0.59	0.23	44.0
3	R2	All MCs	597	3.9	597	3.9	* 0.503	17.5	LOS B	20.4	147.6	0.55	0.74	0.55	39.5
Approach			652	3.7	652	3.7	0.503	16.7	LOS B	20.4	147.6	0.53	0.73	0.53	39.8
East: Greendale Road															
4	L2	All MCs	309	5.4	309	5.4	0.218	8.4	LOS A	5.1	37.7	0.27	0.62	0.27	43.8
5	T1	All MCs	63	41.7	63	41.7	* 0.384	64.9	LOS E	4.2	39.5	0.97	0.75	0.97	26.5
Approach			373	11.6	373	11.6	0.384	18.0	LOS B	5.1	39.5	0.39	0.64	0.39	39.4
West: Greendale Road															
11	T1	All MCs	113	15.9	113	15.9	0.248	44.2	LOS D	6.1	48.4	0.84	0.68	0.84	31.2
12	R2	All MCs	38	13.9	38	13.9	* 0.209	67.7	LOS E	2.4	19.0	0.95	0.73	0.95	25.6
Approach			151	15.4	151	15.4	0.248	50.1	LOS D	6.1	48.4	0.86	0.69	0.86	29.5
All Vehicles			1175	7.7	1175	7.7	0.503	21.4	LOS B	20.4	147.6	0.53	0.70	0.53	38.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

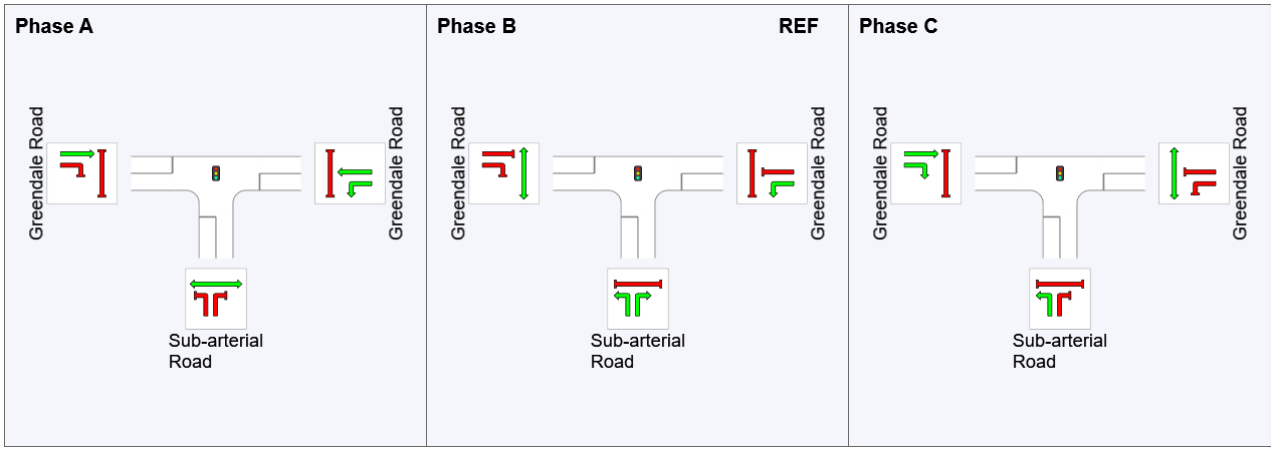
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

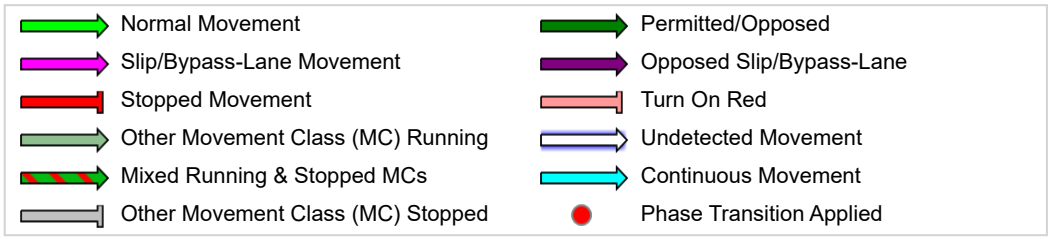
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sub-arterial Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Greendale Road												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Greendale Road												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		150	158	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	119	0	98
Green Time (sec)	15	92	15
Phase Time (sec)	21	98	21
Phase Split	15%	70%	15%
Phase Frequency (%)	100.0	100.0	100.0

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

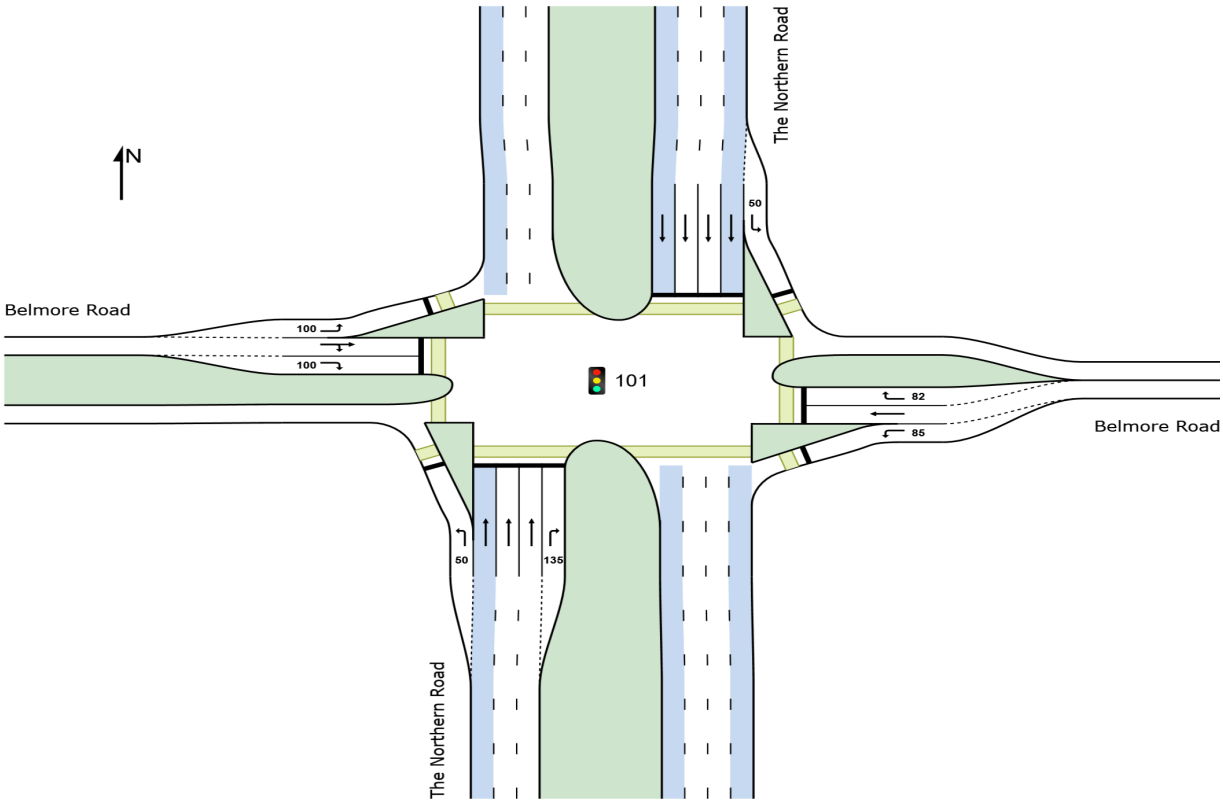
Site: 101 [TNR_Belmore (Site Folder: 100% AM without Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B*, C, D*
Output Phase Sequence: A, B*, C, D*
Reference Phase: Phase A
(* Variable Phase)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	24	0.0	24	0.0	0.015	30.7	LOS C	0.2	1.2	0.16	0.63	0.16	50.6
2	T1	All MCs	2031	6.4	2031	6.4	* 0.798	43.9	LOS D	39.4	290.6	0.92	0.84	0.92	51.1
3	R2	All MCs	1	0.0	1	0.0	0.013	85.1	LOS F	0.1	0.5	0.97	0.59	0.97	24.4
Approach			2056	6.3	2056	6.3	0.798	43.8	LOS D	39.4	290.6	0.91	0.84	0.91	46.4
East: Belmore Road															
4	L2	All MCs	14	0.0	14	0.0	0.014	8.8	LOS A	0.2	1.2	0.28	0.60	0.28	49.7
5	T1	All MCs	11	0.0	11	0.0	0.050	60.8	LOS E	0.6	4.5	0.92	0.63	0.92	30.5
6	R2	All MCs	9	55.6	9	55.6	* 0.066	68.1	LOS E	0.6	6.2	0.93	0.68	0.93	33.5
Approach			34	15.6	34	15.6	0.066	41.7	LOS C	0.6	6.2	0.67	0.63	0.67	36.3
North: The Northern Road															
7	L2	All MCs	6	16.7	6	16.7	0.005	13.5	LOS A	0.0	0.4	0.16	0.62	0.16	59.1
8	T1	All MCs	1045	15.1	1045	15.1	0.397	35.8	LOS C	13.0	103.1	0.79	0.67	0.79	51.1
Approach			1052	15.1	1052	15.1	0.397	35.7	LOS C	13.0	103.1	0.78	0.67	0.78	50.5
West: Belmore Road															
10	L2	All MCs	353	5.4	353	5.4	* 0.545	26.0	LOS B	16.4	120.3	0.85	0.86	0.85	48.1
11	T1	All MCs	7	0.0	7	0.0	0.197	38.1	LOS C	5.3	39.7	0.78	0.72	0.78	32.0
12	R2	All MCs	205	8.2	205	8.2	0.197	42.4	LOS C	5.3	39.7	0.78	0.72	0.78	31.9
Approach			565	6.3	565	6.3	0.545	32.1	LOS C	16.4	120.3	0.82	0.81	0.82	42.3
All Vehicles			3706	8.9	3706	8.9	0.798	39.7	LOS C	39.4	290.6	0.86	0.78	0.86	46.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

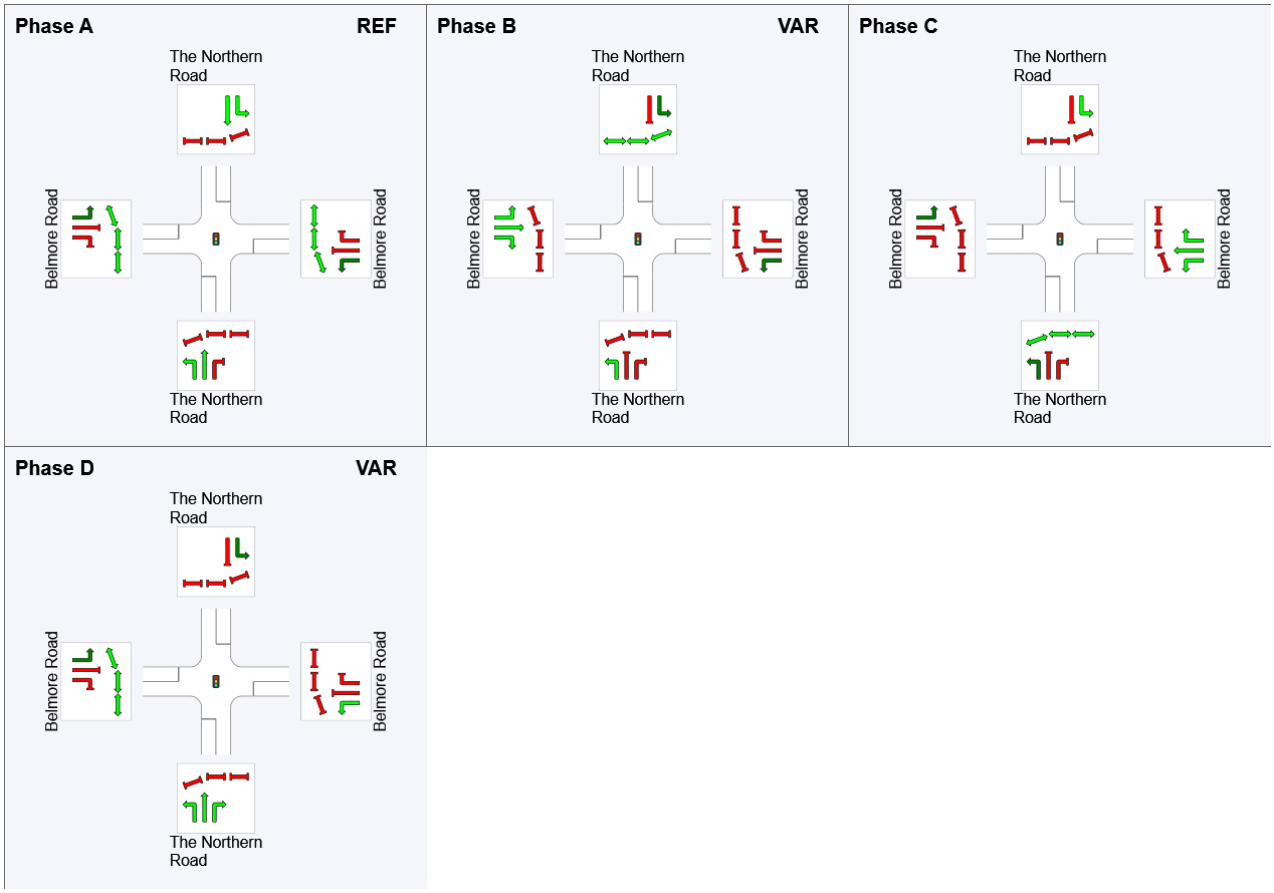
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92
P12	Stage 2	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Belmore Road												
P21	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P22	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

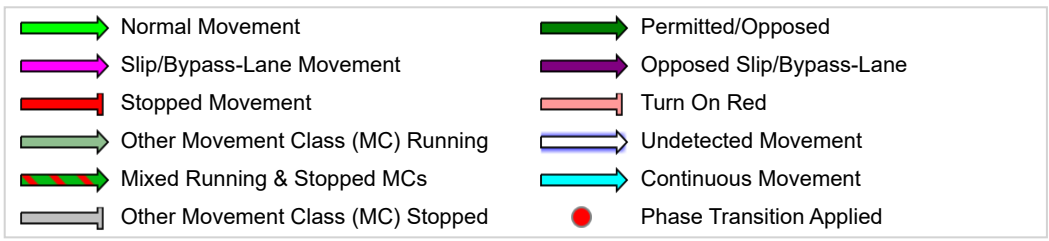
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Belmore Road												
P41	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P42	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		520	547	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	58	107	128
Green Time (sec)	52	43	15	6
Phase Time (sec)	58	49	21	12
Phase Split	41%	35%	15%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

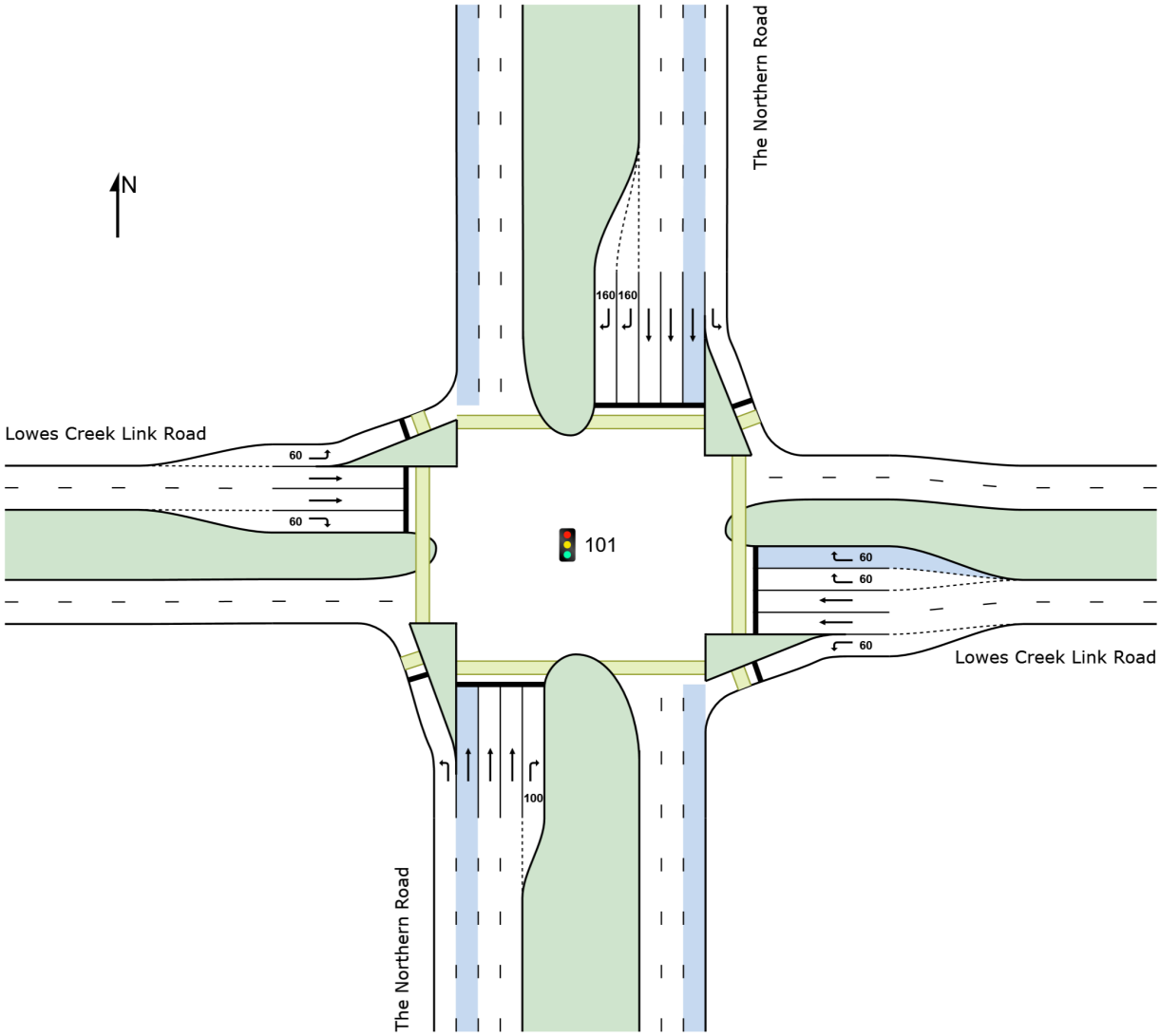
Site: 101 [TNR_Lowes Creek Link (Site Folder: 100% AM without Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import (2)
Input Phase Sequence: A, B, C, D, c1
Output Phase Sequence: A, B, C, D, c1
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	76	1.4	76	1.4	0.078	24.3	LOS B	2.5	17.5	0.52	0.71	0.52	52.8
2	T1	All MCs	1583	6.5	1583	6.5	* 0.718	41.0	LOS C	30.2	223.2	0.91	0.81	0.91	51.4
3	R2	All MCs	1	0.0	1	0.0	0.013	86.7	LOS F	0.1	0.5	0.97	0.59	0.97	36.2
Approach			1660	6.3	1660	6.3	0.718	40.2	LOS C	30.2	223.2	0.89	0.81	0.89	50.3
East: Lowes Creek Link Road															
4	L2	All MCs	1	0.0	1	0.0	0.004	58.0	LOS E	0.1	0.4	0.87	0.59	0.87	40.1
5	T1	All MCs	6	0.0	6	0.0	0.013	56.8	LOS E	0.2	1.3	0.89	0.57	0.89	28.5
6	R2	All MCs	159	10.6	159	10.6	0.339	64.4	LOS E	5.0	38.3	0.95	0.76	0.95	25.5
Approach			166	10.1	166	10.1	0.339	64.1	LOS E	5.0	38.3	0.95	0.76	0.95	25.7
North: The Northern Road															
7	L2	All MCs	157	6.7	157	6.7	0.126	14.6	LOS B	3.4	25.3	0.35	0.69	0.35	45.1
8	T1	All MCs	865	10.7	865	10.7	0.303	20.1	LOS B	11.0	83.9	0.61	0.53	0.61	62.0
9	R2	All MCs	116	7.3	116	7.3	0.191	61.6	LOS E	3.4	25.3	0.90	0.75	0.90	27.1
Approach			1138	9.8	1138	9.8	0.303	23.6	LOS B	11.0	83.9	0.60	0.57	0.60	55.6
West: Lowes Creek Link Road															
10	L2	All MCs	375	1.1	375	1.1	* 0.731	70.1	LOS E	23.2	164.1	0.97	0.86	0.97	27.8
11	T1	All MCs	2	0.0	2	0.0	0.004	64.6	LOS E	0.1	0.4	0.89	0.53	0.89	28.6
12	R2	All MCs	180	1.8	180	1.8	* 0.723	69.5	LOS E	12.3	87.3	1.00	0.87	1.06	37.5
Approach			557	1.3	557	1.3	0.731	69.9	LOS E	23.2	164.1	0.98	0.86	1.00	29.3
All Vehicles			3521	6.8	3521	6.8	0.731	40.7	LOS C	30.2	223.2	0.81	0.74	0.82	46.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

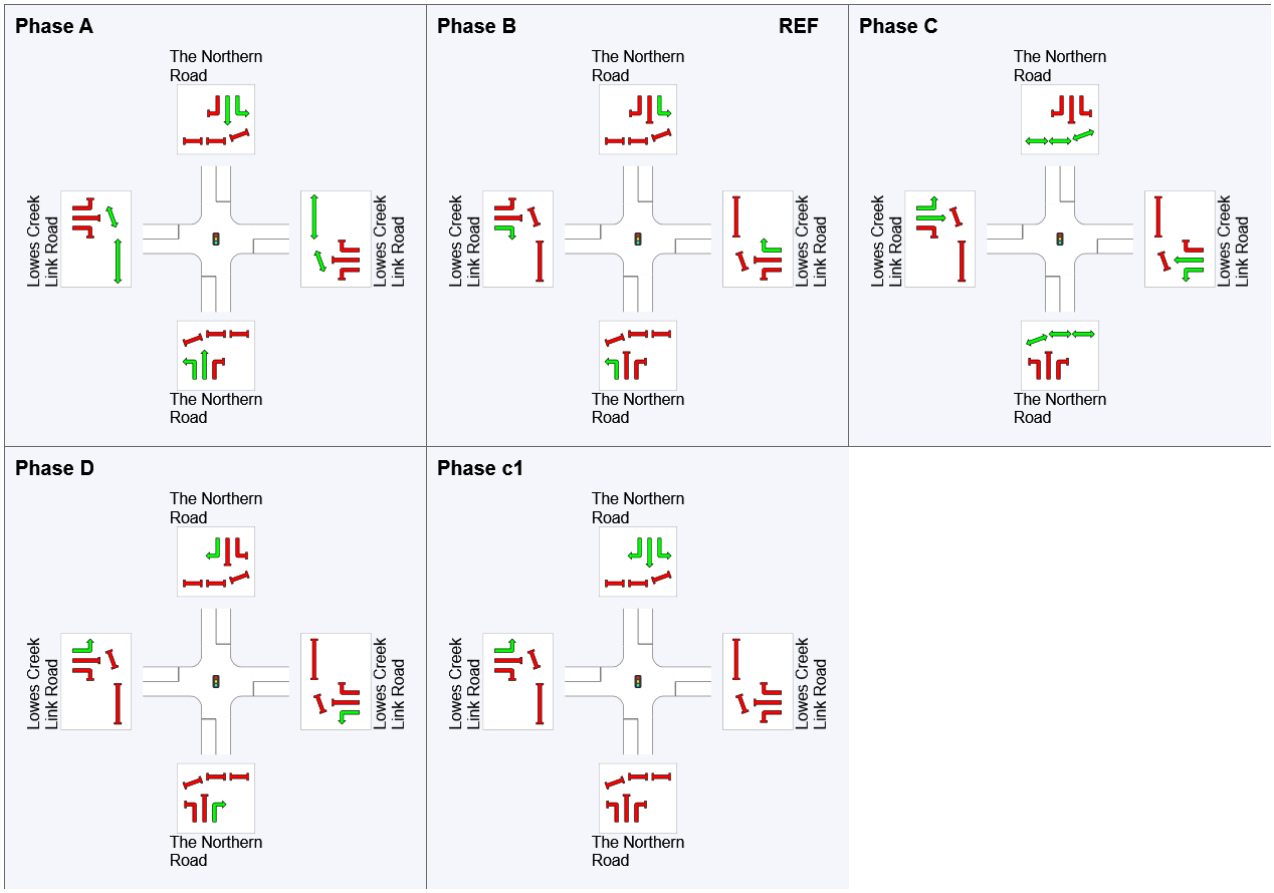
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Lowes Creek Link Road												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

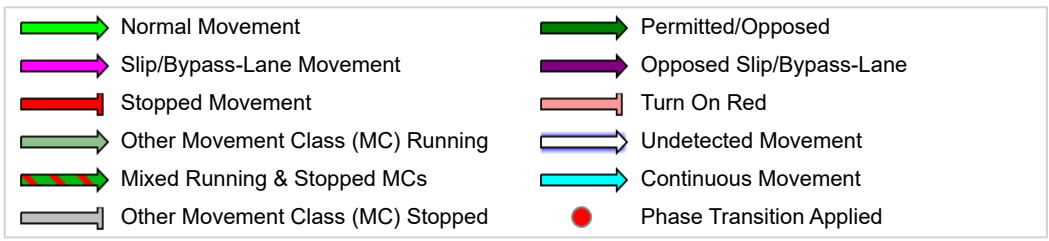
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Lowes Creek Link Road												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D	c1
Phase Change Time (sec)	79	0	25	49	61
Green Time (sec)	55	19	18	6	12
Phase Time (sec)	61	25	24	12	18
Phase Split	44%	18%	17%	9%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

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

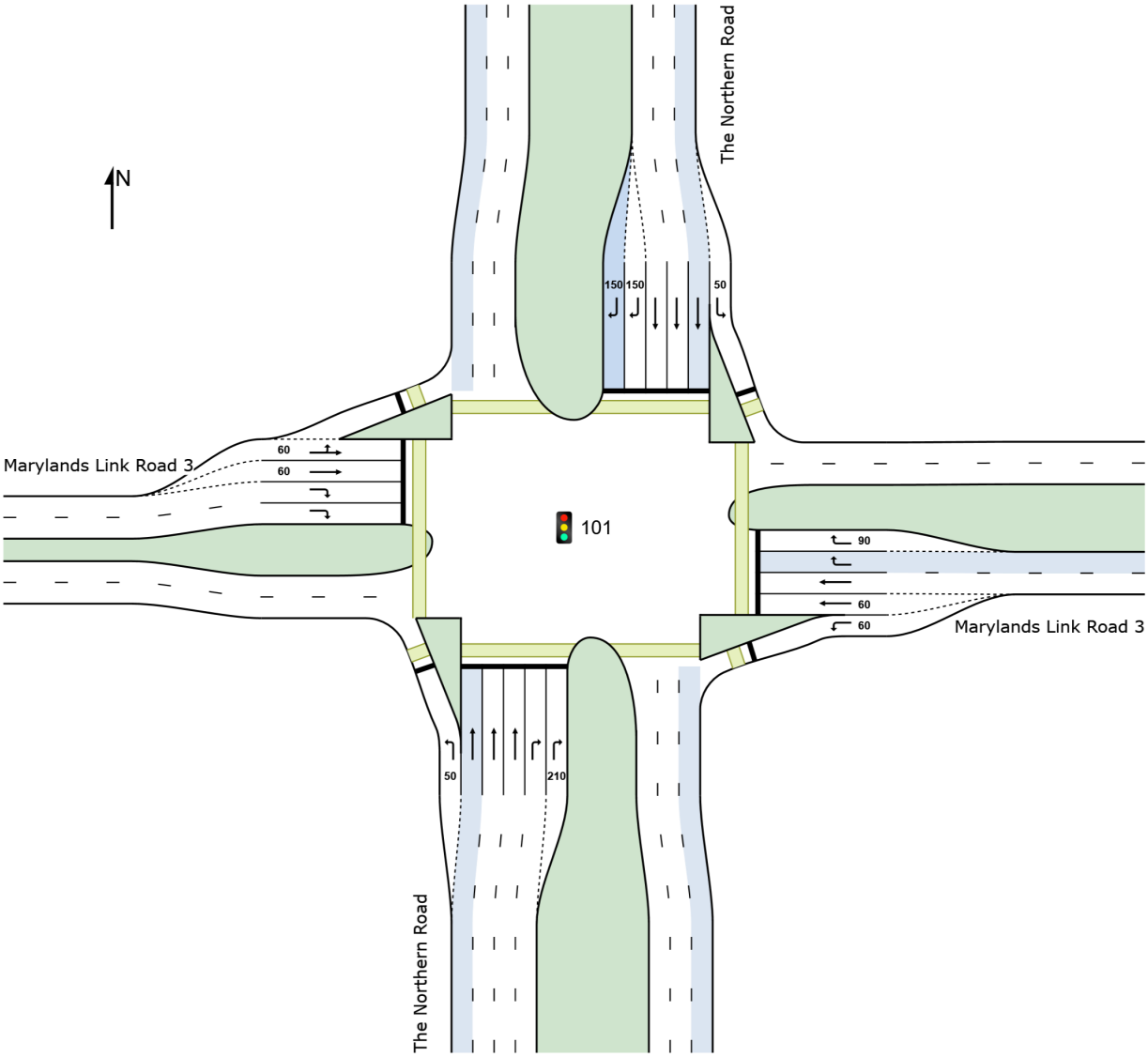
Site: 101 [TNR_Marylands Link 3 (Site Folder: 100% AM without Bus Lanes)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
7	L2	All MCs	76	1.4	76	1.4	0.120	62.4	LOS E	3.5	24.7	0.72	0.74	0.72	39.6
8	T1	All MCs	1583	6.5	1583	6.5	* 0.753	46.5	LOS D	31.8	235.2	0.93	0.83	0.93	54.6
9	R2	All MCs	1	0.0	1	0.0	0.007	78.3	LOS F	0.0	0.2	0.97	0.56	0.97	29.9
Approach			1660	6.3	1660	6.3	0.753	47.2	LOS D	31.8	235.2	0.92	0.83	0.92	50.9
East: Marylands Link Road 3															
10	L2	All MCs	1	0.0	1	0.0	0.002	43.3	LOS D	0.1	0.4	0.74	0.58	0.74	37.7
11	T1	All MCs	6	0.0	6	0.0	0.005	32.2	LOS C	0.1	1.0	0.68	0.45	0.68	35.0
12	R2	All MCs	159	10.6	159	10.6	0.716	79.1	LOS F	5.7	43.9	1.00	0.86	1.14	35.3
Approach			166	10.1	166	10.1	0.716	77.0	LOS F	5.7	43.9	0.99	0.84	1.12	35.3
North: The Northern Road															
1	L2	All MCs	157	6.7	157	6.7	0.258	47.3	LOS D	7.6	56.6	0.76	0.78	0.76	45.5
2	T1	All MCs	865	10.7	865	10.7	0.422	35.0	LOS C	14.7	112.2	0.78	0.67	0.78	57.4
3	R2	All MCs	116	7.3	116	7.3	* 0.765	87.3	LOS F	4.3	32.2	1.00	0.84	1.24	34.5
Approach			1138	9.8	1138	9.8	0.765	42.0	LOS C	14.7	112.2	0.80	0.71	0.83	51.7
West: Marylands Link Road 3															
4	L2	All MCs	375	1.1	375	1.1	* 0.751	72.5	LOS F	23.7	167.6	0.98	0.87	1.00	40.7
5	T1	All MCs	2	0.0	2	0.0	0.003	49.1	LOS D	0.1	0.6	0.68	0.43	0.68	35.0
6	R2	All MCs	180	1.8	180	1.8	* 0.763	79.9	LOS F	6.6	46.6	1.00	0.89	1.18	28.9
Approach			557	1.3	557	1.3	0.763	74.8	LOS F	23.7	167.6	0.98	0.87	1.05	34.2
All Vehicles			3521	6.8	3521	6.8	0.765	51.3	LOS D	31.8	235.2	0.90	0.80	0.92	47.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

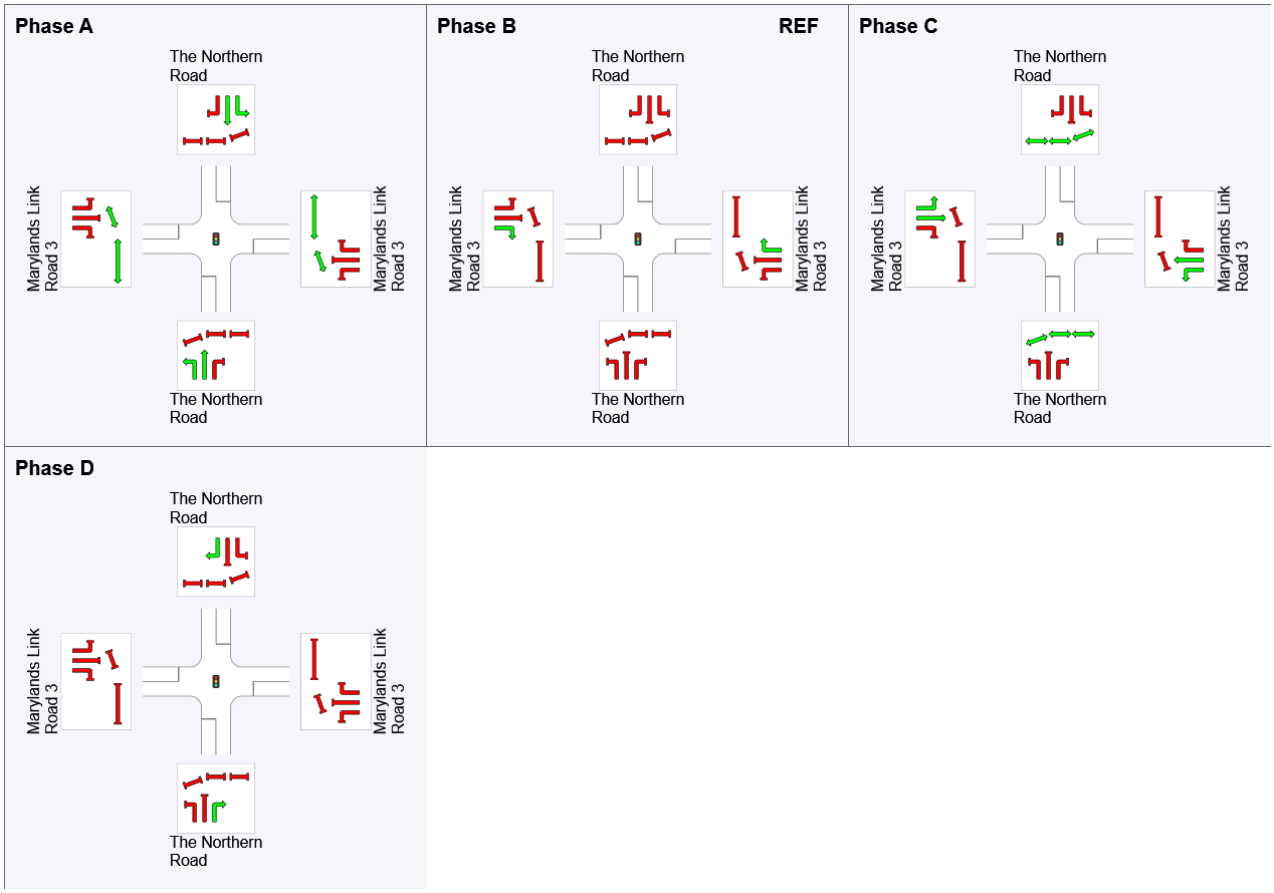
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link Road 3												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

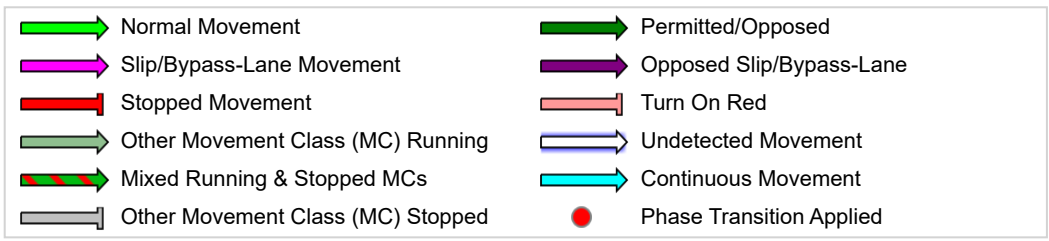
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link Road 3												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	80	0	15	68
Green Time (sec)	54	9	47	6
Phase Time (sec)	60	15	53	12
Phase Split	43%	11%	38%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

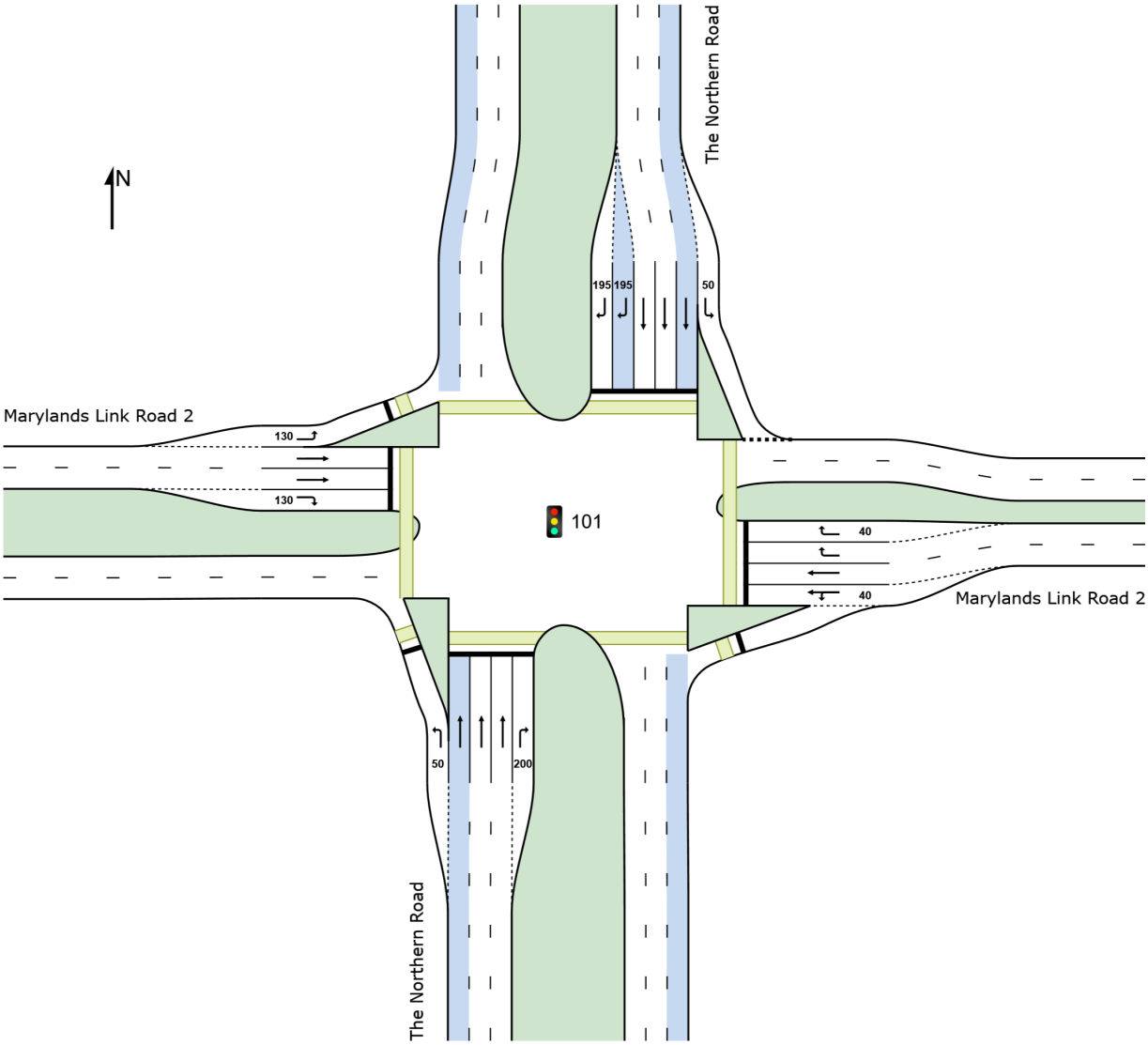
Site: 101 [TNR_Marylands Link 2 (Site Folder: 100% AM without Bus Lanes)]

AM Peak: 6.30AM-7.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	65	14.5	65	14.5	0.118	52.1	LOS D	3.1	24.2	0.73	0.74	0.73	45.4
2	T1	All MCs	995	7.8	995	7.8	* 0.491	39.1	LOS C	17.6	131.5	0.82	0.71	0.82	56.0
3	R2	All MCs	33	6.5	33	6.5	0.198	72.7	LOS F	2.1	15.6	0.96	0.73	0.96	37.3
Approach			1093	8.2	1093	8.2	0.491	40.9	LOS C	17.6	131.5	0.82	0.71	0.82	53.1
East: Marylands Link Road 2															
4	L2	All MCs	1	0.0	1	0.0	0.048	47.2	LOS D	1.3	9.6	0.73	0.55	0.73	46.6
5	T1	All MCs	55	5.8	55	5.8	0.048	35.9	LOS C	1.3	9.7	0.73	0.55	0.73	33.8
6	R2	All MCs	96	14.3	96	14.3	* 0.497	77.5	LOS F	3.4	26.5	1.00	0.75	1.00	28.5
Approach			152	11.1	152	11.1	0.497	62.3	LOS E	3.4	26.5	0.90	0.68	0.90	30.2
North: The Northern Road															
7	L2	All MCs	247	16.2	247	16.2	0.194	8.7	LOS A	1.7	13.4	0.20	0.66	0.20	55.8
8	T1	All MCs	643	15.9	643	15.9	0.327	33.5	LOS C	10.4	82.4	0.76	0.64	0.76	57.2
9	R2	All MCs	159	8.6	159	8.6	* 0.489	75.2	LOS F	5.4	40.2	0.99	0.77	0.99	30.5
Approach			1049	14.8	1049	14.8	0.489	34.0	LOS C	10.4	82.4	0.66	0.67	0.66	51.8
West: Marylands Link Road 2															
10	L2	All MCs	233	4.1	233	4.1	* 0.488	51.3	LOS D	13.4	97.2	0.90	0.81	0.90	34.9
11	T1	All MCs	100	3.2	100	3.2	0.085	36.5	LOS C	2.4	17.2	0.74	0.57	0.74	33.7
12	R2	All MCs	35	0.0	35	0.0	0.327	76.0	LOS F	2.4	16.8	1.00	0.73	1.00	35.9
Approach			367	3.4	367	3.4	0.488	49.6	LOS D	13.4	97.2	0.86	0.74	0.86	34.7
All Vehicles			2661	10.3	2661	10.3	0.497	40.6	LOS C	17.6	131.5	0.77	0.70	0.77	48.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

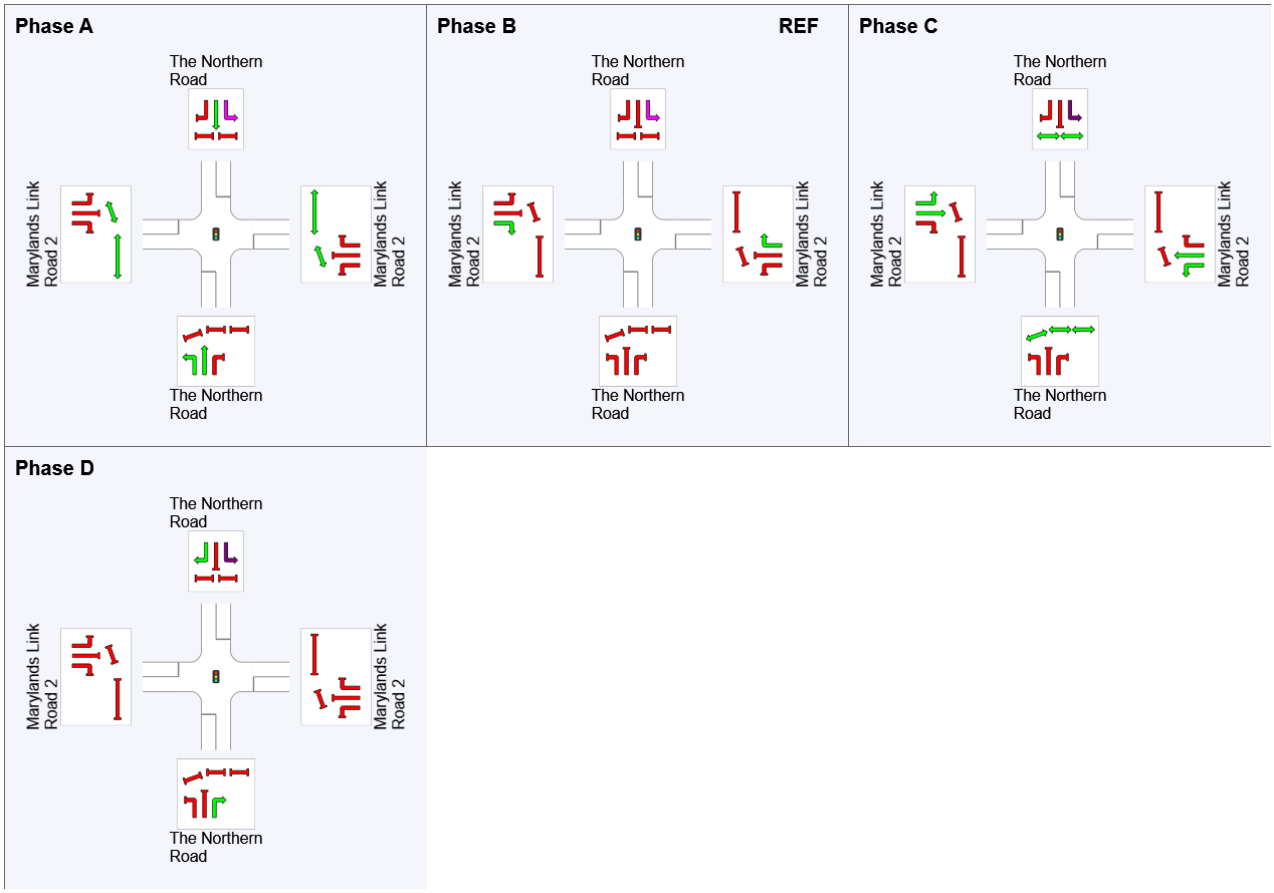
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link Road 2												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

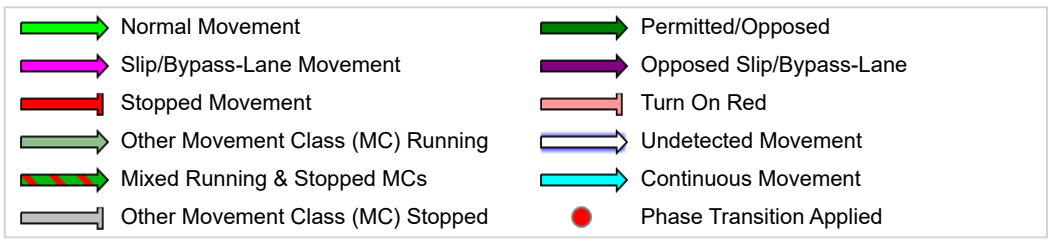
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link Road 2												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		450	474	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	82	0	14	63
Green Time (sec)	52	8	43	13
Phase Time (sec)	58	14	49	19
Phase Split	41%	10%	35%	14%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

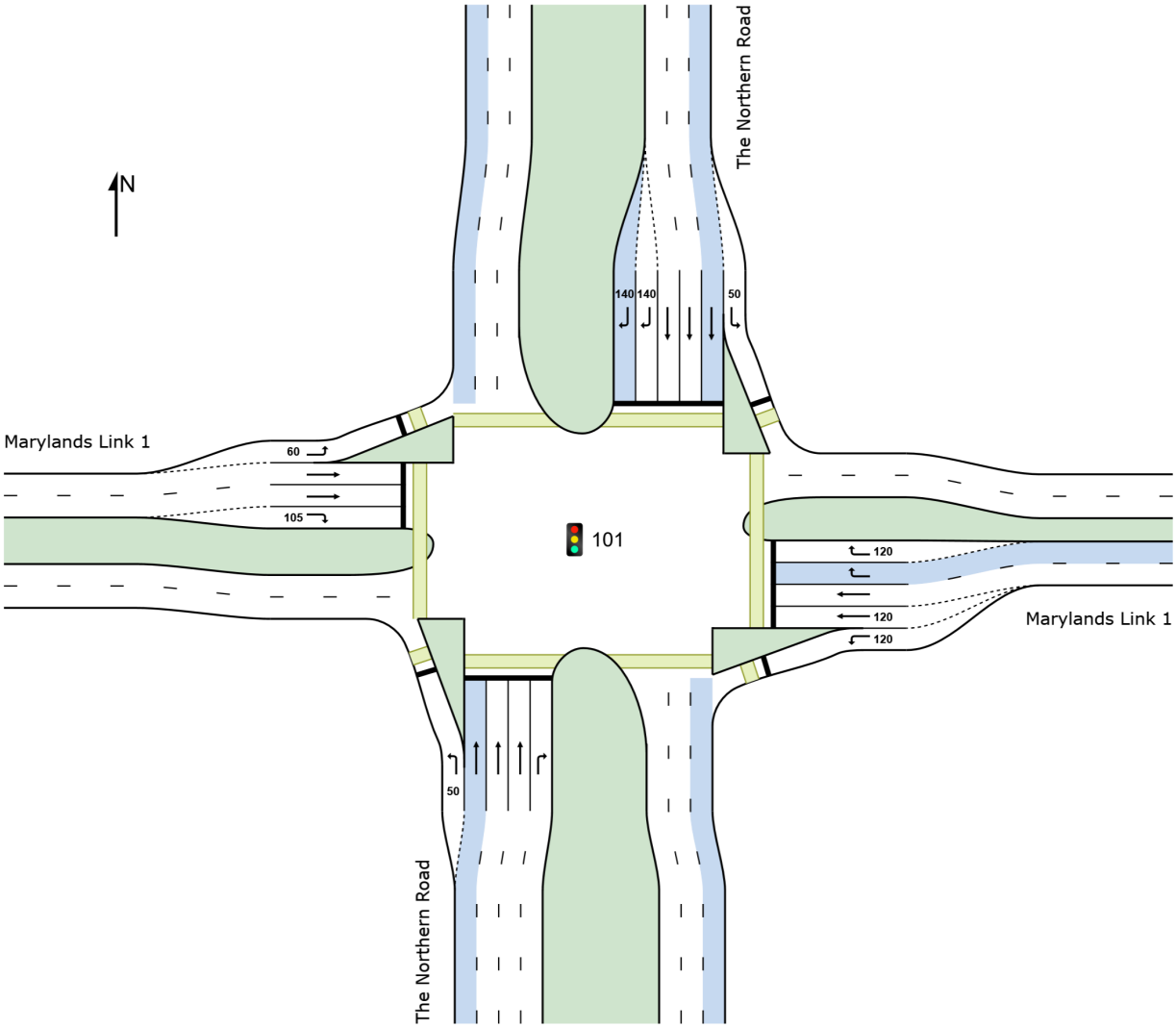
Site: 101 [TNR_Marylands Link 1 (Site Folder: 100% AM without Bus Lanes)]

6.30AM-7.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	60	24.6	60	24.6	0.171	55.3	LOS D	3.3	28.2	0.85	0.75	0.85	37.1
2	T1	All MCs	599	9.3	599	9.3	*0.411	45.6	LOS D	11.2	84.9	0.88	0.73	0.88	53.2
3	R2	All MCs	21	30.0	21	30.0	*0.321	83.8	LOS F	1.5	13.3	1.00	0.71	1.00	30.9
Approach			680	11.3	680	11.3	0.411	47.7	LOS D	11.2	84.9	0.88	0.73	0.88	51.0
East: Marylands Link 1															
4	L2	All MCs	57	13.0	57	13.0	0.275	66.1	LOS E	3.6	28.1	0.95	0.75	0.95	33.3
5	T1	All MCs	122	4.3	122	4.3	0.173	51.6	LOS D	3.5	25.5	0.88	0.68	0.88	29.7
6	R2	All MCs	367	6.3	367	6.3	0.308	40.9	LOS C	9.2	67.9	0.79	0.75	0.79	45.0
Approach			546	6.6	546	6.6	0.308	45.9	LOS D	9.2	67.9	0.82	0.73	0.82	40.5
North: The Northern Road															
7	L2	All MCs	109	8.7	109	8.7	0.283	56.2	LOS D	6.2	46.8	0.87	0.78	0.87	41.1
8	T1	All MCs	575	15.6	575	15.6	0.409	45.7	LOS D	10.8	85.6	0.87	0.73	0.87	53.2
9	R2	All MCs	18	35.3	18	35.3	0.141	82.6	LOS F	0.6	5.7	0.99	0.67	0.99	35.1
Approach			702	15.0	702	15.0	0.409	48.3	LOS D	10.8	85.6	0.88	0.74	0.88	50.6
West: Marylands Link 1															
10	L2	All MCs	98	6.5	98	6.5	0.454	67.6	LOS E	6.4	47.1	0.97	0.78	0.97	37.3
11	T1	All MCs	243	5.2	243	5.2	*0.347	53.7	LOS D	7.3	53.2	0.92	0.74	0.92	29.2
12	R2	All MCs	271	5.1	271	5.1	*0.450	43.1	LOS D	14.4	104.8	0.83	0.79	0.83	40.1
Approach			612	5.3	612	5.3	0.454	51.2	LOS D	14.4	104.8	0.89	0.77	0.89	35.3
All Vehicles			2540	9.9	2540	9.9	0.454	48.3	LOS D	14.4	104.8	0.87	0.74	0.87	45.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

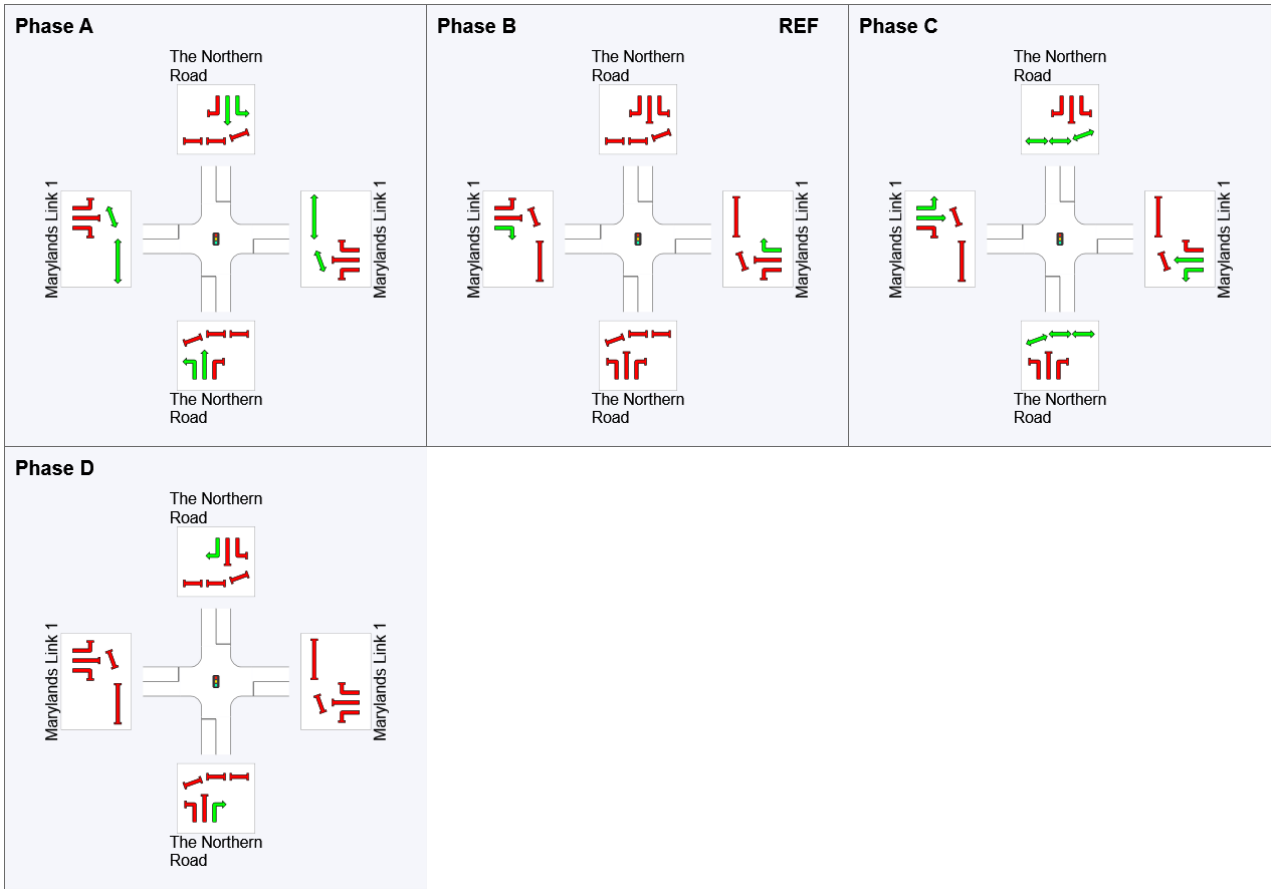
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link 1												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

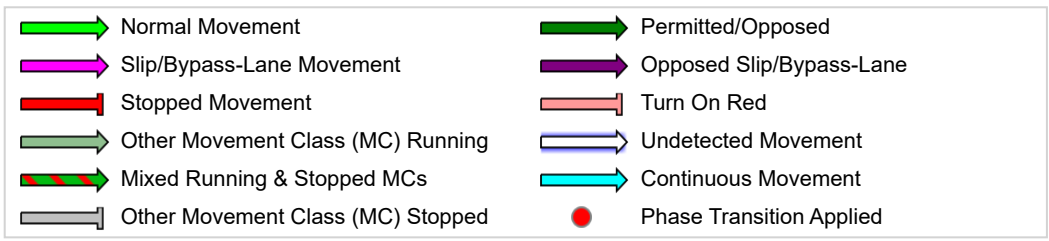
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link 1												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	97	0	53	85
Green Time (sec)	37	47	26	6
Phase Time (sec)	43	53	32	12
Phase Split	31%	38%	23%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

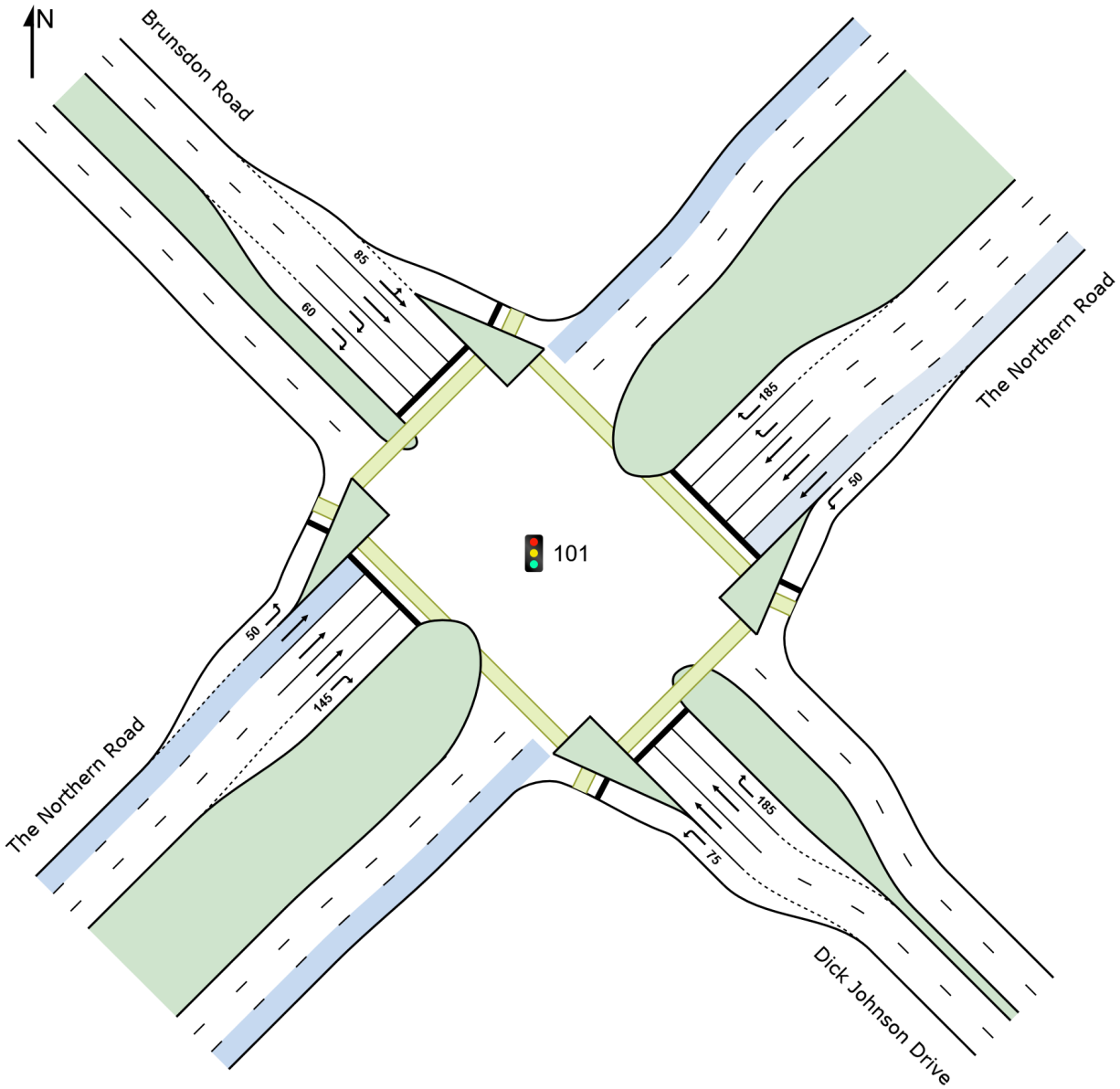
Site: 101 [TNR_Dick Johnson Dr_Brunson Rd (Site Folder: 100% AM without Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Dick Johnson Drive															
4	L2	All MCs	1	0.0	1	0.0	0.009	71.2	LOS F	0.1	0.5	0.95	0.59	0.95	38.1
5	T1	All MCs	66	4.8	66	4.8	0.136	58.8	LOS E	2.0	14.8	0.92	0.68	0.92	28.1
6	R2	All MCs	14	0.0	14	0.0	0.034	50.4	LOS D	0.7	5.1	0.82	0.66	0.82	32.7
Approach			81	3.9	81	3.9	0.136	57.5	LOS E	2.0	14.8	0.90	0.68	0.90	28.9
NorthEast: The Northern Road															
7	L2	All MCs	1	0.0	1	0.0	0.001	33.4	LOS C	0.0	0.3	0.61	0.61	0.61	39.0
8	T1	All MCs	687	8.1	687	8.1	0.279	28.6	LOS C	9.8	73.2	0.68	0.67	0.68	50.4
9	R2	All MCs	8	0.0	8	0.0	0.053	79.9	LOS F	0.3	2.0	0.98	0.64	0.98	26.5
Approach			697	8.0	697	8.0	0.279	29.2	LOS C	9.8	73.2	0.68	0.67	0.68	50.1
NorthWest: Brunsdon Road															
10	L2	All MCs	7	100.0	7	100.0	0.221	76.1	LOS F	2.5	20.9	0.95	0.71	0.95	21.1
11	T1	All MCs	85	4.9	85	4.9	*0.221	60.3	LOS E	3.3	24.4	0.94	0.71	0.94	27.5
12	R2	All MCs	546	4.4	546	4.4	*0.842	77.4	LOS F	19.6	142.4	1.00	0.97	1.16	38.8
Approach			639	5.6	639	5.6	0.842	75.1	LOS F	19.6	142.4	0.99	0.93	1.13	35.7
SouthWest: The Northern Road															
1	L2	All MCs	609	8.3	609	8.3	*0.907	90.9	LOS F	45.1	337.9	1.00	0.97	1.15	40.6
2	T1	All MCs	649	4.7	649	4.7	0.344	29.8	LOS C	12.7	92.8	0.69	0.59	0.69	60.2
3	R2	All MCs	17	37.5	17	37.5	*0.268	83.8	LOS F	1.2	11.1	1.00	0.70	1.00	36.4
Approach			1276	6.8	1276	6.8	0.907	59.7	LOS E	45.1	337.9	0.84	0.77	0.92	43.8
All Vehicles			2693	6.8	2693	6.8	0.907	55.4	LOS D	45.1	337.9	0.84	0.78	0.90	42.6

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

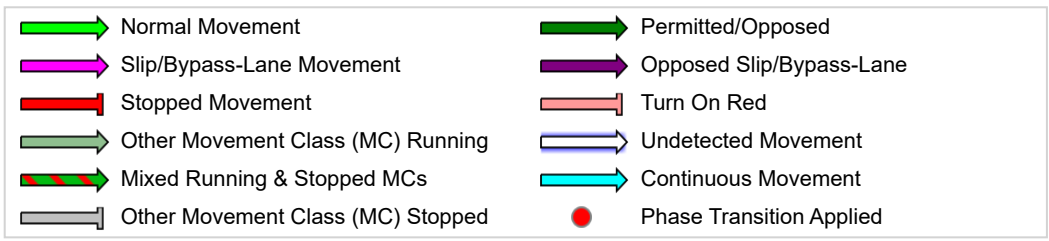
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Dick Johnson Drive												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
NorthEast: The Northern Road												
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

NorthWest: Brunsdon Road												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
SouthWest: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence

REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	72	0	36	60
Green Time (sec)	62	30	18	6
Phase Time (sec)	68	36	24	12
Phase Split	49%	26%	17%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

Site: 101 [Bringelly_Kelvin Park (Site Folder: 100% PM without Bus Lanes)]

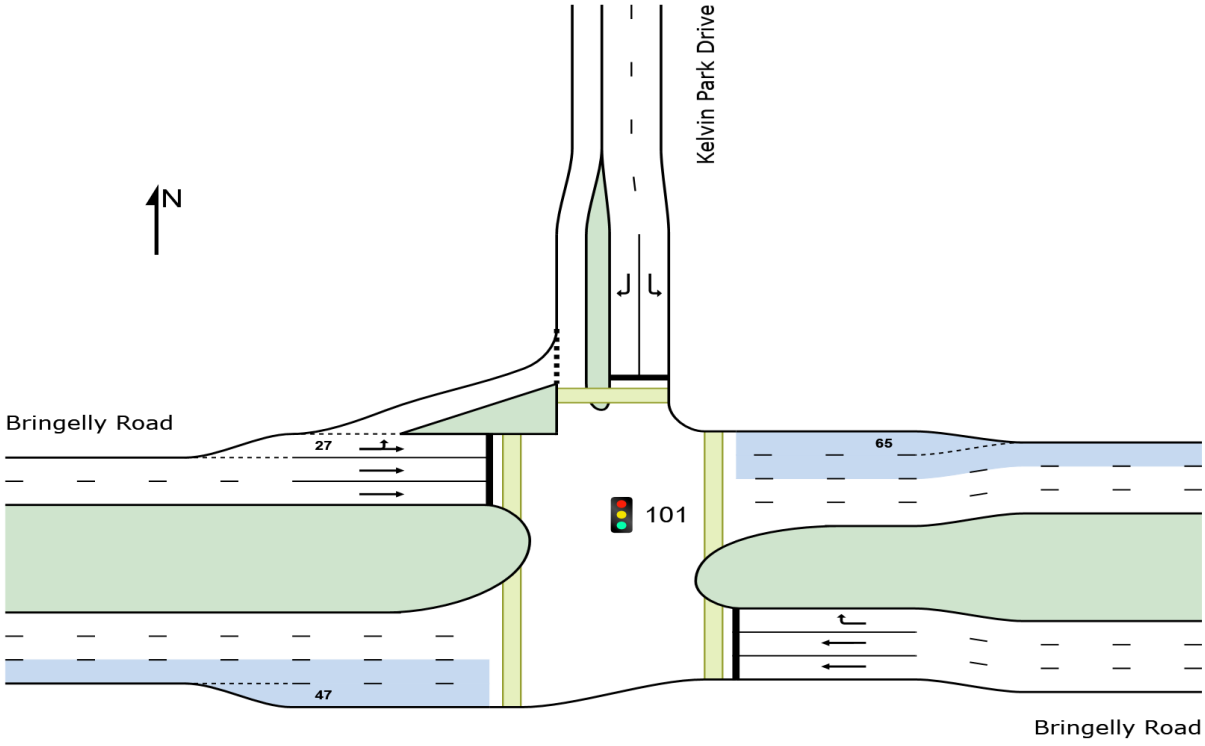
Peak Hour: 6.30AM-7.30AM

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bringelly Road															
5	T1	All MCs	1800	1.6	1800	1.6	*0.616	8.1	LOS A	27.3	193.5	0.50	0.46	0.50	52.0
6	R2	All MCs	37	2.9	37	2.9	0.405	79.4	LOS F	2.6	18.6	1.00	0.73	1.00	25.1
Approach			1837	1.6	1837	1.6	0.616	9.5	LOS A	27.3	193.5	0.51	0.46	0.51	50.7
North: Kelvin Park Drive															
7	L2	All MCs	34	0.0	34	0.0	0.073	47.2	LOS D	1.7	12.2	0.80	0.70	0.80	31.3
9	R2	All MCs	128	0.0	128	0.0	*0.605	69.6	LOS E	8.6	60.1	1.00	0.80	1.00	24.5
Approach			162	0.0	162	0.0	0.605	65.0	LOS E	8.6	60.1	0.96	0.78	0.96	25.8
West: Bringelly Road															
10	L2	All MCs	85	2.5	85	2.5	0.055	11.6	LOS A	0.4	2.7	0.13	0.58	0.13	47.7
11	T1	All MCs	917	5.5	917	5.5	0.385	13.7	LOS A	14.5	106.0	0.49	0.43	0.49	49.6
Approach			1002	5.3	1002	5.3	0.385	13.5	LOS A	14.5	106.0	0.46	0.45	0.46	47.3
All Vehicles			3001	2.7	3001	2.7	0.616	13.9	LOS A	27.3	193.5	0.51	0.47	0.51	47.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

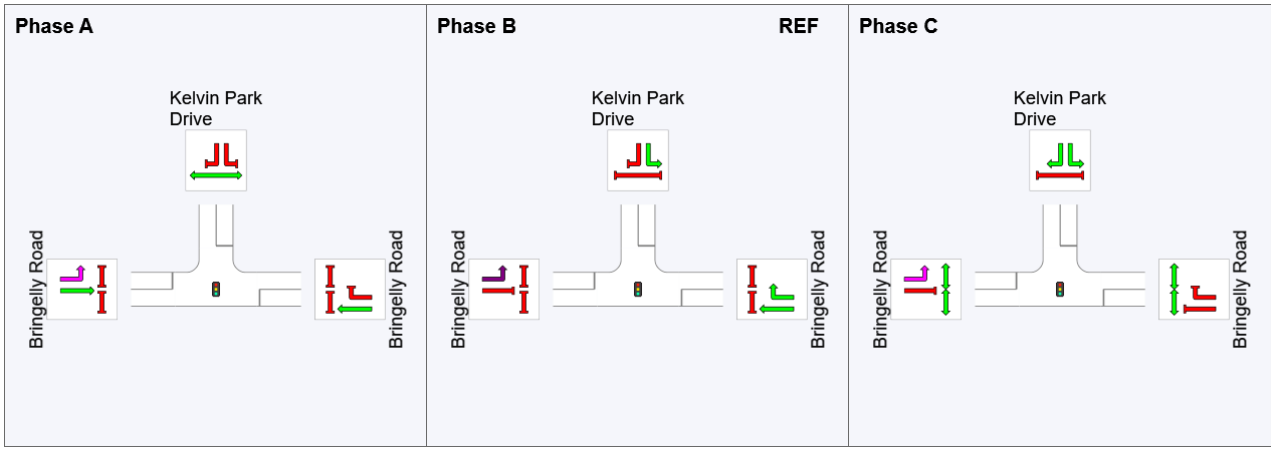
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

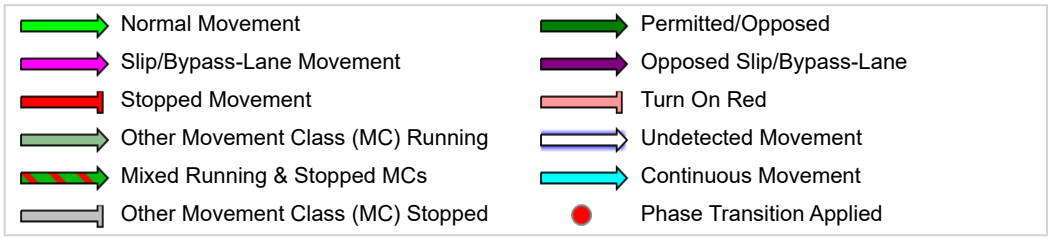
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Bringelly Road												
P21	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P22	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: Kelvin Park Drive												
P3	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Bringelly Road												
P41	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P42	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		250	263	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	41	0	13
Green Time (sec)	93	7	22
Phase Time (sec)	99	13	28
Phase Split	71%	9%	20%
Phase Frequency (%)	100.0	100.0	100.0

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

Site: 01 [TNR_Bringelly (Site Folder: 100% PM without Bus Lanes)]

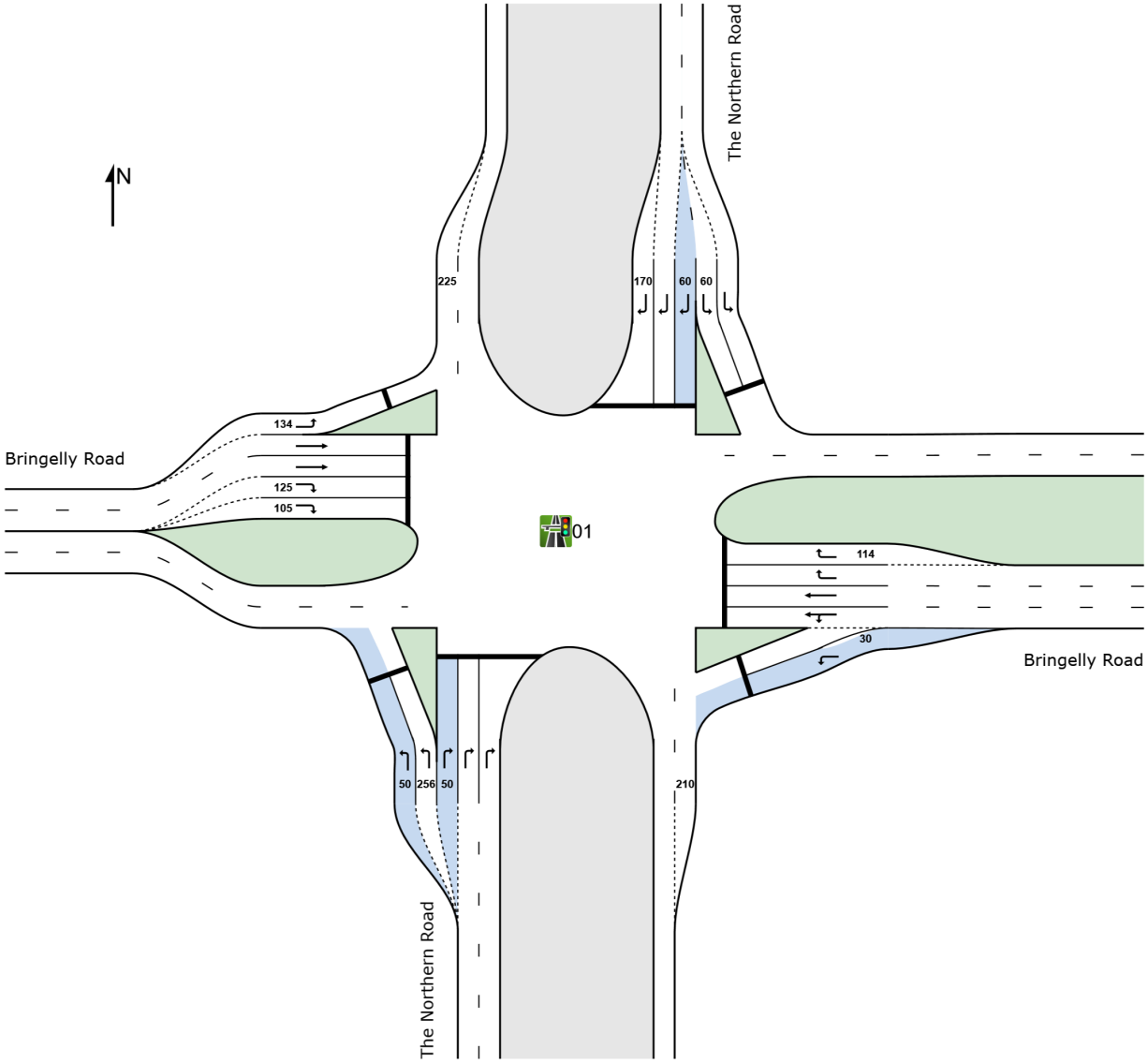
Peak: 5.30PM-6.30PM

Site Category: (None)
Single Point Interchange (Signals) - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Three-Phase Leading Right Turns
Input Phase Sequence: 1, 2, 3, 4
Output Phase Sequence: 1, 2, 3, 4
Reference Phase: Phase 4

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	9	0.0	9	0.0	0.060	77.9	LOS F	0.3	2.3	0.98	0.64	0.98	29.0
3	R2	All MCs	381	4.1	381	4.1	0.363	50.9	LOS D	9.4	68.2	0.86	0.77	0.86	36.7
Approach			391	4.0	391	4.0	0.363	51.5	LOS D	9.4	68.2	0.86	0.77	0.86	36.5
East: Bringelly Road															
4	L2	All MCs	299	1.4	299	1.4	0.193	27.8	LOS B	3.7	26.3	0.20	0.61	0.20	68.0
5	T1	All MCs	1429	1.0	1429	1.0	* 0.818	38.4	LOS C	46.8	330.2	0.90	0.83	0.91	34.5
6	R2	All MCs	195	5.9	195	5.9	0.114	26.8	LOS B	3.6	26.4	0.58	0.67	0.58	43.5
Approach			1923	1.6	1923	1.6	0.818	35.6	LOS C	46.8	330.2	0.76	0.78	0.77	36.0
North: The Northern Road															
7	L2	All MCs	517	5.9	517	5.9	0.303	29.2	LOS C	10.6	77.8	0.65	0.75	0.65	37.6
9	R2	All MCs	840	3.1	840	3.1	* 0.829	70.9	LOS F	26.6	191.1	0.98	0.91	1.07	26.0
Approach			1357	4.2	1357	4.2	0.829	55.0	LOS D	26.6	191.1	0.85	0.85	0.91	28.2
West: Bringelly Road															
10	L2	All MCs	12	0.0	12	0.0	0.015	31.6	LOS C	0.5	3.2	0.62	0.65	0.62	39.8
11	T1	All MCs	102	5.2	102	5.2	0.291	65.5	LOS E	3.3	24.4	0.97	0.73	0.97	23.0
12	R2	All MCs	22	4.8	22	4.8	* 0.144	79.0	LOS F	0.8	5.6	0.99	0.68	0.99	33.0
Approach			136	4.7	136	4.7	0.291	64.8	LOS E	3.3	24.4	0.94	0.72	0.94	26.1
All Vehicles			3806	2.9	3806	2.9	0.829	45.2	LOS D	46.8	330.2	0.81	0.80	0.83	32.6

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

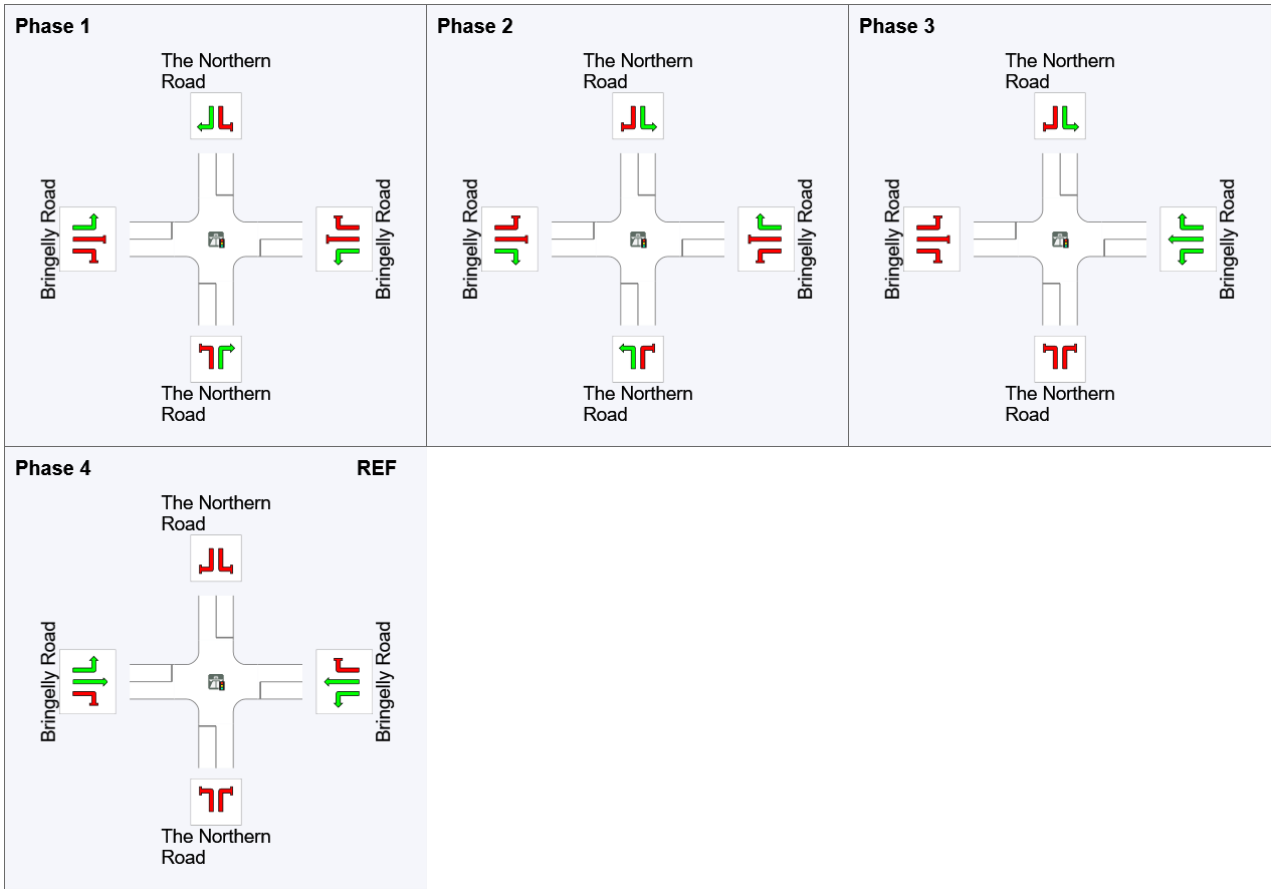
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

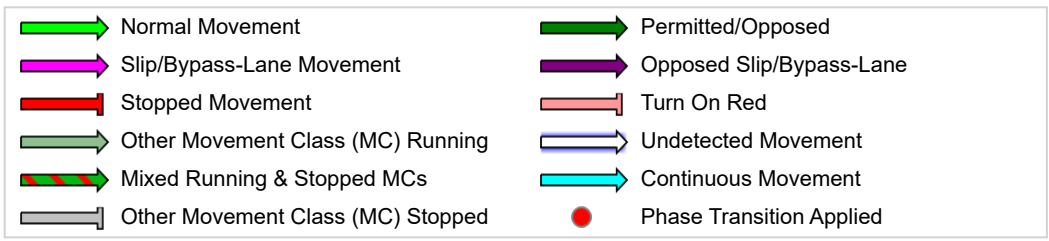
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	1	2	3	4
Phase Change Time (sec)	21	65	79	0
Green Time (sec)	36	6	53	13
Phase Time (sec)	44	14	61	21
Phase Split	31%	10%	44%	15%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

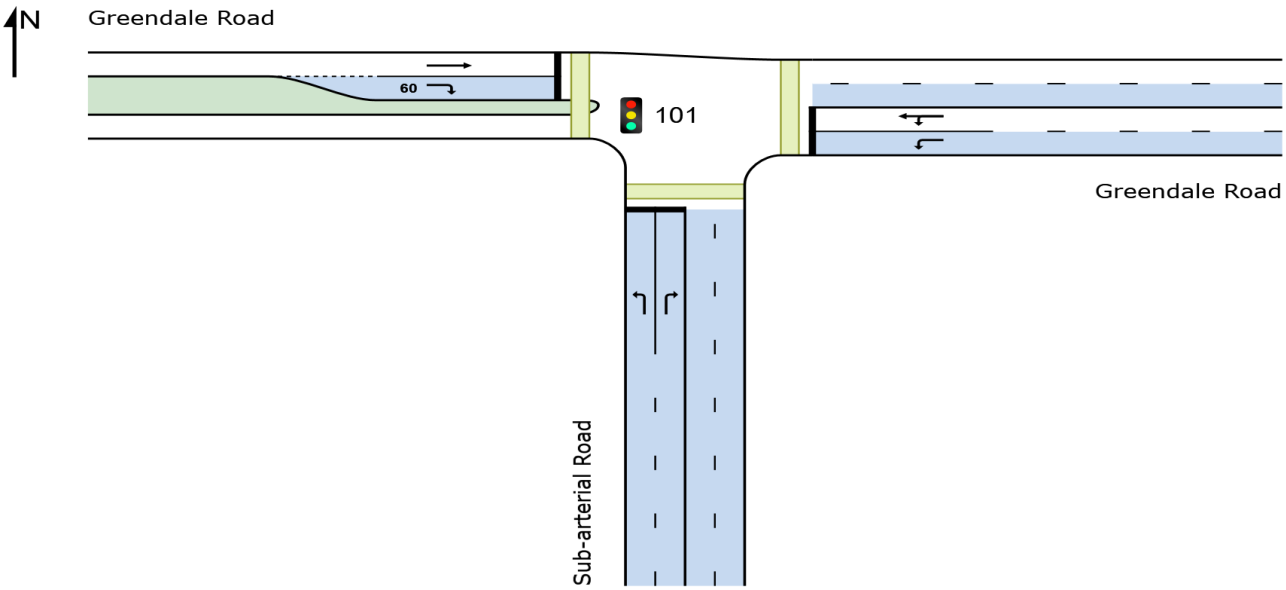
Site: 101 [Greendale Road_New Collector Road (Site Folder: 100% PM without Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Sub-arterial Road															
1	L2	All MCs	57	3.7	57	3.7	0.137	50.6	LOS D	3.1	22.2	0.83	0.73	0.83	29.1
3	R2	All MCs	3	0.0	3	0.0	0.017	65.8	LOS E	0.2	1.4	0.92	0.63	0.92	26.0
Approach			60	3.5	60	3.5	0.137	51.4	LOS D	3.1	22.2	0.84	0.73	0.84	28.9
East: Greendale Road															
4	L2	All MCs	1672	1.6	1672	1.6	0.655	12.4	LOS A	30.1	215.6	0.52	0.72	0.52	41.6
5	T1	All MCs	126	9.2	126	9.2	* 0.655	21.9	LOS B	30.1	215.6	0.57	0.72	0.57	41.6
Approach			1798	2.2	1798	2.2	0.655	13.0	LOS A	30.1	215.6	0.53	0.72	0.53	41.6
West: Greendale Road															
11	T1	All MCs	163	5.2	163	5.2	0.106	2.7	LOS A	2.2	16.0	0.22	0.18	0.22	48.2
12	R2	All MCs	57	1.9	57	1.9	* 0.289	68.1	LOS E	3.7	26.1	0.96	0.75	0.96	25.5
Approach			220	4.3	220	4.3	0.289	19.6	LOS B	3.7	26.1	0.41	0.33	0.41	39.2
All Vehicles			2078	2.4	2078	2.4	0.655	14.9	LOS B	30.1	215.6	0.52	0.68	0.52	40.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

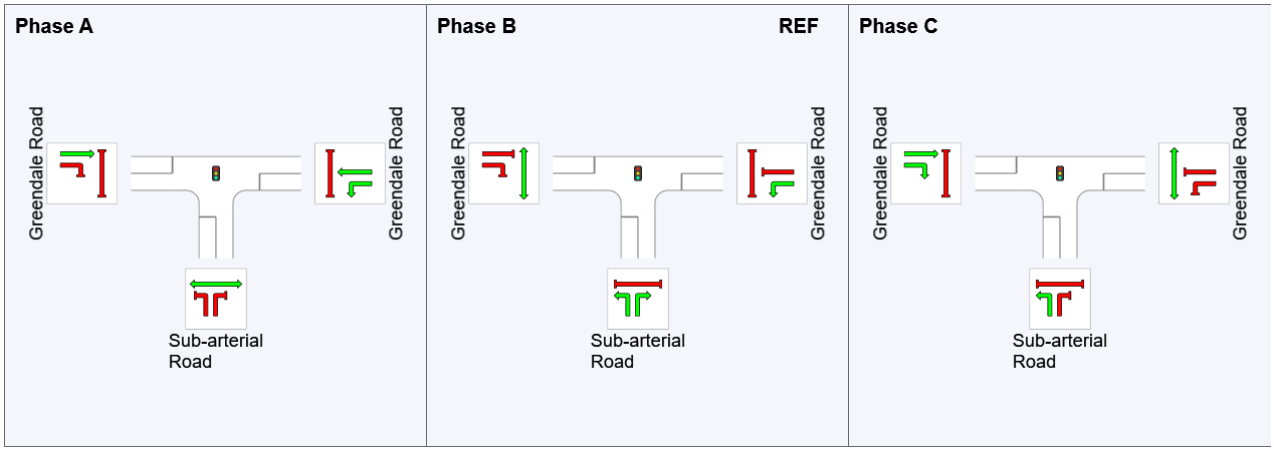
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

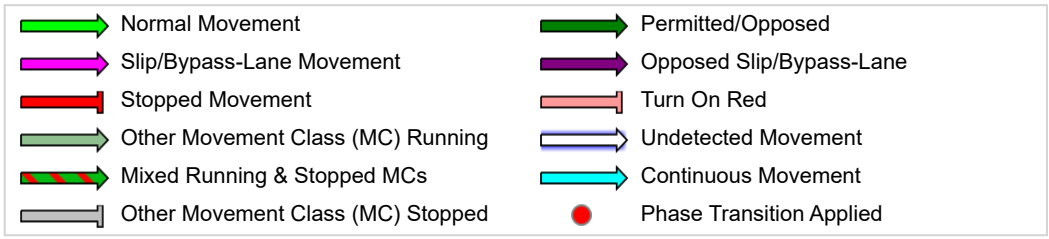
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sub-arterial Road												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Greendale Road												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Greendale Road												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		150	158	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	41	0	20
Green Time (sec)	93	14	15
Phase Time (sec)	99	20	21
Phase Split	71%	14%	15%
Phase Frequency (%)	100.0	100.0	100.0

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

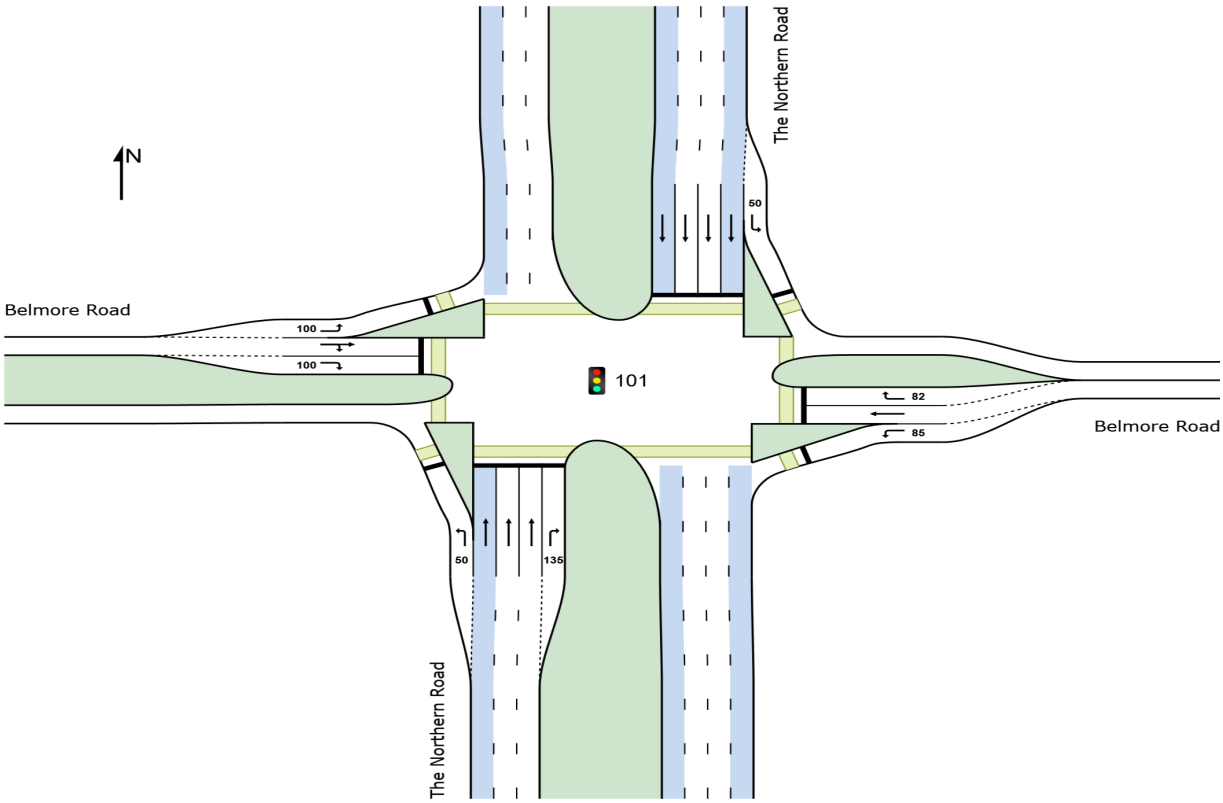
Site: 101 [TNR_Belmore (Site Folder: 100% PM without Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B*, C, D*
Output Phase Sequence: A, B*, C, D*
Reference Phase: Phase A
(* Variable Phase)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	85	0.0	85	0.0	0.055	8.4	LOS A	0.6	4.4	0.17	0.65	0.17	50.6
2	T1	All MCs	936	7.1	936	7.1	0.260	11.2	LOS A	8.9	66.1	0.46	0.40	0.46	67.6
3	R2	All MCs	3	0.0	3	0.0	*0.040	79.7	LOS F	0.2	1.5	0.98	0.63	0.98	24.2
Approach			1024	6.5	1024	6.5	0.260	11.2	LOS A	8.9	66.1	0.44	0.42	0.44	66.1
East: Belmore Road															
4	L2	All MCs	11	50.0	11	50.0	0.022	13.6	LOS A	0.2	2.2	0.40	0.61	0.40	45.1
5	T1	All MCs	23	0.0	23	0.0	*0.111	61.6	LOS E	1.4	10.1	0.94	0.67	0.94	30.3
6	R2	All MCs	1	0.0	1	0.0	0.005	65.2	LOS E	0.1	0.4	0.91	0.59	0.91	34.5
Approach			35	15.2	35	15.2	0.111	47.1	LOS D	1.4	10.1	0.77	0.65	0.77	33.4
North: The Northern Road															
7	L2	All MCs	11	10.0	11	10.0	0.007	20.6	LOS B	0.1	0.6	0.16	0.63	0.16	59.2
8	T1	All MCs	2594	3.5	2594	3.5	*0.612	25.0	LOS B	29.3	211.2	0.73	0.66	0.73	58.8
Approach			2604	3.6	2604	3.6	0.612	25.0	LOS B	29.3	211.2	0.72	0.66	0.72	56.7
West: Belmore Road															
10	L2	All MCs	43	2.4	43	2.4	0.063	6.5	LOS A	0.4	2.5	0.24	0.56	0.24	58.5
11	T1	All MCs	11	0.0	11	0.0	*0.293	61.5	LOS E	4.2	29.7	0.95	0.75	0.95	26.8
12	R2	All MCs	120	2.6	120	2.6	0.293	65.7	LOS E	4.2	29.7	0.95	0.75	0.95	26.3
Approach			174	2.4	174	2.4	0.293	50.8	LOS D	4.2	29.7	0.78	0.70	0.78	32.6
All Vehicles			3837	4.4	3837	4.4	0.612	22.7	LOS B	29.3	211.2	0.65	0.60	0.65	57.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

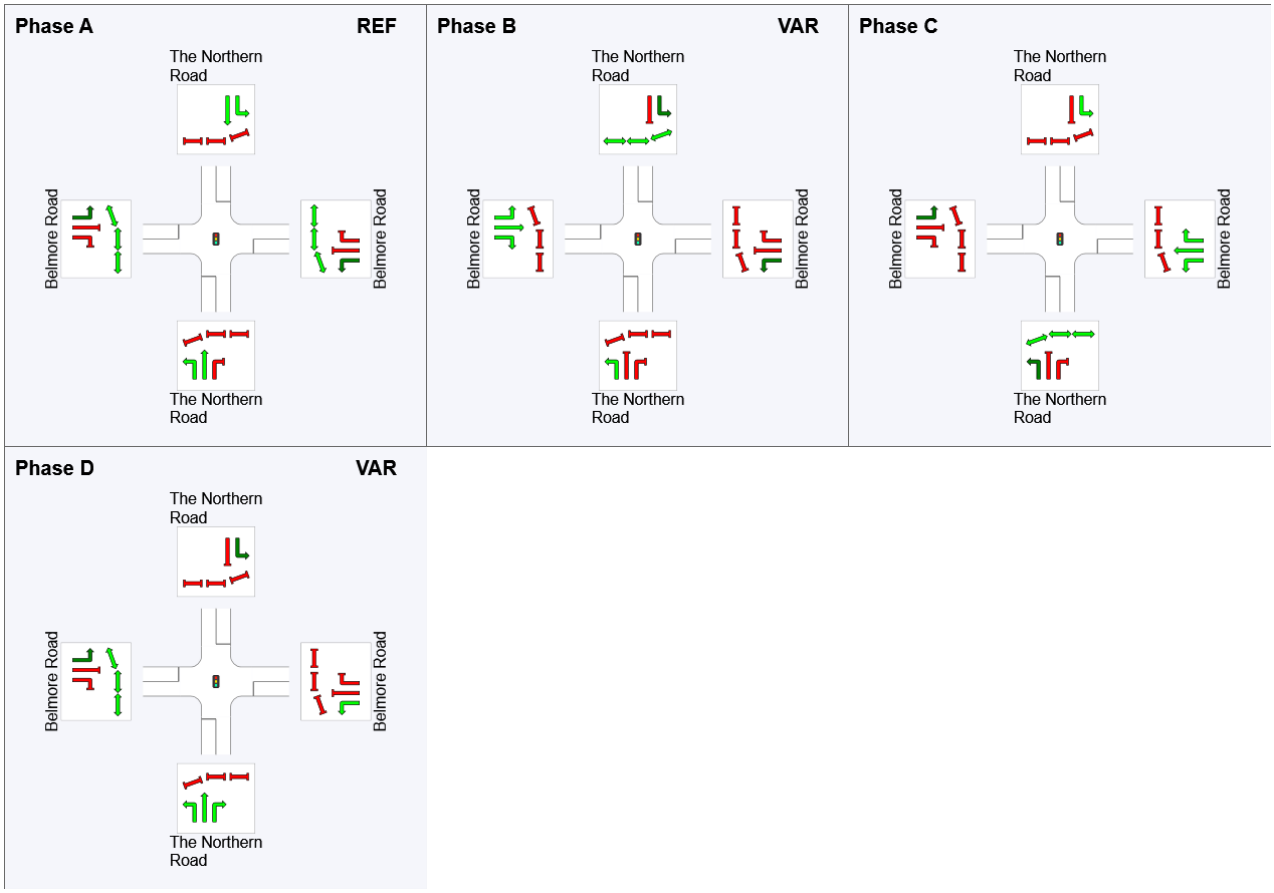
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92
P12	Stage 2	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Belmore Road												
P21	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P22	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

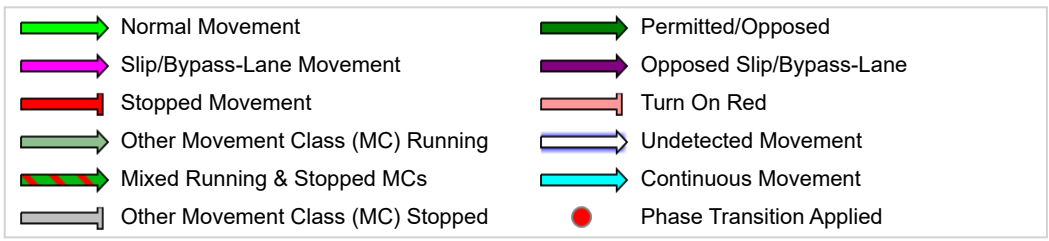
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Belmore Road												
P41	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P42	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		520	547	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	84	107	128
Green Time (sec)	78	17	15	6
Phase Time (sec)	84	23	21	12
Phase Split	60%	16%	15%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

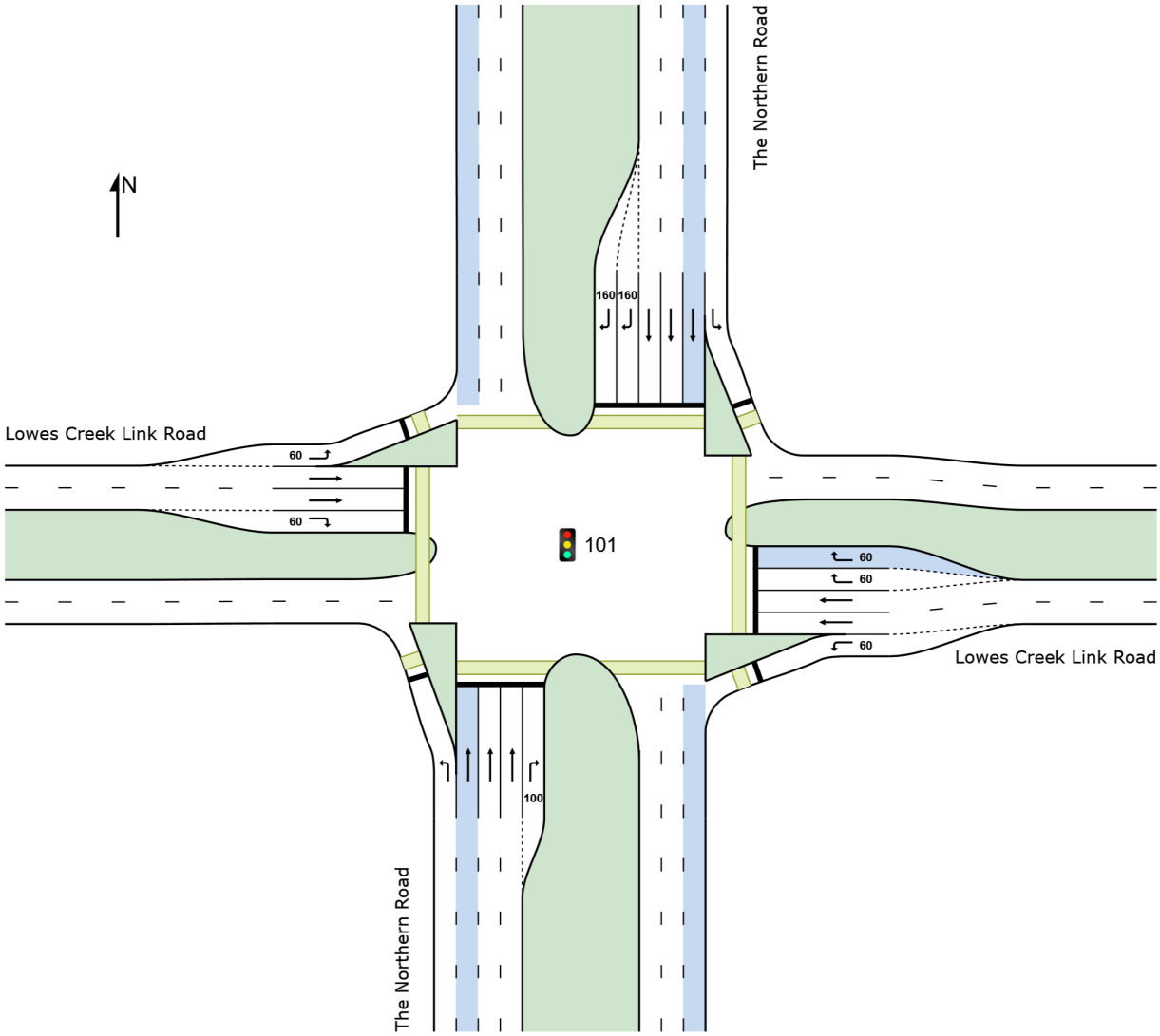
Site: 101 [TNR_Lowes Creek Link (Site Folder: 100% PM without Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import (2)
Input Phase Sequence: A, B, C, D, c1
Output Phase Sequence: A, B, C, D, c1
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	76	1.4	76	1.4	0.078	24.3	LOS B	2.5	17.5	0.52	0.71	0.52	52.8
2	T1	All MCs	1583	6.5	1583	6.5	* 0.718	41.0	LOS C	30.2	223.2	0.91	0.81	0.91	51.4
3	R2	All MCs	1	0.0	1	0.0	0.013	86.7	LOS F	0.1	0.5	0.97	0.59	0.97	36.2
Approach			1660	6.3	1660	6.3	0.718	40.2	LOS C	30.2	223.2	0.89	0.81	0.89	50.3
East: Lowes Creek Link Road															
4	L2	All MCs	1	0.0	1	0.0	0.004	58.0	LOS E	0.1	0.4	0.87	0.59	0.87	40.1
5	T1	All MCs	6	0.0	6	0.0	0.013	56.8	LOS E	0.2	1.3	0.89	0.57	0.89	28.5
6	R2	All MCs	159	10.6	159	10.6	0.339	64.4	LOS E	5.0	38.3	0.95	0.76	0.95	25.5
Approach			166	10.1	166	10.1	0.339	64.1	LOS E	5.0	38.3	0.95	0.76	0.95	25.7
North: The Northern Road															
7	L2	All MCs	157	6.7	157	6.7	0.126	14.6	LOS B	3.4	25.3	0.35	0.69	0.35	45.1
8	T1	All MCs	865	10.7	865	10.7	0.303	20.1	LOS B	11.0	83.9	0.61	0.53	0.61	62.0
9	R2	All MCs	116	7.3	116	7.3	0.191	61.6	LOS E	3.4	25.3	0.90	0.75	0.90	27.1
Approach			1138	9.8	1138	9.8	0.303	23.6	LOS B	11.0	83.9	0.60	0.57	0.60	55.6
West: Lowes Creek Link Road															
10	L2	All MCs	375	1.1	375	1.1	* 0.731	70.1	LOS E	23.2	164.1	0.97	0.86	0.97	27.8
11	T1	All MCs	2	0.0	2	0.0	0.004	64.6	LOS E	0.1	0.4	0.89	0.53	0.89	28.6
12	R2	All MCs	180	1.8	180	1.8	* 0.723	69.5	LOS E	12.3	87.3	1.00	0.87	1.06	37.5
Approach			557	1.3	557	1.3	0.731	69.9	LOS E	23.2	164.1	0.98	0.86	1.00	29.3
All Vehicles			3521	6.8	3521	6.8	0.731	40.7	LOS C	30.2	223.2	0.81	0.74	0.82	46.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

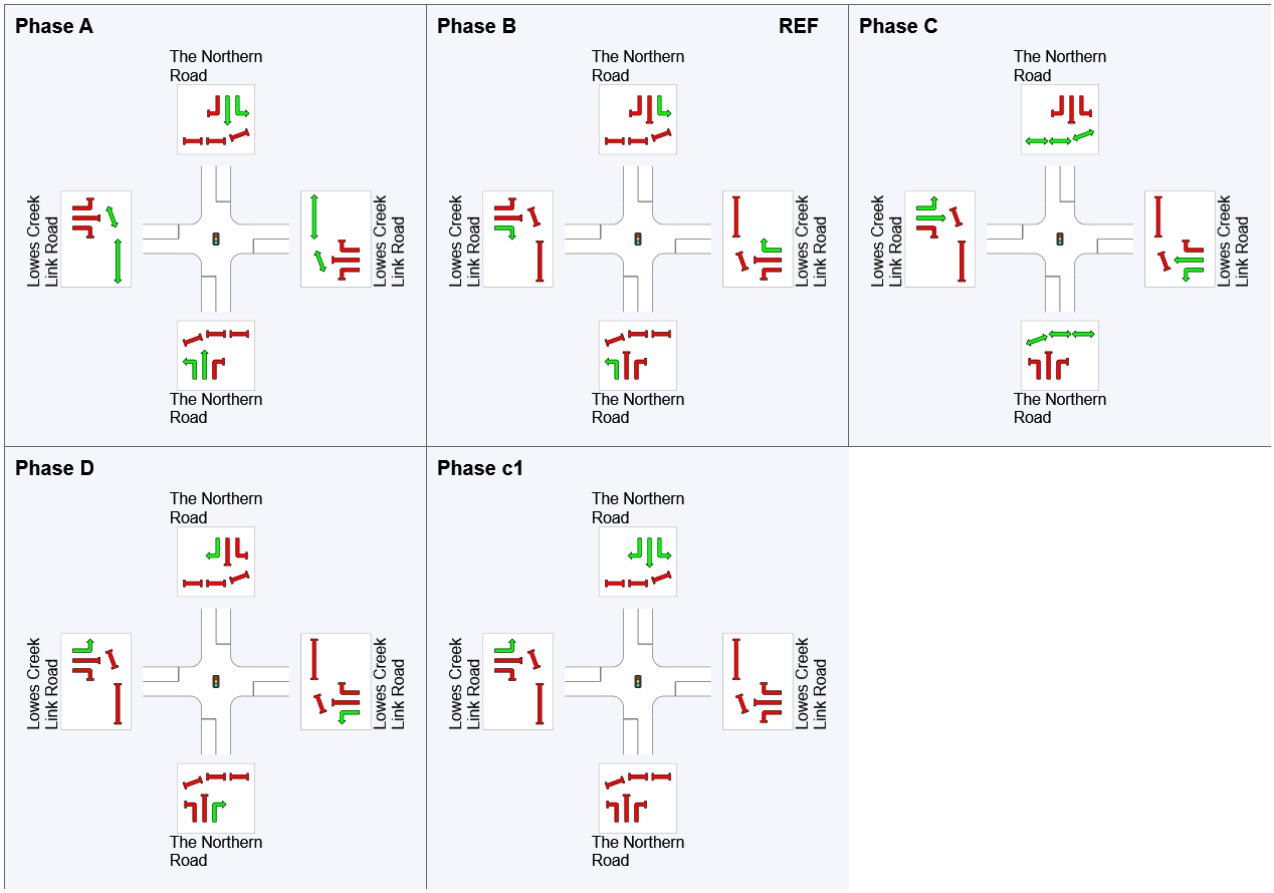
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Lowes Creek Link Road												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

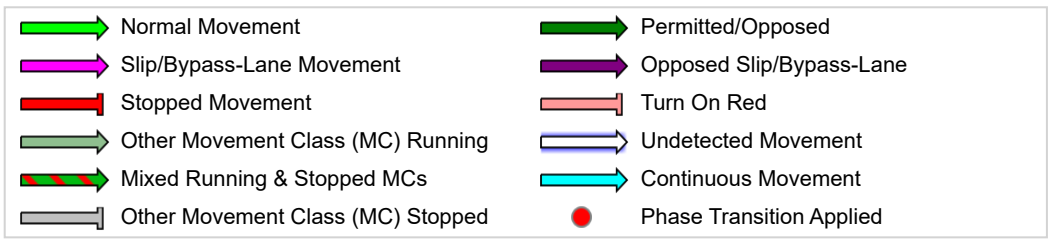
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Lowes Creek Link Road												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D	c1
Phase Change Time (sec)	79	0	25	49	61
Green Time (sec)	55	19	18	6	12
Phase Time (sec)	61	25	24	12	18
Phase Split	44%	18%	17%	9%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

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

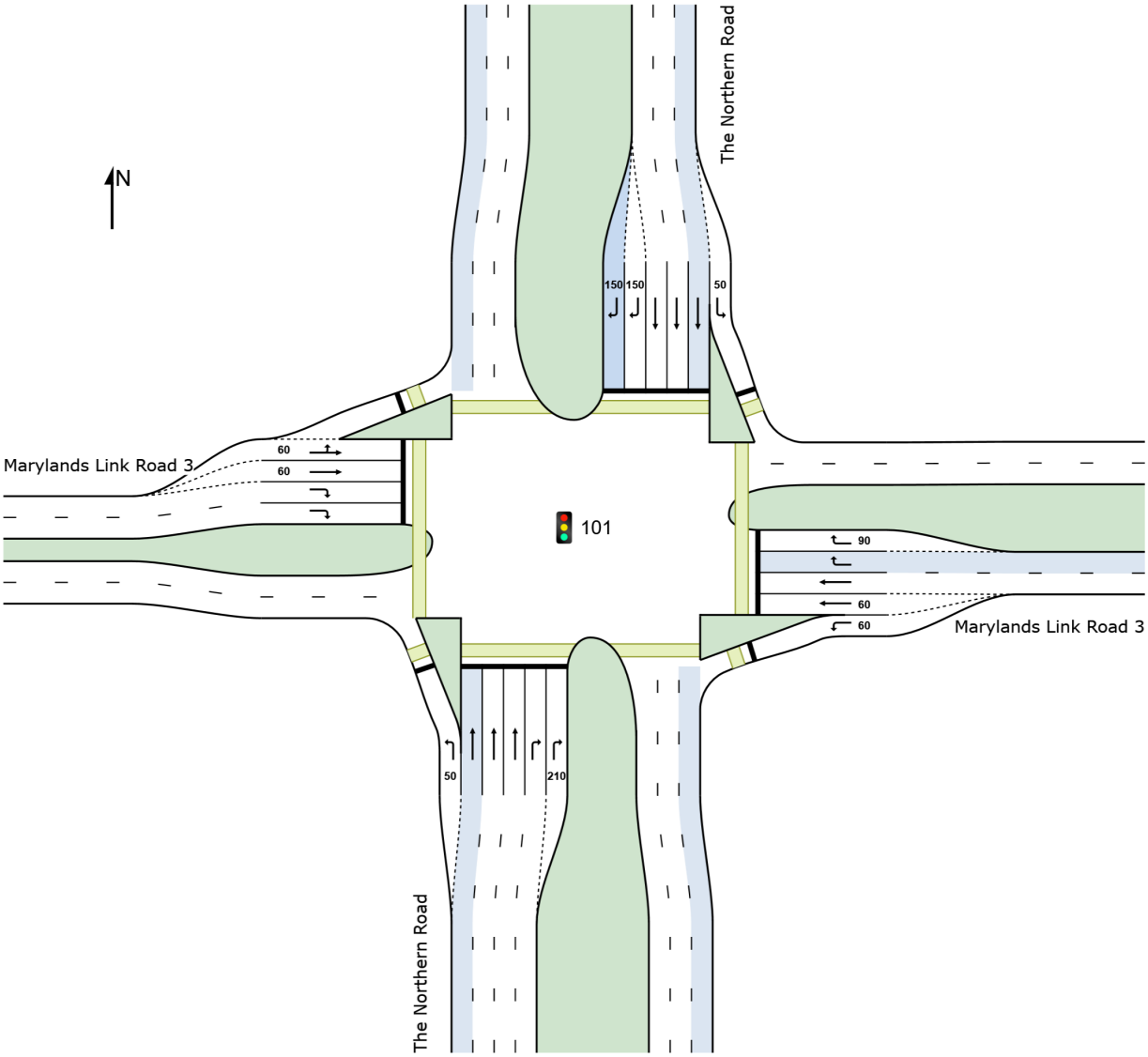
Site: 101 [TNR_Marylands Link 3 (Site Folder: 100% PM without Bus Lanes)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
7	L2	All MCs	265	0.0	265	0.0	0.421	45.1	LOS D	13.5	94.2	0.80	0.81	0.80	38.8
8	T1	All MCs	825	9.4	825	9.4	0.376	31.6	LOS C	13.3	100.3	0.75	0.64	0.75	58.7
9	R2	All MCs	112	4.7	112	4.7	0.272	70.1	LOS E	3.6	25.9	0.95	0.75	0.95	31.6
Approach			1202	6.9	1202	6.9	0.421	38.1	LOS C	13.5	100.3	0.78	0.69	0.78	51.1
East: Marylands Link Road 3															
10	L2	All MCs	208	1.5	208	1.5	*0.794	71.9	LOS F	14.7	104.0	1.00	0.91	1.12	30.1
11	T1	All MCs	292	0.0	292	0.0	0.361	51.3	LOS D	8.5	59.8	0.90	0.74	0.90	29.8
12	R2	All MCs	284	2.6	284	2.6	*0.779	75.8	LOS F	10.2	72.7	1.00	0.92	1.15	36.1
Approach			784	1.3	784	1.3	0.794	65.7	LOS E	14.7	104.0	0.96	0.85	1.05	32.5
North: The Northern Road															
1	L2	All MCs	119	4.4	119	4.4	0.181	61.4	LOS E	5.4	39.6	0.72	0.76	0.72	46.6
2	T1	All MCs	1753	5.4	1753	5.4	*0.796	46.3	LOS D	36.4	266.8	0.95	0.86	0.96	54.7
3	R2	All MCs	342	0.3	342	0.3	*0.808	79.2	LOS F	12.3	86.3	1.00	0.91	1.17	36.1
Approach			2214	4.6	2214	4.6	0.808	52.2	LOS D	36.4	266.8	0.94	0.86	0.98	48.1
West: Marylands Link Road 3															
4	L2	All MCs	107	0.0	107	0.0	0.405	64.2	LOS E	6.8	47.5	0.96	0.78	0.96	38.5
5	T1	All MCs	153	0.7	153	0.7	0.380	51.5	LOS D	9.0	63.3	0.91	0.74	0.91	29.7
6	R2	All MCs	176	0.0	176	0.0	0.473	70.2	LOS E	5.8	40.9	0.99	0.78	0.99	30.9
Approach			436	0.2	436	0.2	0.473	62.2	LOS E	9.0	63.3	0.95	0.77	0.95	32.6
All Vehicles			4636	4.2	4636	4.2	0.808	51.8	LOS D	36.4	266.8	0.90	0.80	0.93	44.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

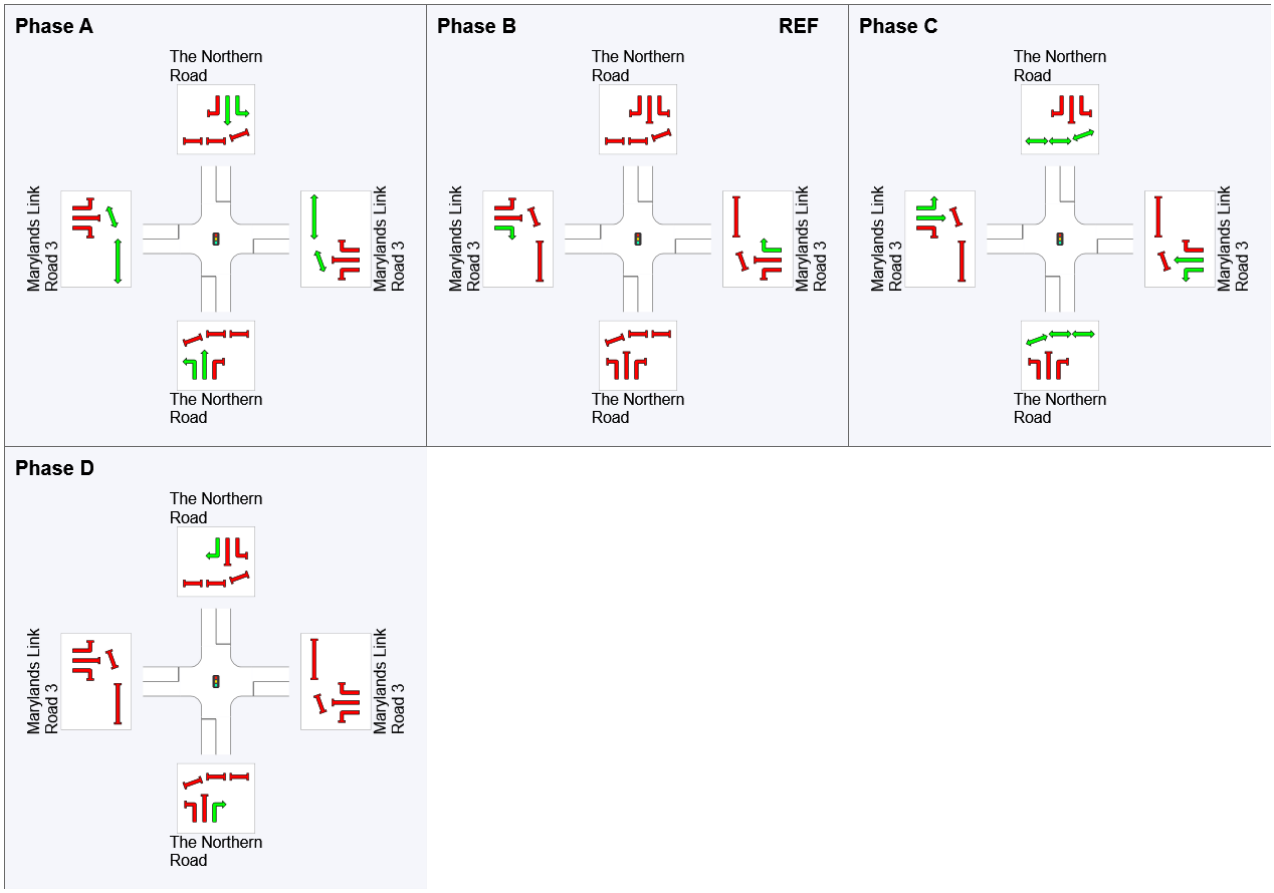
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link Road 3												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

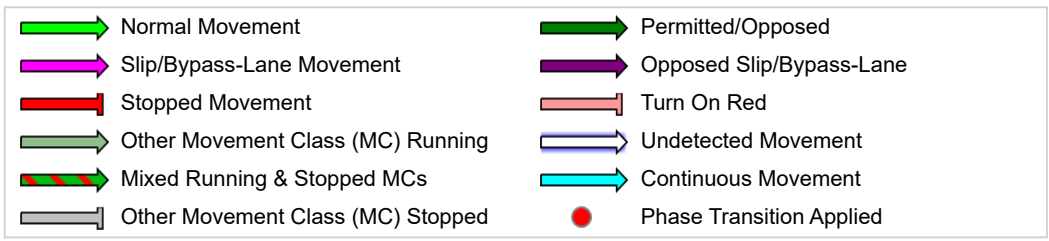
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link Road 3												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	77	0	20	55
Green Time (sec)	57	14	29	16
Phase Time (sec)	63	20	35	22
Phase Split	45%	14%	25%	16%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

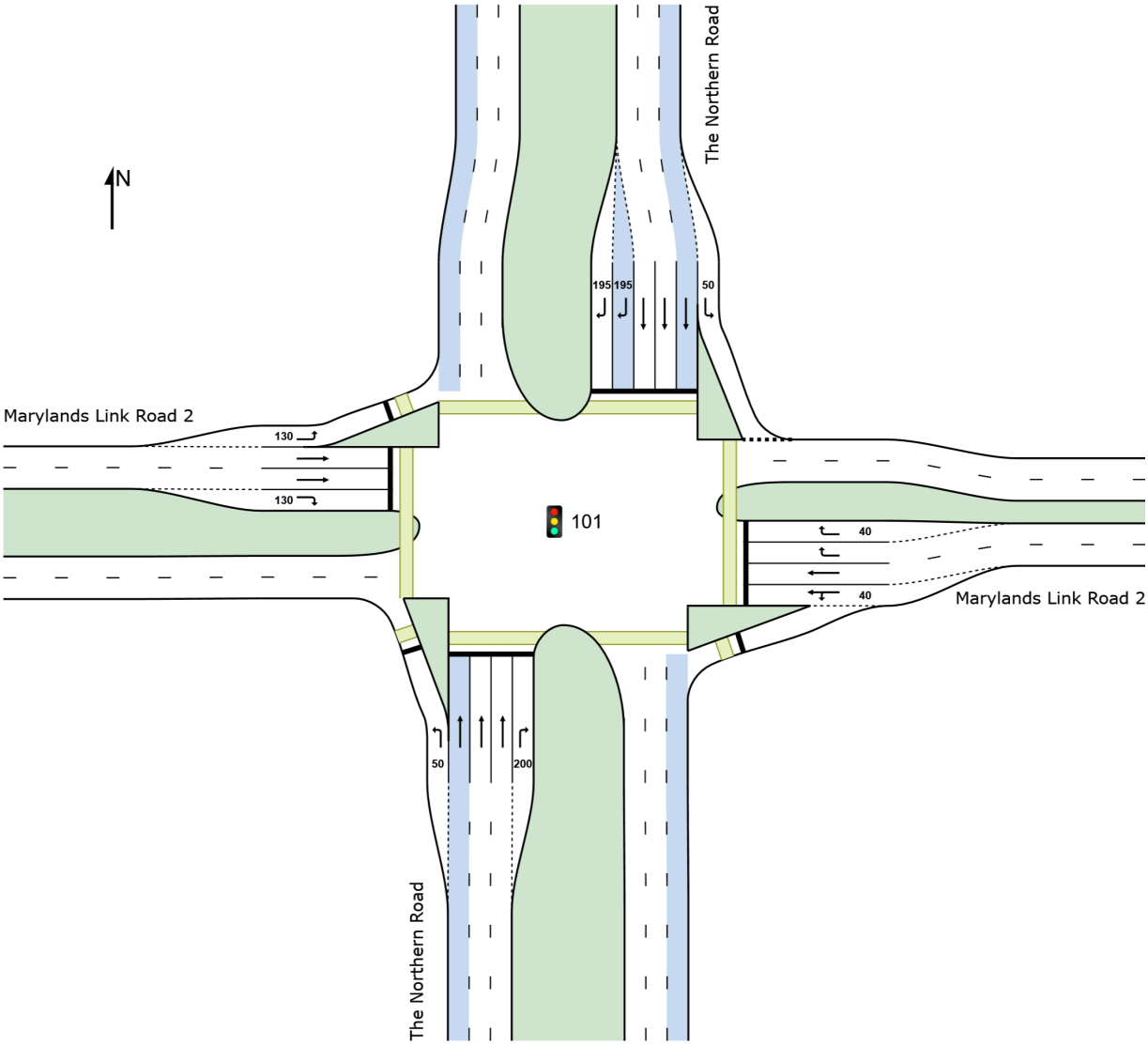
Site: 101 [TNR_Marylands Link 2 (Site Folder: 100% PM without Bus Lanes)]

AM Peak: 6.30AM-7.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	120	0.0	120	0.0	0.192	49.2	LOS D	5.7	40.2	0.75	0.76	0.75	45.4
2	T1	All MCs	938	7.4	938	7.4	0.456	36.9	LOS C	16.3	121.3	0.80	0.69	0.80	56.6
3	R2	All MCs	2	0.0	2	0.0	0.005	52.3	LOS D	0.1	0.8	0.80	0.63	0.80	42.6
Approach			1060	6.6	1060	6.6	0.456	38.3	LOS C	16.3	121.3	0.80	0.70	0.80	54.0
East: Marylands Link Road 2															
4	L2	All MCs	11	0.0	11	0.0	0.263	65.6	LOS E	5.4	37.8	0.90	0.72	0.90	41.0
5	T1	All MCs	173	0.0	173	0.0	0.263	53.1	LOS D	5.4	37.9	0.90	0.72	0.90	29.2
6	R2	All MCs	126	0.0	126	0.0	*0.680	80.3	LOS F	4.6	32.1	1.00	0.83	1.12	28.9
Approach			309	0.0	309	0.0	0.680	64.6	LOS E	5.4	37.9	0.94	0.76	0.99	29.5
North: The Northern Road															
7	L2	All MCs	71	3.0	71	3.0	0.048	29.5	LOS C	0.4	3.0	0.15	0.64	0.15	56.2
8	T1	All MCs	1537	5.8	1537	5.8	*0.740	46.8	LOS D	30.8	226.0	0.93	0.83	0.93	54.2
9	R2	All MCs	609	1.9	609	1.9	*0.751	64.3	LOS E	20.0	142.0	0.99	0.87	1.03	33.0
Approach			2217	4.6	2217	4.6	0.751	51.1	LOS D	30.8	226.0	0.92	0.83	0.93	46.0
West: Marylands Link Road 2															
10	L2	All MCs	174	4.8	174	4.8	*0.713	69.6	LOS E	11.8	86.2	1.00	0.86	1.06	30.4
11	T1	All MCs	42	0.0	42	0.0	0.060	51.0	LOS D	1.2	8.3	0.86	0.62	0.86	29.8
12	R2	All MCs	7	0.0	7	0.0	0.079	75.3	LOS F	0.5	3.5	0.98	0.66	0.98	36.0
Approach			223	3.8	223	3.8	0.713	66.3	LOS E	11.8	86.2	0.97	0.81	1.02	30.5
All Vehicles			3809	4.7	3809	4.7	0.751	49.5	LOS D	30.8	226.0	0.89	0.79	0.90	45.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

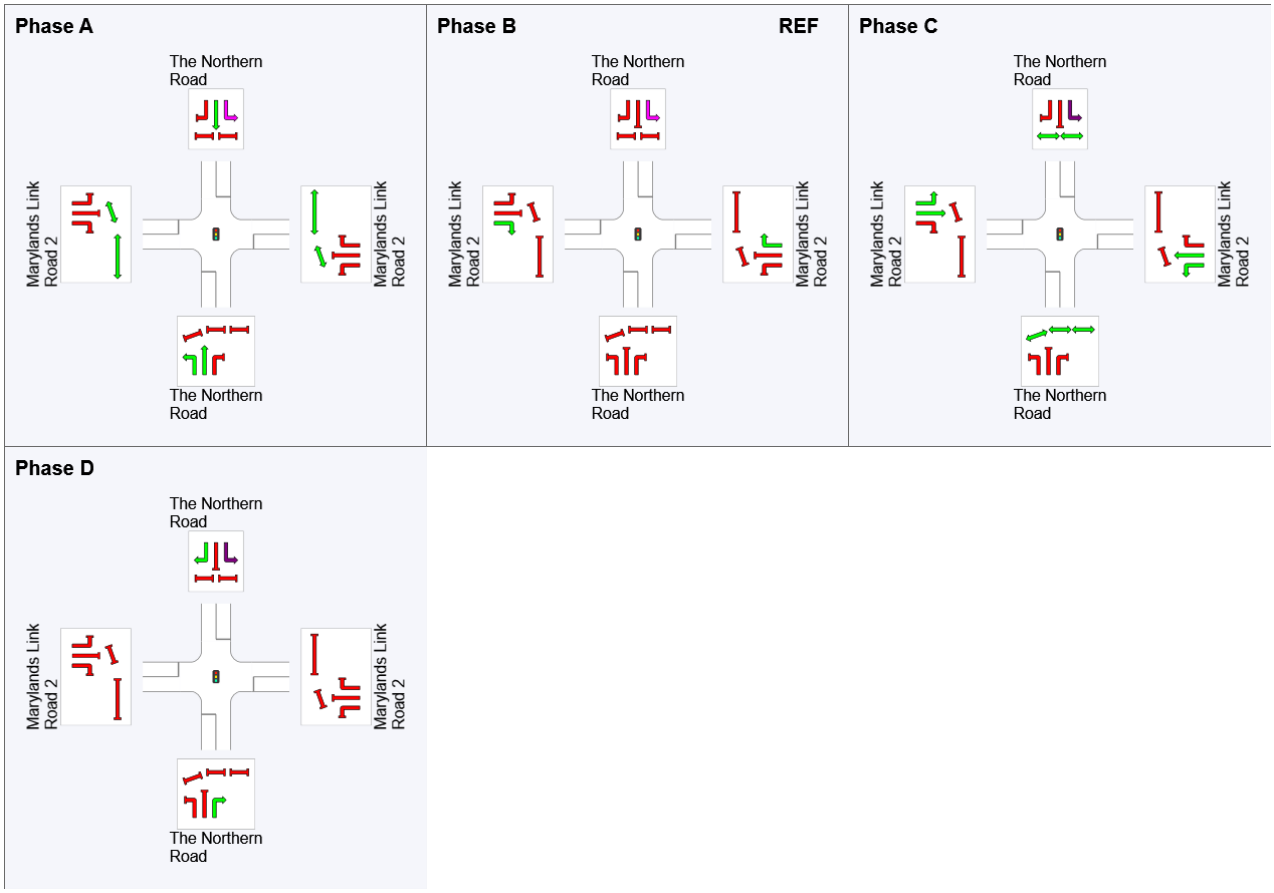
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link Road 2												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

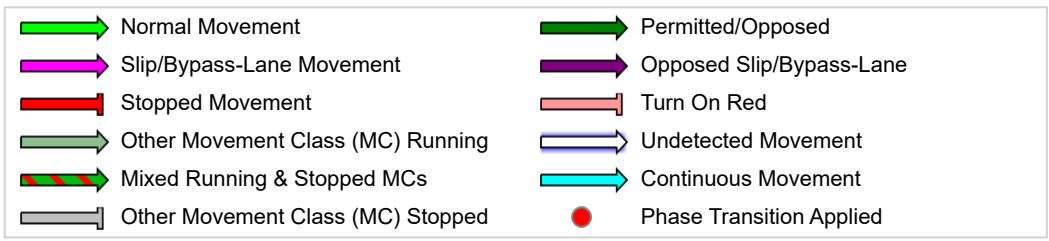
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link Road 2												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		450	474	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	81	0	13	44
Green Time (sec)	53	7	25	31
Phase Time (sec)	59	13	31	37
Phase Split	42%	9%	22%	26%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

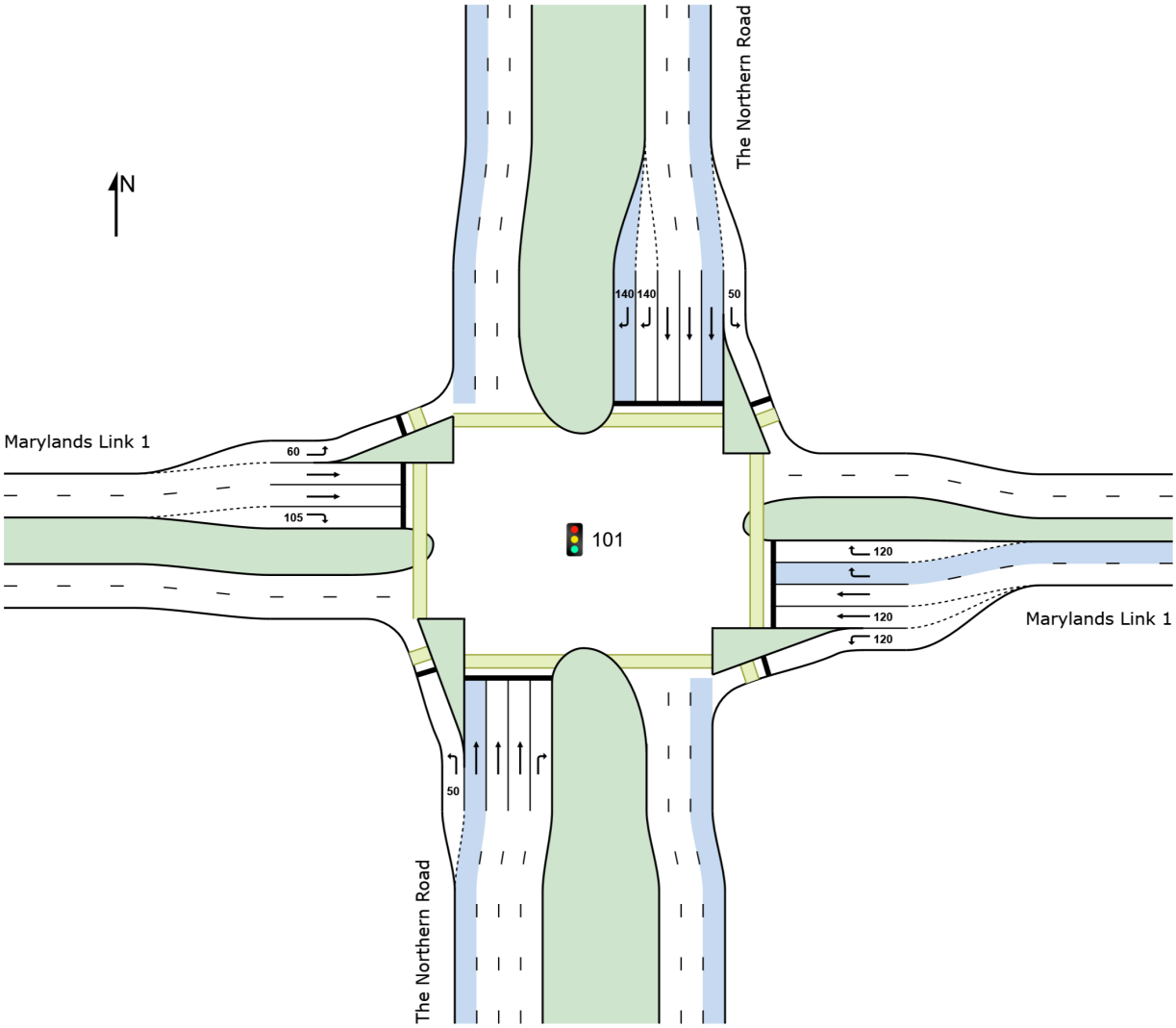
Site: 101 [TNR_Marylands Link 1 (Site Folder: 100% PM without Bus Lanes)]

6.30AM-7.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Northern Road															
1	L2	All MCs	294	2.2	294	2.2	0.467	45.7	LOS D	14.7	105.0	0.79	0.81	0.79	41.7
2	T1	All MCs	700	6.8	700	6.8	0.287	28.5	LOS C	10.1	74.8	0.69	0.58	0.69	61.7
3	R2	All MCs	89	5.9	89	5.9	* 0.586	77.0	LOS F	6.1	45.1	1.00	0.79	1.01	32.2
Approach			1083	5.4	1083	5.4	0.586	37.2	LOS C	14.7	105.0	0.74	0.66	0.74	52.3
East: Marylands Link 1															
4	L2	All MCs	93	14.8	93	14.8	0.551	71.7	LOS F	6.3	49.3	1.00	0.78	1.00	32.0
5	T1	All MCs	397	0.8	397	0.8	* 0.623	59.4	LOS E	12.8	90.1	0.98	0.81	0.98	28.0
6	R2	All MCs	303	2.4	303	2.4	0.581	65.7	LOS E	9.9	70.6	0.98	0.81	0.98	38.1
Approach			793	3.1	793	3.1	0.623	63.2	LOS E	12.8	90.1	0.99	0.81	0.99	32.7
North: The Northern Road															
7	L2	All MCs	337	3.4	337	3.4	* 0.619	53.5	LOS D	18.2	131.5	0.86	0.83	0.86	45.0
8	T1	All MCs	1067	7.6	1067	7.6	0.470	32.6	LOS C	18.2	135.6	0.76	0.66	0.76	60.2
9	R2	All MCs	151	0.7	151	0.7	0.475	75.9	LOS F	5.1	35.8	1.00	0.77	1.00	36.6
Approach			1555	6.0	1555	6.0	0.619	41.3	LOS C	18.2	135.6	0.80	0.71	0.80	52.1
West: Marylands Link 1															
10	L2	All MCs	40	21.1	40	21.1	0.248	69.2	LOS E	2.6	21.5	0.96	0.74	0.96	36.5
11	T1	All MCs	167	1.3	167	1.3	0.263	55.3	LOS D	5.0	35.6	0.92	0.72	0.92	28.8
12	R2	All MCs	159	2.0	159	2.0	* 0.608	66.0	LOS E	10.4	74.0	0.99	0.81	0.99	33.9
Approach			366	3.7	366	3.7	0.608	61.5	LOS E	10.4	74.0	0.95	0.76	0.95	32.1
All Vehicles			3797	5.0	3797	5.0	0.623	46.7	LOS D	18.2	135.6	0.84	0.72	0.84	45.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

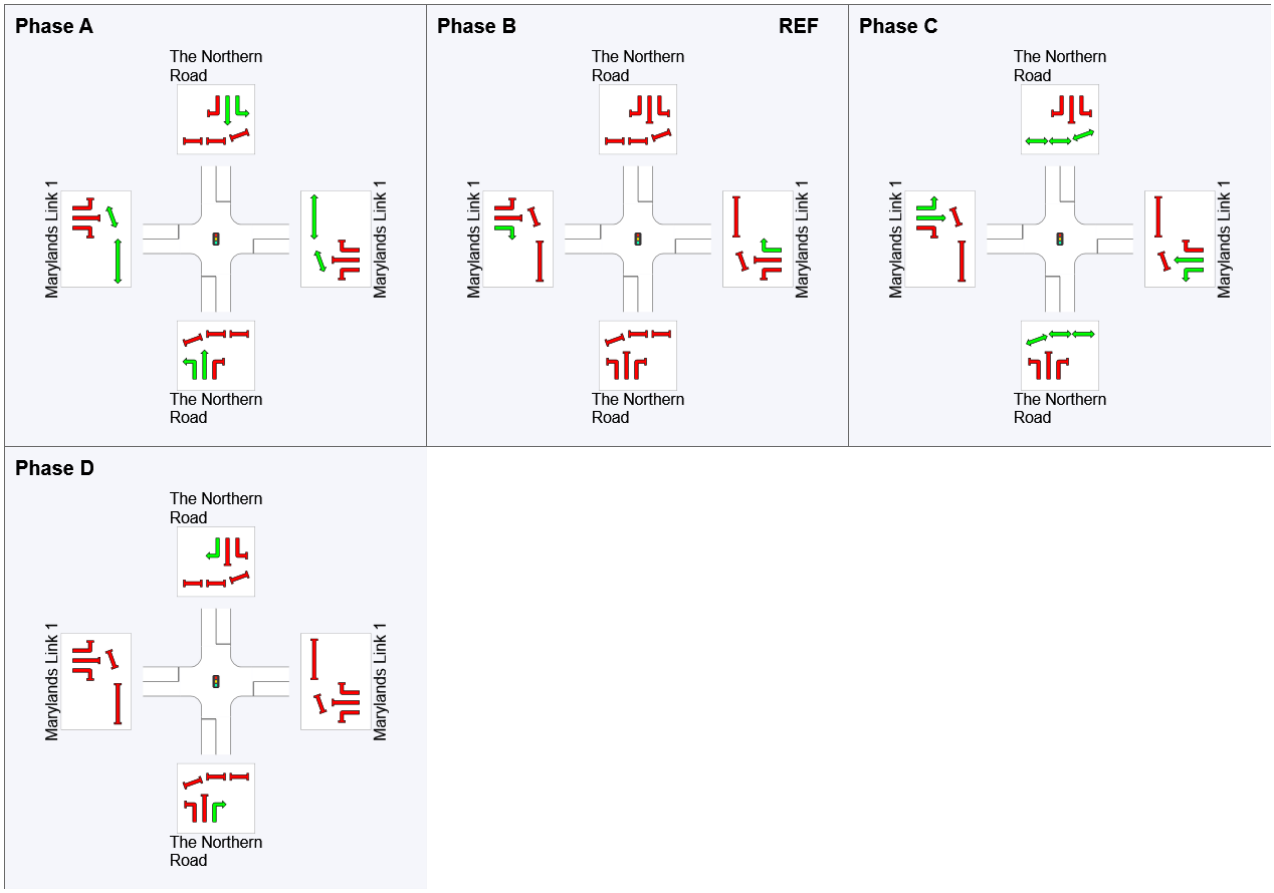
Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
East: Marylands Link 1												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
North: The Northern Road												

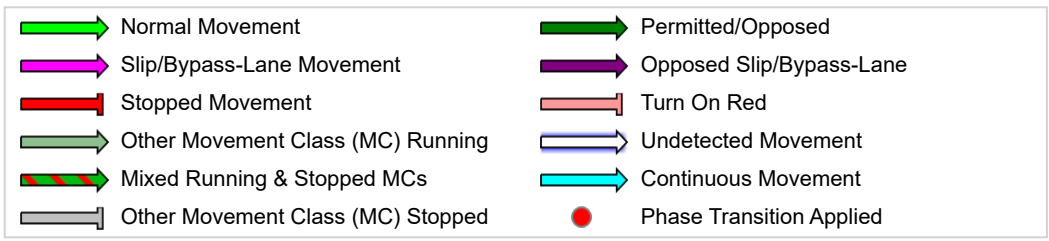
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
West: Marylands Link 1												
P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	73	0	26	55
Green Time (sec)	61	20	23	12
Phase Time (sec)	67	26	29	18
Phase Split	48%	19%	21%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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

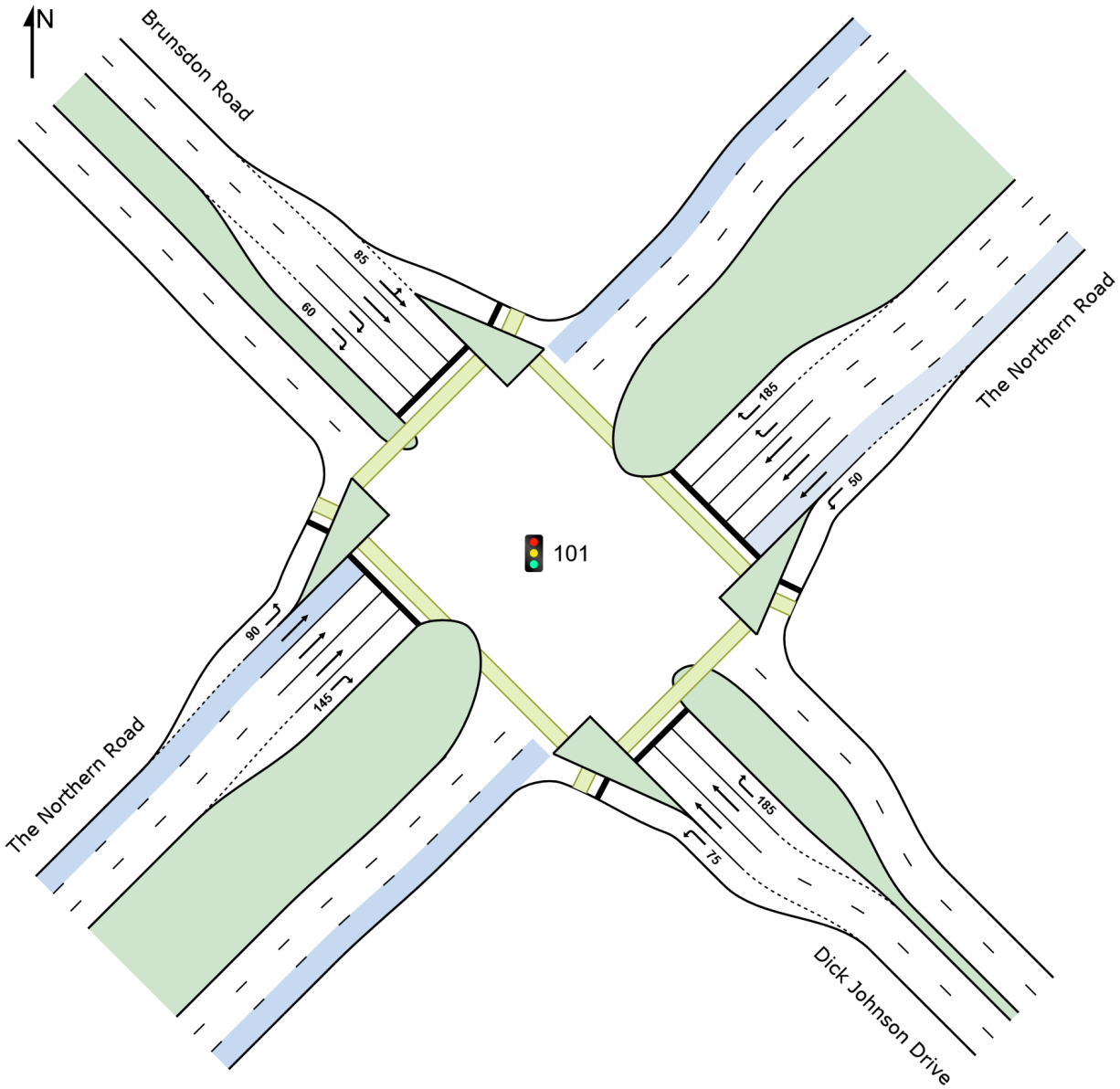
Site: 101 [TNR_Dick Johnson Dr_Brunson Rd (Site Folder: 100% PM without Bus Lanes)]

Peak: 7.30AM-8.30AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns - Import
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Dick Johnson Drive															
4	L2	All MCs	17	0.0	17	0.0	0.141	73.5	LOS F	1.1	7.9	0.97	0.69	0.97	37.6
5	T1	All MCs	138	0.0	138	0.0	*0.275	60.2	LOS E	4.3	30.2	0.94	0.73	0.94	27.8
6	R2	All MCs	184	1.7	184	1.7	0.827	75.8	LOS F	13.4	94.9	1.00	0.96	1.18	26.7
Approach			339	0.9	339	0.9	0.827	69.3	LOS E	13.4	94.9	0.98	0.85	1.08	27.8
NorthEast: The Northern Road															
7	L2	All MCs	1	0.0	1	0.0	0.001	25.9	LOS B	0.0	0.2	0.52	0.62	0.52	42.4
8	T1	All MCs	853	3.7	853	3.7	0.279	21.0	LOS B	10.4	74.8	0.58	0.63	0.58	53.6
9	R2	All MCs	47	0.0	47	0.0	*0.298	82.2	LOS F	1.7	11.7	1.00	0.71	1.00	26.0
Approach			901	3.5	901	3.5	0.298	24.2	LOS B	10.4	74.8	0.61	0.63	0.61	51.9
NorthWest: Brunsdon Road															
10	L2	All MCs	5	0.0	5	0.0	0.122	74.6	LOS F	1.4	10.1	0.94	0.68	0.94	29.0
11	T1	All MCs	47	2.2	47	2.2	0.122	59.4	LOS E	1.8	13.1	0.93	0.68	0.93	27.7
12	R2	All MCs	400	5.0	400	5.0	*0.918	86.6	LOS F	15.8	115.5	1.00	1.08	1.35	35.1
Approach			453	4.7	453	4.7	0.918	83.6	LOS F	15.8	115.5	0.99	1.04	1.30	34.5
SouthWest: The Northern Road															
1	L2	All MCs	872	0.5	872	0.5	*0.977	97.9	LOS F	74.8	526.0	1.00	1.07	1.26	37.5
2	T1	All MCs	973	5.4	973	5.4	0.448	22.1	LOS B	18.5	135.6	0.65	0.57	0.65	63.8
3	R2	All MCs	14	0.0	14	0.0	0.172	81.3	LOS F	1.0	6.7	0.99	0.68	0.99	36.9
Approach			1858	3.1	1858	3.1	0.977	58.1	LOS E	74.8	526.0	0.82	0.81	0.94	44.4
All Vehicles			3551	3.2	3551	3.2	0.977	53.8	LOS D	74.8	526.0	0.80	0.80	0.91	42.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

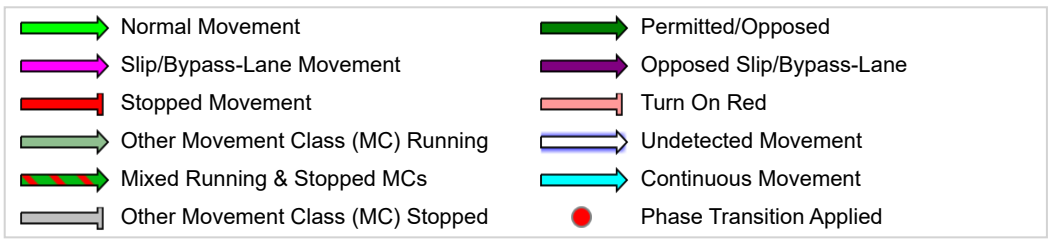
Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
SouthEast: Dick Johnson Drive												
P2	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P2B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
NorthEast: The Northern Road												
P31	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P32	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P3B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
NorthWest: Brunsdon Road												

P4	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P4B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
SouthWest: The Northern Road												
P11	Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P12	Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
P1B	Slip/ Bypass	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92
All Pedestrians		500	526	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

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.

Output Phase Sequence

REF: Reference Phase
VAR: Variable Phase



Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	59	0	23	47
Green Time (sec)	75	17	18	6
Phase Time (sec)	81	23	24	12
Phase Split	58%	16%	17%	9%
Phase Frequency (%)	100.0	100.0	100.0	100.0

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


SCT
Consulting