WOLLI CREEK AND BONAR STREET PRECINCT TRAFFIC STUDY

FINAL REPORT

FOR

ROCKDALE CITY COUNCIL

BITZIOS consulting

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EXECUTIVE SUMMARY

Bitzios Consulting have been commissioned by Rockdale City Council to undertake the Wolli Creek and Bonar Street Precinct Traffic and Transport Study to resolve existing and future transport related issues affecting the area. The primary consideration of this study was to respond to increasing concerns regarding the perceived level of 'through traffic' in Wolli Creek and the subsequent effects it would have on pedestrian and cycle amenity as the centre develops.

There is currently a strong shift in mode choice in the precinct towards walking. As the town centre continues to develop it is important that sufficient pedestrian and cycle treatments are implemented to support their movement. The current infrastructure plan does not reflect these needs and this is required to be addressed as part of this study. The high level of re-development forecast for the Bonar Street and Wolli Creek precincts is likely to bring forward the need to implement more pedestrian and cycle oriented treatments.

The key existing issues in the study area predominantly related to a poor provision of pedestrian and cycle facilities and greater priority given to the private motor vehicle. Current perceptions are that there is a high volume of 'through traffic' using Arncliffe Street. Based on traffic data obtained in October 2012, 10% to 30% of traffic using Arncliffe Street is 'through traffic' with a large proportion of this traffic likely to be generated by residents within the Rockdale local government area (ie Bexley, Bexley North and Kingsgrove). This is considered to be within reasonable tolerances for a regional road / main street.

As part of assessing solutions to address future traffic growth, four options were considered for the year 2031 horizon, testing different road network configurations and transport mode choice scenarios, listed as follows:

1. *Current DCP Improvements;*
2. *DCP Improvements with a reduction in private vehicle mode share;*
3. *Scenario 2 with Allen St open to Right Turn 'In'; and*
4. *Scenario 3 with Arncliffe Street Closed south of Guess Avenue.*

The assessment of the above scenarios highlighted that the reduction of private motor vehicle use contained the greatest benefit to the traffic network. This assisted with determining the preferred option for the Wolli Creek and Bonar Street precincts. Option 3 assisted with alleviating traffic through Arncliffe Street, but became an attractive alternative for right turners at the Forest Road / Princes Highway intersection. In addition, the additional southbound traffic along the Princes Highway began to introduce some congestion as a result of cars weaving/manoeuvring into correct lanes in the vicinity of the West Botany Street / Princes Highway intersection. Option 4 forced all of the westbound traffic down towards Allen Street and Forest Road and the Princes Highway was not able to cater for this additional traffic. The level of queuing was unacceptable and this option could only proceed if additional capacity was provided along the Princes Highway which is unlikely to be justified financially.

The Preferred Option was based on creating a series of "one-way street sections" along Arncliffe Street, Guess Avenue and Mount Olympus Boulevard to provide more space for pedestrians and cyclists. This creates urban design opportunities for a much improved amenity for pedestrians and cyclists within the town centre. The Preferred Option is expected to support an increasing pedestrian and cycle mode share, with the aim to retain private motor vehicle usage to existing levels.

The Preferred Option is schematically shown in Figure 1 below. The main roundabout in the town centre at the Brodie Spark Drive / Arncliffe Street intersection has been shown to be removed. It may be possible to either retain, or signalise, this intersection treatment as an alternative to the Preferred Option. This would be subject to further detailed community consultation. Currently the Brodie Spark Drive access has been restricted to 'left in and left out' movements only to simplify the intersection and improve its safe operations. As a result, traffic from Brodie Spark Drive wanting to head down Arncliffe Street will be required to travel to Spark Lane and then Magdalene Terrace to be able to travel in that direction.

Figure 1: Preferred Traffic Configuration – Wolli Creek Town Centre

The traffic management solution for the Bonar Street is less problematic and is partially realted to the need to manage traffic routes through to the Princes Highway. The recommended road configuration adopted was consistent across all options tested and is shown in Figure 2 below.

Figure 2: Preferred Traffic Configuration – Bonar Street Precinct

1. INTRODUCTION

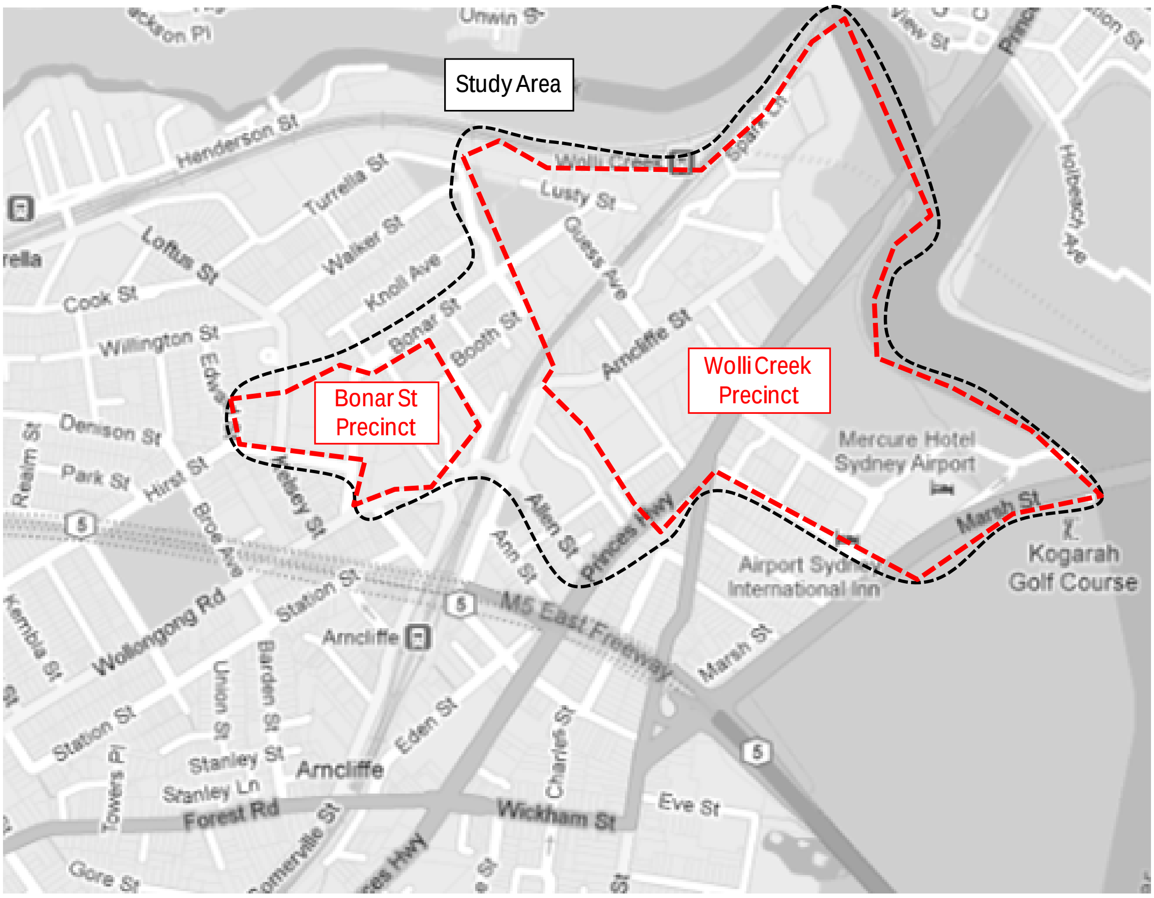
1.1 PURPOSE

Bitzios Consulting has been commissioned by Rockdale City Council to prepare a “traffic and transport study” for the Wolli Creek and Bonar Street precincts to address a number of items, such as:

- the increasing pressure on the local road system;
- issues associated with through traffic;
- opportunities to improve walking, cycling and public transport access; and
- updating the current Section 94 development contributions plan.

1.2 BACKGROUND

The study area contains two precincts that correlate to the Rockdale Development Control Plan 2011 (DCP) area for the Wolli Creek and Bonar Street precincts. Wolli Creek Village, previously known as North Arncliffe, is transforming from an industrial area into a high quality urban precinct with a town centre focused around the Wolli Creek rail interchange. The Bonar Street precinct has also experienced significant redevelopment recently and is expected to continue its transition into a more modern and active area. While this study focuses on the Wolli Creek and Bonar Street precincts, it also considers external vehicle movements relating to significant road corridors and land uses adjacent to the study area.



Source: Google Maps

Figure 1.1: Study Area

A Section 94 Plan was originally developed in response to a traffic study completed in 1998. It consists of a levy on developments in the Wolli Creek and Bonar Street precincts towards the cost of providing additional public facilities and services required to meet the needs of those developments.

Since the development of the Section 94 Plan, a series of studies and policies have been developed, including the Rockdale Development Control Plan 2011 (DCP), Rockdale Local Environmental Plan 2011 (LEP), and Wolli Creek and Bonar Street Precinct Public Domain Plan 2011(PDP). There have also been a number of large scale developments introduced in the area that has placed pressure on competing transport modes. As such, infrastructure demands for the precinct have changed and the Section 94 plan is required to be updated to reflect the current situation and ensure that it is aligned with other planning tools and operational needs.

2. METHODOLOGY

This traffic study followed the main project phases, as detailed below:

Phase 1 – Data Collection and Site Inspections

During this phase, Bitzios Consulting worked closely with Council officers to collate and review as much relevant data as possible for this study. A number of site visits were undertaken to help identify some of the issues and give a better understanding of current conditions.

The data collected includes:

- Rockdale Local Environment Plan 2011 (LEP);
- Rockdale Development Control Plan 2011 (DCP);
- Wolli Creek and Bonar Street Precinct Public Domain Plan (PDP);
- Rockdale Section 94 Contributions Plan 2004 (s94);
- Previous transport studies developed for the study area;
- Future population and demographic data;
- Parking inventory;
- Public transport route/timetable information;
- Existing transport strategies (including pedestrian and cycling); and
- Key developments within or adjacent to the study area.

Phase 2 – Identification of Existing and Emerging Transport Issues

A thorough investigation was carried out during this phase to identify all the existing transport issues and those likely to emerge in the future. The current and forecast flows of vehicular traffic, pedestrians and cyclists within Wolli Creek and the Bonar Street Precinct were assessed together with the regional factors and development yield achievable under the LEP. This allowed quantifying the transport issues and conflicts in the area now and over the next 20 years as the LEP development levels are realised.

Section 4 to Section 6 highlights issues identified across Planning Issues, Development Issues and Transport Issues. These issues are then summarised in a table located in Section 7. This table was used to help identify future year options that could help mitigate the networks deficiencies.

Phase 3 – Workshops

A number of meetings / workshops took place throughout the duration of the project. Some of the project meetings / workshops included:

- Issue Identification with Council Officers;
- Presentation of Base Traffic Model with Council Officers;
- Presentation of Future Year Traffic Model with Council Officers;
- Presentation of Option Models to Council Officers;
- Councillor Presentation;
- Meeting with Road and Maritime Services (RMS) – Local Traffic Committee;
- Phone discussions with RMS Network Planning;
- Meeting with Transport for NSW (TfNSW) Bike and Pedestrian Planner;
- Meeting with TfNSW Public Transport Planner; and
- Meeting with TfNSW Growth Centre's Planners.

The issues identification process continued through the duration of the project and was iteratively updated. The meetings / workshops allowed all key agency stakeholders to have some input into this process and all issues to be discussed in detail. This assisted with obtaining a robust understanding of the objectives and existing issues within the Wolli Creek and Bonar Street precincts.

Phase 4 – Development of the Current Year Simulation Model

A traffic microsimulation model was developed to for the Wolli Creek and Bonar Street precincts. The Paramics suite of software was used to develop the simulation models.

Separate morning and evening peak models were developed for the study area. The model area was extended to the south to include the Princes Highway and Forest Road through towards the Wollongong Road intersection. This was undertaken to ensure the route choice issue from Bexley through to Tempe were given due consideration. The traffic model was used as the basis of testing potential option to resolve the traffic issues in Wolli Creek. The traffic model was audited by an independent consultancy verifying its calibration/validation attributes and endorsing it as being 'fit for purpose'.

Phase 5 – Future Year Options Assessment

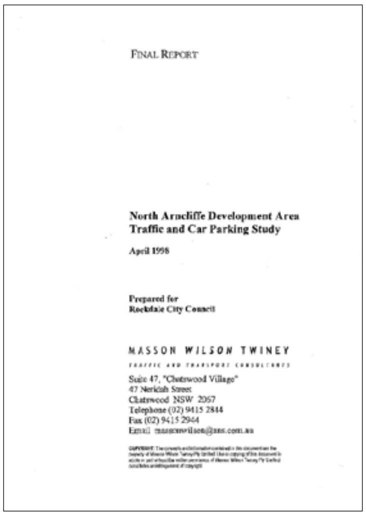
Upon identifying current and emerging issues in the study area, a number of future year alternative options were assessed. The future year model was developed to cater for 2031 forecast traffic demands. The outcomes of this assessment were discussed with Rockdale City Council and led to the identification of the preferred option and implementation plan.

Phase 6 – Preferred Option and Implementation Plan

The preferred option was subsequently refined in consultation with Council officers. The preferred option, including infrastructure and non-infrastructure items were subsequently costed and incorporated into an implementation plan.

3. PREVIOUS STUDIES

3.1 NORTH ARNCLIFFE DEVELOPMENT AREA TRAFFIC AND CAR PARKING STUDY


FINAL REPORT

North Arncliffe Development Area
Traffic and Car Parking Study

April 1998

Prepared for
Rockdale City Council

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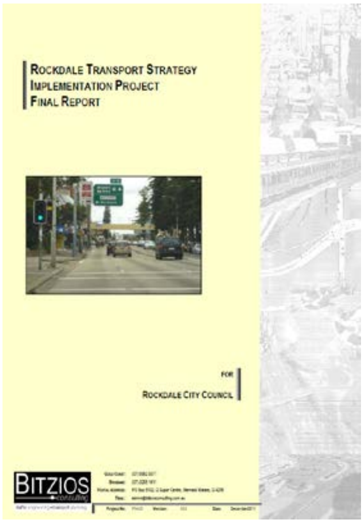
This study was submitted to Council in 1998 by Masson Wilson Twiney. It was prepared in response to Council's proposal to rezone the area as a mixed use zone and investigated requirements for short and long term traffic and parking management of the area.

Some of the key findings of this study were:

- Wollongong Road, Allen Street and Princes Highway corresponded to the most popular route through the study area (eastbound in the morning and westbound in the afternoon);
- the traffic generated within the study area would potentially increase by 260% (low development scenario) to 400% (high development scenario);
- required improvements in the road system included the need to accommodate through traffic, provide high quality access to the rail station, provide access for increased traffic generation and to provide a convenient internal traffic system for circulation and site access;
- the potential increase of traffic volumes along Wollongong Road was identified and the impact of the implementation of traffic calming measures was evaluated. It was recommended that a study be commissioned to assess traffic calming requirements; and
- a number of network improvements (predominantly near the rail station) were identified as being the State Government's funding responsibility while other upgrades within the study area were marked as being subject to inclusion in a Section 94 plan.

3.2 ROCKDALE TRANSPORT STRATEGY IMPLEMENTATION PROJECT


ROCKDALE TRANSPORT STRATEGY
IMPLEMENTATION PROJECT
FINAL REPORT

FOR
ROCKDALE CITY COUNCIL

BITZIOS consulting

This report was completed by Bitzios Consulting and was submitted to Rockdale City Council in 2011.

While the report focuses on a large area and provides direction in the development of an integrated transport strategy for Rockdale, it makes reference to some deficiencies and localised issues in the Wolli Creek precinct.

It also discusses the need for an integrated approach to increase mode share benefits between pedestrian/cyclists and public transport while still providing for the existing private vehicular requirements. More specifically, the Arncliffe Street pedestrian underpass was identified as a safety concern due to its narrow width and its locality to the adjacent travel lanes.

The forecast population and employment growth in the Rockdale LGA was anticipated to occur mostly in the Wolli Creek and Cooks Cove areas.

3.3 ROCKDALE CITY COUNCIL M5 SUBMISSION

The M5 submission, completed by Bitzios Consulting, was submitted to Rockdale City Council in 2010. This report identified the M5 expansion project proposal as being misaligned with the Land Use and Development plans of the Wolli Creek precinct.

More specifically, it highlights how there is no mention in the project proposal of Wolli Creek impacts/integration issues. Public transport and cycleway linkages are stated as key factors omitted by the proposal.

It is, however, highlighted how the proposed M5 expansion project may reduce traffic on local roads such as Forrest Road and other roads within the Wolli Creek area.

Improvements to the Marsh Street interchange will potentially provide greater flexibility in incorporating public transport priority initiatives between Wolli Creek, Cooks Cove and the Sydney Airport.

3.4 COOKS RIVER CYCLEWAY EXTENSION FEASIBILITY STUDY

This study was prepared by GTA Consultants in June 2012. It investigates a number of options for the extension of the Cooks River Cycleway between Cahill Park and Gough Whitlam Park.

This extension requires crossings of Princes Highway, the railway line and Wolli Creek. The report highlights how the completion of the missing link between Cahill Park and Gough Whitlam Park would significantly increase the cycleway's catchment and improve access to the Wolli Creek rail station.

The feasibility assessment divides the study area into five segments and provides preliminary concept design and costings as a reference for future stages of the project.

It identifies an underpass as the preferred option to cross the Princes Highway. Flood risks are considered to be manageable but studies (including flood modelling) are recommended.

3.5 COOKS RIVER PEDESTRIAN AND CYCLE STRATEGY

The Cooks River Pathway is one of the oldest shared pedestrian and bicycle paths in Sydney. It is a largely off-road facility that is about 34.6km long from Mason Park at Homebush Bay Drive to the Cooks River entrance at Botany Bay. The study area also included the Alexandra Canal from Perry Park at Bourke Road to the Cooks River, as well as strategic links to other pathways and local connections. Limits of the study area are boundaries of the participating councils, viz Strathfield, Burwood, Canterbury, Marrickville, Rockdale, Botany and Sydney.

The project identified safety, access and other issues with a view to developing a strategy for the improvement of the walking and cycling environment. Key strategic issues identified from the project were:

- Shared paths have inherent conflicts between user groups, including bicycles, pedestrians, joggers, roller bladers, service vehicle, dog-walkers, etc.; and
- Existing road and rail crossings are unsuitable for current usage patterns. Most existing road and rail bridges currently provide inadequate hydraulic flow capacity, which limits opportunities to use the existing bridge structures over the River. Accordingly, it was recommended to provide at-grade crossings with improved access for a wide range of pathway user groups.

3.6 REGIONAL BICYCLE NETWORK PLAN FOR SEVEN SSROC COUNCILS


Southern Sydney Regional Organisation of Councils

SSROC

Regional Bicycle Network Plan for Seven SSROC Councils

Project report

January 2008

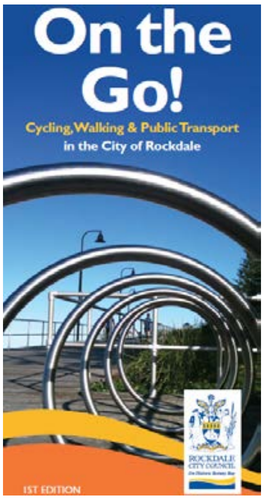
This study was prepared by Sustainable Transport Consultants Pty Ltd in 2008 for the Southern Sydney Regional Organisation of Councils (SSROC). It aimed to identify gaps, deficiencies, mismatches and opportunities in the existing/planned regional bicycle network.

A regional bicycle network is proposed, consisting of an interconnected set of marked bicycle routes providing access to residential areas and major trip generators. The network design objectives are:

- reduce encounters between cyclists, pedestrians and fast-moving traffic;
- treat bicycle route crossings of streets or roads as intersections;
- design bicycle facilities to include all types of bicycle users; and
- integration to local and adjoining municipal cycle networks.

While the Rockdale City Council did not participate in this initiative, the study identifies the proposed Kingsgrove to Wolli Creek route (via Wolli Creek Valley and Bexley North) as a regional network linkage.

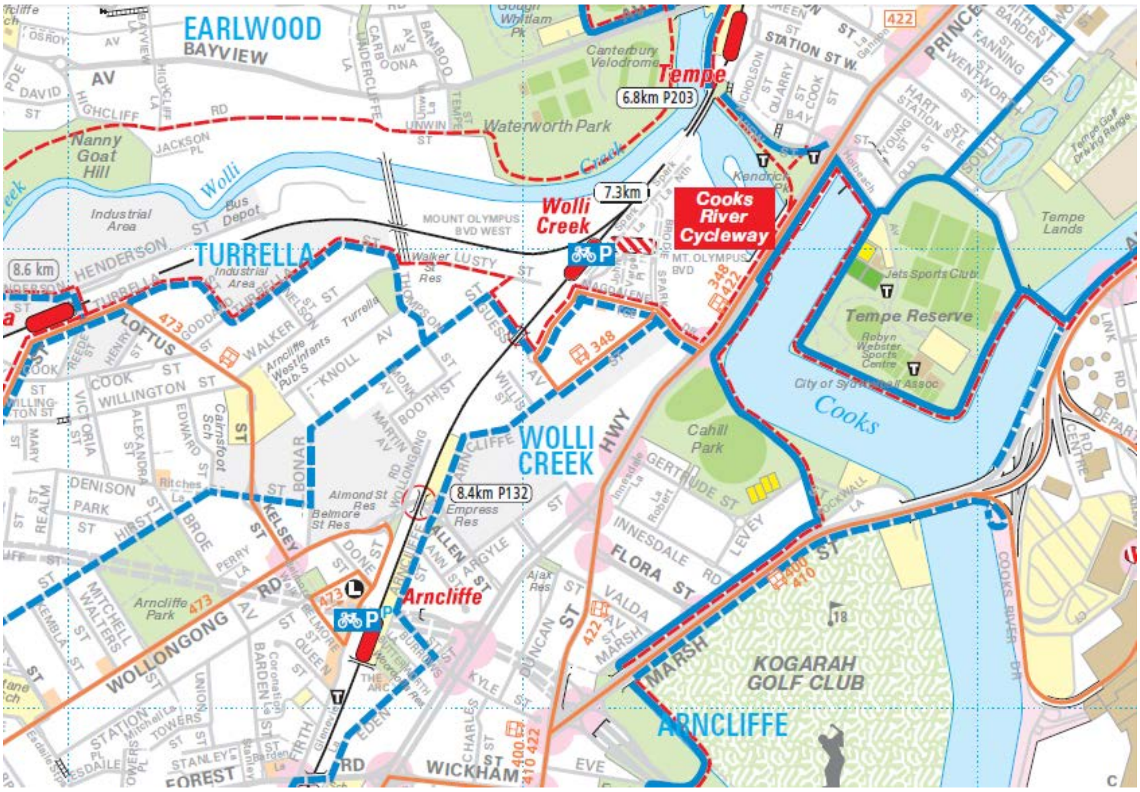
3.7 ON THE GO MAP



Rockdale City Council's "On the Go" map promotes the use of sustainable transport modes and encourages residents and visitors to use the existing cycleway network, walking routes or public transport services.

It identifies the main attractions in the city and how to access them using sustainable transport. Some of the network components mentioned in this document are:

- the Cook Park Recreational Cycleway (begins at Cahill Park near Wolli Creek and ends at Fraters Avenue);
- the Wolli Creek Trail (just north of the study area);
- the Cook Park walking trail, which forms part of the Sydney Coastal Walk; and
- the multiple public transport routes that service Rockdale City in general (of which six pass through the study area).



Source: On The Go Map

Figure 2.1: Extract of the "On The Go" Map

4. Planning Policy Issues

4.1 Overview

Council's vision for Wolli Creek, as outlined in the DCP is:

"to create a high quality, high density urban environment for living, working and recreation. Wolli Creek residents and workers will walk, cycle and use public transport and will have access to a wide range of recreation, entertainment and shopping facilities within Wolli Creek. The network will encourage the use of the extensive recreation and open space facilities within Wolli Creek and provide good connections from outside the area. Wolli Creek's location, being 8km from Sydney CBD, containing a major railway interchange – one stop from the airport, and being close to the M5 Motorway – will help to establish it as an important employment base within the region."

Some of the key objectives established in the DCP for the Bonar Street precinct are:

"to promote the development of the land predominantly for medium-high density residential use with a mix of dwelling types, with a limited amount of compatible uses including retail, child care, community facilities and open space to serve local residents." and *"to allow for underutilised properties to be redeveloped while existing viable businesses in the precinct continue operations in the short term."*

There is a community perception that there are high levels of 'through traffic' using collector roads and local streets in Wolli Creek in order to avoid congestion on the arterial road network. Key concern relate to the impact that driver behaviour is having on the amenity within the area, particularly along the section of Arncliffe Street between Guess Avenue and Brodie Spark Drive.

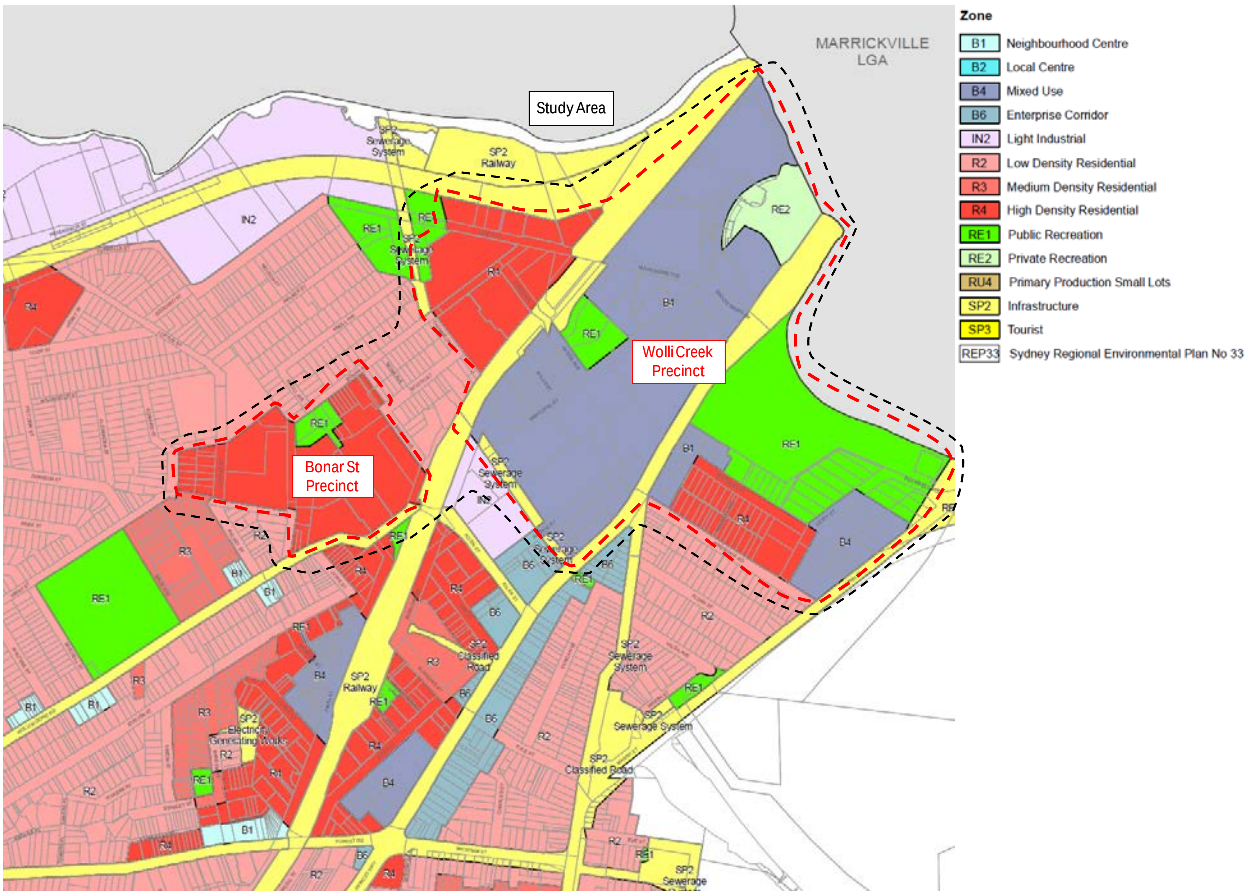
This issue will become more significant as the existing industrial developments in the area are replaced by medium density residential development, in accordance with the LEP and DCP. With the LEP and DCP approved in late 2011, the current S94 plan (which is based on a traffic report completed in 1998) is now considered to be out-dated.

4.2 Rockdale Local Environmental Plan 2011(LEP)

The LEP is the principle planning instrument applied to the Rockdale local government area. Some of the LEP objectives are:

- to promote economic activity within Rockdale through the facilitation of commercial, employment-generating and tourism opportunities;
- to provide high quality open space and a range of recreational facilities to meet the demands of Rockdale and its visitors; and
- to encourage residential and employment densities around transport nodes in order to provide sustainable transport options.

The LEP zoning maps identify the Wolli Creek precinct land use as a combination of B4(Mixed Use), R4(High Density Residential) and a smaller proportion of R2(Low Density Residential). The Bonar Street precinct is shown to predominantly contain R4(High Density Residential) land uses, as shown in Figure 4.1.



Source: Rockdale Local Environmental Plan 2011

Figure 4.1: LEP Zoning Map

4.3 ROCKDALE DEVELOPMENT CONTROL PLAN 2011(DCP)

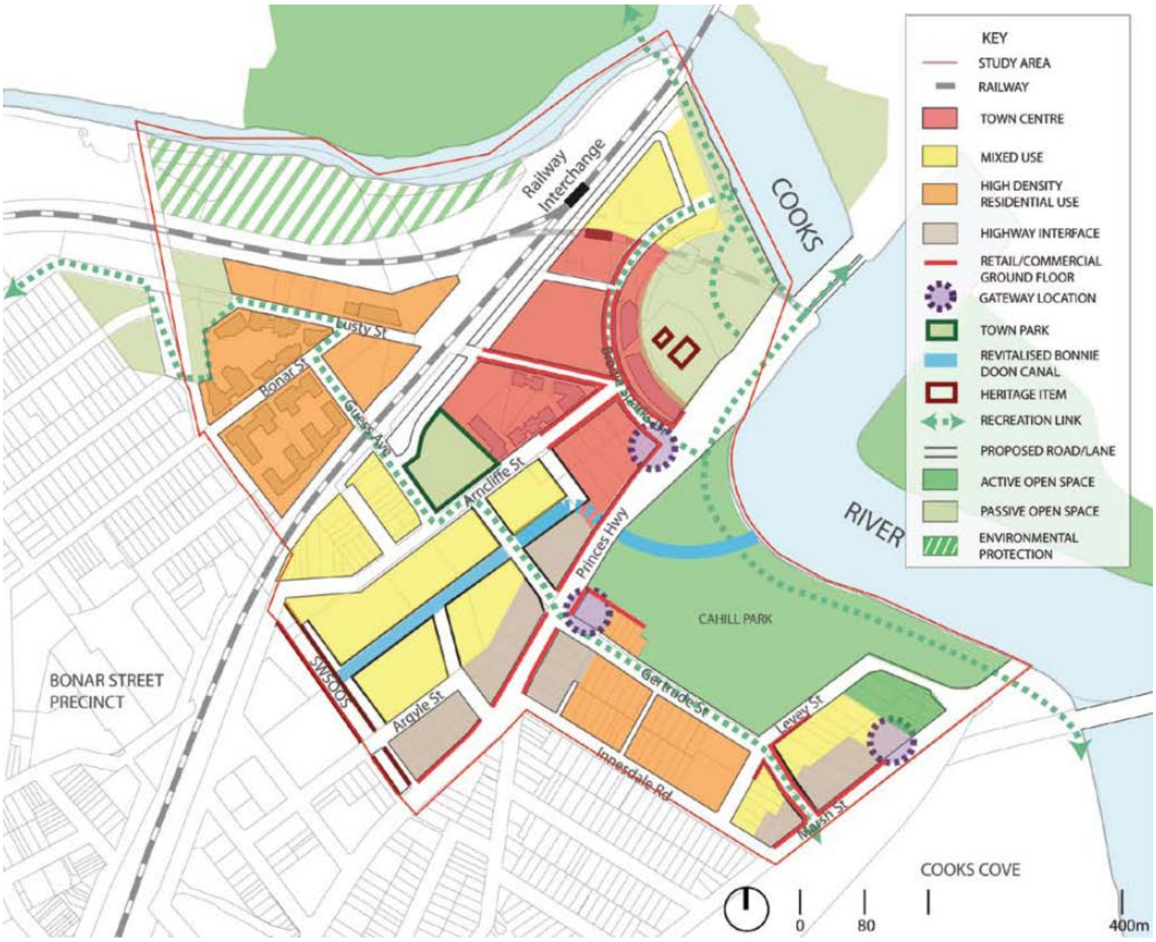
The DCP complements the LEP with specific planning objectives and design guidelines for development. Its specific purpose is to:

- communicate the planning, design and environmental objectives and controls against which Council will assess future Development Applications (DAs);
- promote high quality urban design outcomes within the context of environmental, social and economic sustainability; and
- encourage innovative design with particular emphasis on the integration of buildings and landscaped areas that contribute to the character of neighbourhoods.

The DCP contains a section for "special precincts" that aims to provide additional design requirements for certain areas in the city that require special consideration. Both Wolli Creek and Bonar Street precincts are included in this section with further details as follows:

4.3.1 Wolli Creek Special Precinct

The DCP states the vision for this precinct to be based on a high quality, high density urban environment. An activity hub is proposed to adjoin the Wolli Creek railway station as shown in the Wolli Creek Structure Plan. An activity hub is a location where multiple activities occur. For Wolli Creek, this is intended to mean retail and commercial activity, along with a high quantum of local residential based pedestrians interfacing between these uses and the rail interchange. The range of retail and commercial activity proposed to be on offer has the potential to attract pedestrians, through the rail interchange, from outside locations.



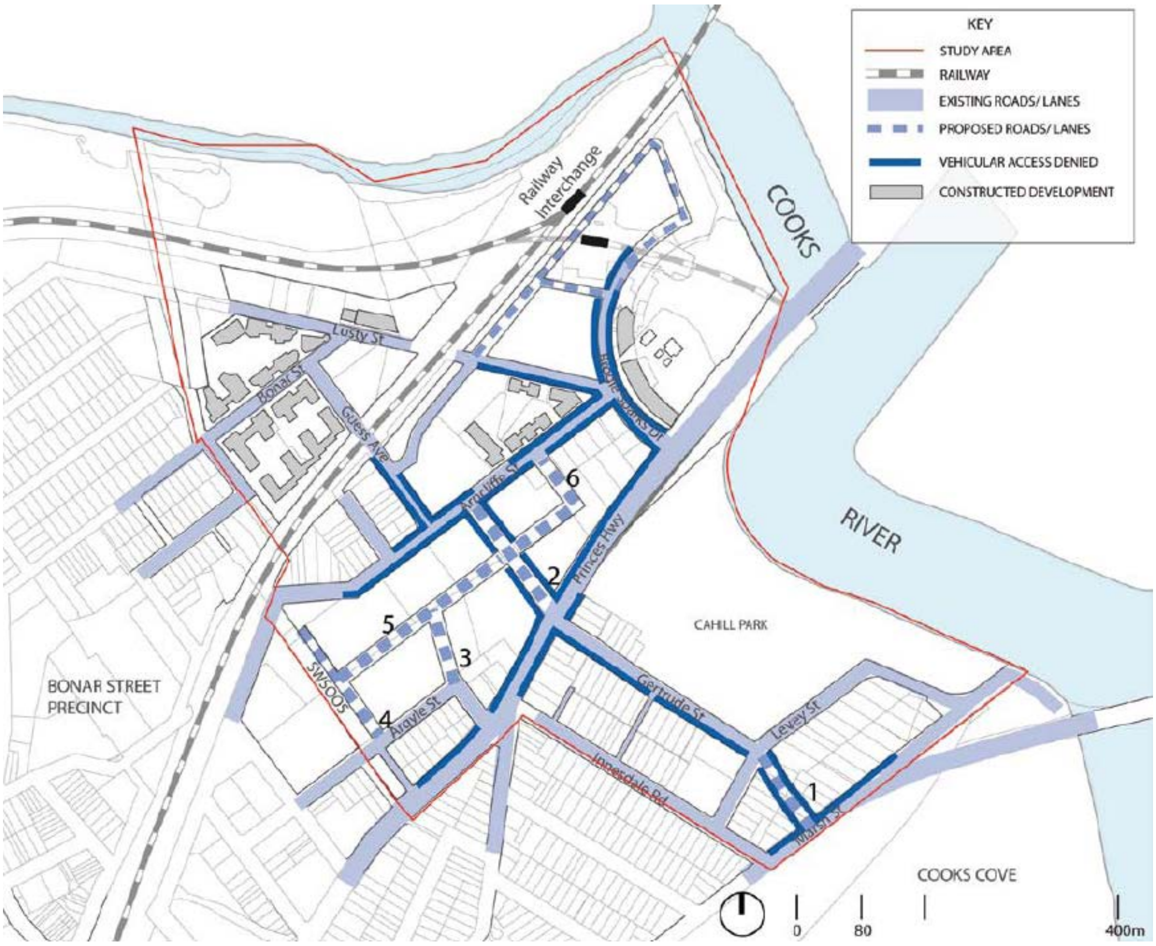
Source: Rockdale Development Control Plan 2011

Figure 4.2: Wolli Creek Structure Plan

A series of road upgrades/widening and new roads are proposed for the precinct. Some of the most relevant modifications proposed are as follows:

- extension and widening of Gertrude Street to convert it to a 23m wide road corridor extending from Arncliffe Street to Marsh Street;
- widening of Arncliffe Street (both sides) by 5m; and
- widening of Princes Highway (west side) by 4.5m from just north of Allen Street to just south of Brodie Spark Drive.

Figure 4.3 illustrates the DCP proposed road network for Wolli Creek.



Source: Rockdale Development Control Plan 2011

Figure 4.3: Proposed Wolli Creek Road Network

As shown in Figure 4.3, the DCP proposes some new roads/lanes to be constructed between Arncliffe Street and Princes Highway as part of the re-development of this part of the precinct. However, it is noted that this internal road network is proposed to be predominantly connected to the Princes Highway, with the alignment suggesting that the majority of the traffic travelling to/from this part of the study area will use the Princes Highway. Consideration should be given to modifying this scheme so that these new developments can only be accessed via Arncliffe Street. This would have multiple benefits such as;

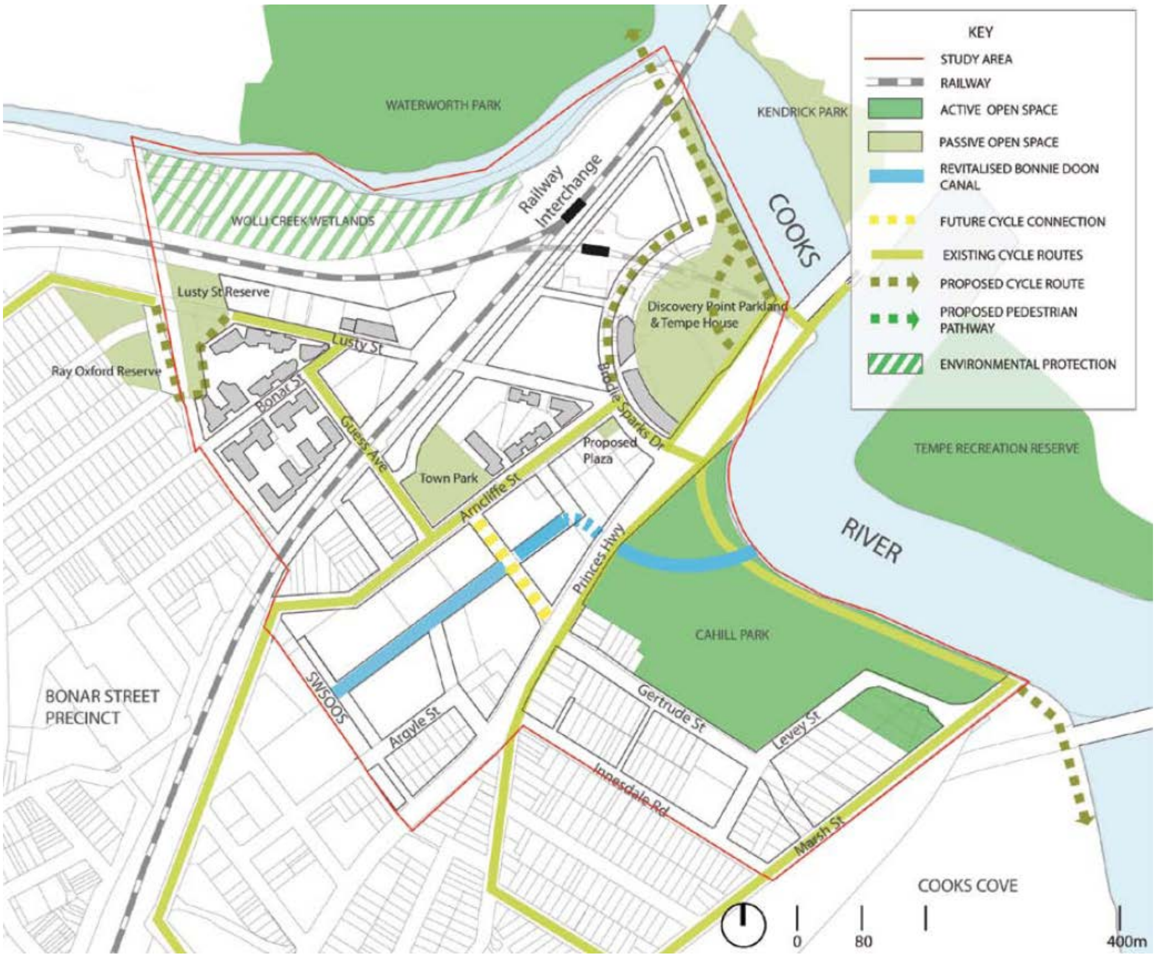
- contributing to a higher number of intersections and lower speed / volume on Arncliffe Street;
- reinforce Arncliffe Street as the gateway to the new Wolli Creek town centre, catering for local traffic rather than through traffic;
- minimise additional traffic on the Princes Highway; and
- provide a more logical hierarchy of roads.

Issue 1
The re-development proposed to occur between Arncliffe Street and Princes Highway (in the vicinity of Argyle Street) should have the internal road network re-designed to allow access exclusively off Arncliffe Street and limit / remove the access points towards the Princes Highway

The DCP recognises opportunities to achieve good quality infrastructure for pedestrians and cyclists in the Wolli Creek precinct by taking advantage of existing links and provide additional facilities such as:

- a bridge over Wolli Creek to Waterworth Park, Earlwood;
- an underpass beneath Princes Highway at Cooks River;
- a pedestrian/ cycle bridge over Cooks River adjacent to the Princes Highway (possible use of the existing Sydney Water bridge); and
- a pedestrian and cycle path along Cooks River foreshore and connecting path to Arncliffe Street.

Figure 4.4 outlines the proposed pedestrian and cycle network.



Source: Rockdale Development Control Plan 2011

Figure 4.4: Proposed Wolli Creek Pedestrian/Cycle Network

The existing cycle routes shown in the DCP conflict with those shown in the "On The Go Map" (see Figure 2.1) along a number of links such as the Princes Highway, Bonar Street, Magdalene Terrace, etc. Moreover, there is generally no infrastructure to support the routes marked in both documents other than signs on the side of the road. The cycle network shown in the DCP also shows a cycle route that crosses the Princes Highway near the Cooks River Bridge but there is no crossing facility at this location.

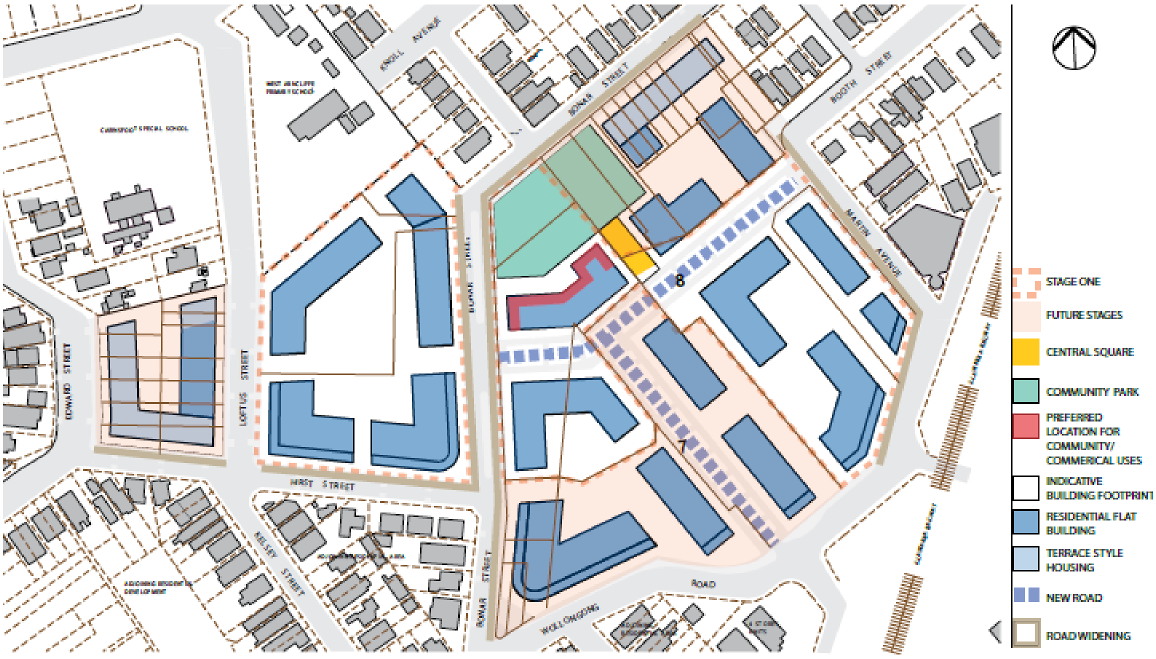
Issue 2
The current and proposed cycle routes specified in the DCP are not consistent with those shown in the "On The Go Map" and the infrastructure currently provided does not support the routes mentioned in any of the documents.

It is also important to highlight how the DCP does not make reference to any existing or proposed pedestrian pathways.

Issue 3
No reference is made in the DCP to any current or proposed pedestrian pathways.

4.3.2 Bonar Street Special Precinct

The DCP proposes that the Bonar Street precinct be transformed from an underutilised industrial area into a medium to high density residential environment. Figure 4.5 shows the Bonar Street Structure Plan.



Source: Rockdale Development Control Plan 2011

Figure 4.5: Bonar Street Structure Plan

A number of new roads are proposed, together with localised road widening at some points of the network, with the most significant initiatives as follows:

- two new roads (Road 7 and Road 8);
- localised road widenings of Bonar Street, Hirst Street and Wollongong Road.

4.3.3 Infrastructure Provision Summary

A summary of the DCP proposed road and cycling links is shown in Figures 4.6 and 4.7.

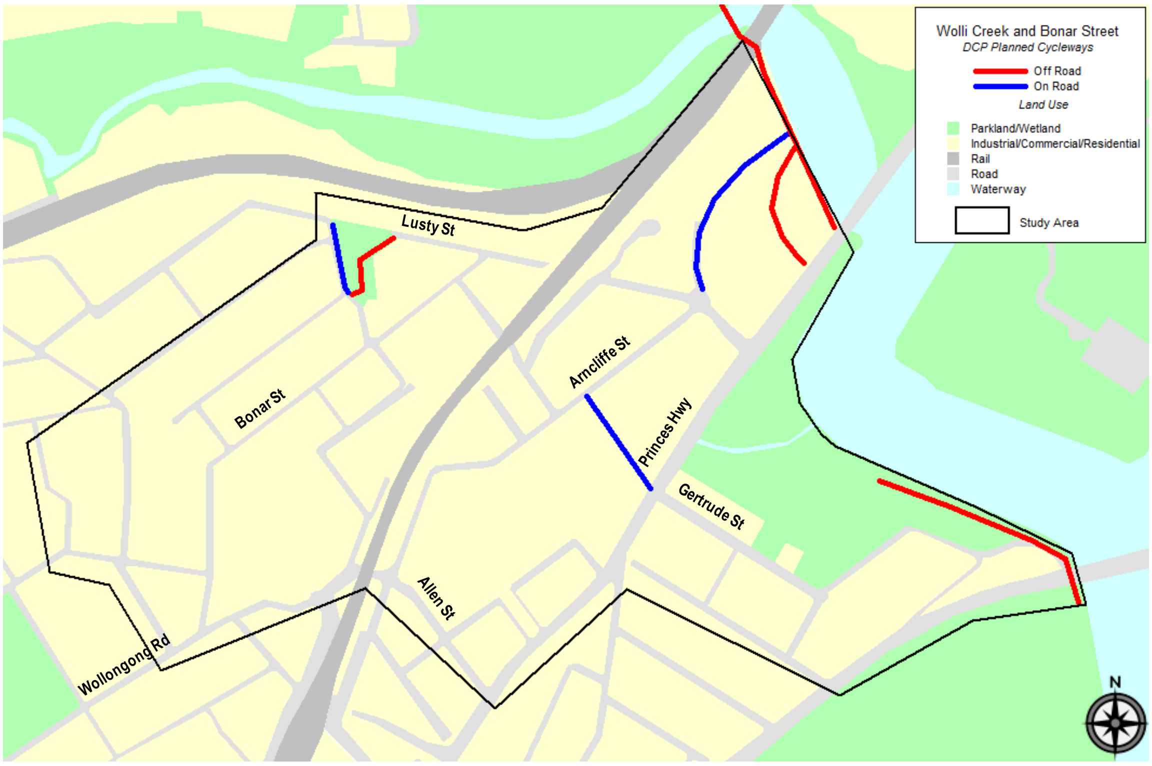


Figure 4.6: DCP Planned Cycleways

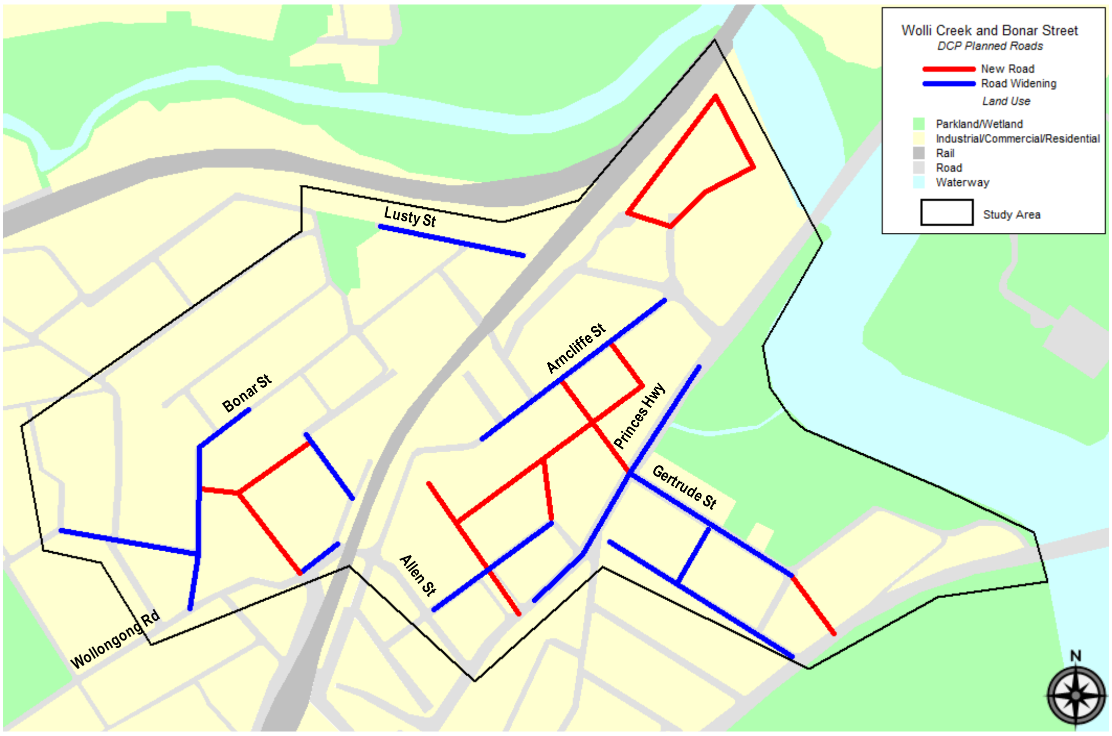
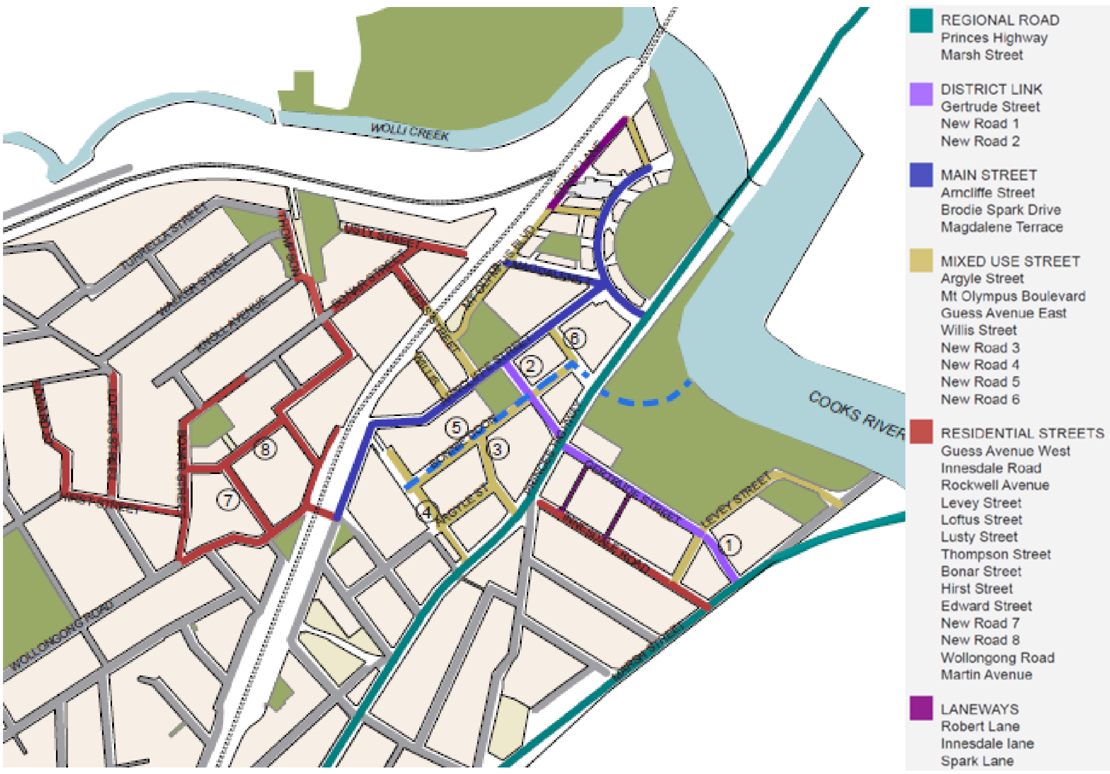


Figure 4.7: DCP Planned Roads

4.4 WOLLI CREEK AND BONAR STREET PRECINCT PUBLIC DOMAIN PLAN (PDP)

The Public Domain Plan (PDP) is intended to guide and coordinate the design and construction of improvements to the public domain of Wolli Creek and Bonar Street precinct. It aims to provide guidance in the design, construction and maintenance of the public domain for these two areas.

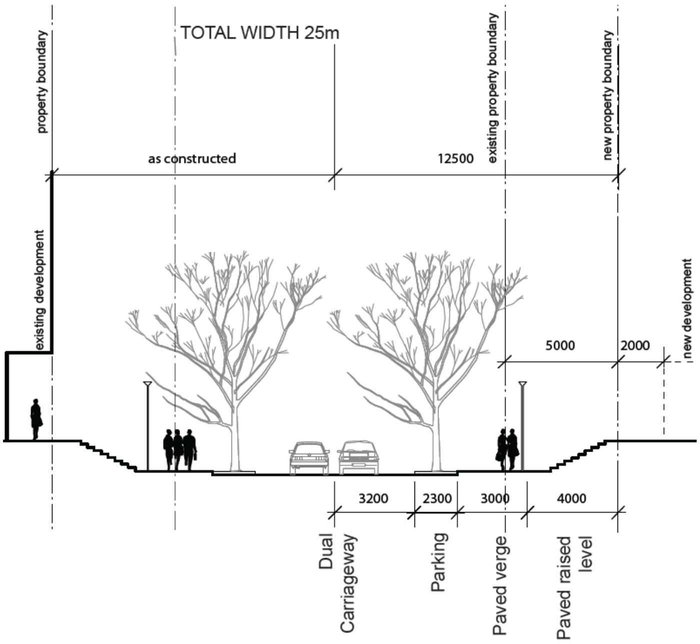
The PDP proposes the Wolli Creek commercial centre to be focused on Brodie Spark Drive, Magdalene Terrace and Arncliffe Street. These have been classified as main streets, while residential streets occur mostly around the Bonar Street precinct. The detailed road hierarchy for both precincts are shown in Figure 4.8.

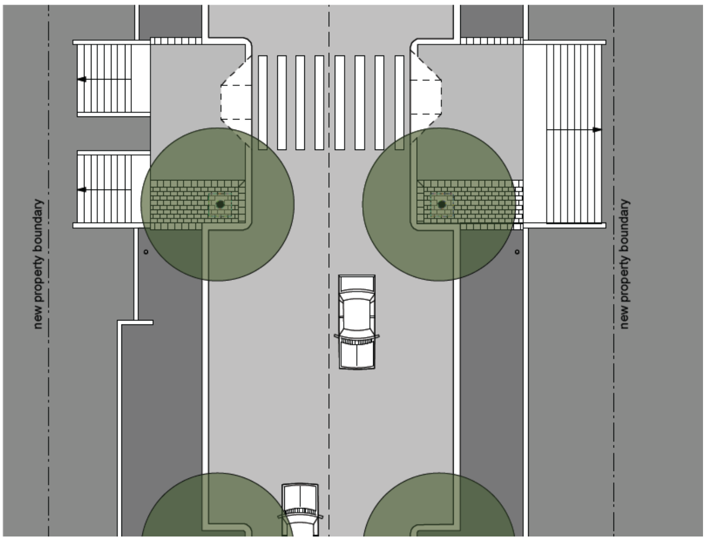


Source: Wolli Creek and Bonar Street Precinct PDP May 2011

Figure 4.8: PDP Street Hierarchy

The PDP outlines detailed design principles for each street type within the PDP study area, including proposed road cross sections. A street section with significant importance is Arncliffe Street, proposed to be ultimately converted to a 25m cross section with details as shown in Figure 4.9:



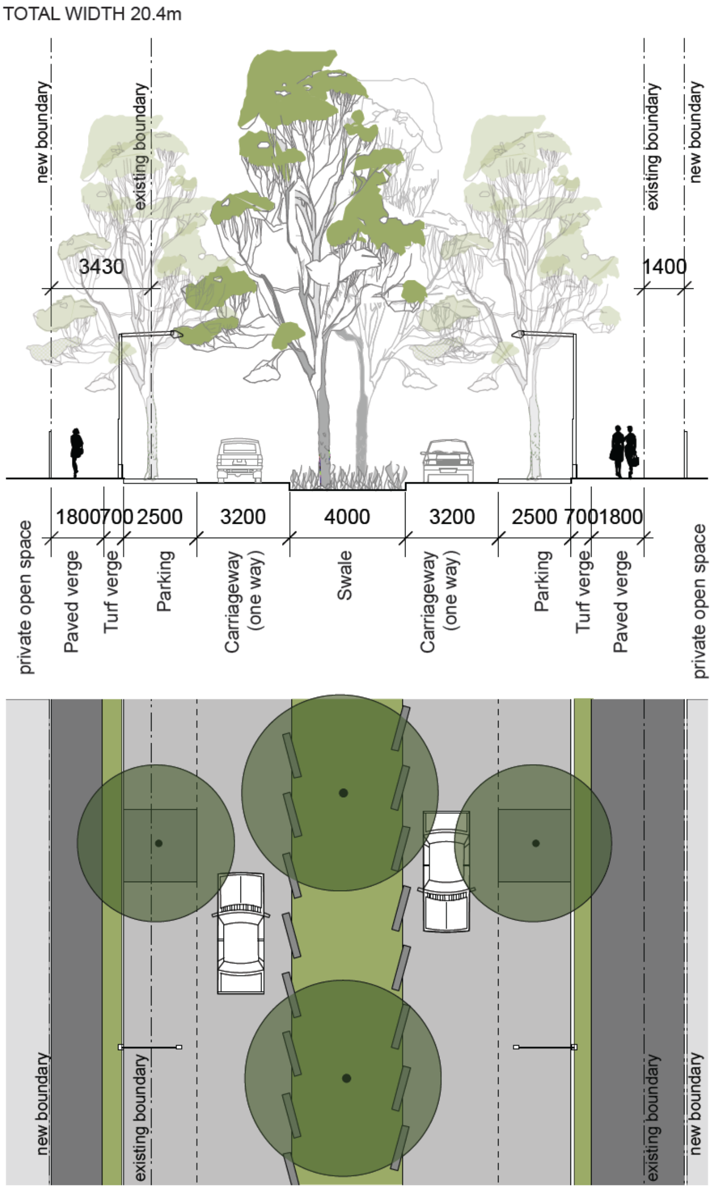


Source: Wolli Creek and Bonar Street Precinct PDP May 2011

Figure 4.9: Arncliffe Street Proposed Cross Section

Issue 4
The proposed Arncliffe Street cross section and intent conflicts with the current layout and some recently constructed developments along this road section. The width is not sufficient to safely cater for all modes of transport as suggested by the PDP / DCP. This issue also exists for many of the surrounding streets within the Wolli Creek precinct such as Mount Olympus Boulevard and Guess Avenue. The key issue relates to the lack of consideration for cyclists and buses.

Bonar Street is proposed to undergo a significant upgrade that includes the provision of a centre median of 4.0m and parking lanes on either side of the road. The proposed upgrade includes widening the road reserve by approximately 4.8m but it shows no provision for on-road or off-road cycling facilities. This upgrade corresponds to the southern part of Bonar Street. No reference is made in the PDP or other planning documents to the cross section proposed for the northern part of Bonar Street. It is, however, important to achieve consistency along the corridor and ensure that a good outcome is achieved from a cycling perspective.



Source: Wolli Creek and Bonar Street Precinct PDP May 2011

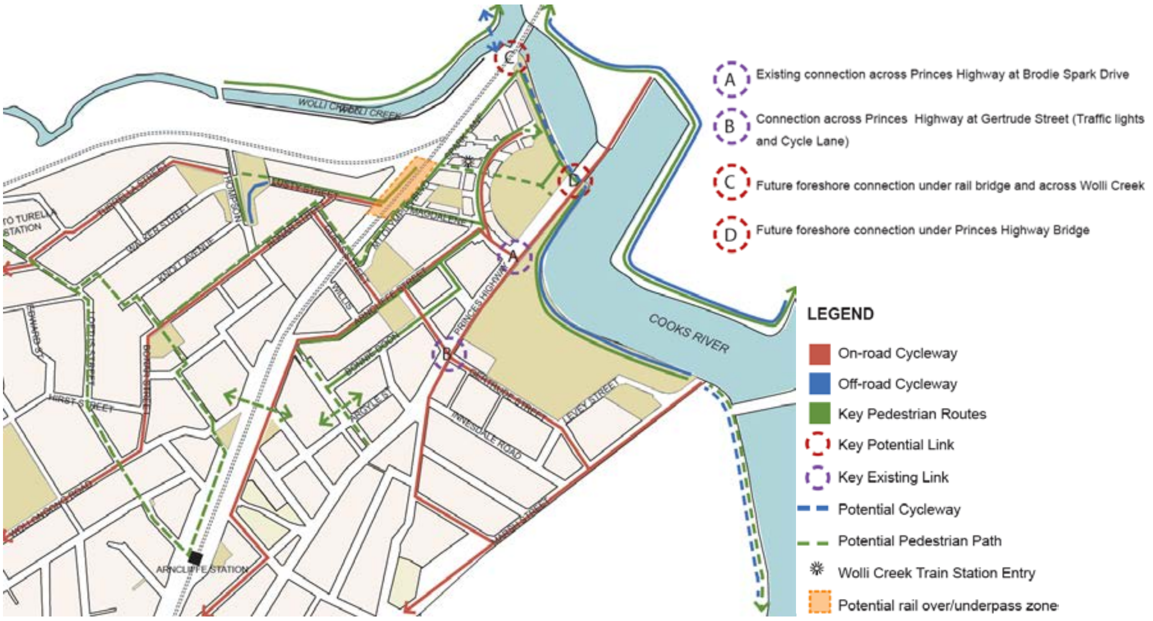
Figure 4.10: Bonar Street Proposed Cross Section

Issue 5
The proposed cross section to be provided along Bonar Street features a 3.2m carriageway in each direction, parking lanes on either side and a 4.0m median but no provision for cyclists.

It is noted that Wollongong Road is defined as a residential street in the PDP which conflicts with its current and future function and volumes.

Issue 6
Wollongong Road is classified as a residential street in the PDP, conflicting with its function in the road network. This is required to be updated to be a "Main Street' consistent with Arncliffe Street.

The PDP proposes a number of improvements to the pedestrian and cycling infrastructure provided in the precinct, including a potential rail over/underpass near Magdalene Terrace. Figure 4.11 provides an overview of the proposed pedestrian and cycling connections.



Source: Wolli Creek and Bonar Street Precinct PDP May 2011

Figure 4.11: Proposed Parks and Open Space

Some conflicts appear to exist between the PDP and DCP cycle strategies and the current or proposed infrastructure. Road widths often appear to be too narrow to cater for cyclists and traffic, particularly in sections of the network with high traffic volumes (e.g. Arncliffe Street).

Issue 7
Existing and proposed road infrastructure defined in the PDP and DCP conflicts with the intended road use, particularly from a cycling perspective. Shared lanes are proposed but the width appears to be insufficient to safely cater for motorised traffic and cyclists.

4.5 SECTION 94 PLAN

The Section 94 Plan was originally prepared in response to the North Arncliffe Development Area Traffic and Car Parking Study, prepared by Masson Wilson Twiney in 1998. It consists of a levy on developments towards cost of providing additional public facilities and services required to meet the needs of those developments. The current plan contains 76 items listed and respective status (“completed”, “in progress” or “not started”).

Since the development of the Section 94 Plan, a series of studies and policies have been developed, including the above mentioned LEP, DCP and PDP. As such, infrastructure requirements have changed and the Section 94 plan needs to be revised to reflect the current situation and ensure that it is aligned with other planning tools.

The focus of the current plan appears to be more on improving the road network than the streetscape or pedestrian and cycle facilities. This conflicts with the DCP ‘vision’ for the Wolli Creek precinct.

5. KEY DEVELOPMENT ISSUES

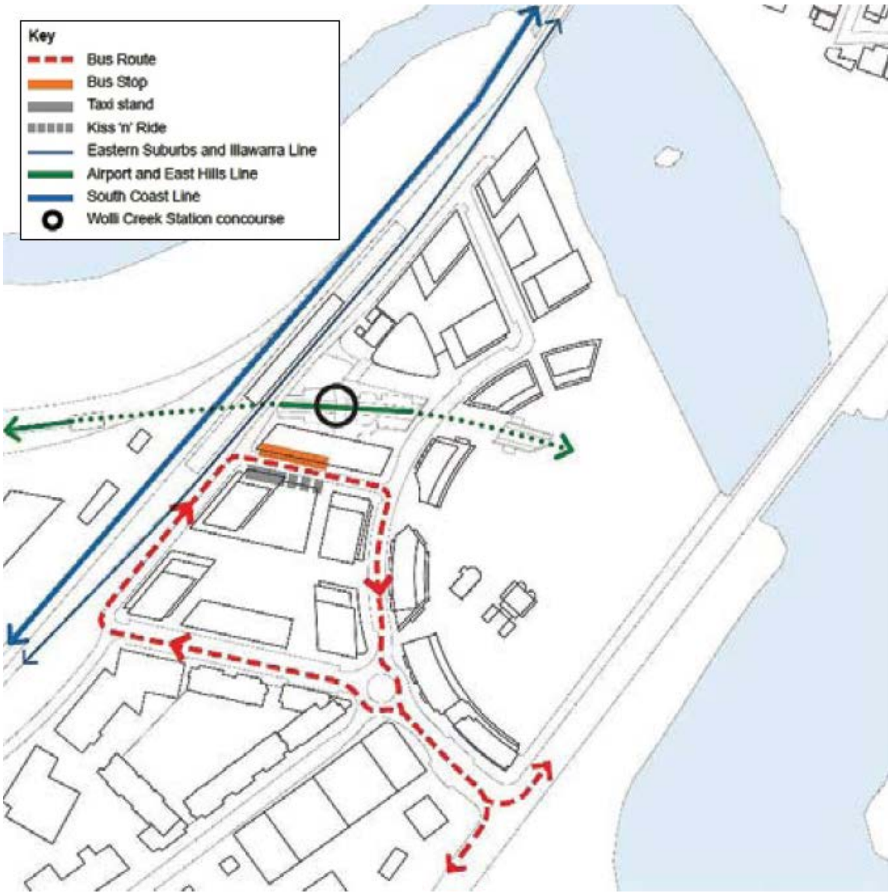
5.1 DISCOVERY POINT

The Discovery Point site (bounded by the rail line, Princes Highway, Cooks River and Magdalene Terrace) has a total area of around 7.8 hectares. The site is located in the vicinity of the Wolli Creek rail station and it proposed to ultimately comprise approximately 1,000 units and about 14,000 m^2 of retail.

Figure 5.1: Discovery Point Development Master Plan

The first stages of the development have been completed comprising a significant residential component on the northern side of Brodie Spark Drive. It is noted that approximately 165 parking spaces currently provided as part of the initial stages will be made available for future development stages.

The Discovery Point Environmental Assessment Report (DPEAR) identifies the future public transport, cycling and pedestrian facilities and proposed operation, as shown in Figures 5.2, 5.3 and 5.4.

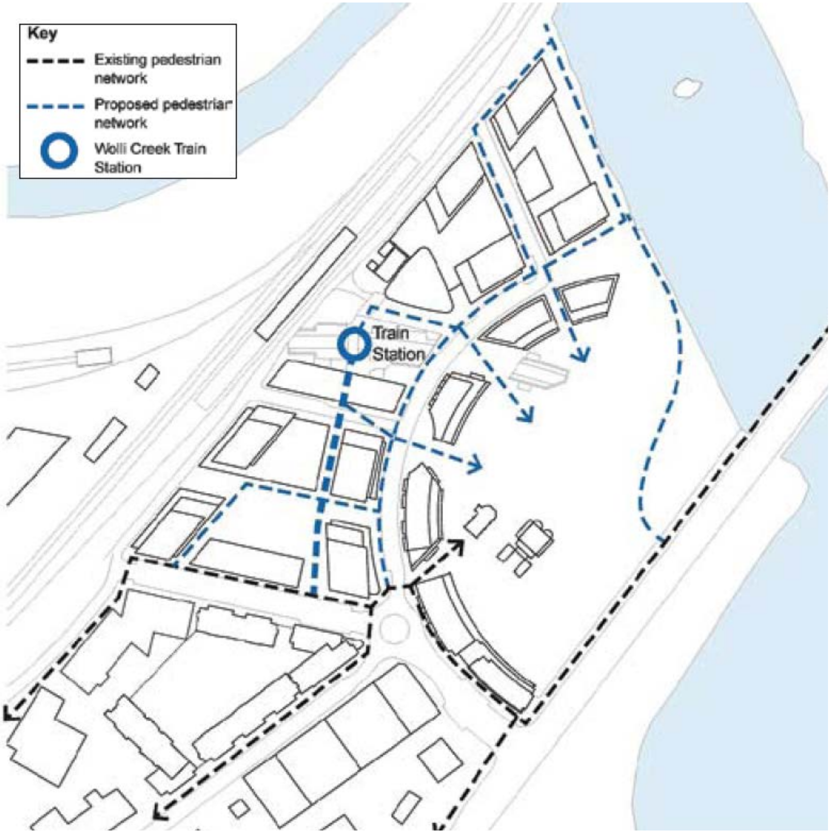


Source: Discovery Point Environmental Assessment Report

Figure 5.2: Proposed Public Transport Network near Discovery Point

Source: Discovery Point Environmental Assessment Report

Figure 5.3: Existing and Proposed Cycle Routes near Discovery Point



Source: Discovery Point Environmental Assessment Report

Figure 5.4: Existing and Proposed Pedestrian Network near Discovery Point

Issue 8
The proposed cycling network includes a route along the western side of the Princes Highway that crosses the Cooks River. This route will be difficult to implement and conflicts with that shown in DCP which stops just south of the river crossing. Constraints exist adjacent to the Mount Olympus roadside cutting and the Princes Highway bridge.

5.2 Cooks Cove

The Cooks Cove site comprises approximately 100 hectares of land directly west of Sydney airport, generally bound by the Cooks Rover, Marsh St, West Botany St and Muddy Creek. The planning objectives for the site are:

- to capitalise on its physical proximity to the Airport and Port Botany to create trade-focussed development;
- to provide open space for a range of recreational uses;
- to provide good public access through the site and along the Cooks River foreshores; and
- to protect environmentally significant wetlands and habitat.

An approved Masterplan envisages up to 11,000 employees on the site and has a public transport mode share target of 35%, achieved through reduced carparking rates and improved connections to existing railway stations at Wolli Creek and Sydney Airport. It is questionable whether such a high mode share could actually be achieved with the supporting infrastructure outlined in the approved proposal.

It is likely that there will be an amendment to the current planning framework for the site brought about by altered global economic circumstances. Future progress in the planning for this development should take in consideration the importance of connecting buses through Gertrude Street and therefore the need to retain the corridor. The long term function of this corridor is envisaged to be a primary public transport / walking / cycling priority corridor connecting the development area with the Wolli Creek activity centre.

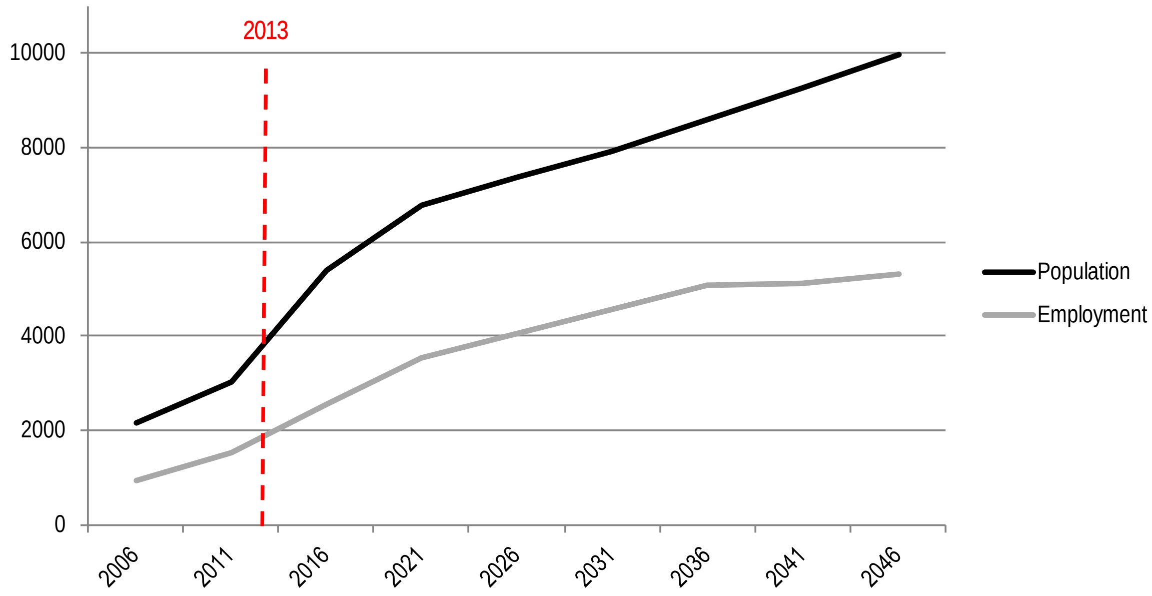
Source: Cooks Cove Master Plan

Figure 5.5: Cooks Cove Development Site

6. TRAFFIC AND TRANSPORT ISSUES

6.1 CURRENT LAND USE AND MODE SHARE

The "Population and Employment Travel Zone Forecasts" issued by the NSW Bureau of Transport Statistics in August 2012 indicates that the area defined in this study as the "Wolli Creek precinct" experienced a significant population and employment increase between 2006 and 2011, as shown in Figure 6.1.



Source: NSW Bureau of Transport Statistics

Figure 6.1: Population and Employment in the Wolli Creek Precinct

It is important to note that an even faster population growth is anticipated for the period between 2011 and 2016. That is in fact estimated to be the "five year period" with the greatest population growth between 2006 and 2046.

Whilst there may be some traffic delays expected to be incurred in the near future as a result of this additional growth, the greater issue relates to the lack of existing pedestrian and cycle infrastructure. This infrastructure shortfall will make it very difficult to encourage a behavioural change to a reduced reliance on car use, as intended by the vision for Wolli Creek.

Issue 9
Significant population growth is anticipated to occur within the Wolli Creek precinct in the short / medium term. This will place significant pressure on the local road network already experiencing capacity / safety issues. Pedestrians and cyclists need to be encouraged through appropriate infrastructure provisions to support their movement. Existing pedestrian / cycle facilities are not of a standard to handle these additional trips and there is a risk that incoming residents will subsequently choose to drive.

The Journey to Work data indicates that in 2011 more than 50% of the Wolli Creek residents travelled to work by train, as shown in Figure 6.2.

Wolli Creek	2011			2006			Change
Main method of travel	Number	%	Rockdale City	Number	%	Rockdale City	2006 to 2011
Train	903	51.0	24.7	548	40.0	21.9	+355
Bus	14	0.8	2.4	18	1.4	2.6	-4
Tram or Ferry	0	0.0	0.0	0	0.0	0.0	0
Taxi	4	0.3	0.3	9	0.7	0.4	-5
Car - as driver	589	33.3	50.9	527	38.5	50.7	+62
Car - as passenger	49	2.8	4.6	50	3.7	5.6	-1
Truck	2	0.2	1.0	7	0.6	1.2	-5
Motorbike	5	0.3	0.5	5	0.4	0.3	0
Bicycle	4	0.2	0.3	6	0.4	0.4	-2
Walked only	29	1.7	2.8	38	2.8	3.4	-8
Other	18	1.0	0.8	13	1.0	0.6	+5
Worked at home	23	1.3	2.4	19	1.4	2.3	+4
Did not go to work	101	5.7	7.5	101	7.4	8.2	0
Not stated	25	1.4	1.7	23	1.7	2.3	+2
Total employed persons aged 15+	1,772	100.0	100.0	1,369	100.0	100.0	+403

Source: Australian Bureau of Statistics

Figure 6.2: Method of Travel to Work for Wolli Creek Residents

A significant increase occurred in the number of residents using train as the method of travel to work between 2006 (40%) and 2011 (51%). The proportion of residents using a private vehicle to travel to work decreased between 2006 and 2011 and it corresponds to approximately one-third of all residents.

Issue 10
Discussions with TfNSW highlight a capacity shortfall through the Wolli Creek rail interchange on the Illawarra Line. This may affect the potential for a continued increased in rail mode share. There is however ample capacity available on the East Hills rail line.

6.2 WALKING

The Wolli Creek and Bonar Street precincts feature a network of existing pedestrian footpaths. These paths, however, are of a varying standard and width as detailed in Figure 6.3. Additionally, Figure 6.4 shows the current pedestrian volumes (estimated based on the surveys undertaken in October 2012), highlighting how there is currently high pedestrian activity in the Wolli Creek town centre, especially near the train station and Guess Avenue underpass. The primary pedestrian routes to the Wolli Creek Train Station are as follows:

- from Bonar Street to Guess Avenue to Mount Olympus Boulevard; and
- from Princes Highway to Brodie Spark Drive to Magdalene Terrace to Mount Olympus Boulevard.

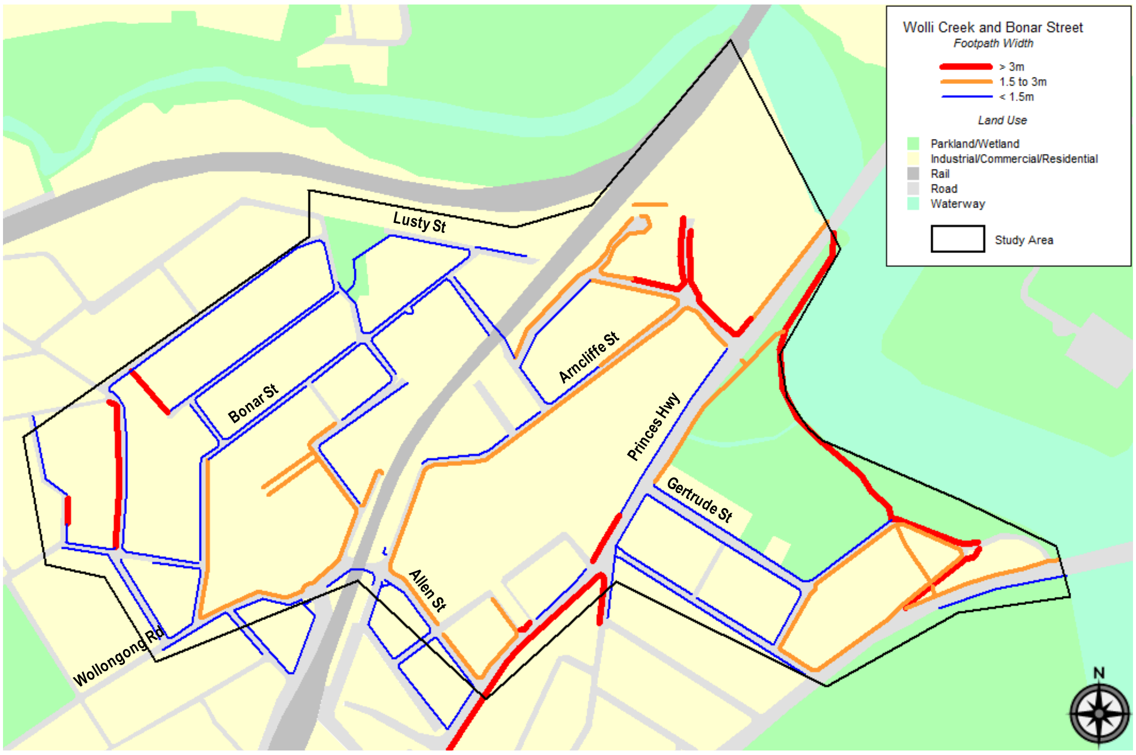


Figure 6.3: Footpath Widths

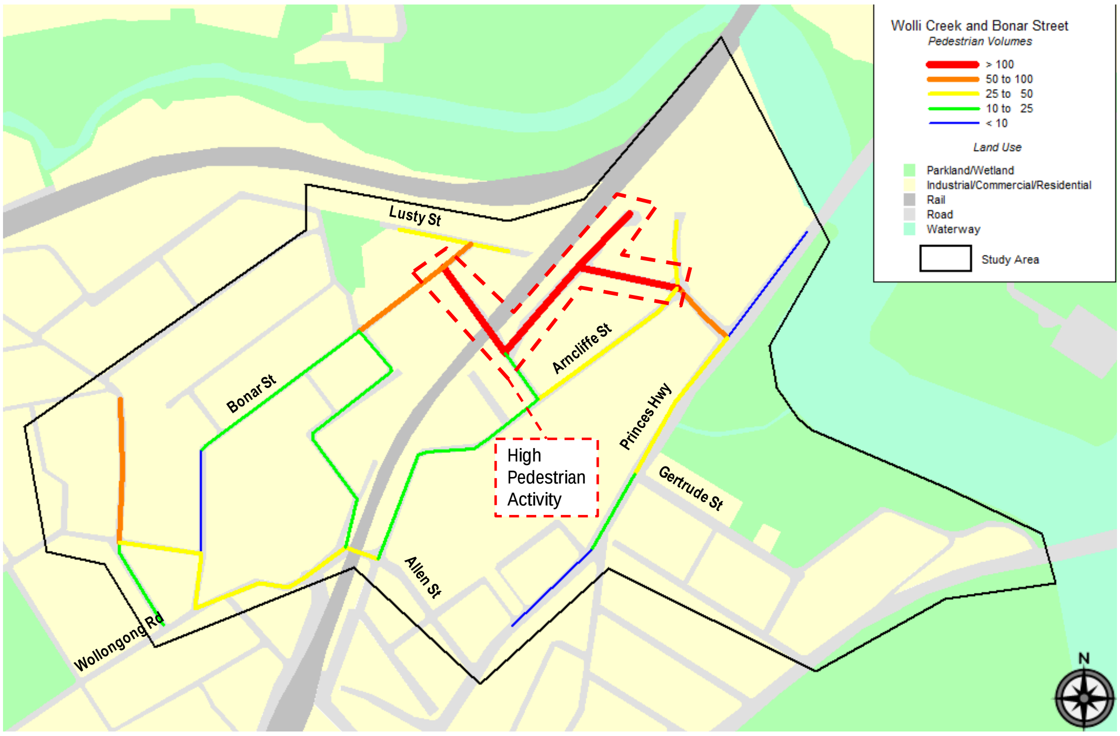


Figure 6.4: Estimated Pedestrian Volumes

Issue 11
The sections of the study area experiencing higher pedestrian activity typically feature narrow footpaths (often <1.5m wide). Both the Allen Street and Guess Avenue underpasses have reduced pedestrian amenity (mainly due to width and location), and present safety issues.

Figure 6.5 and Figure 6.6 show the lack of pedestrian and cycle amenity that exists under rail overpasses.

Source: Google Maps

Figure 6.5: Guess Avenue Underpass

Figure 6.6: Allen Street Underpass

The footpath network is missing one section on western side of Arncliffe Street near the Wollongong Road – Allen Street roundabout and public car park. There is a raised kerb (approximately 1m wide) between the car park and Arncliffe Street but businesses normally use this to place advertising signs. This forces people to walk along the car park or cross the road where there are no crossings allowing pedestrians to access the underpass.

The adjacent Allen Street / Wollongong Road roundabout also lacks pedestrian facilities or dedicated crossing points.

Source: Google Maps

Figure 6.7: Arncliffe Street West Footpath

Issue 12
Missing pedestrian link along the western side of Arncliffe Street and at the Allen Street / Wollongong Road roundabout, and lack of crossing facilities to encourage crossing to the eastern side.

The Wollongong Road / Firth Street roundabout is also problematic for pedestrians. The Bonar Street Structure Plan proposed in the DCP identifies a new road (Road 7) connecting to this intersection, effectively converting it to a four leg intersection. Consideration should be given to the provision of good quality pedestrian crossing facilities at this location, possibly achieved by converting the intersection to signal control.

The Mount Olympus Boulevard footpath is also too narrow on the eastern side and the trees are an obstruction on the western side, effectively reducing the available footpath width for pedestrians.

Wolli Creek Rail Station is an easy access station, and as such, suitable footpath width and grades should be provided within the walkable catchment area to support the infrastructure provision that exists at the rail station.

A large proportion of the footpaths currently provided in both Wolli Creek and Bonar Street precincts require maintenance or present deficiencies such as width, location, etc. This will be of particular relevance as the redevelopment of the area takes place and pedestrian volumes increase. Whilst Council may wait for redevelopment to occur before the frontage footpath is replaced, there will be growing pressure to replace the missing links. These missing links also detract from encouraging walking in the area. Council should consider installing / upgrading footpaths in the interim ahead of development where possible.

Issue 13
Many existing footpath sections require maintenance or rectification. Staging of footpath implementation for missing sections will need to be carefully planned as redevelopment in the area occurs.

The current pedestrian infrastructure is shown in Figure 6.8, highlighting different types of crossings in the Wolli Creek and Bonar Street Precincts. There are a few key intersections where crossings are not present, or their form is inadequate.

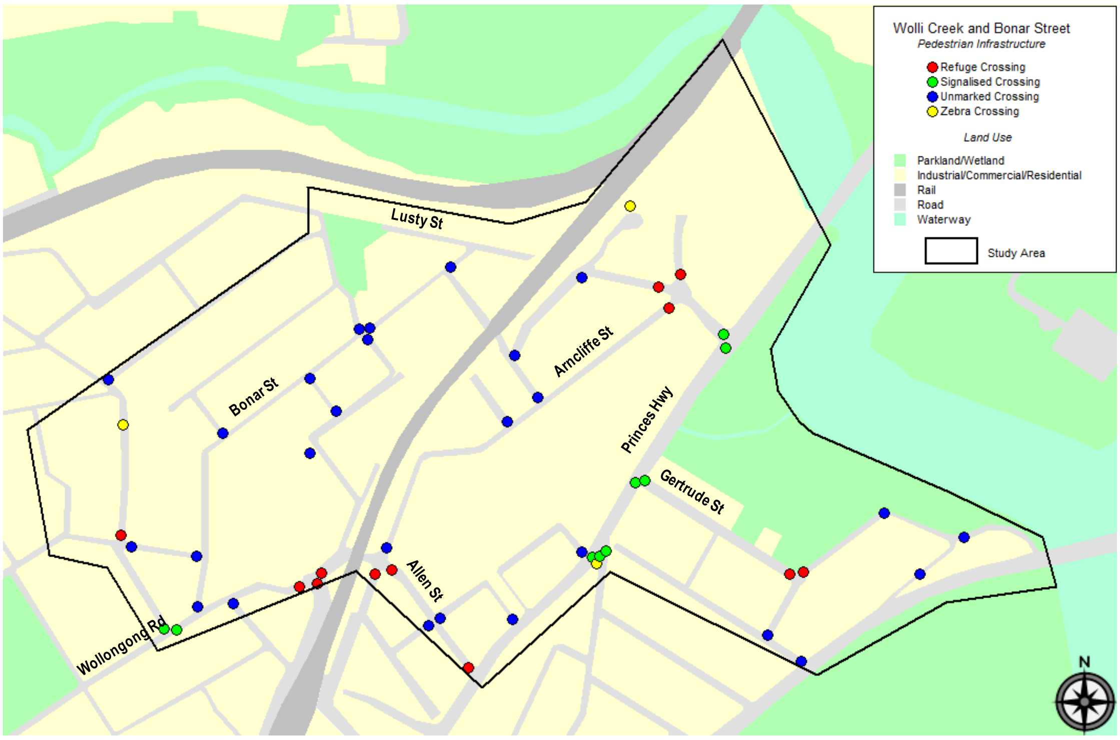


Figure 6.8: Pedestrian Infrastructure

One of the sections where concerns exist about the existing pedestrian infrastructure is the Brodie Spark Drive / Arncliffe Street roundabout. The current intersection presents a safety hazard for pedestrians attempting to cross the road due to the high traffic volumes and lack of marked facilities. Furthermore, the recent addition of Woolworths increases trips across this roundabout to / from Guess Avenue and the train station.

Issue 14
Pedestrian movements at the Brodie Spark Drive / Arncliffe Street intersection are unsafe due to high traffic volumes, width of road, lack of designated crossing points, sight distance constraints, intersection queuing and general driver behaviour.

Similarly, the Magdalene Terrace / Mount Olympus Boulevard intersection does not provide adequate pedestrian crossing facilities. Currently, pedestrians cross randomly and this issue will be exacerbated as pedestrian and car volumes increase.

Issue 15
Lack of pedestrian crossing facilities along Magdalene Terrace and Mount Olympus Boulevard.

The marked foot crossing provided at the intersection of Firth Street / Forest Road is currently missing signage, and is badly worn / faded, as shown in Figure 6.9.

Source: Google Maps

Figure 6.9: Firth Street / Forest Road Intersection

Issue 16
Signage and re-marking required at the marked foot crossing at the intersection of Firth Street / Forest Road.

The current informal pedestrian link from Turella Street to Lusty Street is unsafe and does not encourage the use of this connection. A bypass pedestrian / cycle route has been provide in accordance with the PDP. Whilst this facility is too low, it has been retained as an 'informal' pedestrian access point.

Issue 17
Overall, street lighting across the Wolli Creek precinct is generally poor which does not contribute to the desired high pedestrian activity in the area. Public safety issues need to be addressed at dusk/dawn/evening with improved lighting, passive surveillance and security.

6.3 CYCLING

As previously stated, no formal cycling facilities exist in the study area other than the regional cycleway along part of the Cooks River. Typically, existing cycle routes predominantly are designed as informal facilities with advisory markings and directional signage. The cycling provision should be in accordance with the regional cycle plan hierarchy, with premium facilities provided along the main cycle corridors. Local routes must also include some type of formal lane markings or other facilities for cyclists which currently are lacking in the study area.

Figure 6.10 shows the cycle volumes, estimated based on recent traffic surveys. Similar to the pedestrian situation described in Section 6.2, there is high cycle activity in the Wolli Creek Town Centre. The primary cyclist routes to the Wolli Creek Train Station are:

- from Wollongong Road to Arncliffe Street to Guess Avenue to Mount Olympus Boulevard; and
- from Princes Highway to Brodie Spark Drive to Magdalene Terrace to Mount Olympus Boulevard.

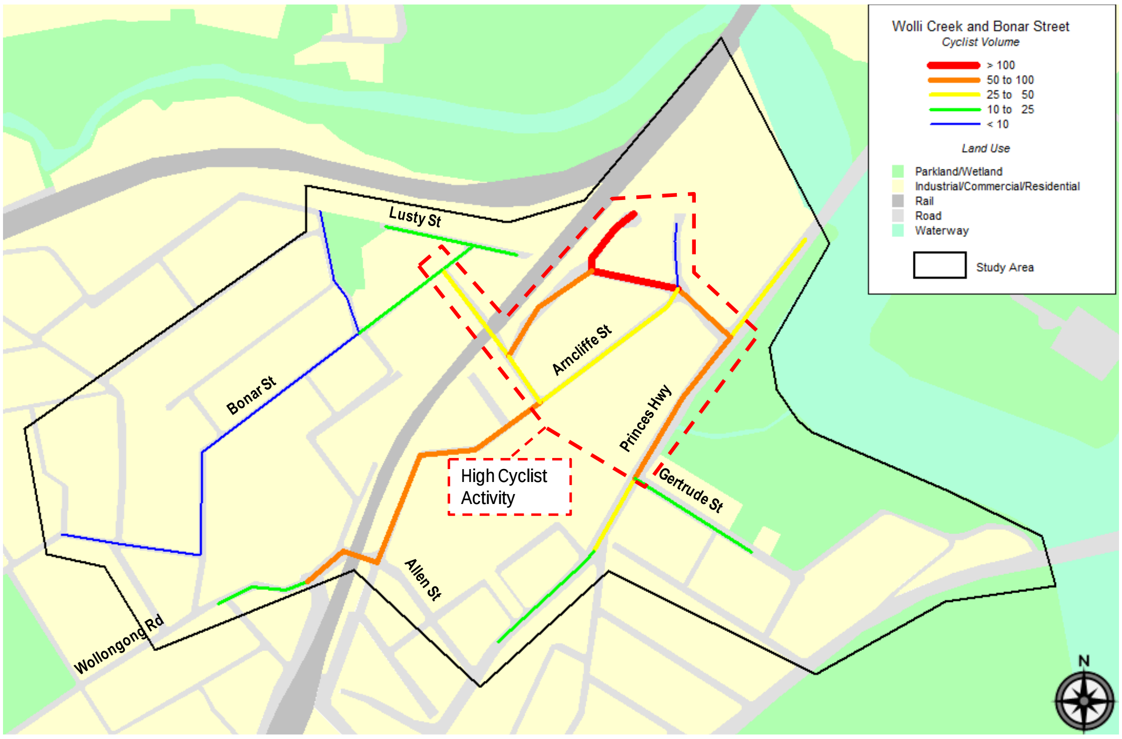


Figure 6.10: Estimated Cyclist Volumes (Peak Period – One Hour)

Arncliffe Street is shown in multiple planning documents (including the DCP) as an “existing cycle route”. However, this part of the transport network has no provision for cyclists. Its current cross section and ‘straight’ road alignment pose a number of safety concerns not only for cyclists but also for pedestrians and motorists. These safety concerns are exacerbated by higher ‘through traffic’ volumes and speeds, existence of bus services, exiting traffic from Woolworths, and a lack of high turn-over on-street parking (to reduce vehicle speeds).

Source: Google Maps

Figure 6.11: Arncliffe Street Cross Section

Issue 18
Arncliffe Street is currently classified as a cycle route but provides no cycling infrastructure or pavement signs. Current and future traffic volumes are too high to support shared on-road cycling facilities for the proposed future cross-section.

Cycle routes exist to the west of the study area along Bonar Street, Thompson Street and Hirst Street. The routes include pavement symbols which suggest that the road is shared between vehicles and cyclists. Despite lower traffic volumes along these road sections, the level of infrastructure provided for cyclists is unsuitable considering the crash history and road width limitation.

Source: Google Maps

Figure 6.12: Bonar Street Cycle Route

Issue 19
Existing cycle routes on Bonar Street, Thompson Street and Hirst Street correspond to shared on-road lanes with safety implications at some points due to the insufficient width to safely accommodate both types of users.

Mount Olympus Boulevard has a high demand for cyclists due to its proximity to the train station. Its cross section is currently too narrow to accommodate two-way traffic and cyclists, which compromises safety at this location. The PDP suggests that no modifications are proposed for this link. It should also be noted that buses are re-routed to use this link.

Issue 20
Mount Olympus Boulevard is too narrow to accommodate two-way traffic, buses, cyclists and pedestrians.

A considerable number of cyclists travel along the Princes Highway, with the section between Gertrude Street and Brodie Spark Drive experiencing higher volumes. While an off-road path is provided along the eastern side, the western side offers a narrower footpath width. This issue is exacerbated by the limited crossing opportunities between the two sides of the Princes Highway. This limitation is also evident to the north of Brodie Spark Drive.

Source: Google Maps

Figure 6.13: Narrow Footpath on Western Side of Princes Highway

Issue 21
Footpath needs widening (converted to a shared path) on western side of Princes Highway to support existing number of cyclists.

A cycle connection from the study area to Waterworth Park is proposed in the DCP. The project is likely to have a high cost risk. The benefit to the local community is questionable and requires further discussion with State agencies.

Issue 22
The cycle connection to Waterworth Park involves a significant cost risk. The provision of at grade facilities may be more cost effective.

It is mentioned in the Cooks River Cycleway Extension Feasibility Study how the cycle underpass, proposed to be placed under the Princes Highway and rail alignment, is likely to be problematic essentially due to the flooding risks and likely impact mitigation costs. Considering these associated costs and risk, it appears to be more suitable to investigate alternative solutions such as improving at grade crossing facilities and using the existing foreshore cycleway to the north of the study area.

As the proposed facility is considered to be a regional cycleway, funds for these provisions should be lobbied from the State government.

Figure 6.14 shows the proposed underpass facility proposed on the northern side of Cooks River, whilst Figure 6.15 shows the limited headroom available on the southern side.

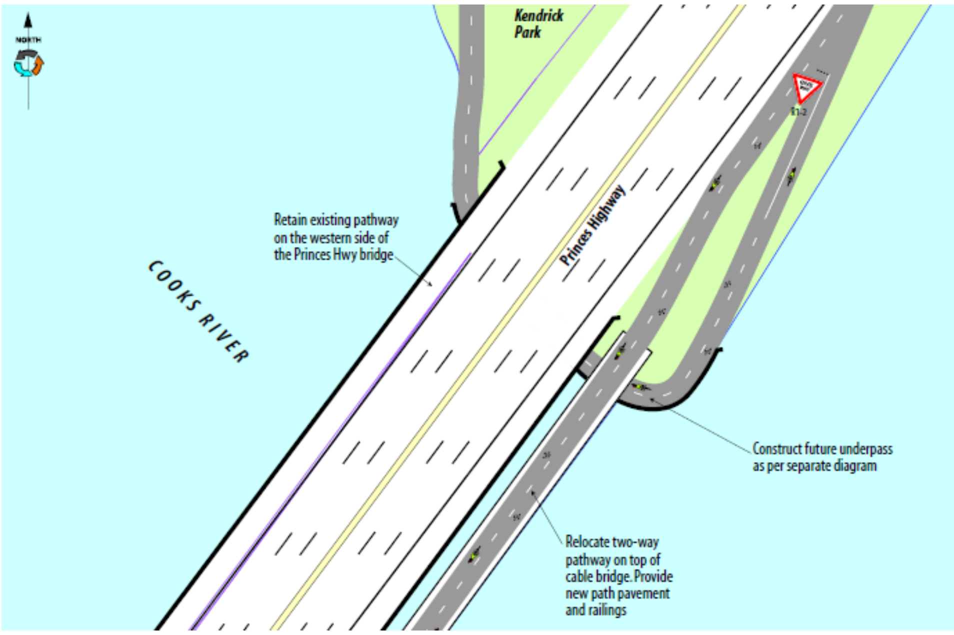


Figure 6.14: Cooks River Crossing, Princes Highway Bridge - Tempe

Source: Cooks River Cycleway Extension Feasibility Study

Figure 6.15: Headroom under the Princes Highway Road Bridge

Issue 23
Potential construction of a cycle underpass under the Princes Highway involves flood and sight distance issues. Investigations to provide improved "at grade" facilities should be considered.

The current cycleway maps for Wolli Creek also suggest that there is a "missing link" in the existing network from the Gertrude Street cycle route to the Wolli Creek town centre. This will be addressed by the Gertrude street extension (west).

Issue 24
Missing link from the Gertrude Street (west) cycle route to the village centre.

The signs used to direct cyclists in the area are often confusing and some appear to be shown in the wrong place and/or pointing in the wrong direction. Two signs are currently placed on the western side of the Princes Highway (north of Brodie Spark Drive) but one is facing the road and the other appears to suggest that cyclists cross the road at that point to access Arncliffe and Bankstown. A crossing point possibly existed on this part of the network previously, which would explain the unusual directions shown. Cycle route signage should be reviewed and fixed where necessary.

Figure 6.16: Incorrect Cycle Route Signage on Princes Highway

Issue 25
Cycle route signage needs to be reviewed throughout the study area.

6.4 PUBLIC TRANSPORT

Five (5) bus routes currently service the Wolli Creek and Bonar Street Precincts, supplementing the two rail lines that converge at the northern end of the study area. The current bus routes and bus stops are seen in Figure 6.17 below.

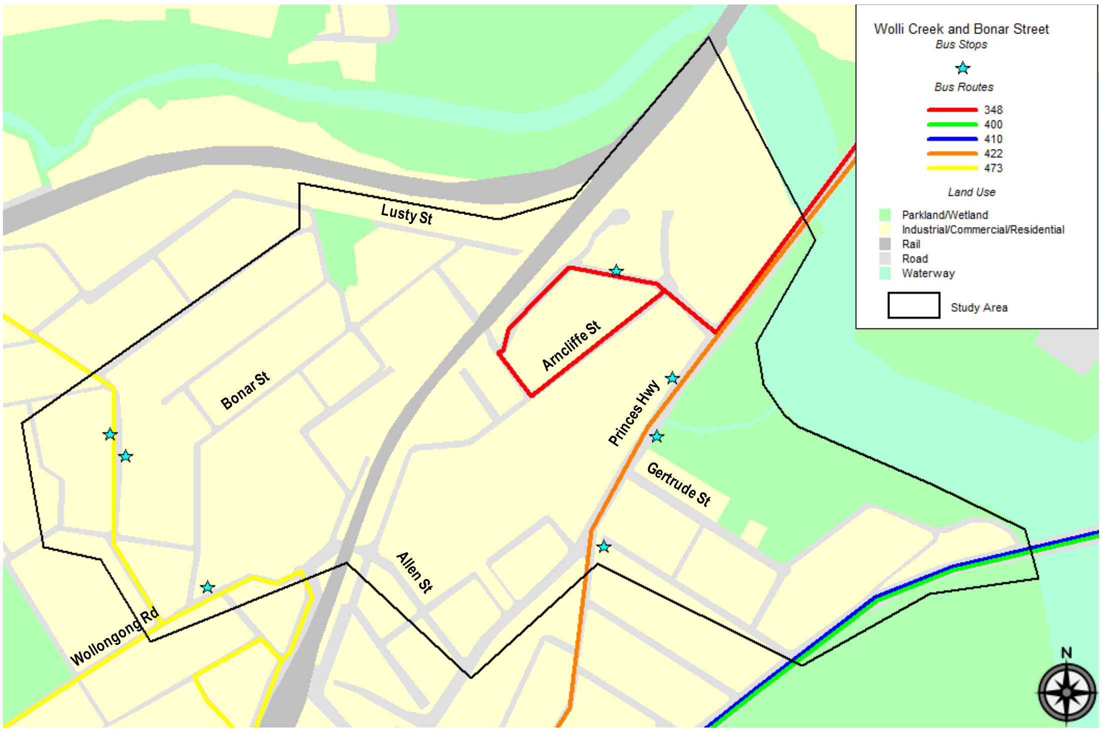


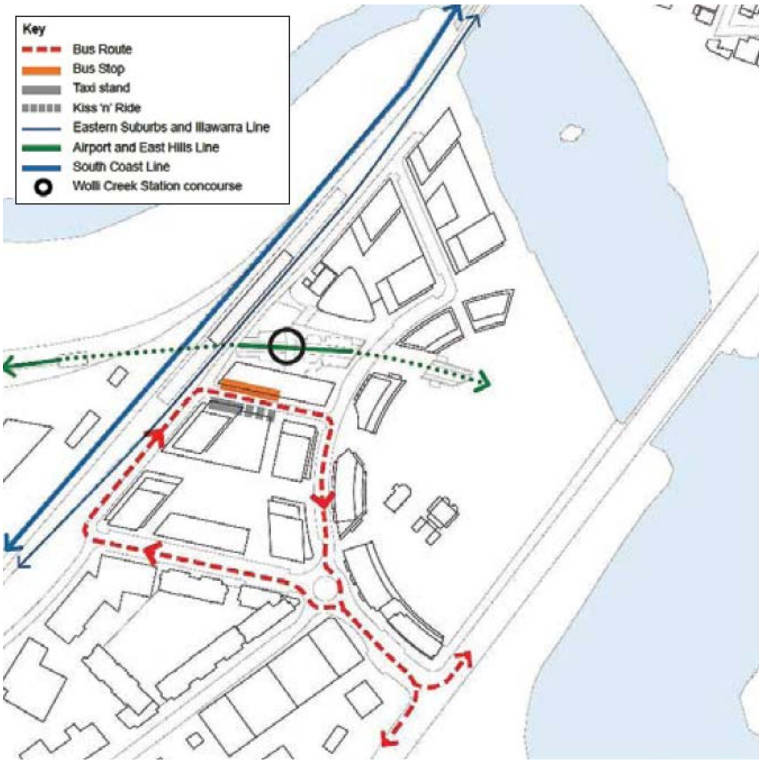
Figure 6.17: Existing Bus Routes

The number and frequency of bus services are relatively low, resulting in a low percentage of residents currently using this mode of transport. The demand is likely to increase substantially in the medium term with the expected increase in number of residents in the near future.

Issue 26
Low number of bus services and poor frequency is likely to require future improvements as resident population establishes and demand for more routes and services increases.

Consideration should be given to the placement of bus stops on the outskirts of the town centre and possibly maintaining the Magdalene Terrace stop to encourage pedestrian movements into the area. Good quality pedestrian facilities will then need to be provided between bus stops and the rail station / town centre.

Plans exist to provide taxi and 'kiss and ride' bays on Discovery Point Drive, adjacent to the rail station, together with a bus zone. This will help to improve accessibility to the station and encourage users to interchange at this location but does little to provide activity in the town centre through the movement of pedestrians.



Source: Discovery Point Environmental Assessment Report Concept Plan

Figure 6.18: Proposed Public Transport Network at Discovery Point

It is important to ensure that the Gertrude Street extension remains in all future strategies due to its importance to the study area. The western section should have high quality pedestrian, cycling and public transport connectivity to the Wolli Creek town centre from the eastern side of the Princes Highway.

Consideration should also be given to the mobility-impaired access needs to the town centre and train station. Current difficulties exist for mobility-impaired to travel between Bonar Street and the Wolli Creek town centre. It is noted also that currently only one lift is provided at the train station, with no alternative solutions provided in the event of lift malfunction.

Issue 27
Poor access arrangements are currently provided to/from the train station for the mobility- impaired.

6.5 PARKING

The parking types currently available in the Wolli Creek and Bonar Street Precincts are seen in Figure 6.19 below.

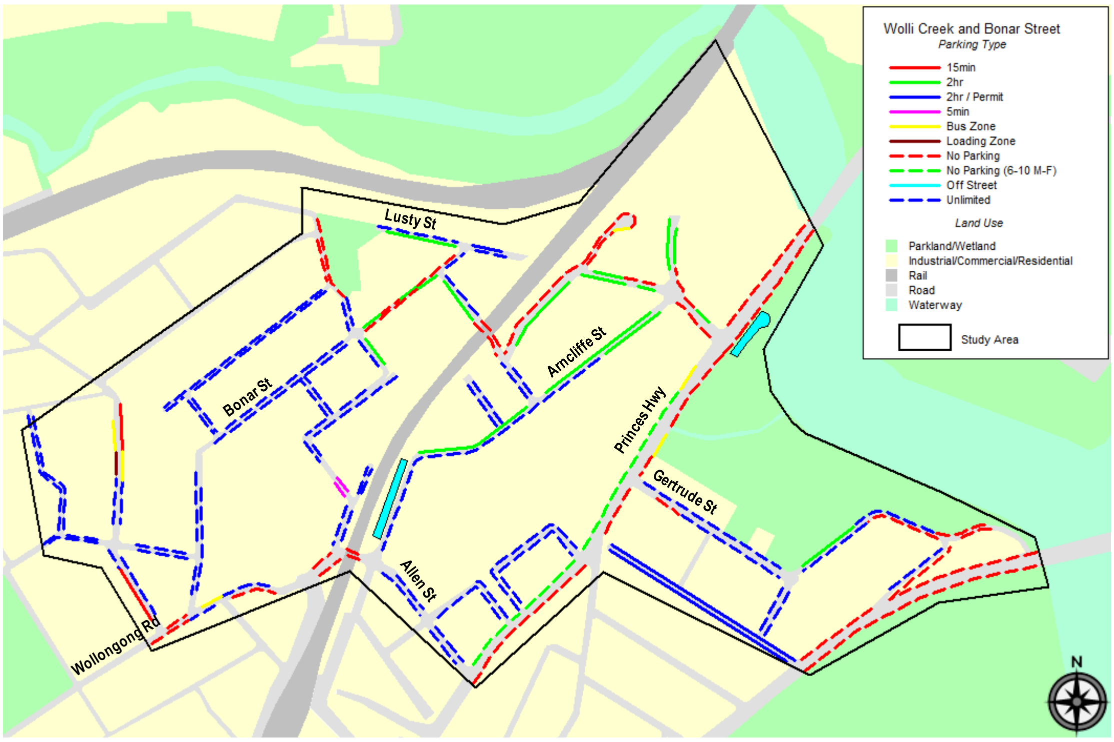


Figure 6.19: Existing Parking Types

The Wolli Creek precinct has an even share of "no parking", "2 hour parking" and "unlimited parking". The Bonar Street Precinct contains almost exclusively unlimited parking. It is important to effectively manage on-street parking in the study area and consider the option of providing metered parking where appropriate. Consideration must also be given to the need for longer stay parking alternatives for visitors to commercial premises.

A lack of public parking appears to exist in the study area and a considerable proportion of the private parking is currently underutilised. The car ownership data (ABS) suggests that the proportion of local residents that own no motor vehicles is increasing (refer Figure 6.20).

Current area: Wolli Creek | Current benchmark: Rockdale City | Data type: Enumerated | Comparison year: 2006 | reset

Car ownership

export | reset

Wolli Creek	2011			2006			Change
Number of cars	Number	%	Rockdale City	Number	%	Rockdale City	2006 to 2011
No motor vehicles	196	16.4	13.1	128	12.4	14.6	+68
1 motor vehicle	654	54.5	42.1	538	52.0	42.0	+115
2 motor vehicles	227	19.0	27.3	215	20.8	24.8	+13
3 or more motor vehicles	31	2.6	9.6	20	2.0	8.5	+11
Not stated	89	7.4	7.9	133	12.9	10.1	-44
Total households	1,199	100.0	100.0	1,036	100.0	100.0	+163

Source: Australian Bureau of Statistics, Census of Population and Housing 2006 and 2011. Compiled and presented by .id, the population experts.

Figure 6.20: Car Ownership

Whilst the Discovery Point development is in the process of providing public parking within the centre, consideration should be given to reviewing the parking rates associated with the Wolli Creek Town Centre to better reflect the current trend on car ownership patterns.

Issue 28
The current car ownership trends suggest that the private parking rate in the DCP is required to be reviewed. Public parking to be provided as part of the Discovery Point development will also require careful management to ensure the Wolli Creek Town Centre vision is achieved.

Commuter parking is currently not provided nor is it recommend for the area. This transport mode type offers increases the pedestrian/cycle and vehicle conflicts whilst offering no economic / activity benefit to the town centre. Other stations such as Arncliffe Station are more suitable to cater for local commuter travellers.

Wolli Creek rail station should be largely focused on servicing the adjacent residential catchment (which will continue to grow). As the precinct is re-developed, more bus/train interaction is expected to occur with passengers interchanging in this area.

6.6 ROAD INFRASTRUCTURE

The road network contained in the Wolli Creek and Bonar Street precincts currently features four signalised intersections and five roundabouts with all other intersections controlled by give-way or stop signs, as shown in Figure 6.21.

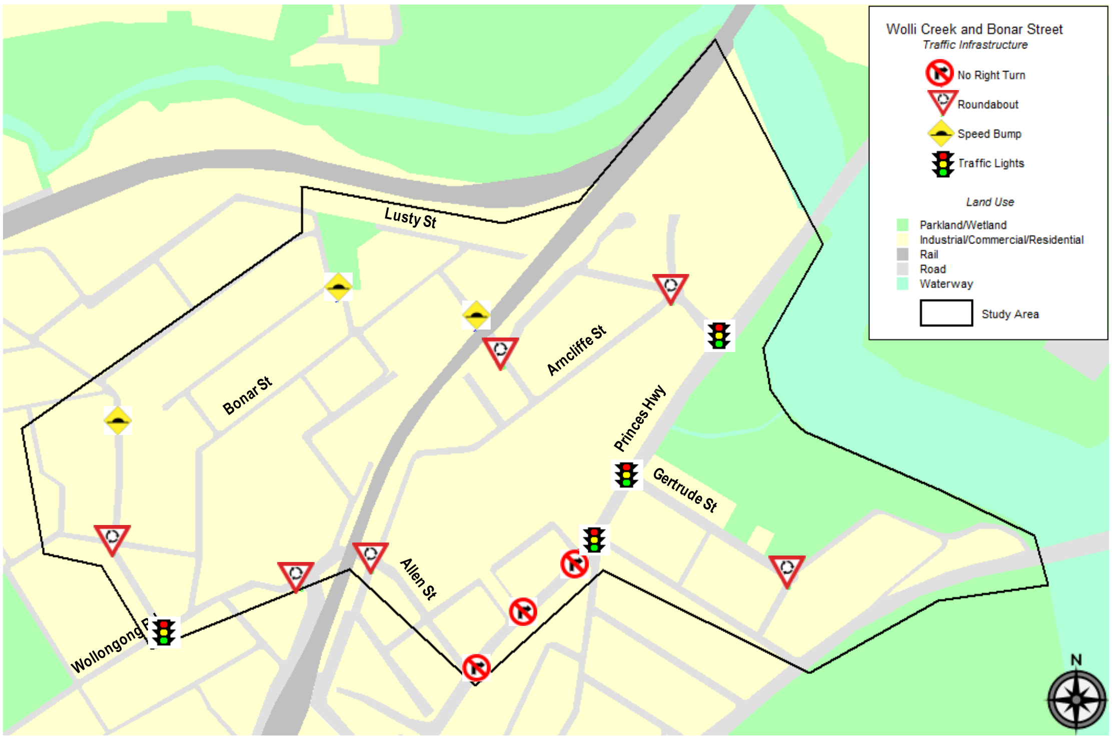


Figure 6.21: Existing Traffic Infrastructure

6.7 TRAFFIC VOLUMES

Typically, road hierarchy classifications are established based on the following traffic volumes (vehicles per day):

- Arterial > 15,000 vpd;
- Sub-Arterial < 15,000 and > 7,500 vpd;
- Collector < 7,500 and > 2,000 vpd; and
- Local Street < 2,000 vpd.

The traffic survey completed in October 2012 allowed the ability to estimate the daily volumes currently using the different parts of the road network. Therefore, using the above road hierarchy classifications, the functional road hierarchy currently observed within the precinct is as shown in Figure 6.22.

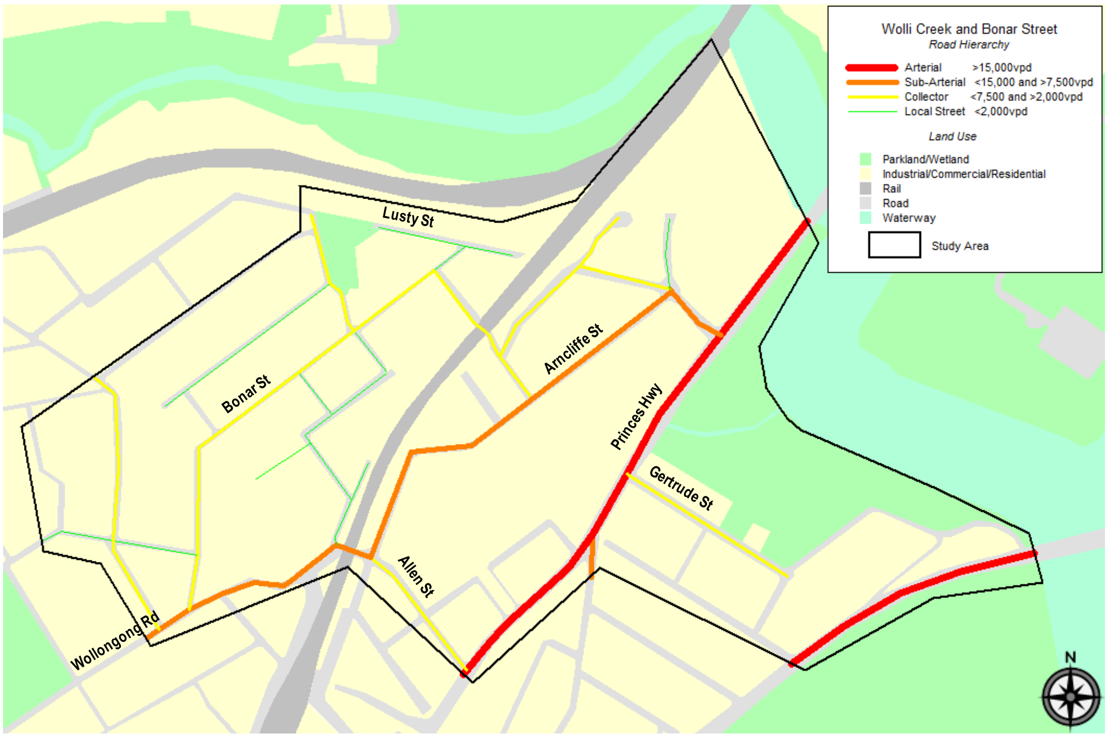


Figure 6.22: Road Hierarchy Based on Estimated Daily Traffic Volumes

The volumes on Arncliffe Street suggest that it is operating as a sub-arterial road. Traffic volumes of around 6,000 – 8,000 vehicles per day are ideal for a vibrant main street. The current volumes are only slightly higher than that desired at 10,000-11,000 vehicles per day. Future focus should be to improve the adjacent road frontages and parking turnover, which may also then reduce throughput.

Issue 29
Current volumes along Arncliffe Street are slightly higher than those desired for a vibrant main street. A considerable proportion of the traffic travelling along this corridor corresponds to through traffic, which should be reduced in favour of “local” trips.

During peak conditions, the road network experiences capacity issues in some locations during peak conditions that impact the way traffic operates and route choice. The most noticeable example is the insufficient capacity currently provided by the Princes Highway / Forest Road intersection which is possibly the key factor that encourages motorists to use the Arncliffe Street / Wollongong Road route as an alternative. While this intersection is external to the study area, its operation is of paramount importance to overall traffic performance. During the morning peak period, the left turn from Forest Road (eastbound) onto the Princes Highway (northbound) appears to be the major cause of delays and congestion on Forest Road. During the afternoon peak period, the right turn from the Princes Highway (southbound) onto Forest Road (westbound) causes the majority of the delays at this intersection.

Issue 30
Capacity constrains at the Princes Highway / Forest Road intersection and associated congestion contributes to the increased attractiveness of Wollongong Road and Arncliffe Street. A combination of “pinch point” improvements at Forest Road together with roadside improvements along Arncliffe Street may be sufficient to achieve the desired outcome. Contra-flow measures (to increase right turn storage bay lengths) have recently been implemented, with it being too early to ascertain the benefits.

The operation of Arncliffe Street is also hindered by other factors such as its narrow cross section with parking provided on both sides of the road. The access to the recently constructed Woolworths supermarket from Arncliffe Street is problematic due to the combination of high traffic volumes, poor sight distance and narrow driveway. A factor that further contributes to the safety issues at this point is the lack of adequate pedestrian access, which results in pedestrians using the same access as vehicles.

Figure 6.23: Woolworths Access

Issue 31
The access to the recently constructed Woolworths supermarket poses a number of safety and operational concerns due to the poor sight distance, narrow driveway, high through volumes and conflict with pedestrian movements.

Some parts of Bonar Street were found to require some form of improved intersection control. The intersection with Thompson Street is not apparent when approaching from the west. A localised roundabout treatment would assist with this issue while also assisting with reconfiguring the higher right turn movement from north to west. It would also assist with reducing speed of the through traffic along Bonar Street, improving pedestrian and cycle safety. Further north, the implementation of splitter islands should be considered at the intersection with Guess Avenue to prevent vehicles from cutting corners when turning at this intersection. A similar arrangement should be considered for the intersection with Wollongong Road, together with an intersection realignment to remove the angled approach.

Source: Google Maps

Figure 6.24: Bonar Street / Thompson Street Intersection

It is understood that a roundabout is proposed to be installed at the intersection of Bonar Street and Hirst Street. No planning documents appear to make reference to this item and the justification for the need of this roundabout is unclear.

It is considered that the current give-way arrangement should be retained as there is not expected to be sufficient volumes in the future to warrant such a treatment. This will be confirmed with future year modelling.

Issue 32
The implementation of a roundabout at the Bonar Street / Thompson Street intersection should be considered, together with the implementation of splitter islands at the Bonar Street / Guess Avenue and Bonar Street / Wollongong Road intersections. The plans to install a roundabout at the intersection of Bonar Street / Hirst Street should be revised.

The section of Thompson Street / Booth Street between Bonar Street and Monk Avenue appears to be more suitable for one-way traffic only. Consideration should be given to the conversion of this section of the network to one-way northbound. The deficient road width and safety concerns are expected to be exacerbated in the future as additional traffic emanates from the Bonar Street precinct.

The current Guess Street underpass formation is deficient for traffic and pedestrians/cyclists. Consideration should be given to reconfigure this underpass, with a possible solution being a formation of 3m travel lanes, a 1m on-road cycle lane, a 1m footpath on the south side (signed as "No Pedestrians") and a 3m off-road shared path on the north side.

Issue 33
Consider modifying the formation of the Guess Avenue underpass to a more efficient and safer configuration for all users (ie reduce traffic lane width to allow for an on-street cycle lane and wider off-street shared path).

To the east of this underpass, the intersection of Guess Avenue / Mount Olympus Boulevard is currently controlled by a roundabout. This is ineffective due to the poor deflection, low traffic demands and turn volumes. Consideration should be given to replace the roundabout with a threshold that focuses more on delivering improved pedestrian/cycle amenity.

Figure 6.25: Guess Avenue / Mount Olympus Boulevard Roundabout

Issue 34
Existing roundabout at the Guess Avenue / Mount Olympus Boulevard is ineffective and does not provide a high level of pedestrian / cyclist amenity.

This part of the road network (Guess Avenue, Mount Olympus Boulevard and Magdalene Terrace) should have a lower traffic speed environment applied, with improved pedestrian and cycling amenity to encourage higher active transport usage. Consideration should be given to installing a 40km/h zone with multiple marked foot crossings, road narrowing for parking bays, on-road cycling markings and other supporting initiatives. This will become even more important as the Discovery Point site continues its expansion with pedestrian and cycling demands increasing in the same proportion.

Figure 6.26 and Figure 6.27 below show some typical main street examples as compared to what currently exists in Magdalene Terrace. As can be seen by the below figures, there are many alternatives available to improving the pedestrian and cycle amenity within Magdalene Terrace.

Figure 6.26: Main Street Example

Figure 6.27: Existing Magdalene Terrace Road Environment

Issue 35
The speed environment and road infrastructure along Guess Avenue, Mount Olympus Boulevard and Magdalene Terrace should support lower traffic speeds and high pedestrian and cycling activity, particularly as the Discovery Point development evolves.

The right turn from Allen Street onto Wollongong Road is considered to be unsafe due to its location on a curve, adjacent to the underpass. A more effective and safer arrangement is to restrict the right turn at this location. The Firth Street intersection is controlled by a roundabout, at which point westbound vehicles would be able to undertake a U-turn. The intersection of Allen Street / Wollongong Road would also benefit from improved delineation such as the installation of chevron alignment markers, raised pavement markers and improved line marking.

Figure 6.28: Allen Street / Wollongong Road Intersection

Issue 36
Existing intersection of Allen Street / Wollongong Road is unsafe due to poor sight distance and narrow road width. The issue is increased during school peaks periods.

6.8 CRASH ANALYSIS

Crash Data for the Wolli Creek and Bonar Street precincts for the five year period between 2007 and 2011 has been supplied by Rockdale City Council and is summarised in Figures 6.27 to 6.31 below.

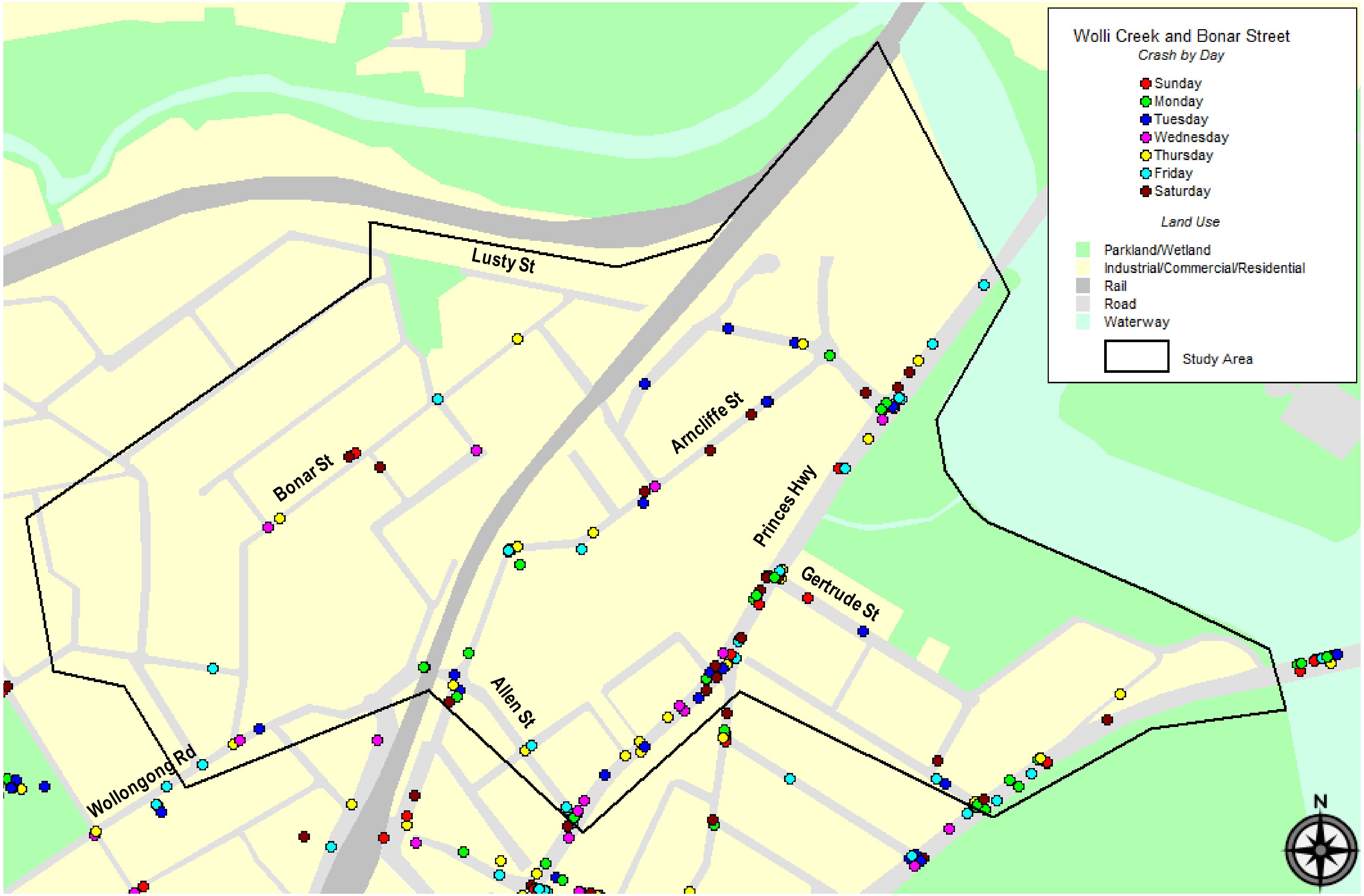


Figure 6.29: Crash by Day

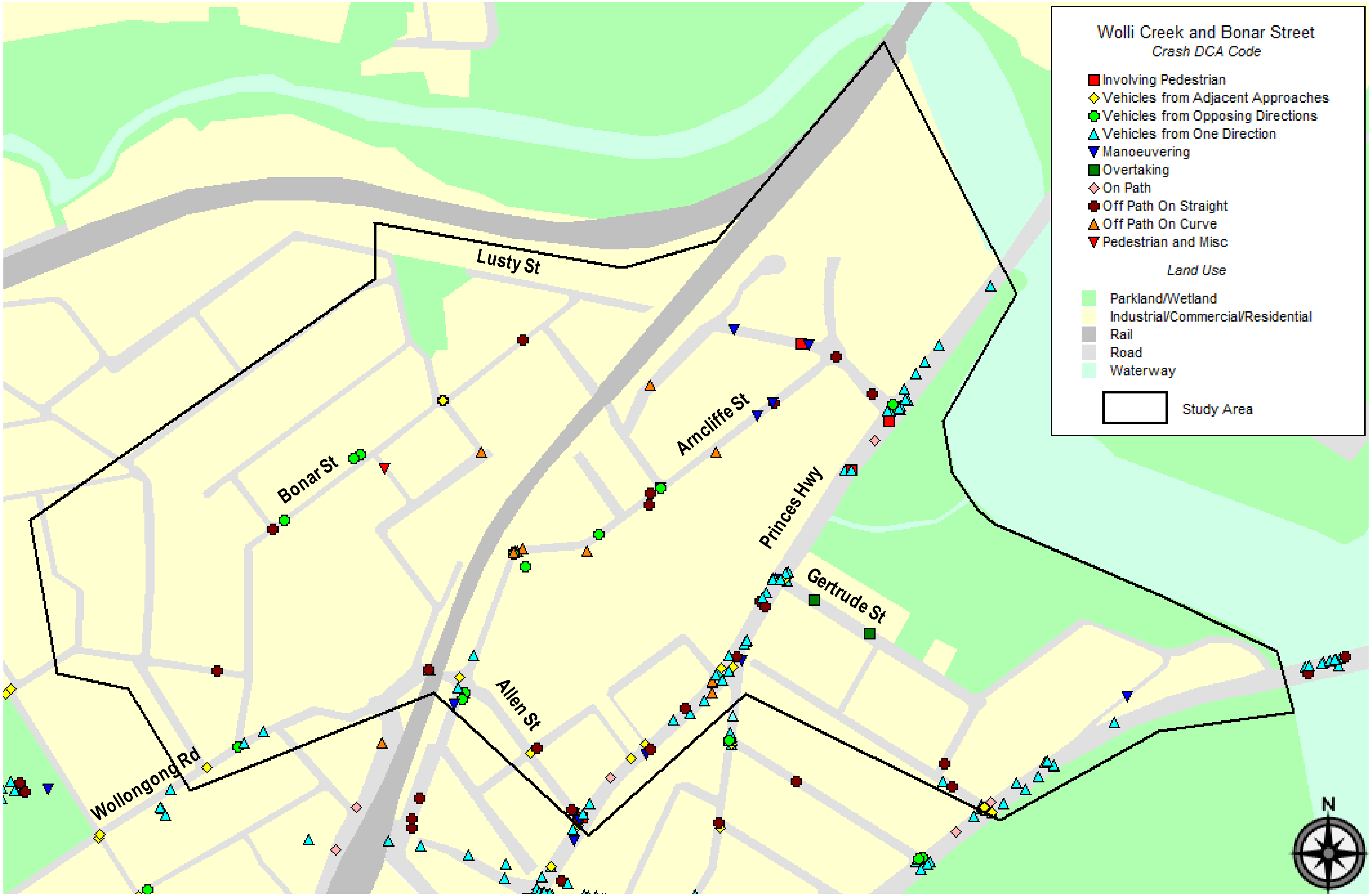


Figure 6.30: Crash by DCA Code

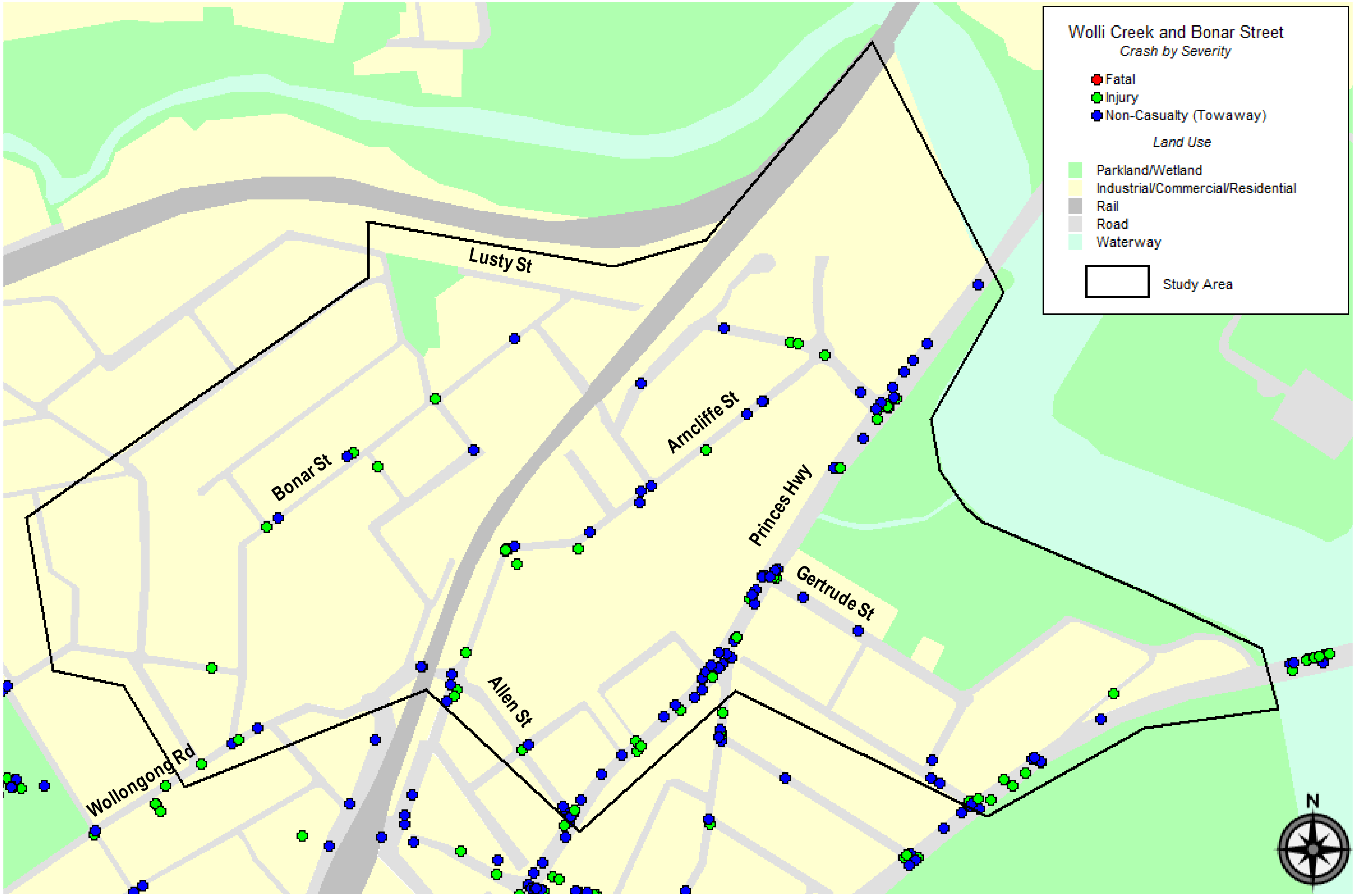


Figure 6.31: Crash by Severity

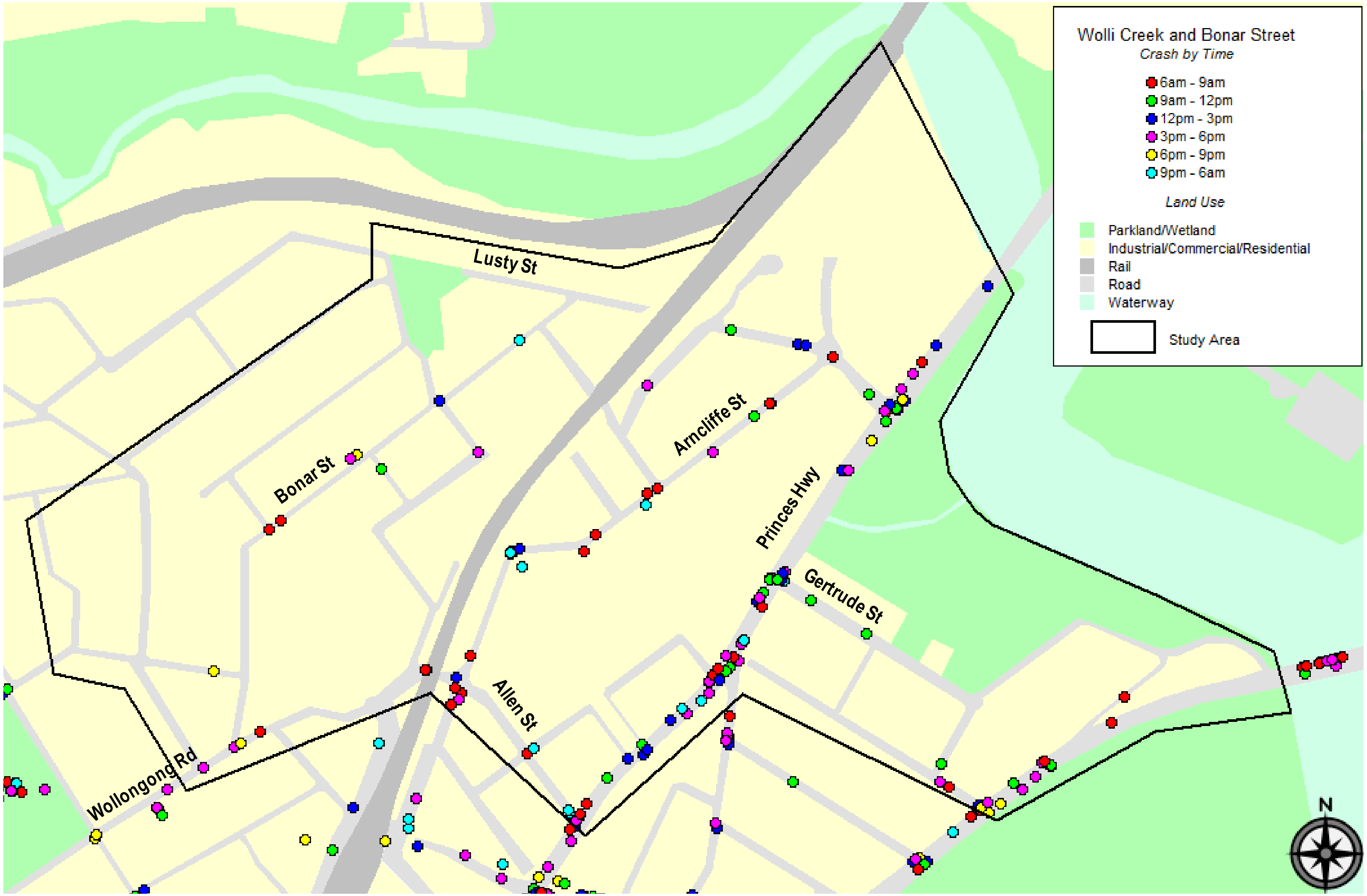


Figure 6.32: Crash by Time

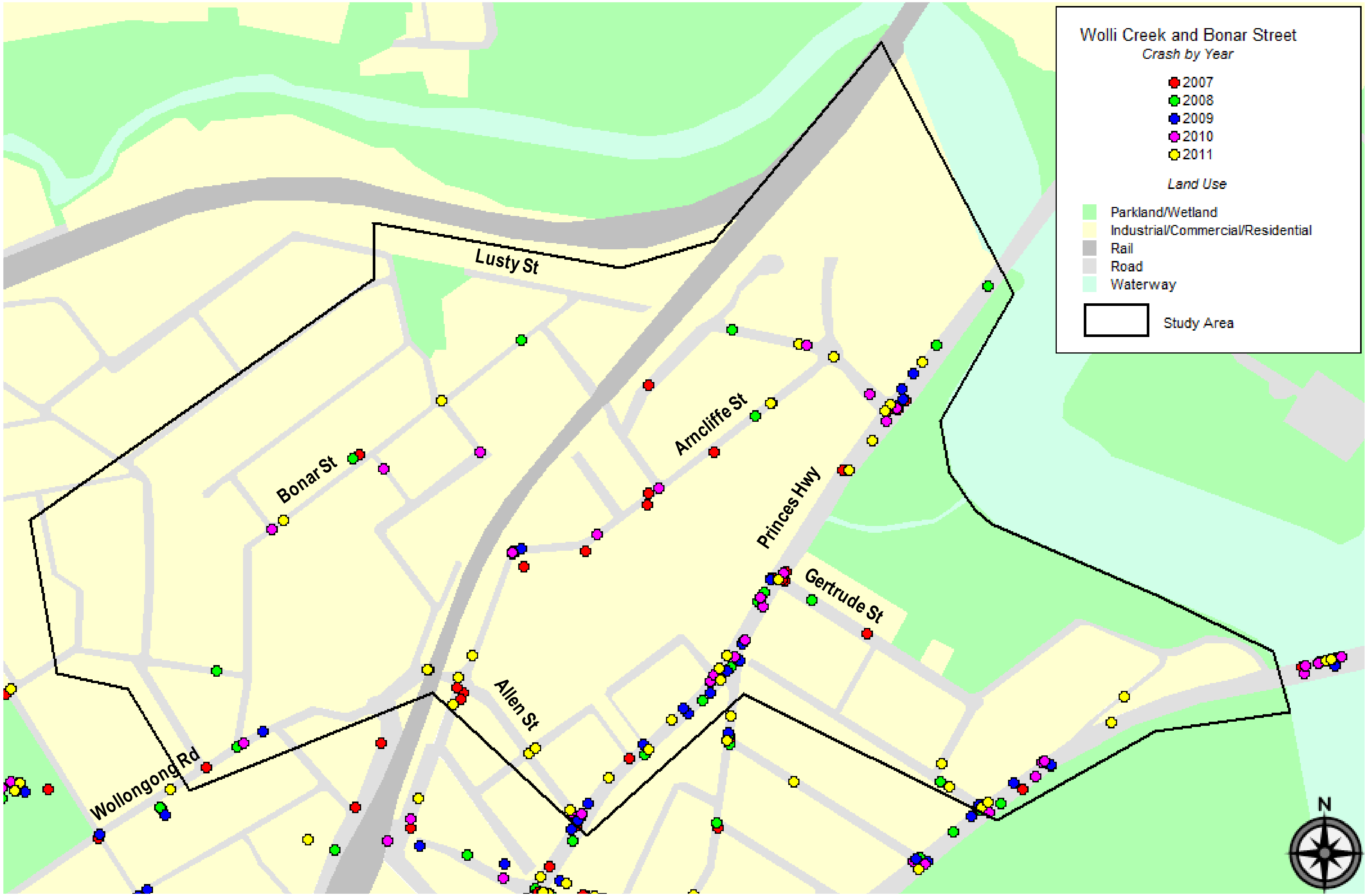


Figure 6.33: Crash by Year

The key findings obtained from the crash data are as follows:

- crashes appear to be distributed across the week with no particular day experiencing a significantly higher number of occurrences;
- the main clusters are located on the Princes Highway, more specifically at the intersections with Brodie Spark Drive, Gertrude Street and West Botany Street;
- there have been no fatal injuries between 2007 and 2011;
- the number of crashes around the Bonar Street precinct and the northern part of the Wolli Creek precinct (near the Brodie Spark Drive / Princes Highway intersection) has increased in 2010 and 2011; and
- two pedestrian crashes occurred on Brodie Spark Drive between 2010 and 2011, which corresponds with the concerns previously mentioned for this part of the network.

7. SUMMARY OF CURRENT AND EMERGING ISSUES

A summary of the key issues identified through Section 4 to Section 6 are summarised in Table 7.1 below.

Table 7.1: Existing Issue Summary

No.	Issue
1	The re-development proposed to occur between Arncliffe Street and Princes Highway (in the vicinity of Argyle Street) should have the internal road network re-designed to allow access exclusively off Arncliffe Street and limit / remove the access points towards the Princes Highway
2	The current and proposed cycle routes specified in the DCP are not consistent with those shown in the "On The Go Map" and the infrastructure currently provided does not support the routes mentioned in any of the documents.
3	No reference is made in the DCP to any current or proposed pedestrian pathways.
4	The proposed Arncliffe Street cross section and intent conflicts with the current layout and some recently constructed developments along this road section. The width is not sufficient to safely cater for all modes of transport as suggested by the PDP / DCP. This issue also exists for many of the surrounding streets within the Wolli Creek precinct such as Mount Olympus Boulevard and Guess Avenue. The key issue relates to the lack of consideration for cyclists and buses.
5	The proposed cross section to be provided along Bonar Street features a 3.2m carriageway in each direction, parking lanes on either side and a 4.0m median but no provision for cyclists.
6	Wollongong Road is classified as a residential street in the PDP, conflicting with its function in the road network. This is required to be updated to be a "Main Street' consistent with Arncliffe Street.
7	Existing and proposed road infrastructure defined in the PDP and DCP conflicts with the intended road use, particularly from a cycling perspective. Shared lanes are proposed but the width appears to be insufficient to safely cater for motorised traffic and cyclists.
8	The proposed cycling network includes a route along the western side of the Princes Highway that crosses the Cooks River. This route will be difficult to implement and conflicts with that shown in DCP which stops just south of the river crossing. Constraints exist adjacent to the Mount Olympus roadside cutting and the Princes Highway bridge.
9	Significant population growth is anticipated to occur within the Wolli Creek precinct in the short / medium term. This will place significant pressure on the local road network already experiencing capacity / safety issues. Pedestrians and cyclists need to be encouraged through appropriate infrastructure provisions to support their movement. Existing pedestrian / cycle facilities are not of a standard to handle these additional trips and there is a risk that incoming residents will subsequently choose to drive.
10	Discussions with TfNSW highlight a capacity shortfall through the Wolli Creek rail interchange on the Illawarra Line. This may affect the potential for a continued increased in rail mode share. There is however ample capacity available on the East Hills rail line.
11	The sections of the study area experiencing higher pedestrian activity typically feature narrow footpaths (often <1.5m wide). Both the Allen Street and Guess Avenue underpasses have reduced pedestrian amenity (mainly due to width and location), and present safety issues.
12	Missing pedestrian link along the western side of Arncliffe Street and at the Allen Street / Wollongong Road roundabout, and lack of crossing facilities to encourage crossing to the eastern side.
13	Many existing footpath sections require maintenance or rectification. Staging of footpath implementation for missing sections will need to be carefully planned as re-development in the area occurs.
14	Pedestrian movements at the Brodie Spark Drive / Arncliffe Street intersection are unsafe due to high traffic volumes, width of road, lack of designated crossing points, sight distance constraints, intersection queuing and general driver behaviour.
15	Lack of pedestrian crossing facilities along Magdalene Terrace and Mount Olympus Boulevard.
16	Signage and re-marking required at the marked foot crossing at the intersection of Firth Street / Forest Road
17	Overall, street lighting across the Wolli Creek precinct is generally poor which does not contribute to the desired high pedestrian activity in the area. Public safety issues need to be addressed at dusk/dawn/evening with improved lighting, passive surveillance and security.

No.	Issue
18	Arncliffe Street is currently classified as a cycle route but provides no cycling infrastructure or pavement signs. Current and future traffic volumes are too high to support shared on-road cycling facilities for the proposed future cross-section.
19	Existing cycle routes on Bonar Street, Thompson Street and Hirst Street correspond to shared on-road lanes with safety implications at some points due to the insufficient width to safely accommodate both types of users.
20	Mount Olympus Boulevard is too narrow to accommodate two-way traffic, buses, cyclists and pedestrians.
21	Footpath needs widening (converted to a shared path) on western side of Princes Highway to support existing number of cyclists.
22	The cycle connection to Waterworth Park involves a significant cost risk. The provision of at grade facilities may be more cost effective.
23	Potential construction of a cycle underpass under the Princes Highway involves flood and sight distance issues. Investigations to provide improved "at grade" facilities should be considered.
24	Missing link from the Gertrude Street (west) cycle route to the village centre.
25	Cycle route signage needs to be reviewed throughout the study area.
26	Low number of bus services and poor frequency is likely to require future improvements as resident population establishes and demand for more routes and services increases.
27	Poor access arrangements are currently provided to/from the train station for the mobility- impaired.
28	The current car ownership trends suggest that the private parking rate in the DCP is required to be reviewed. Public parking to be provided as part of the Discovery Point development will also require careful management to ensure the Wolli Creek Town Centre vision is achieved.
29	Current volumes along Arncliffe Street are slightly higher than those desired for a vibrant main street. A considerable proportion of the traffic travelling along this corridor corresponds to through traffic, which should be reduced in favour of "local" trips.
30	Capacity constrains at the Princes Highway / Forest Road intersection and associated congestion contributes to the increased attractiveness of Wollongong Road and Arncliffe Street. A combination of "pinch point" improvements at Forest Road together with roadside improvements along Arncliffe Street may be sufficient to achieve the required outcome. Contra-flow measures (to increase right turn storage bay lengths) have recently been implemented, with it being too early to ascertain the benefits.
31	The access to the recently constructed Woolworths supermarket poses a number of safety and operational concerns due to the poor sight distance, narrow driveway, high through volumes and conflict with pedestrian movements.
32	The implementation of a roundabout at the Bonar Street / Thompson Street intersection should be considered, together with the implementation of splitter islands at the Bonar Street / Guess Avenue and Bonar Street / Wollongong Road intersections. The plans to install a roundabout at the intersection of Bonar Street / Hirst Street should be revised.
33	Consider modifying the formation of the Guess Avenue underpass to a more efficient and safer configuration for all users (ie reduce traffic lane width to allow for an on-street cycle lane and wider off-street shared path).
34	Existing roundabout at the Guess Avenue / Mount Olympus Boulevard is ineffective and does not provide a high level of pedestrian / cyclist amenity.
35	The speed environment and road infrastructure along Guess Avenue, Mount Olympus Boulevard and Magdalene Terrace should support lower traffic speeds and high pedestrian and cycling activity, particularly as the Discovery Point development evolves.
36	Existing intersection of Allen Street / Wollongong Road is unsafe due to poor sight distance and narrow road width. The issue is increased during school peaks periods.

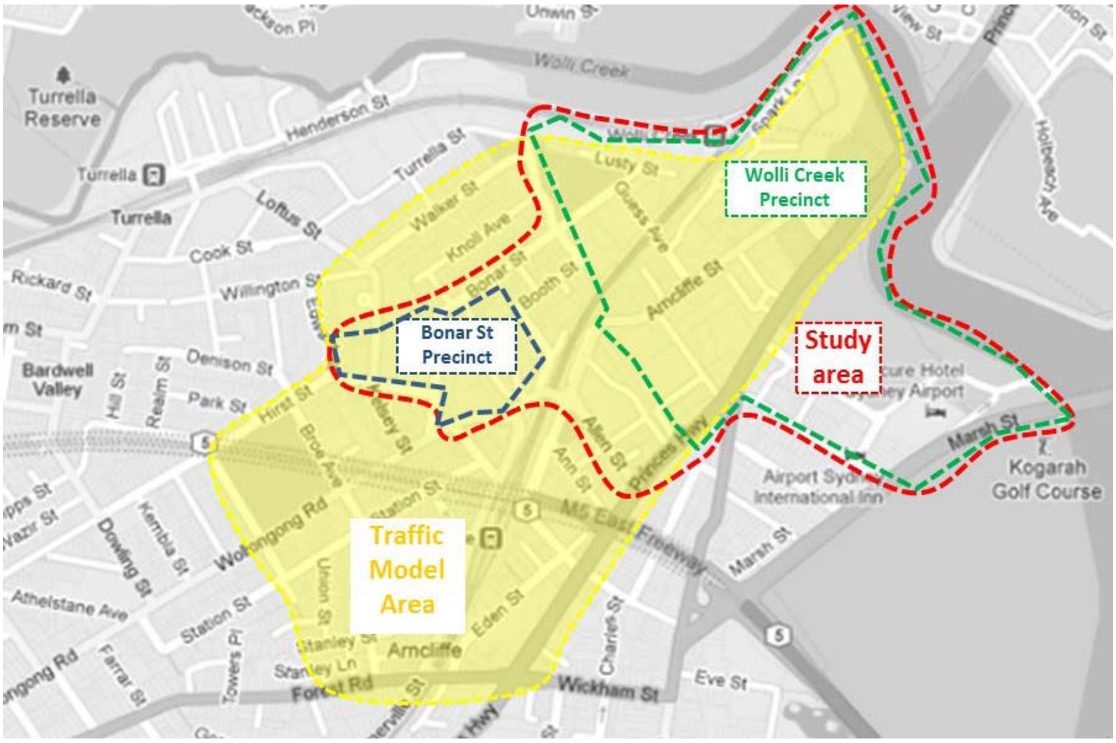
8. CURRENT YEAR TRAFFIC SIMULATION MODEL

A traffic microsimulation model was developed as part of this study to help assess current and future network operation levels. The Paramics suite of software was used to develop the simulation model.

Separate models were developed for the morning and afternoon peak periods, with the respective periods as follows:

- AM peak: 7.00am – 9.00am; and
- PM peak: 3.00pm – 6.00pm

Figure 8.1 shows the Development Control Plan (DCP) boundaries for the Bonar Street and Wolli Creek precincts while the red dashed line shows the study area. To enable a detailed analysis of the traffic operation in the area (especially through traffic), the modelled network was extended to cover the yellow zone shown in Figure 8.1.



Source: Google Maps

Figure 8.1: Model Boundary and Study Area

The model development, calibration and validation stages required the collection of different types of data, such as:

- Intersection Counts (*Traffic Data and Control*) - October 2012;
- Origin-Destination Data (*Traffic Data and Control*) - October 2012;
- Travel Time Data (*Traffic Data and Control*) – October/November 2012;
- Back of Queue Data (*Traffic Data and Control*) – October/November 2012;
- Signal Phasing Data (RMS) – October 2012; and
- Aerial Photography Data (Rockdale City Council) – January 2011;

Both models were calibrated and validated to meet the requirements established in the RMS Microsimulation Modelling Manual and correspond to a realistic representation of real network operation.

An independent model audit was carried out by Sinclair Knight Merz in January 2013. The model audit identified some minor improvements to be added to the model. In response, Bitzios Consulting updated the model and responded to all the issues identified by the auditor.

Council has subsequently confirmed that all issues raised in the model audit were adequately responded to. The revised base models are therefore deemed suitable for the purpose of testing alternative network configuration options and future traffic demands associated with future development in the study area and forecast background traffic modifications.

Appendix A contains the "Wolli Creek Traffic Model Calibration and Validation Report", the "Wolli Creek Paramics Traffic Model Audit Report" and a Table outlining Bitzios Consulting's response to the audit and Council's comments on the final outcome.

9. FUTURE YEAR OPTIONS ASSESSMENT

9.1 OPTION DEVELOPMENT

A total of four options were developed for the year 2031 horizon, testing different road network configurations and trip generation figures. Each option is discussed in detail below.

9.1.1 Option 1 – Current DCP Improvements

The first scenario developed for the 2031 horizon (Option 1) corresponds to the road network and traffic demands based on the full implementation of the DCP. The road infrastructure was maintained as per the existing configuration, except for those locations where the DCP or other planning documents clearly identify any modifications to be added.

Option 1 includes the full development of the Discovery Point site, including the respective access points, internal roads identified in the approved concept plan and resultant trips to and from the site (in accordance with the proposed yields). The approved concept plan identifies the proposed location for a bus stop near the rail station. This bus stop was also added to the model and the bus routes were amended.

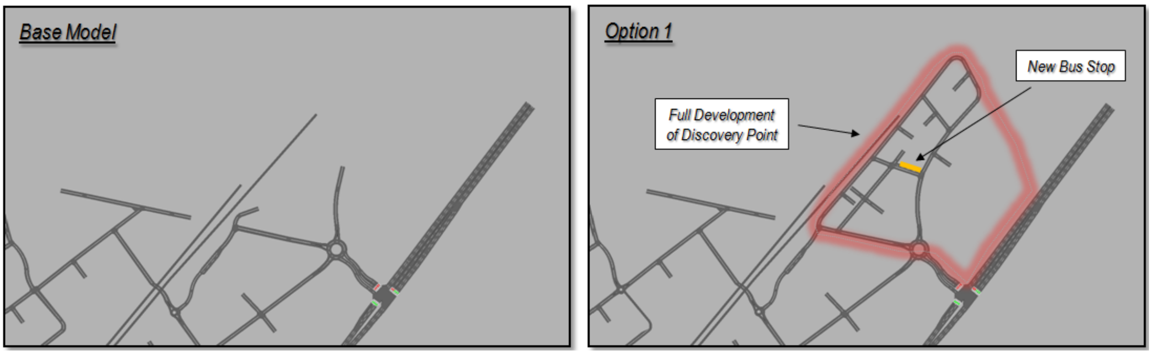


Figure 9.1: Discovery Point Fully Developed as part of Option 1

Further south, some modifications were added to the Bonar Street precinct road network. Two new internal roads were added to the modelled network (road 7 and road 8), in accordance to the PDP. The Wollongong Road / Firth Street intersection (currently a three leg roundabout) was converted to a signalised intersection with “Road 7” (therefore a four leg intersection). The implementation of traffic signals at this location effectively converts Wollongong Road to a 4 lane link from just west of the intersection with Kelsey Street until just east of the intersection with Firth Street. The right turns at the Wollongong Road / Allen Street intersection were banned, converting this intersection to a “left in – left out” arrangement.

Figure 9.2: Modifications near the Bonar Street Precinct as part of Option 1

Contra-flow measures were added to the Forest Road / Wickham Street / Princes Highway intersection after the development of the base models, and are therefore not included in those models. These arrangements were, however, incorporated in all 2031 models, including Option 1.

The 2031 development yields (residential, commercial, etc.) were obtained from RCC and the trip generation figures for Option 1 were calculated based on typical RMS rates, based on the assumption that the current transport mode shares would generally remain the same.

All through trips using the modelled area (trips between "external" zones) were increased at a rate of 0.5% per annum (compounding). This is in accordance with historical traffic data for the area.

The signal phasing operation was optimised based on the network and demands developed for Option1. Typically, this corresponded to minor adjustments to the green time for specific movements.

9.1.2 Option 2 – DCP Improvements with Mode Share Reduction

The road network used for Option 2 is the same of that described for Option 1. The only modifications correspond to the transport mode choice assumed to be in place in the study area by 2031. More specifically, Option 2 is based on the assumption that a higher proportion of residents and visitors to the Wolli Creek and Bonar Street precincts will use public transport and active transport modes compared to the current patterns, as intended for the area.

The target mode share adopted as part of Option 2 is shown in Table 9.1. It was developed in consultation with Council and TfNSW.

Table 9.1: 2031 Target Mode Shares for Option 2

Transport Mode	Current [1]	2031 Target
Train	51.0%	55.0%
Bus	0.8%	0.5%
Taxi	0.3%	1.0%
Car (driver)	33.3%	27.6%
Car (passenger)	2.8%	3.0%
Bicycle	0.2%	1.0%
Walk	1.7%	2.0%
Other	9.9%	9.9%

[1]: *Source: Australian Bureau of Statistics – 2011 Census*

The trip generation used for all traffic going to or from the modelled area was therefore adjusted to match the assumptions listed above. Overall, this resulted in an average reduction of 11% on the total traffic demands in the modelled area, when compared to Option 1. The background 'through traffic' was not adjusted with the mode share reduction.

The signal phasing operation was modified for this option to optimise the system for the observed traffic conditions.

To achieve the mode share targets suggested, a number of initiatives would need to be implemented such as:

- improve active transport facilities (footpaths, road crossings, cycleways, etc);
- upgrade public transport facilities; and
- encourage appropriate street level land uses to encourage walking and cycling.

9.1.3 Option 3 – DCP with Mode Share Reduction with Allen St open to Right Turn 'In'

Option 3 was developed with the specific intent of assessing the impacts / benefits of allowing right turn movements from the Princes Highway (southbound) onto Allen Street. This has been requested by stakeholders and members of the local community, and in response Council decided to investigate this option as part this study. The demands used in Option 3 are as per those described for Option 2 (target 2031 transport mode share).

The detailed configuration of the proposed scheme involves converting Lane 3 (the median side lane) on the Princes Highway southbound carriageway to a right turn only bay at the intersection with Allen Street.

The remaining two southbound lanes are proposed to operate "unopposed" (the right turn out of Allen Street is not permitted and no pedestrian crossing of the Princes Highway is included in the modified arrangement).

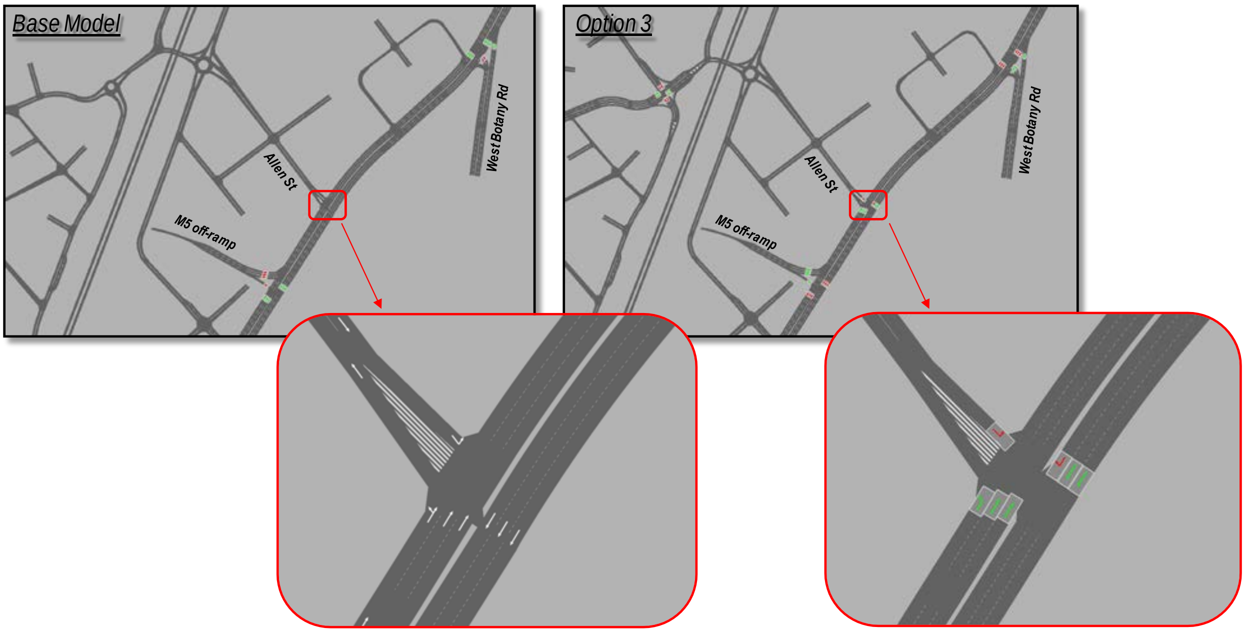


Figure 9.3: Right Turn onto Allen Street Permitted as part of Option 3

The signal phasing operation was adjusted as necessary within the modelled area to reflect modified traffic conditions.

9.1.4 Option 4 – DCP with Mode Share Reduction and Allen St Right Turn and Arncliffe Street Closed to "through traffic" south of Guess Avenue

Option 4 maintains the traffic demands used in Options 2 and 3 (target 2031 transport mode share) and also maintains the right turn from the Princes Highway onto Allen Street, as described for Option 3. Option 4 includes a number of modifications to the road network near the Wolli Creek and Bonar Street precincts, as follows:

- Arncliffe Street converted to a "cul de sac" south of Guess Avenue;
- Implementation of a clockwise one-way circuit along Arncliffe Street, Guess Avenue, Mount Olympus Boulevard and Magdalene Terrace (only Magdalene Terrace maintains two-way traffic);
- Removal of the Brodie Spark Drive / Arncliffe Street roundabout and conversion of this intersection to a give-way arrangement;
- Access to/from Discovery Point converted to "left in / left out" at the Brodie Spark Drive / Arncliffe Street intersection; and
- Right turn from Bonar Street onto Wollongong Road removed.

Similar to other options, the signal phasing for Option 4 was also adjusted as necessary to ensure that the operation of all signalised intersections correctly matched the modified traffic conditions and patterns.

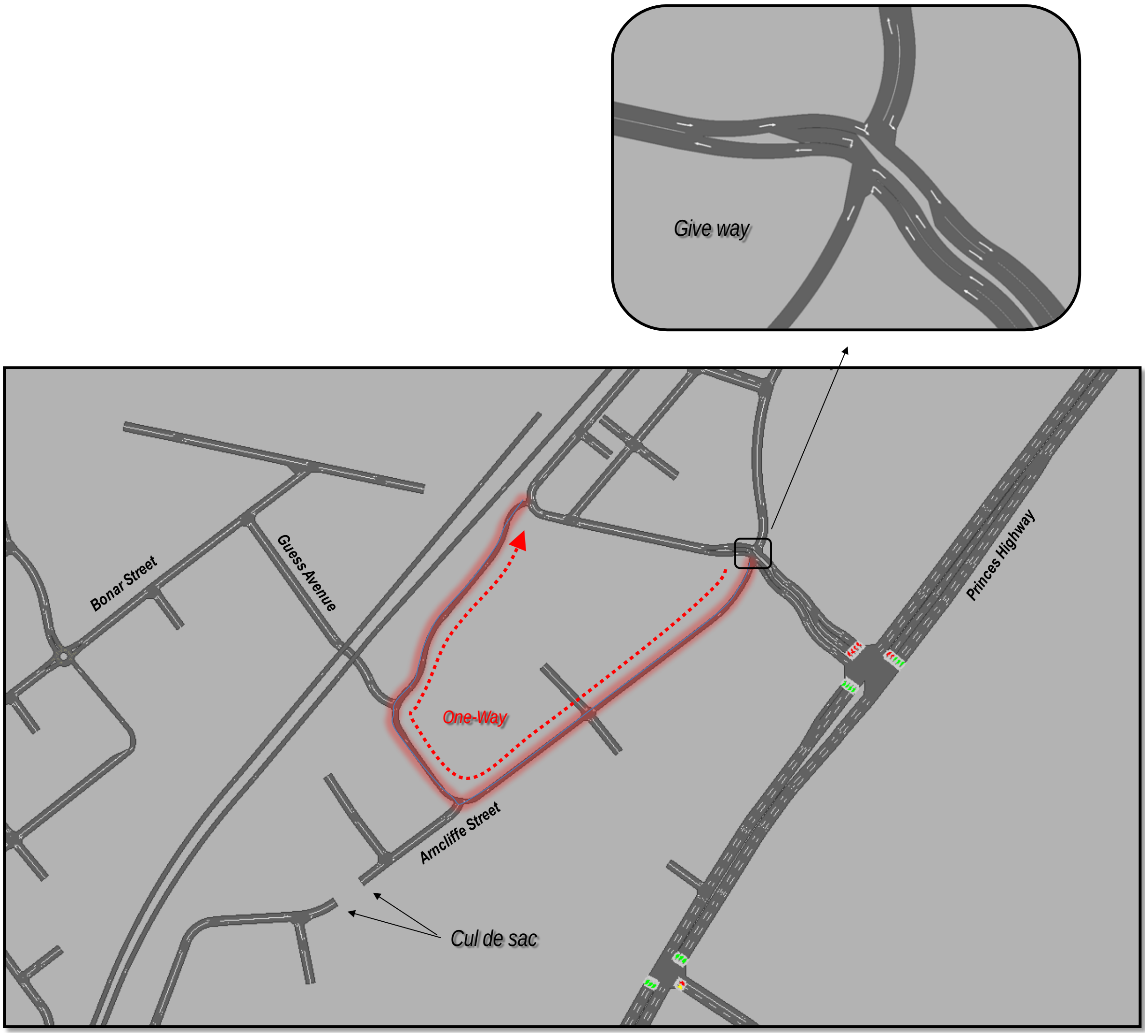


Figure 9.4: Road Network Modifications near the Wolli Creek Town Centre as part of Option 4

9.2 2031 Modelling Results

To better understand and compare how each option operates, a series of outputs was extracted from the morning and afternoon peak models. The 2012 base models were also included in the comparison to help put some of the results in perspective.

Eight specific output categories were selected to conduct a comparative assessment of the performance of each of the options tested. The output categories were as follows:

- Total Demands
  - Provides an indication on the number of vehicles attempting to enter the network on each option and each hour;
  - Puts in perspective the different trip generation scenarios;
- Vehicle Hours Travelled (VHT)
  - Performs a multiplication between the number of vehicles on the network and the hours required to travel between their respective origin and destination;
  - Provides an indication of network performance levels and possible congestion issues or ineffective routing;
- Number of Vehicles on the Network
  - Identifies the total number of vehicles on the network (by minute);
  - Demonstrates how each option operates over time, its stability and how it responds to the peak conditions;
  - Shows how effective each option is in allowing vehicles to complete their trips;
- Unreleased Vehicles
  - Identifies the number of vehicles that were unable to enter the modelled network in each hour, due to queues extending past the modelled area;
- Eastbound Queues on Forest Road (AM peak only)
  - Illustrates the maximum queue on Forest Road (eastbound) during the morning peak for all options;
  - Provides a detailed comparison on how one of the key congestion hotspots in the modelled area varies with the different scenarios;
- Travel Times Along the Princes Highway
  - Measures the average time required to complete a trip between the southern and northern extremities of the model (and vice-versa) along the Princes Highway;
  - Allows an assessment of the impacts associated with each scenario on the operation of trough traffic along the Princes Highway;
- Key Hourly Volumes
  - Identifies the average hourly volumes on key points of the network
  - Helps compare the average traffic volumes anticipated to use the key parts of the network under each option;
- Route Choice Analysis
  - Compares the routes chosen by vehicles to travel between the northern extremity of the Princes Highway and the western extremity of Forest Road (near the intersection with Wollongong Road) and vice-versa;
  - Provides an indication of how vehicles modify their routes depending on the network modifications included in each option;
  - Assesses the proportion of “rat running” traffic travelling along Wollongong Road, Arncliffe Street, Bonar Street, etc.

9.2.1 Total Demands

The 2012 origin destination demands used in the base model were modified to reflect estimated demands in 2031 for each scenario. Option 1 established a background traffic growth of 0.5% per annum (compound). This growth was applied only to trips between “external zones” (i.e. through trips that use part of the modelled network). This growth rate was adopted after reviewing historical traffic growth rate figures for the area. The external traffic growth was 2%, but 15yrs of growth was assumed to be reduced based on the benefits of Westconnex. This resulted in a 2% growth per annum applied over a five year period, which equates to an average rate of 0.5% over a 20 year period.

The trips going to or from “internal zones” (i.e. traffic travelling to/from the modelled area) were calculated based on the yields provided by RCC. As described in Section 8.1, Option 1 is based on typical RMS trip generation rates while Options 2, 3 and 4 adopt revised transport mode share figures. These targets are shown in Table 8.1. The reduction in total demands between Option 1 and the other options is typically in the order of 11%.

Figure 9.5 illustrates the total traffic demands used in all periods for all 2031 options and 2012 base scenario.

It is interesting to note that the adoption of the “2031 mode share targets” in Options 2, 3 and 4 results in the total demands being very similar to those used in the 2012 calibrated and validated models. In other words, should those modifications to the transport mode share be achieved and the background traffic growth rate over the next 20 years be in the order of 0.5% per annum, the total demands in 2031 would be comparable to those currently using the modelled area.

9.2.2 Vehicle Hours Travelled (VHT)

The vehicle hours travelled for each scenario help understand impact associated with the combination of demands used in each option and respective network modifications. Higher “VHT” statistics typically indicate factors such as higher number of vehicles in the model (higher demands), higher congestion levels and delays, longer routes adopted for the same origin-destination trips, etc.

Table 9.2 and Figure 9.6 document the “VHT” for each 2031 option and compare them with the 2012 results.

Table 9.2: Vehicle Hours Travelled

Scenario	AM Peak	PM Peak
2012 Base	1647	2276
2031 Option 1	2257	4167
2031 Option 2	1742	3026
2031 Option 3	1724	3053
2031 Option 4	1862	3457

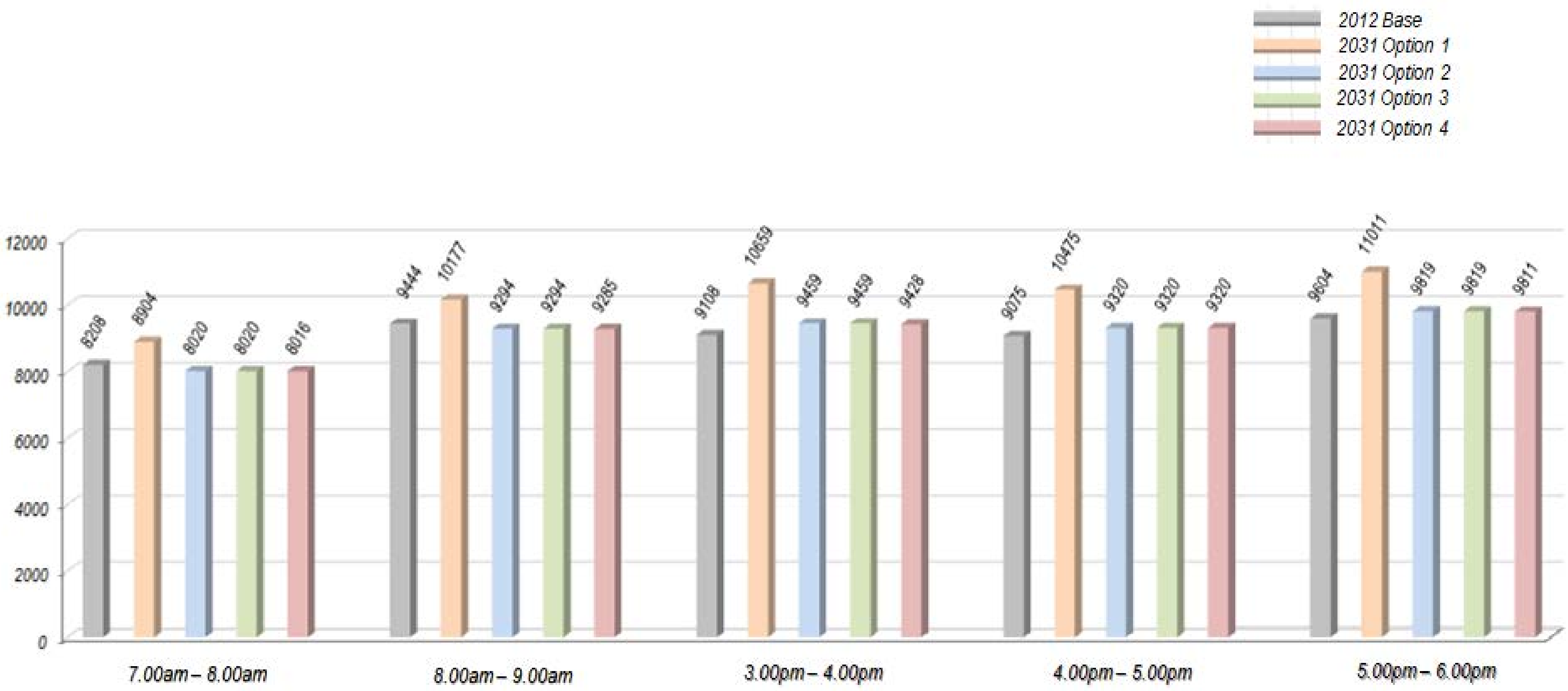


Figure 9.5: Total Demands

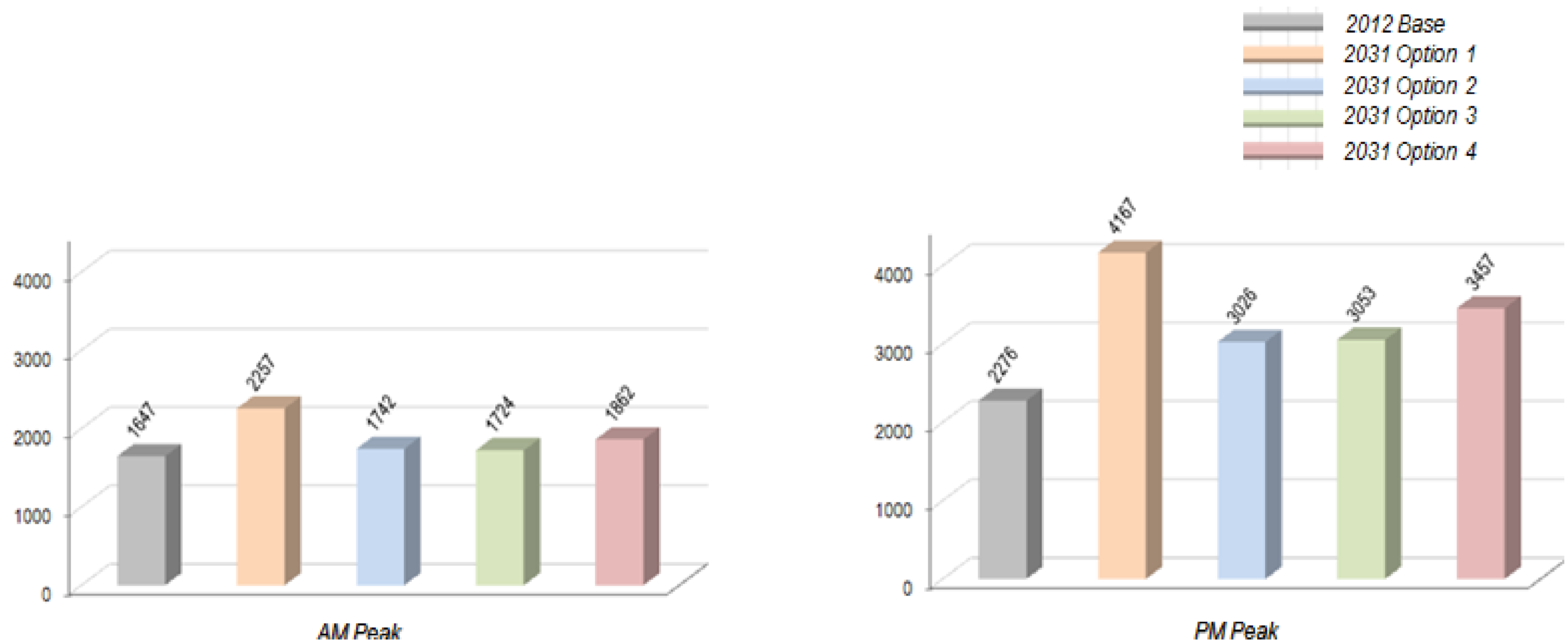


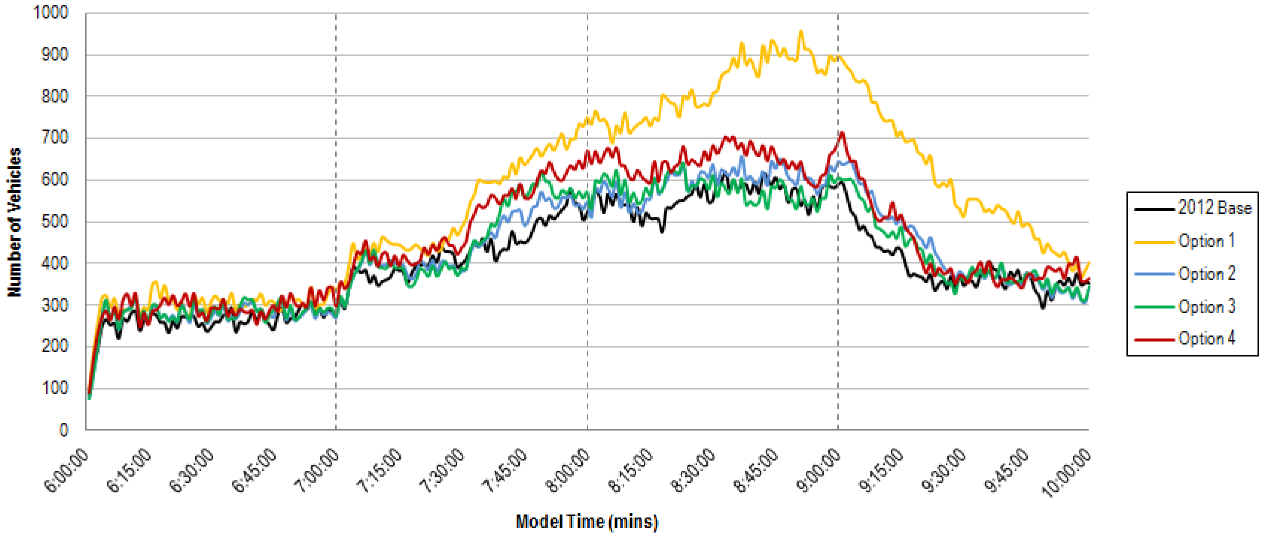
Figure 9.6: Vehicle Hours Travelled Graphs

The results indicate that the afternoon peak period is much more sensitive to the modifications added to the road network and demands. The afternoon peak "VHT" statistics for Option 1 correspond to almost double to the 2012 Base levels, which is a result of significantly higher demands on a network that is already operating beyond its practical capacity on some of its key areas. Moreover, Option 1 includes minimal network improvements, which helps understand the significantly higher VHT figures.

While all other options also show VHT values higher than the 2012 base model (especially in the PM peak), the results show a reduction in the order of 25% when compared to Option 1. This reduction is a good indicator of the potential benefits on the network performance should the target mode share be achieved or not.

9.2.3 Number of Vehicles on the Network

A detailed analysis of the number of vehicles on the network during the full duration of both peak periods helps to interpret the network operation of all options and how the vehicle release profiles affect the network performance.



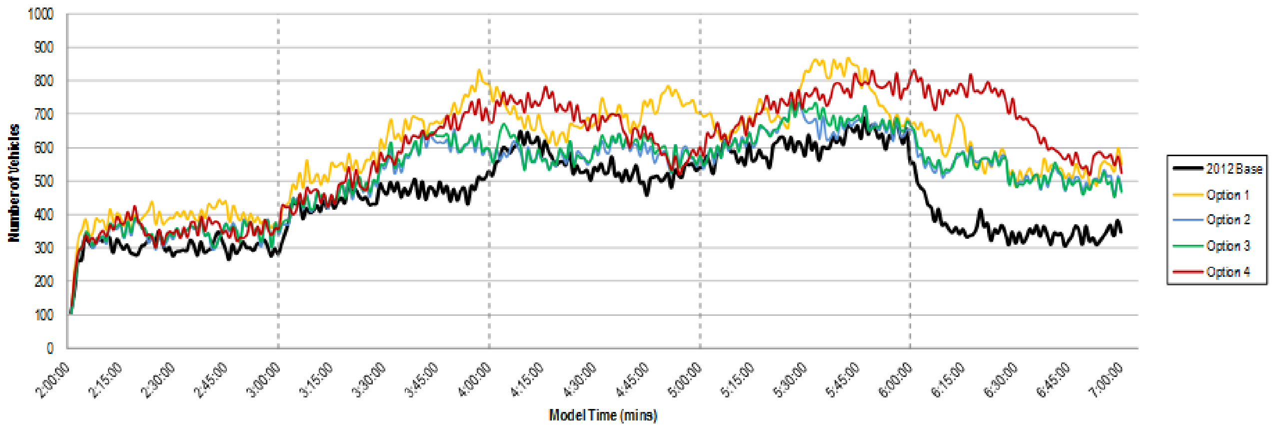


Figure 9.7: Number of Vehicles on the Network (AM and PM Peaks)

As shown in Figure 8.7, during the morning peak, Option 1 shows a substantial higher number of vehicles on the network after 8.00am when compared to other options. This mostly a result of the congestion along Forest Road (eastbound) as discussed further below. During the morning peak, all other options show results with a similar pattern as the base model but higher number of vehicles, as expected. The network appears to respond relatively well to the "target mode share demands" during the morning peak period.

In the afternoon peak, two distinct peaks occur – one being the school peak between 3.30pm and 4.00pm and the other the "after 5.00pm" peak. Options 2 and 3 demonstrate identical results but Option 4 shows poor operation especially during those two peaks. The results are in fact comparable to those shown by

Option 1 which is based on higher demands. The reason behind this performance is largely related to the effective closure of Arncliffe Street for southbound through traffic. The alternative of using Bonar Street represents a long detour and as such the large majority of through trips use the Princes Highway and then turn at Allen Street or Forest Road. Near Allen Street, only two lanes are provided for southbound traffic with the additional lane corresponding to the right turn bay. The combination of high volumes and weaving (lane changing) at this location results in considerable delays. This issue is further documented with other output results.

9.2.4 Unreleased Vehicles

During the 2012 base model development, the extremities of the model were extended so that all queues were shown in the modelled area. This was particularly necessary for Wickham Street, where the model was actually extended beyond the intersection with West Botany Street to allow for a visual representation of the number of vehicles attempting to enter the network.

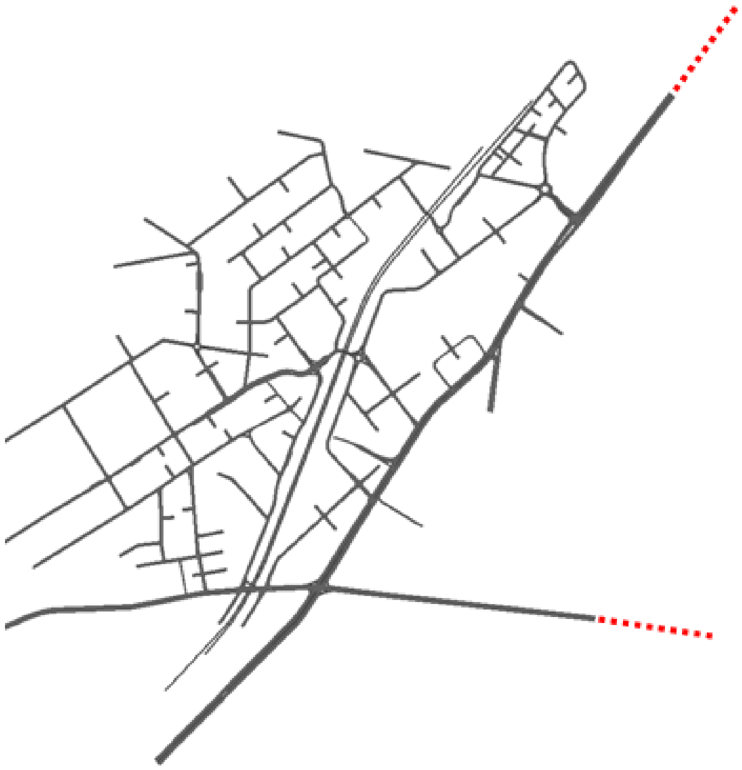
In the 2031 scenarios, the queues were still contained within those model boundaries for all morning peak models. However, this was not the case in the afternoon peak models. Queues were observed extending beyond the modelled area at the Wickham Street and Princes Highway North extremities. The total number of vehicles unable to enter the network was extracted from the models at 4.00pm, 5.00pm and 6.00pm, as shown in Figure 9.8.

Number of vehicles that could not enter the network due to congestion along the Princes Highway (SB) :

at 4.00pm			
Option 1	Option 2	Option 3	Option 4
0	0	0	89

at 5.00pm			
Option 1	Option 2	Option 3	Option 4
0	0	0	0

at 6.00pm			
Option 1	Option 2	Option 3	Option 4
186	0	0	248



Number of vehicles that could not enter the network due to congestion along Wickham Street (WB) :

at 4.00pm			
Option 1	Option 2	Option 3	Option 4
120	76	70	0

at 5.00pm			
Option 1	Option 2	Option 3	Option 4
314	193	189	123

at 6.00pm			
Option 1	Option 2	Option 3	Option 4
430	193	194	165

Figure 9.8: Unreleased Vehicles in the Afternoon Peak

The northern extremity of the model experiences some unreleased vehicles under Option 1 (at 6.00pm) and Option 4 (at 4.00pm and 6.00pm). The unreleased vehicles at 6.00pm further demonstrate the delays experienced by vehicles travelling southbound due to the removal of the "Arncliffe Street alternative". The increased volumes along the Princes Highway and weaving issues near the intersection with Allen Street contribute to the insufficient capacity and consequent delays.

The queues along Wickham Street constantly extend beyond the modelled network. Option 1 shows the worst results, reaching a total of 430 unreleased vehicles at 6.00pm, which corresponds to a "virtual queue" of approximately 1300m in addition to the 700m shown in the modelled area.

The other options show lower numbers of unreleased vehicles and relatively small variations between options, mainly related to different signal phasing operations at the intersection with the Princes Highway.

9.2.5 Eastbound Queues on Forest Road

As discussed in previous sections, the eastbound queues on Forest Road are of particular relevance during the morning peak period. This is one the current congestion hotspots in the network, with queues typically extending beyond 700m. It is therefore important to assess the impact of the proposed options on this part of the network.

Table 9.3 and Figure 9.9 document the maximum queue length observed during each hour for all 2031 Options and 2011 Base model.

Table 9.3: Maximum Queue Length at Forest Road (Eastbound)

Scenario	7.00am – 8.00am	8.00am – 9.00am
2012 Base	755m	750m
2031 Option 1	1140m	1910m
2031 Option 2	770m	1050m
2031 Option 3	930m	1040m
2031 Option 4	870m	1190m

The results indicate that the issues currently experienced on this part of the network are exacerbated by the combination of demands and network configuration adopted on all options. Option 1 shows a total queue extending beyond the intersection with Wollongong Road (1910m) which is approximately three times longer than the current maximum queue length.

As expected, Options 2 and 3 show very similar results, since the only difference between those two options corresponds to the right turn at Allen Street. This has no effect on traffic travelling eastbound on Forest Road.

Option 4 takes away the option of using Arncliffe Street as a through traffic route which is widely used at present. The result, as discussed below, is that a significant number of vehicles use Bonar Street instead. The queues on Forest Road extend a further 400m when compared to the base model.

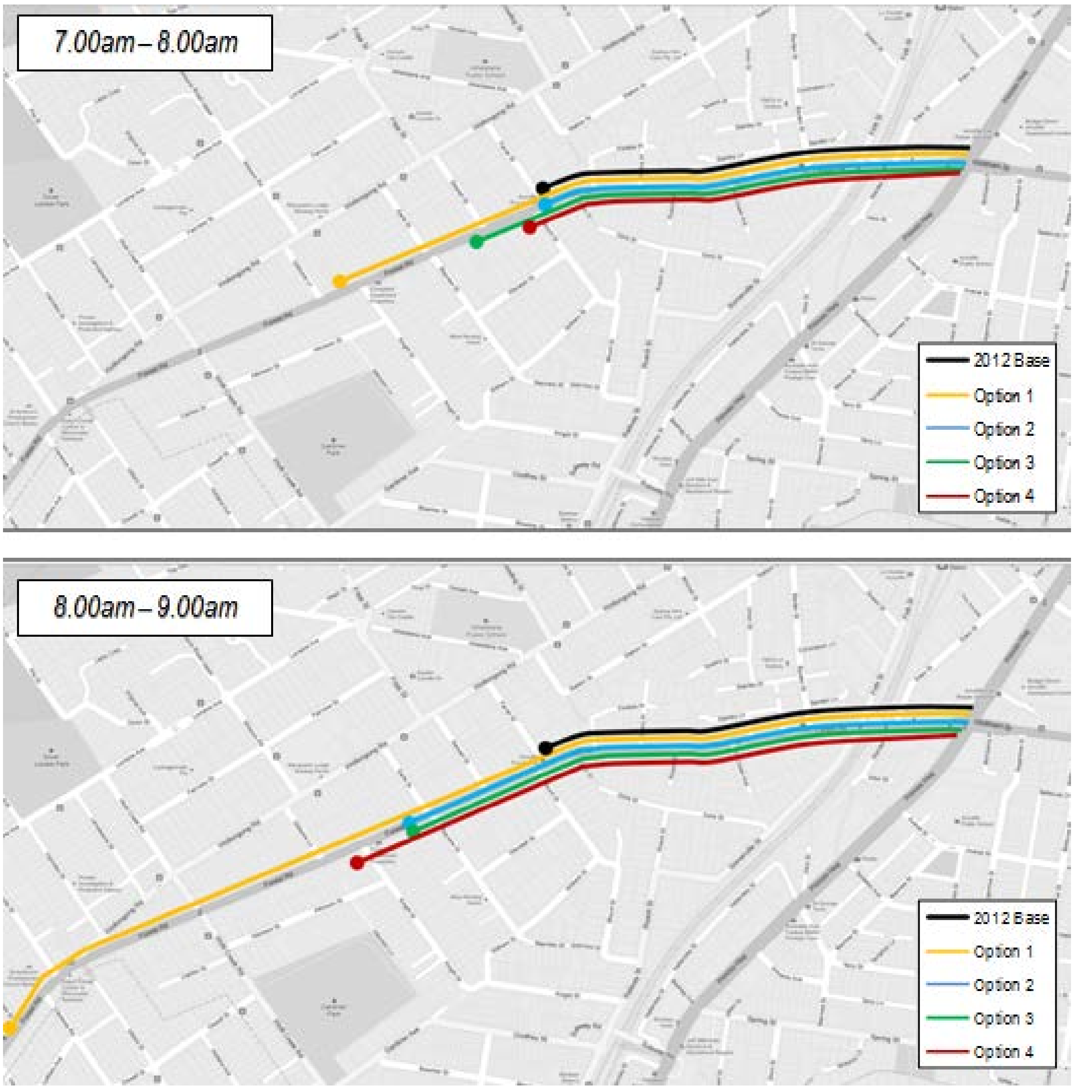


Figure 9.9: Maximum Queue Length at Forest Road (Eastbound)

9.2.6 Travel Times along the Princes Highway

A significant proportion of the traffic using the study area corresponds to through traffic travelling along the Princes Highway. To better understand the impacts on these trips, the average travel times between the two southern and northern extremities of the model were extracted for each hour and each option. The results are shown in Figure 9.10.

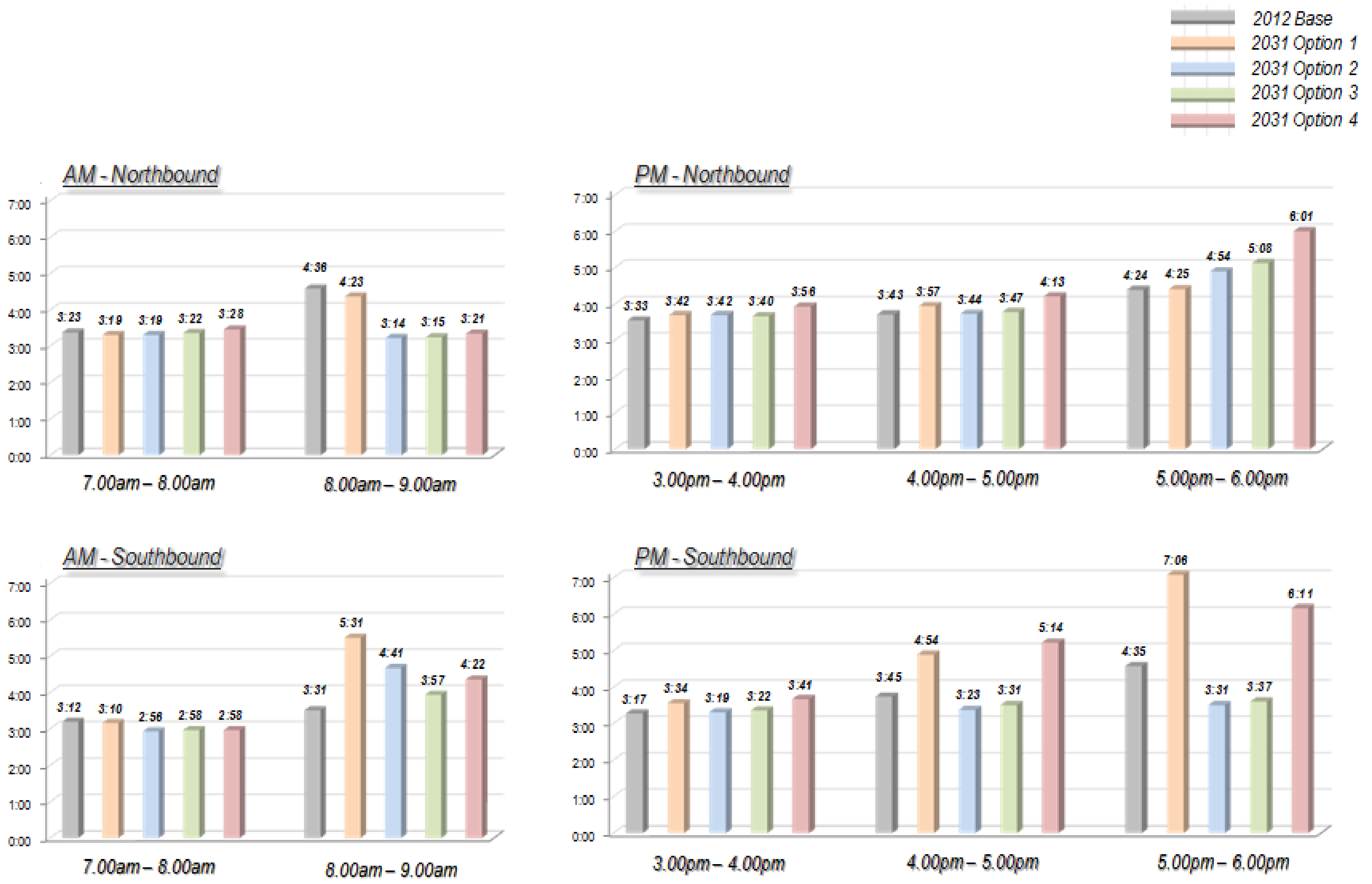


Figure 9.10: Northbound and Southbound Average Travel Times for Through Traffic

The results indicate that most of the morning peak travel times are maintained or even reduced when compared to the 2012 base model with the exception of the southbound direction in the 8.00am – 9.00am period. This can be attributed to the contra-flow arrangements at the Princes Highway / Wickham Street / Forrest Road intersection (not added to the 2012 base model) and the adjusted signal phasing on all options to optimise its operation based on modified volumes and network arrangements.

The afternoon peak results indicate that the delay levels along the Princes Highway increase substantially in both directions with Option 4, particularly towards the end of the peak period (5.00pm – 6.00pm). The configuration proposed as part of Option 4 results in substantially higher volumes using the southbound carriageway of the Princes Highway between Brodie Spark Drive and Allen Street. The volumes clearly exceed the capacity of this section of the network, with this issue being exacerbated by the weaving caused by vehicles attempting to access Lane 3 to turn right onto Allen Street.

The other key finding is that Options 2 and 3 typically provide significant benefits when compared to Option 1, which further documents the importance of achieving the mode share targets previously discussed.

9.2.7 Key Hourly Volumes

To help evaluate the performance of the key parts of the road network, average hourly volumes were also extracted from all models. These are shown in Figures 9.11 and 9.12.

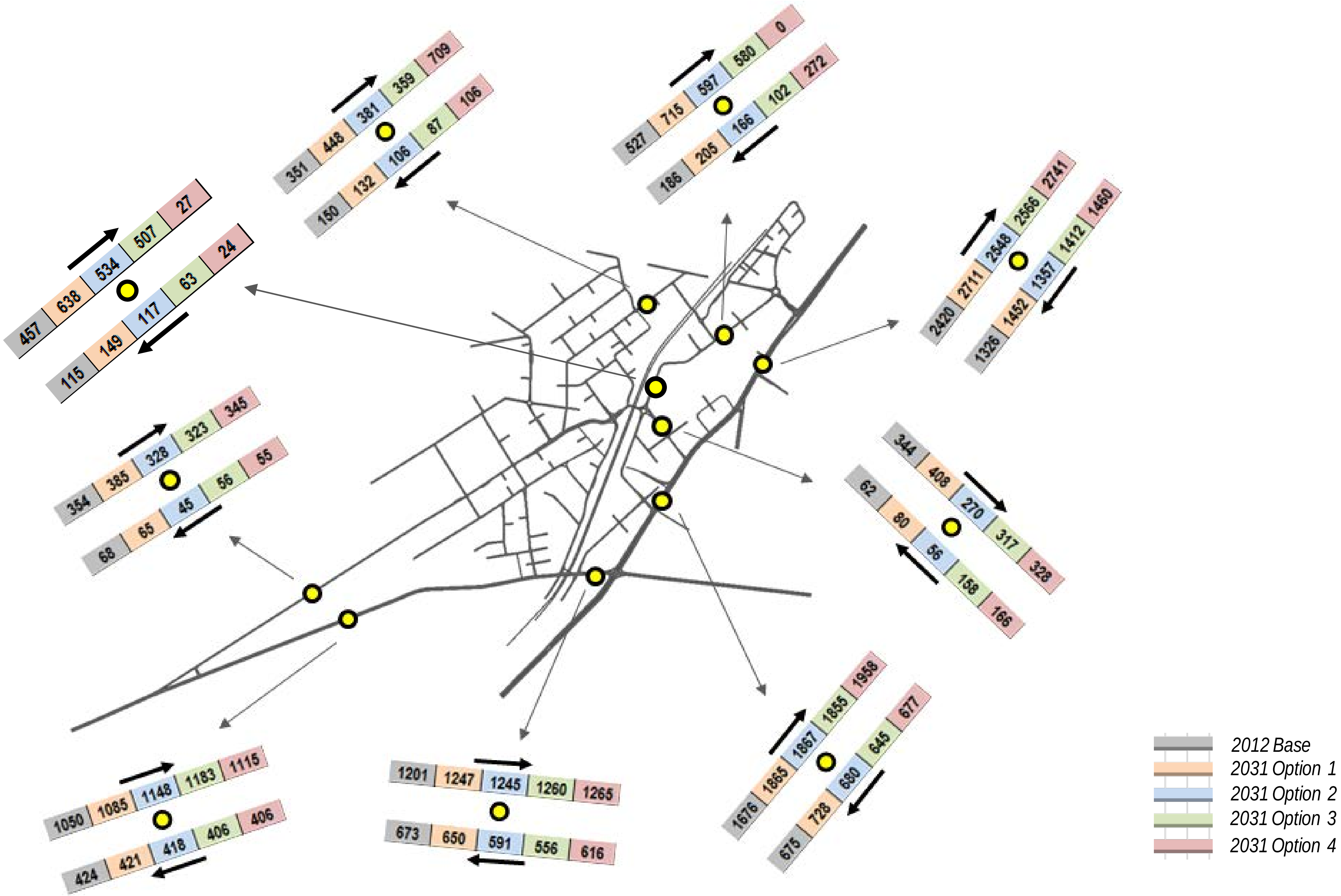


Figure 9.11: AM Peak Key Hourly Volumes

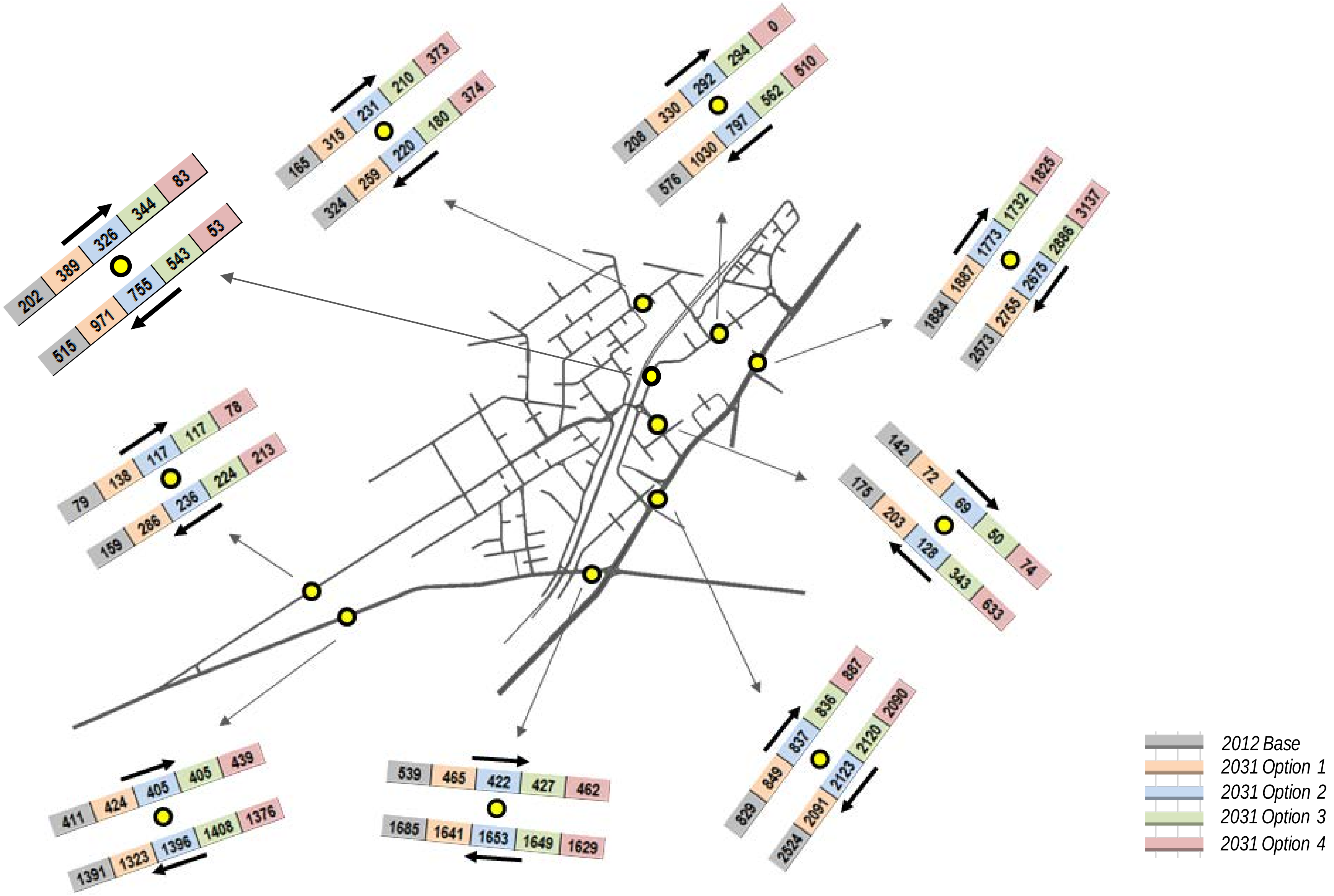


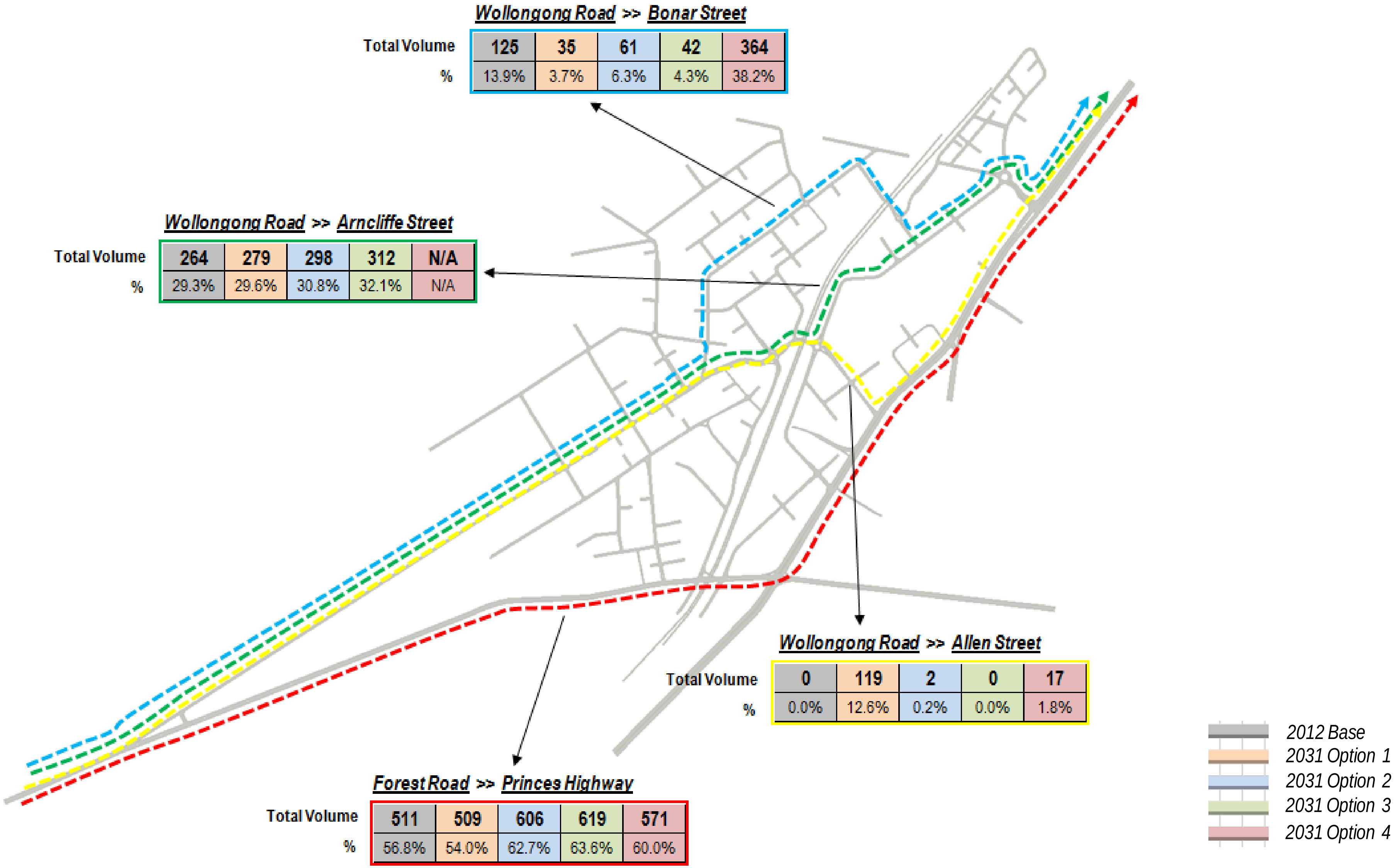
Figure 9.12: PM Peak Key Hourly Volumes

Overall, the hourly volumes demonstrate how Options 2 and 3 result in a more balanced network operation when compared to Option 1. The main difference between Option 2 and 3 corresponds to the additional 215 hourly trips using Allen Street (westbound) in the afternoon.

With Option 4, Bonar Street experiences significantly higher traffic volumes (particularly during the morning peak in the northbound direction) due to the closure of Arncliffe Street. This alternative "rat run" route appears to be more favourable in the northbound direction which is a consequence of the removal of the right turn from Bonar Street onto Wollongong Road.

9.2.8 Route Choice Analysis

As discussed as part of the current issues identification, the number of vehicles that currently "rat run" along the "Wollongong Road / Arncliffe Street corridor" is one of the key concerns for the current network operation. It is therefore important to evaluate the effect that each option will have in the route choice. Figures 9.13 and 9.14 identify the number of vehicles using each of the main corridors to travel from the north-eastern extremity to the south-western extremity (and vice versa) of the model.



Wollongong Road >> Bonar Street

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4
Total Volume	125	35	61	42	364
%	13.9%	3.7%	6.3%	4.3%	38.2%

Wollongong Road >> Arncliffe Street

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4
Total Volume	264	279	298	312	N/A
%	29.3%	29.6%	30.8%	32.1%	N/A

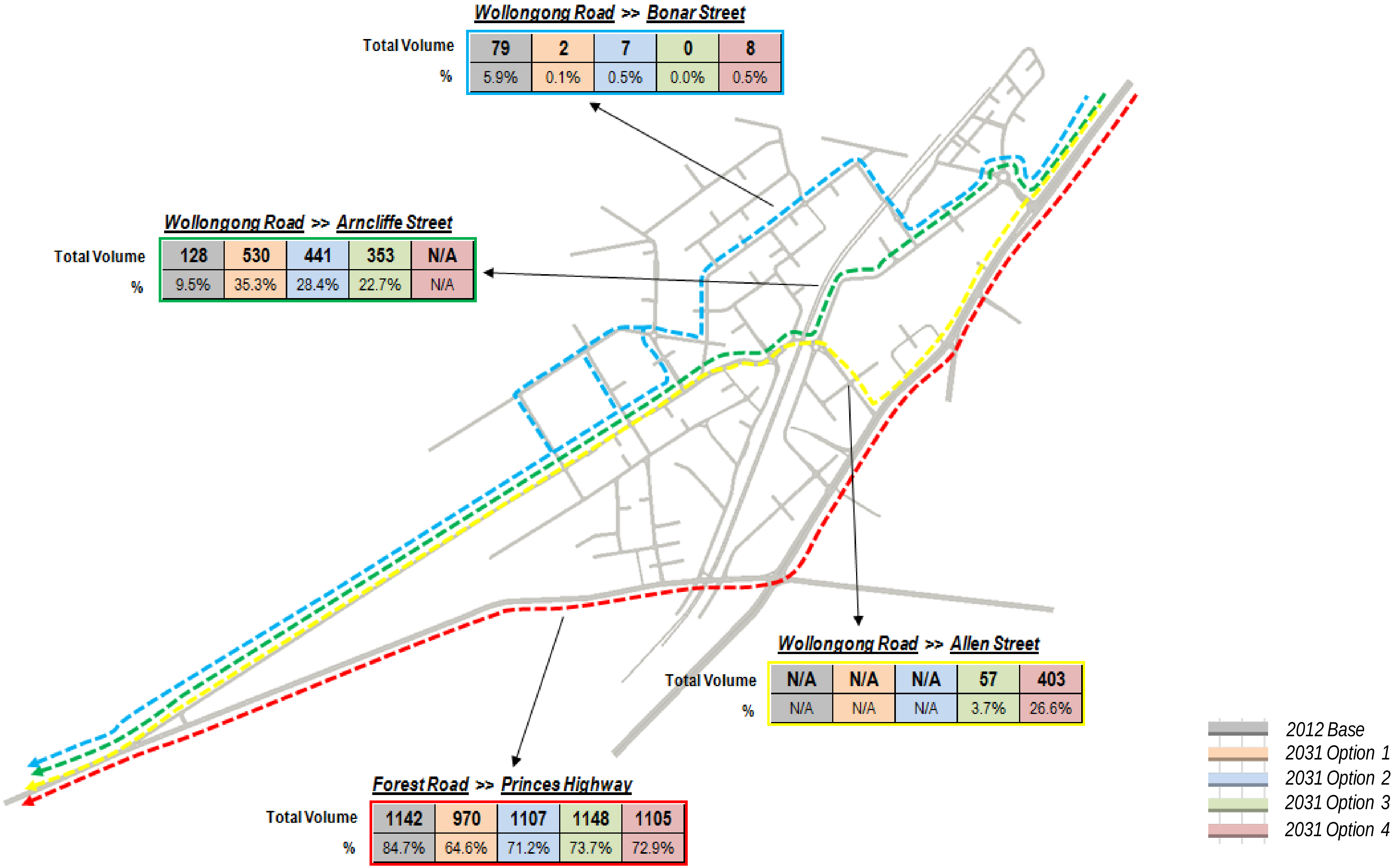
Wollongong Road >> Allen Street

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4
Total Volume	0	119	2	0	17
%	0.0%	12.6%	0.2%	0.0%	1.8%

Forest Road >> Princes Highway

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4
Total Volume	511	509	606	619	571
%	56.8%	54.0%	62.7%	63.6%	60.0%

Figure 9.13: AM Route Choice Analysis



Wollongong Road >> Bonar Street

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4
Total Volume	79	2	7	0	8
%	5.9%	0.1%	0.5%	0.0%	0.5%

Wollongong Road >> Arncliffe Street

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4
Total Volume	128	530	441	353	N/A
%	9.5%	35.3%	28.4%	22.7%	N/A

Wollongong Road >> Allen Street

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4
Total Volume	N/A	N/A	N/A	57	403
%	N/A	N/A	N/A	3.7%	26.6%

Forest Road >> Princes Highway

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4
Total Volume	1142	970	1107	1148	1105
%	84.7%	64.6%	71.2%	73.7%	72.9%

Figure 9.14: PM Route Choice Analysis

The most visible modifications to the route choice adopted in the morning peak period can be summarised as follows:

- the additional trips associated with Option 1 result in higher congestion levels and approximately 12% of the trips between the two zones use Allen Street. This route is practically not used in any of the other scenarios; and
- the layout proposed as part of Option 4 (including closing Arncliffe Street) results in a significant number of vehicles (364) using Bonar Street. This corresponds to approximately 38% of the trips between the two zones.

In the afternoon peak period, the most noticeable modifications are:

- Options 1, 2 and 3 "attract" a high number of trips to the Arncliffe Street route and actually reduce the proportion of through traffic using the Princes Highway / Forest Road route;
- Option 4 effectively moves the "rat run" trips (approximately the same number as Option 2) to the Allen Street / Wollongong Road corridor, therefore removing any through trips from the Arncliffe Street / Bonar Street area.

10. PREFERRED OPTION DEVELOPMENT

The modelling outputs from the options assessment allowed each scenario to be assessed in detail and compared to the alternative concepts and current operation. The key findings were as follows:

- The current transport mode share is not compatible with the forecast growth in the Wolli Creek and Bonar Street precincts. The gradual re-development of these two precincts will exacerbate current network deficiencies and put more pressure on a road network that is already operating beyond its practical capacity unless a shift towards public transport and active transport occurs within the study area;
- The part of the network that would experience the most significant impacts corresponds to the eastbound carriageway of Forest Road during the morning peak period. Currently, queues typically extend for approximately 750m, and these would increase to just under 2000m under a "do nothing" scenario;
- Allowing right turn movements from the Princes Highway onto Allen Street has a marginal impact on through traffic route choice. That is, in the afternoon peak period, under 4% of the southbound through trips would use this route. However, allowing right turn movements at this location is highly beneficial for local trips, resulting in over 200 vehicles turning right at this location as opposed to Brodie Spark Drive and therefore bypassing the Arncliffe Street and the Wolli Creek precinct centre. Furthermore, the conversion of the Princes Highway from three lanes to two lanes in the southbound direction (required as part of the provision of the right turn onto Allen Street) is sufficient to cater for the southbound traffic; and
- Option 4 effectively removes all through traffic from Arncliffe Street. However, it is important to point out that during the morning peak period, the northbound "through traffic" along Bonar increases to approximately three times the volumes currently observed. In effect, all "rat run" trips are moved to the Bonar Street corridor. In the afternoon peak period, practically no through trips occur along Bonar Street. A significant number of trips is therefore "transferred" to the Princes Highway. This increase in traffic volumes, together with the removal of one southbound lane near Allen Street and weaving issues occurring at this location, contribute to an extremely poor level of operation and southbound queues extending beyond the modelled area.

Taking into consideration the modelling results, a "Preferred Option" was developed and discussed with Council.

The options assessment revealed that the greatest level of benefit was obtained by reducing the 'car mode share'. The preferred option is subsequently based on developing a traffic network that provides the greatest opportunity to improve the pedestrian and cycling environment.

The Preferred Option configuration addresses many of the 'existing issues' summarised in Section 7 and removes many of the flow-on implications associated with previous tested options. The network adopted as the Preferred Option mostly corresponds to Option 4, however with Arncliffe Street re-opened to 'through traffic', and the Allen Street intersection returned to its existing configuration.

Figure 10.1 illustrates the Preferred Option configuration.

Figure 10.1: Preferred Option

The Preferred Option allows significant improvements to the active transport facilities to be implemented near the Wolli Creek town centre. The most significant upgrade occurs along the "one-way sections" adopted at Arncliffe Street, Guess Avenue and Magdalene Terrace. Since these links require one traffic lane only, the remaining width can be used to provide cycle lanes, good quality footpaths, street furniture and other schemes that encourage active transport.

Overall, the network performance associated with the Preferred Option is very similar to that described for Option 2 (mode share reduction), with most of the statistics showing some marginal improvements.

The proposed one-way circuit has little impact of traffic distribution, however enables greater opportunity to design high quality pedestrian and cycle facilities to encourage 'non-car based' travel. Importantly, the existence of managed 'through traffic' will assist with ensuring a vibrant and active town centre for extended periods of the days.

The provision of the one-way arrangement addresses many existing issues such as:

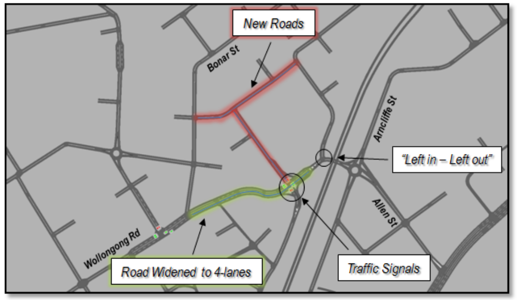
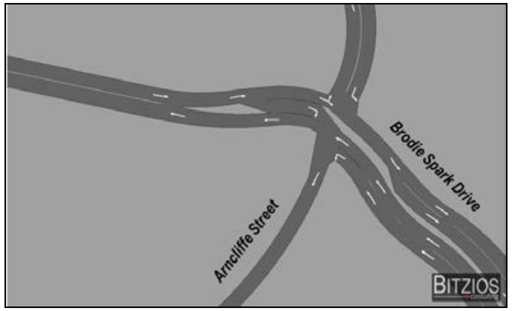
- *the existing Woolworths access;*
- *the ability to include on-street cycle facilities;*
- *provision of additional on-street parking;*
- *passive surveillance along Mount Olympus Boulevard;*
- *wider footpath areas; and*
- *improved pedestrian / cycle safety at key intersection conflict points (eg Brodie Spark Drive roundabout).*

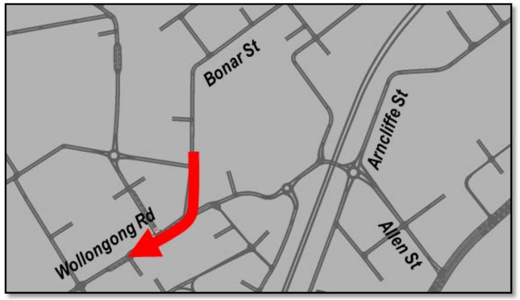
The key network performance measures for the Preferred Option are discussed below:

- The Preferred Option results in the lowest VHT statistics out of all of the options tested;
- The total number of unreleased vehicles with the preferred option is lower than all other scenarios;
- The Preferred Option contributes to a reduction of approximately 10% of the morning peak eastbound queue along Forest Road when compared to Option 2 (the best performer of other options);
- The southbound "rat run" volume along Arncliffe Street is slightly reduced with the Preferred Option when compared to the previously tested scenarios. In the northbound direction, the "rat run" volume along Arncliffe Street increases approximately 21 vehicles per hour when compared to Option 2 which is negligible. However, that is an indication that the longer route required to be adopted by "rat runners" via the one-way section does not contribute to a reduction of "rat running" in the northbound direction.
- Detailed results for the Preferred Option are shown in Appendix B which also helps compare its performance with all other configurations tested and discussed above.

Table 10.1 provides a detailed description of all the network modifications required to fully implement the "Preferred Option" concept.

Table 10.1: Preferred Option Detailed Description

Item	Description	Figure
1	Wollongong Road / Firth Street roundabout converted to a signalised intersection and localised widening on Wollongong Road to four lanes.	
2	Right turn from Allen Street onto Wollongong Road banned.	
3	Construction of "Road 7" and "Road 8" within the Bonar Street Precinct, in accordance with the Public Domain Plan.	
4	Arncliffe Street / Brodie Spark Drive roundabout converted to a "give-way" intersection with improved walking and cycling facilities.	
5	Access to/from the Discovery Point site near the intersection with Arncliffe Street and Brodie Spark Drive converted to a "left-in/left-out arrangement".	
6	Arncliffe Street converted to one way southbound (one lane only) between Brodie Spark Drive and Guess Avenue, with improved cycling and pedestrian facilities and a slow speed environment.	
7	Guess Avenue converted to one way wesbound (one lane only) between Arncliffe Street and Mount Olympus Boulevard with improved cycling and pedestrian facilities and a slow speed environment.	
8	Mount Olympus Boulevard converted to one way northbound (one lane only), with improved cycling and pedestrian facilities and a slow speed environment.	
9	Guess Avenue / Mount Olympus Boulevard roundabout removed. This junction is converted to a T- intersection configuration and its alignment modified so that the priority movement is that going from Guess Avenue (eastern leg) to Mount Olympus Boulevard and vice versa. The eastern leg of the intersection would have to give way to the dominant flow of traffic running along Mount Olympus Boulevard and Guess Avenue.	

10	Right turn from Bonar Street onto Wollongong Road removed, with consideration to further increase the restrictions at this location to allow 'left out' movements only. This will remove any future possible "rat run" through Bonar Street / Guess Avenue and onward towards Brodie Spark Drive.	

11. IMPLEMENTATION PLAN

The implementation plan summarises the key actions arising from the Wolli Creek and Bonar Street precinct. The implementation plan includes infrastructure and non-infrastructure items which are summarised in Table 11.1 and Table 11.2 below.

The works have been prioritised based on the following generic timeframes:

- Short-Term (0 - 3yrs);
- Medium Term (3 -10yrs); and
- Long Term (10 - 20yrs).

The infrastructure items recommended have also been shown by location in Figure 11.1. The issue relating to infrastructure item A1 (footpath improvement requirements) is further articulated in Figure 11.2 which shows the existing footpaths widths.

Table 11.1: Implementation Plan – Infrastructure Items

ID	Item	Action Description	Priority
A1	Footpaths adjacent to new developments	New developments to deliver pedestrian footpaths in the vicinity of the respective sites. This should be done in accordance with the specifications included in the PDP for that location. In the absence of any specifications in the PDP, footpaths should have a minimum width of 2.4m (3.0m for paths to be shared with cyclists).	Ongoing
A2	Guess Avenue underpass	Guess Avenue underpass layout / width allocation to be modified to include 3m travel lanes, a 1m cycle lane and a 3m shared path. New marked foot crossing to be installed and associated kerbside blisters to delineate parking and crossing facility.	Short Term
A3	Allen St / Arncliffe St underpass	Allen St / Arncliffe St underpass to be upgraded to provide improved pedestrian/cycle amenity. This will also address the missing pedestrian/cycle link along the western side of Arncliffe Street (just north of the underpass) by providing a crossing point to the existing footpath on the eastern side. This project is underway with some funds already allocated.	Short Term
A4	Allen Street / Wollongong Road intersection	This intersection should be converted to a "left-in / left-out" arrangement due to the safety concerns associated with the right turn movements particularly during school peak periods. The implementation of a central median should be considered. U-turns should be permitted at the Firth Street roundabout (ultimately, the intersection with Firth Street will be signalised and new roads provided will enable appropriate access.)	Short Term
A5	New roads in the Bonar Street Precinct	Construction of New Road 7 and New Road 8.	Short Term
A6	Minor improvements at the Bonar Street / Guess Avenue and Bonar Street / Wollongong Road intersections	Install splitter islands at the Bonar Street / Guess Avenue and Bonar Street / Wollongong Road intersections. Consider restricting the Bonar Street / Wollongong Road intersection to left out only to reduce through traffic on Bonar Street.	Medium Term
A7	Wollongong Road / Firth Street intersection	Install traffic signals at the Wollongong Road / Firth Street intersection.	Medium Term
A8	Wollongong Road / Bonar Street intersection	Ban right turn from Bonar Street onto Wollongong Road in conjunction with Item A6.	Medium Term
A9	Implementation of one-way circulation along Arncliffe Street, Guess Avenue and Mount Olympus Boulevard (refer to Figure 8.15)	Implementation of a clockwise one-way circuit along Arncliffe Street, Guess Avenue and Mount Olympus Boulevvard (only Magdalene Terrace maintains two-way traffic).	Medium Term (staging of works in the short term should be considered)
		Removal of the Brodie Spark Drive / Arncliffe Street roundabout and conversion of this intersection to a give-way arrangement with access restrictions to provide wider pedestrian and cycle areas.	
		Removal of the Mount Olympus Boulevard and Guess Avenue roundabout	
		Consideration for the provision of separated cycleways, additional pedestrian crossings and speed threshold devices.	
A10	Bonar Street / Thompson Street intersection	Install a roundabout at the Bonar Street / Thompson Street intersection.	Long Term
A11	Turella Street cycleways	Provide on-street cycleways along Turella Street together with traffic calming devices	Long Term

Table 11.2: Implementation Plan – Non-Infrastructure Items

Note: All of these items are considered short-term / ongoing priorities

ID	Item	Action Description
B1	Access for proposed developments near Argyle Street	Further investigation into development access arrangements due to site constraints and access being limited to the Princes Highway.
B2	Address inconsistencies and conflicts found across planning documents	Planning instruments such as the RDCP, PDP, Section 94 and the "On The Go Map" need to be updated to remove inconsistencies and to be aligned with the actions outlined in this study.
B3	Footpath maintenance and upgrade programme	A footpath maintenance and upgrade programme needs to be developed for the study area, identifying missing links that need to be constructed and outlining footpath specifications for the precinct. Footpaths should be a minimum of 2.4m wide (3.0m for paths to be shared with cyclists). Maintenance and upgrade works should be brought forward as opportunities arise. A/C asphalt may be considered as an interim solution.
B4	Footpath widening along the Princes Highway	RCC to discuss with TfNSW and RMS opportunities to widen the footpath on western side of the Princes Highway (between Gertrude Street and Cooks River).
B5	Street lighting improvement programme	RCC to prepare a programme that can address insufficient street lighting across the precinct.
B6	Bonar Street / Hirst Street cycle lanes	The existing cross-section of Bonar Street and Hirst Street (within the Bonar Street PDP area) is inadequate for cyclists. The cross-section proposed in the PDP makes no provision for cyclists and needs to be re-considered.
B7	Bonar Street / Thompson Street cycle lanes	The designated cycle routes along Bonar Street and Thompson Street have inadequate cross-sections. Revised cross-sections should be investigated to consider on-street cyclists. Consideration should be given to the implementation of "one-way circulation" on Thompson St and Booth Street (between Bonar Street and Monk Street) to allow for a more efficient use of the road reserve and implementation of cycle lanes.
B8	Bonar Street PDP missing link	The Bonar Street PDP needs to consider Bonar Street in its full extent to ensure that consistent and adequate cycling facilities are provided along the corridor (it currently considers the southern part only).
B9	Cycle connection to Waterworth Park	RMS / TfNSW should be lobbied for funds to support the project
B10	Cycle underpass under the Princes Highway	RMS / TfNSW should be lobbied for funds to support the project
B11	Cycle underpass under the rail line	RMS / TfNSW should be lobbied for funds to support the project
B12	Gertrude Street (west) extension	Road reservation to be maintained. Short term use for pedestrians and cyclist should be considered.
B13	Cycle route signage maintenance	Cycle route signage needs to be reviewed and rectified throughout the study area.
B14	Bus services / frequency upgrades	Discussions should be held with TfNSW regarding the opportunities to improve bus frequencies and hours of operation in the vicinity of the Wolli Creek precinct.
B15	Access to the train station for mobility impaired users	Access arrangements to/from the train station for mobility-impaired are currently limited to the provision of a single access lift. Discussions should be held with TfNSW regarding the possibility of providing an additional lift or alternative solutions in case of lift malfunctioning.

ID	Item	Action Description
B16	Parking provision	In the medium term, a parking study should be developed for the precinct, assessing both public and private parking provision, cost, supply vs demand, long stay vs short stay, commuter vs business, etc. It should take in consideration car ownership trends and desired mode share targets. This study should be conducted after the implementation of the public car park proposed for Discovery Point.
B17	Remove proposal for a roundabout at Bonar Street / Hirst Street	The current give-way arrangement at the Bonar Street / Hirst Street should be retained as there are not expected to be sufficient volumes to warrant the implementation of a roundabout. The intersection operation should be monitored.
B18	Pinch point / corridor improvements along Forest Road and Princes Highway	Discuss with RMS opportunities to investigate corridor improvements to be implemented along Forest Road and Princes Highway to better manage current and future traffic flows.
B19	New bridge over Cooks River	Discuss with RMS and Sydney Water opportunities to use the existing bridge over the Cooks River (to the east of the Princes Highway) for cyclists and pedestrians.
B20	Pedestrian crossing at Brodie Spark Drive	Discuss with RMS opportunities to improve the crossing facilities for pedestrians and cyclists at the Princes Highway / Brodie Spark Drive intersection.
B21	Bus & rail signage	Signage throughout the precinct should be upgraded for bus and rail timetables.
B22	Load limit within the Wolli Creek Town Centre	A 3tonne load limit should be applied to the Wolli Creek town centre

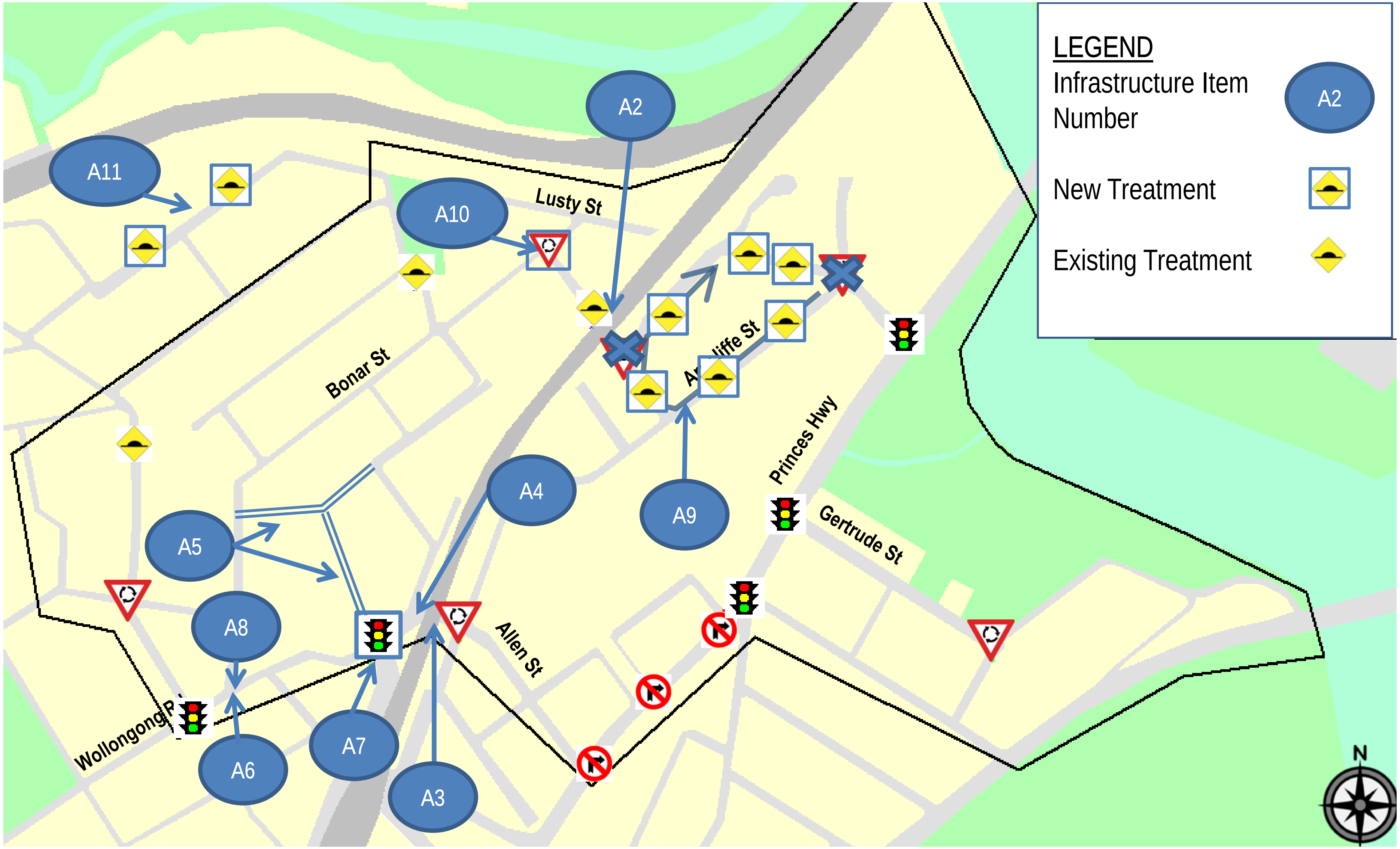


Figure 11.1: Implementation Plan – Infrastructure Items locations

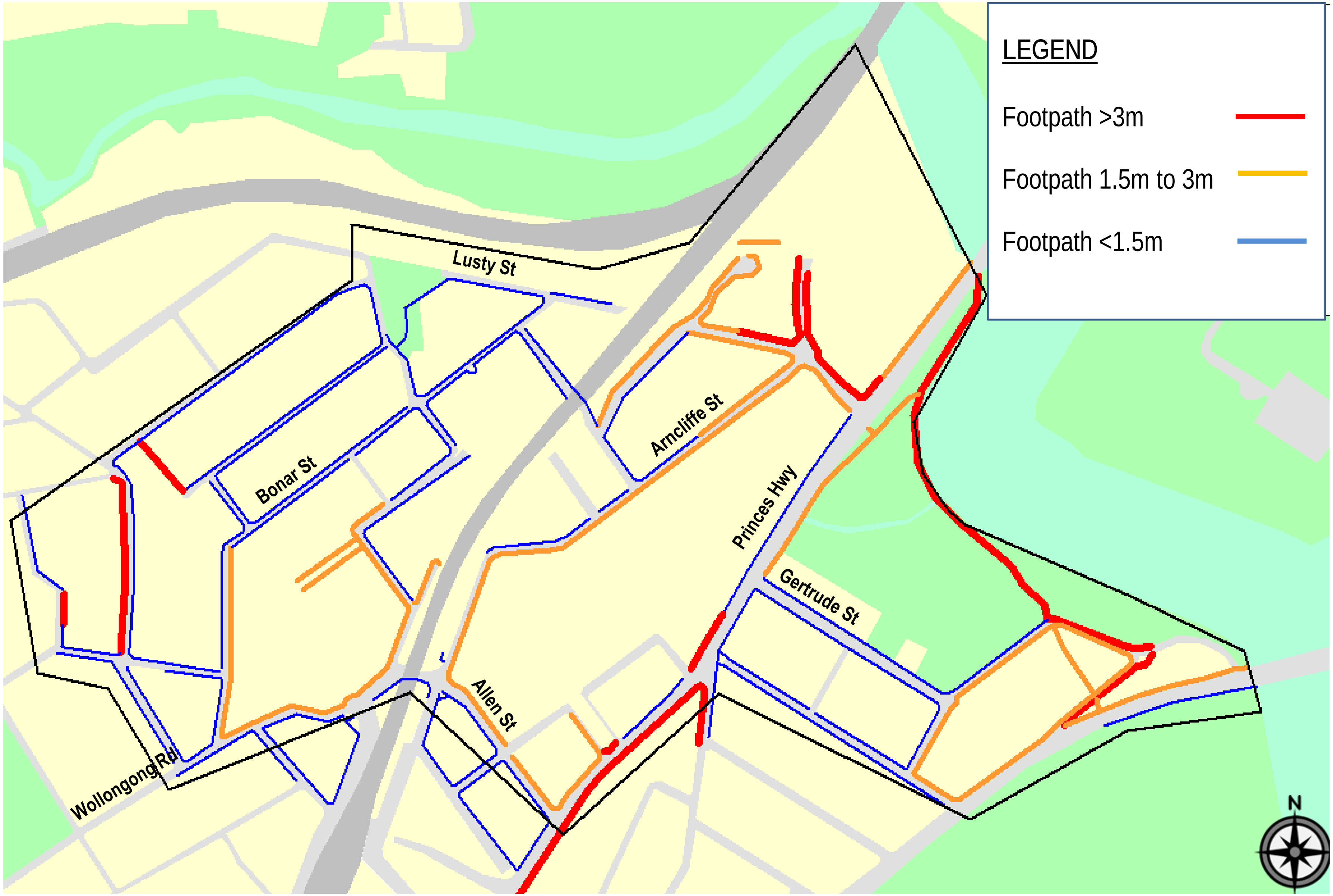


Figure 11.2: Implementation Plan – Item A1 – Existing Footpath Widths

APPENDIX A

WOLLI CREEK TRAFFIC MODEL CALIBRATION AND VALIDATION REPORT

WOLLI CREEK TRAFFIC MODEL CALIBRATION AND VALIDATION REPORT

FOR

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1. INTRODUCTION

1.1 PURPOSE

Bitzios Consulting has been commissioned by Rockdale City Council to prepare a "traffic and transport study" for Wolli Creek to address a number of items, such as:

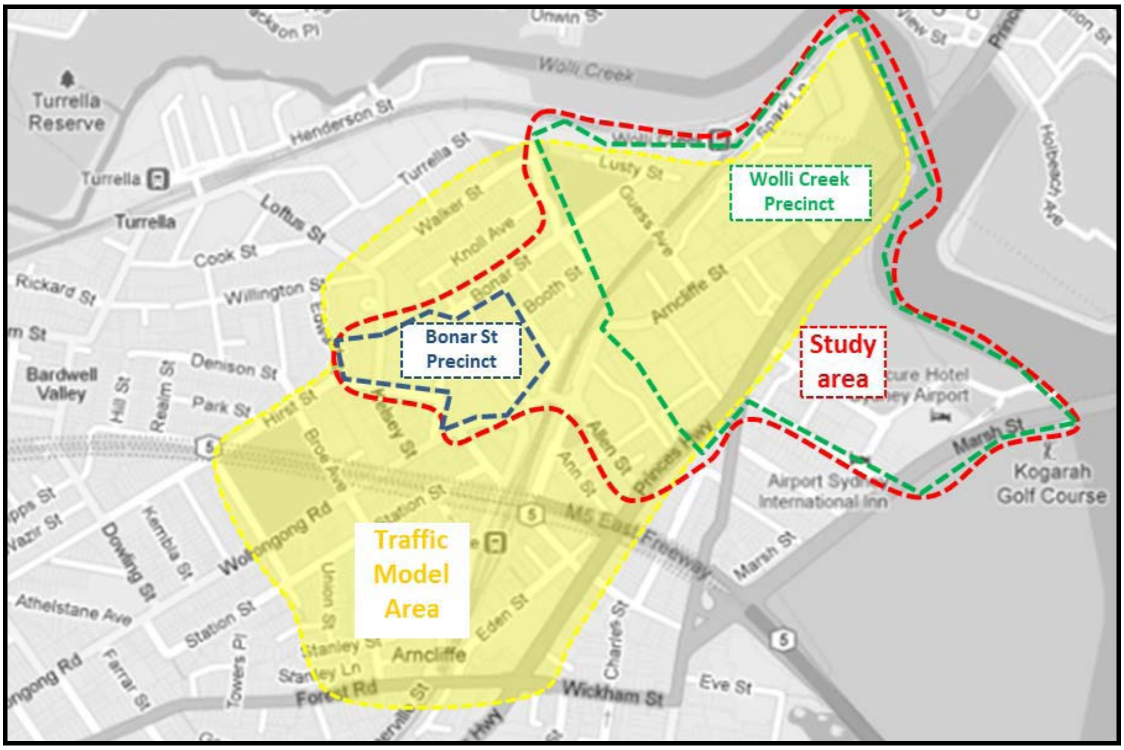
- the increasing pressure on the local road system;
- issues associated with through traffic;
- opportunities to improve walking, cycling and public transport access; and
- updating the current Section 94 development contributions plan.

As part of this study, a traffic microsimulation model was developed to help assess current and future network operation levels and allow for a detailed evaluation of multiple options/scenarios possible to be implemented in the precinct. The Paramics suite of software was used to develop the simulation models.

The purpose of this report is to document the base traffic model development process and relevant calibration/validation statistics.

1.2 BACKGROUND

Figure 1.1 shows the Development Control Plan (DCP) boundaries for the Bonar Street and Wolli Creek precincts while the red dashed line shows the study area. To enable a detailed analysis of the traffic operation in the area (especially through traffic), the modelled network was extended to cover the yellow zone shown in Figure 1.1. External vehicle movements relating to significant road corridors and land uses were considered in the context of this project and therefore added to the model area which is beyond the study area.



Source: Google Maps

Figure 1.1: Model Boundary and Study Area

Council has indicated its concern about through traffic using the collector roads and local streets in Wolli Creek in order to avoid congestion on the arterial road network, including Princes Highway and Forest Road. This issue will become more significant as the existing industrial lands in the area are replaced by medium density residential development, as permitted in Council's Local Environmental Plan (LEP) and DCP.

2. Data Collection and Analysis

Different types of data were collated to accurately develop a Paramics microsimulation model for the study area with the respective description and source as follows:

- Intersection Counts (*Traffic Data and Control*) - October 2012;
- Origin-Destination Data (*Traffic Data and Control*) - October 2012;
- Travel Time Data (*Traffic Data and Control*) – October/November 2012;
- Back of Queue Data (*Traffic Data and Control*) – October/November 2012;
- Signal Phasing Data (RMS) – October 2012; and
- Aerial Photography Data (Rockdale City Council) – January 2011;

In addition to the data mentioned above, two site inspections were also conducted during the model development stage to help understand traffic behaviour and several detailed network parameters. During one of these site visits, a number of videos were recorded and subsequently used during the model validation stage. These videos will also be provided together with this report.

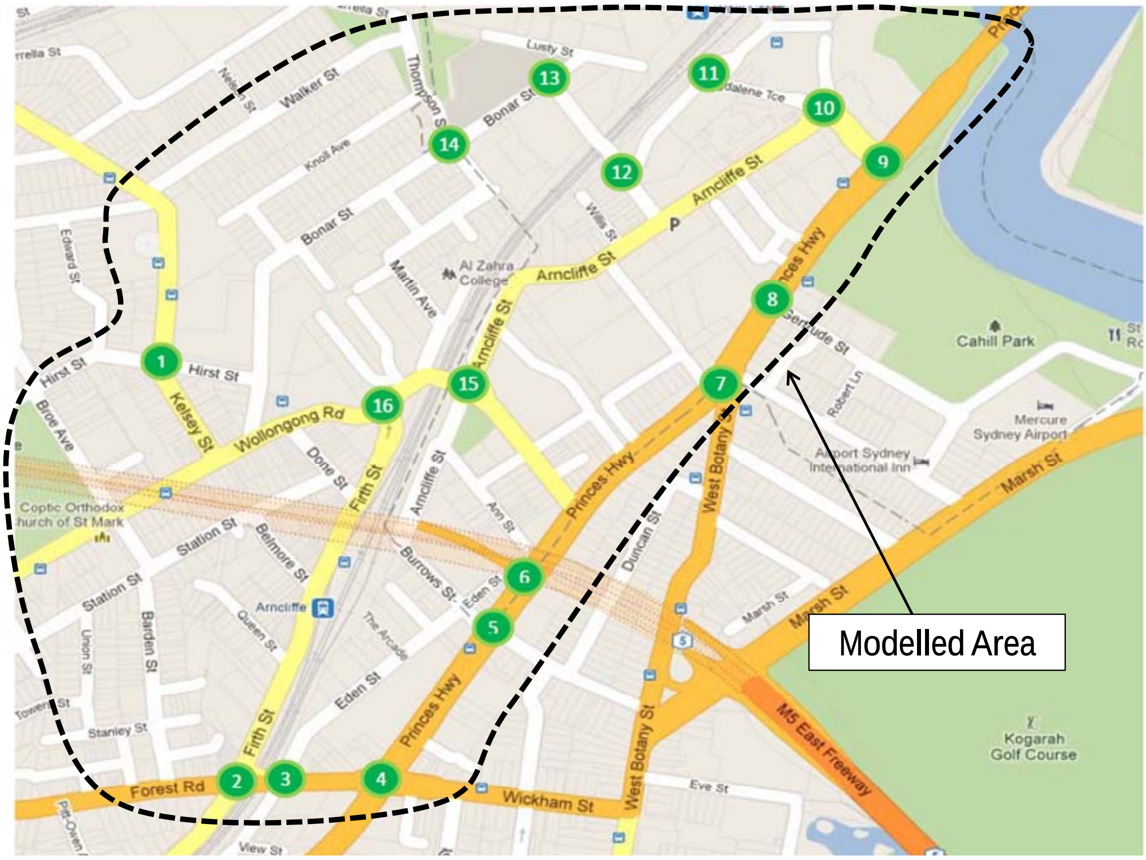
To achieve consistency with modelled periods (further discussed in Section 4) the collected data refers to the following periods:

- AM Period: 7.00am – 9.00am; and
- PM Period: 3.00pm – 6.00pm.

2.1 Intersection Counts

Traffic counts were conducted in October 2012 by Traffic Data and Control. A total of 16 junctions were surveyed during both the morning and afternoon peak periods. Due to the large number of intersections covered in the survey, this had to be carried out across two weekdays (i.e. Wednesday 17th October 2012 and Thursday 18th October 2012).

Figure 2.1 shows the intersections included in this survey and the date they were surveyed.



Site No.	Type	Location	Survey Date
1	VCU	Hirst St & Loftus St/ Kelsey St, Arncliffe	Thursday 18th October, 2012
2	VCU	Forest Rd & Firth St/ Somerville St, Arncliffe	Wednesday 17th October, 2012
3	VCU	Forest Rd & Wardell St, Arncliffe	Wednesday 17th October, 2012
4	VCU	Princes H'way & Forest Rd/ Wickham St, Arncliffe	Wednesday 17th October, 2012
5	VCU	Princes H'way & Burrows St/ Kyle St, Wolli Creek	Wednesday 17th October, 2012
6	VCU	Princes H'way & M5 East Freeway, Arncliffe	Wednesday 17th October, 2012
7	VCU	Princes H'way & West Botany St, Wolli Creek	Wednesday 17th October, 2012
8	VCU	Princes H'way & Gertrude St, Wolli Creek	Wednesday 17th October, 2012
9	VCU	Princes H'way & Brodie Spark Dr, Wolli Creek	Wednesday 17th October, 2012
10	VCU	Brodie Spark Dr & Arncliffe St, Wolli Creek	Thursday 18th October, 2012
11	VCU	Magdalene Tce & Mount Olympus Bvd, Wolli Creek	Thursday 18th October, 2012
12	VCU	Mount Olympus Bvd & Guess Ave, Wolli Creek	Thursday 18th October, 2012
13	VCU	Guess Ave & Bonar St, Wolli Creek	Thursday 18th October, 2012
14	VCU	Bonar St & Thompson St, Arncliffe	Thursday 18th October, 2012
15	VCU	Arncliffe St & Wollongong Rd/ Allen St, Arncliffe	Thursday 18th October, 2012
16	VCU	Wollongong Rd & Firth St, Arncliffe	Thursday 18th October, 2012

Note: VCU – Video Capture Unit

Source: Google Maps

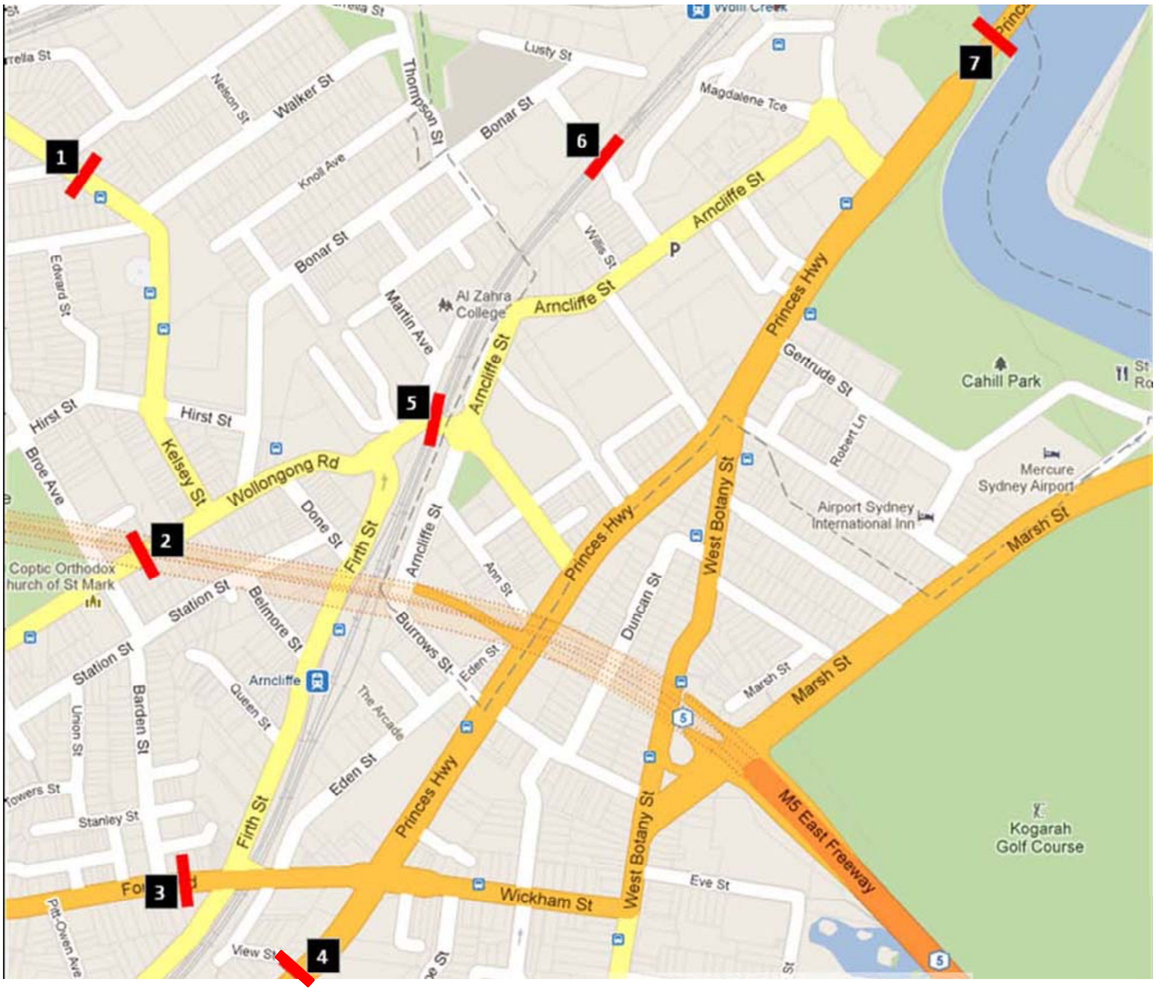
Figure 2.1: Intersection Count Location and Dates

Appendix A contains a diagram for each peak period, outlining the hourly volumes at each of the surveyed sites. These traffic volumes were used for the calibration of the Paramics base model. Due to the nature of the estimation process and zone placement, the volumes had to be "balanced". Typically, this consisted of minor adjustments to specific turn movements to ensure that adjacent intersections had consistent upstream and downstream volumes. In reality, cars would turn into individual driveways or intermediate side streets, however this fine level of detail is not accommodated in the model.

The volumes shown in Appendix A correspond to the "balanced volumes" used in the model calibration. Appendix B contains the "raw" count results together with other survey results.

2.2 ORIGIN – DESTINATION SURVEY

An origin – destination survey consisting of seven “base sites” was conducted on Thursday 18th October 2012. The sites covered in the origin-destination survey are shown in Figure 2.2.



Source: Google Maps

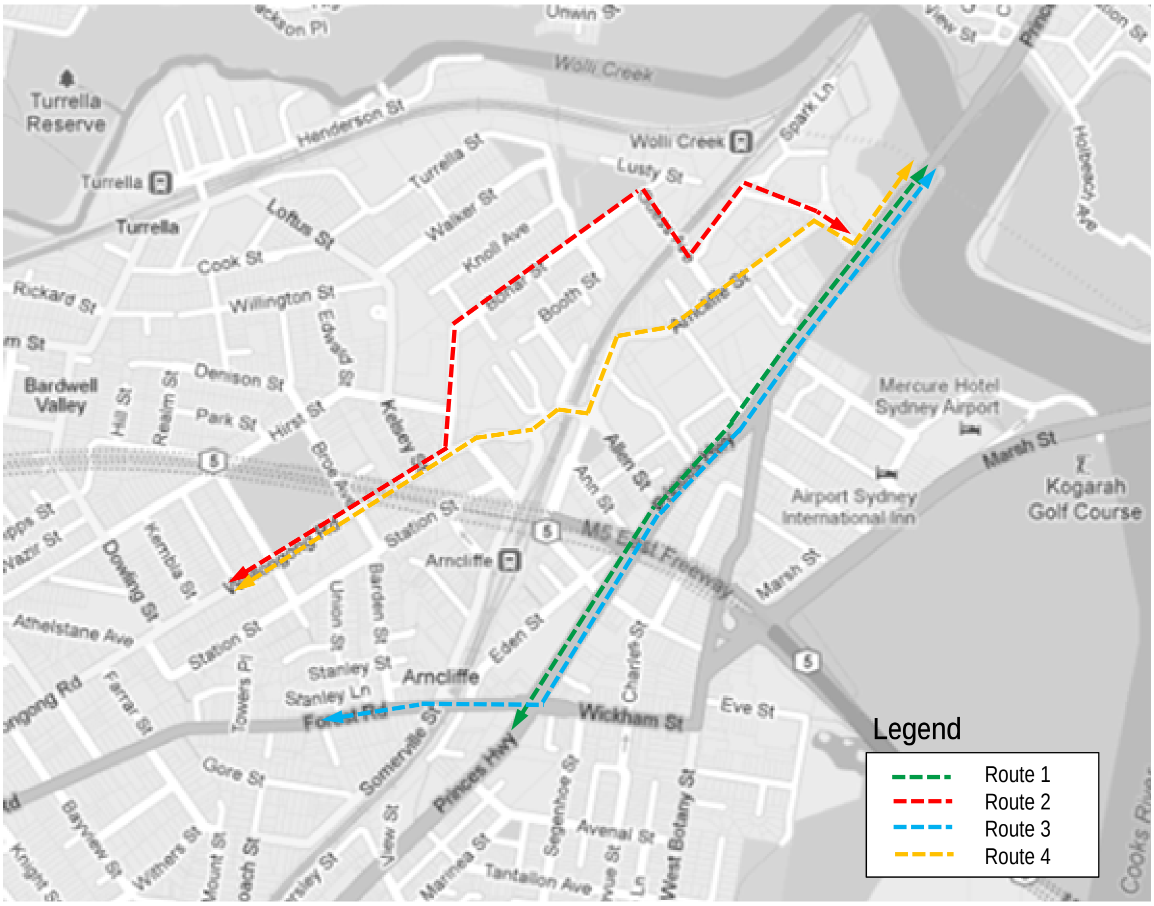
Figure 2.2: Origin – Destination Survey Sites

The origin – destination data obtained by this survey was converted into a matrix format and used during the model demands estimation and also during the model validation stage.

Detailed results are shown in Appendix B.

2.3 TRAVEL TIME SURVEY

Travel time data was collected for four separate bi-directional routes, as shown in Figure 2.3.



Source: Google Maps

Figure 2.3: Travel Time Routes

The survey dates for each of the routes shown in Figure 2.3 were as follows:

- Route 1 (both peaks): Wednesday, 17th October 2012;
- Route 2 (both peaks): Wednesday, 17th October 2012;
- Route 3 (AM peak): Wednesday, 28th November 2012;
- Route 3 (PM peak): Tuesday, 27th November 2012;
- Route 4 (AM peak): Wednesday, 28th November 2012; and
- Route 4 (PM peak): Tuesday, 27th November 2012;

Appendix B contains detailed results for all routes (both peaks and both directions). It should be noted that separate reports were created for these surveys and as such the route numbers shown in Figure 2.3 do not match the route numbers used in Appendix B.

2.4 BACK OF QUEUE SURVEY

Back of queue data was collected for all 16 intersections mentioned in Section 2.1 (i.e. all intersections that had turn volumes collected as well). This survey was undertaken over two days (Tuesday 27th November 2012 and Wednesday 28th November 2012) which means that it wasn't carried out on the same day as the traffic count survey.

For ease of comparison, the survey results were compiled into a format that shows the average back of queue length and the number of observations for each intersection approach and for each hour. The results were then added to separate diagrams which were used during the model validation stage. These diagrams are shown in Appendix E.

2.5 SIGNAL PHASING DATA

Traffic signal phasing and timing information was obtained from Roads and Maritime Services (RMS) for the key intersections of:

- Princes Highway/Forest Road/Wickham Street (TCS 118);
- Princes Highway/M5 off ramp (TCS 2010); and
- Princes Highway/Brodie Spark Drive (TCS 3437).

The information ordered included:

- Signal design plans for the above key intersections;
- Intersection Diagnostic Monitors (IDMs) for these intersections; and
- The SCATS 'LX' file for the regional computer controlling this area.

The SCATS LX file was used to determine the relationships between the traffic signal intersections in the study area, including which intersections were the 'critical' (or controlling) intersections. For the minor intersections, a combination of IDM and LX data were used to determine the phase splits, while the phasing was recorded from on-site observations. The LX data were also used to determine the coordination offsets (timing relationship) between intersections.

Signal 'gap-outs' were observed on site during the diamond phase at TCS 118 where the signals run an overlap. As this is not recorded in the IDM data but was assumed as a proportion of the E phase based on observed queue lengths and behaviour.

The IDMs were also used to determine the frequency of operation of pedestrian crossings at key intersections. In turn, this was used in the Paramics model to replicate the delays to turning vehicles.

Appendix C contains the relevant signal phasing data used in the model.

2.6 AERIAL PHOTOGRAPHY DATA

Recent aerial photography data was provided by Rockdale City Council to assist in the model coding process. This data consists of ECW files that were imported to the model as necessary. It was noted at the time that the base data was collected that the tidal flow arrangements on the Princes Highway had not been implemented.

Source: Rockdale City Council

Figure 2.4: Aerial Photography Data

3. NETWORK CODING

3.1 MODELLED PERIODS

Separate models were developed for the AM and PM peaks. For each peak, a "warm-up" and "cool-down" period of 1 hour each was added, with overall modelled periods as follows:

- AM Peak:
  - Warm-up: 6.00am – 7.00am;
  - Modelled period: 7.00am – 9.00am;
  - Cool-down: 9.00am – 10.00am.
- PM Peak:
  - Warm-up: 2.00pm – 3.00pm;
  - Modelled period: 3.00pm – 6.00pm;
  - Cool-down: 6.00pm – 7.00pm.

The model was coded to allow each "1 hour" period to be analysed individually. Periodic files were created such as separate demand files for each hour. The estimation, calibration and validation of the model was therefore processed separately for each hour resulting in five individual periods (two for the morning peak and three for the afternoon peak).

3.2 MODEL COVERAGE

The Paramics model developed for this project covers the area shown in yellow in Figure 1.1. The modelled precinct is bounded by Forest Road (to the south), Brodie Spark Drive (to the north), Princes Highway (to the east) and Mitchell Street / Hirst Street / Walker Street (to the west).

Figure 3.1 shows a screenshot of the base model.

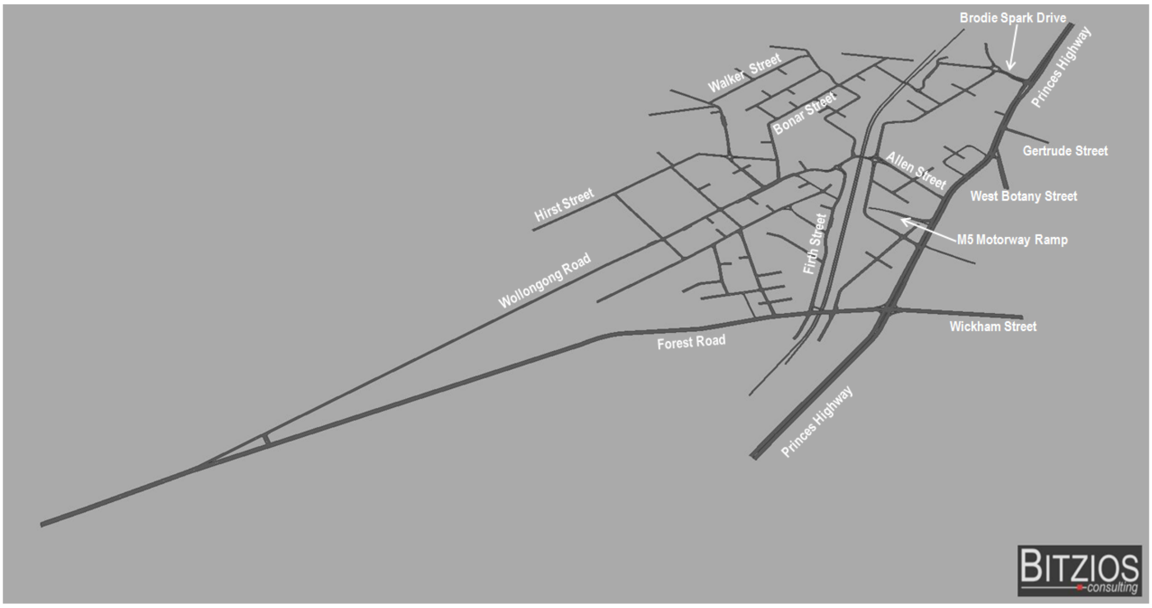


Figure 3.1: Base Model Coverage

Wollongong Road and Forest Road were both extended to the west (outside the "modelled area" described above). These two links were extended to the point where they intersect each other – near Wolli Creek Road. The purpose of doing this was to enable the assessment of route choice under the future year scenarios. The actual split between the two alternative routes was captured by origin-destination surveys and will be discussed in more detail in Section 5.

3.3 LINK CATEGORIES

The link categories used in the base model coding were taken from RMS's standard category file. Only one link category was added to the list to allow the correct coding of a laneway on the northern side of Forest Road with a low speed environment (coded as 20km/h). Figure 3.2 highlights this modification.

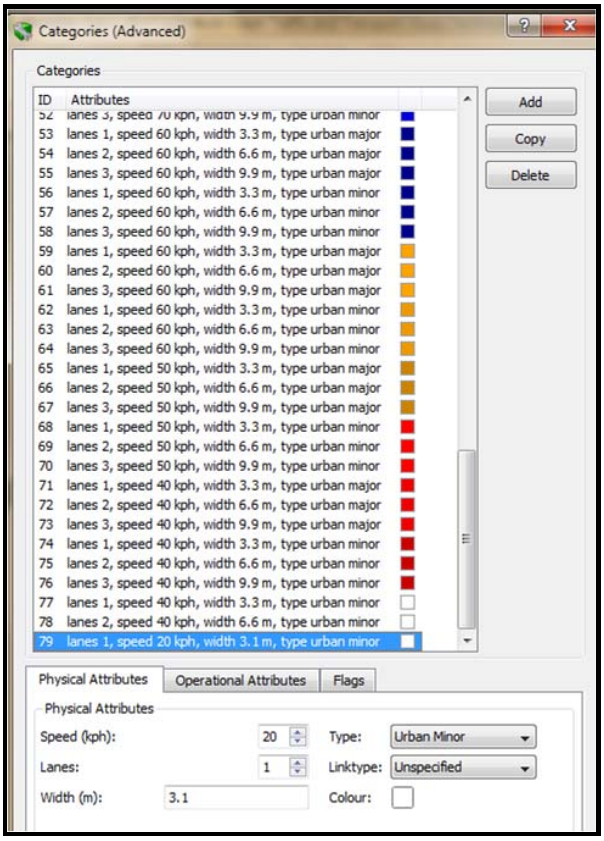


Figure 3.2: Link Categories

All links were coded to reflect current road hierarchy, posted speeds, number of lanes and all other operational attributes.

Typically, the main corridors (Princes Highway, Forest Road, Wollongong Road, M5 Ramps, etc.) were coded as "major links" while the other parts of the network (residential streets and lower hierarchy roads) were coded as "minor links". This has no influence in the traffic assignment or the way the model operates.

The rail alignment and rail station are shown in the model and trains are also shown running along the track but this also has no influence on the traffic model operation and was only used for visual/graphical purposes.

3.4 TRAFFIC SIGNALS

The model features nine signalised intersections, as follows:

1. Princes Highway / Brodie Spark Drive;
2. Princes Highway / Gertrude Street;
3. Princes Highway / West Botany Street;
4. Princes Highway / M5 Motorway off-ramps;
5. Princes Highway / Burrows Street;
6. Princes Highway / Forest Road;
7. Forest Road / Firth Street;
8. Forest Road / Wollongong Road; and
9. Wollongong Road / Kelsey Street.

Figure 3.3 illustrates the location of all the above intersections.

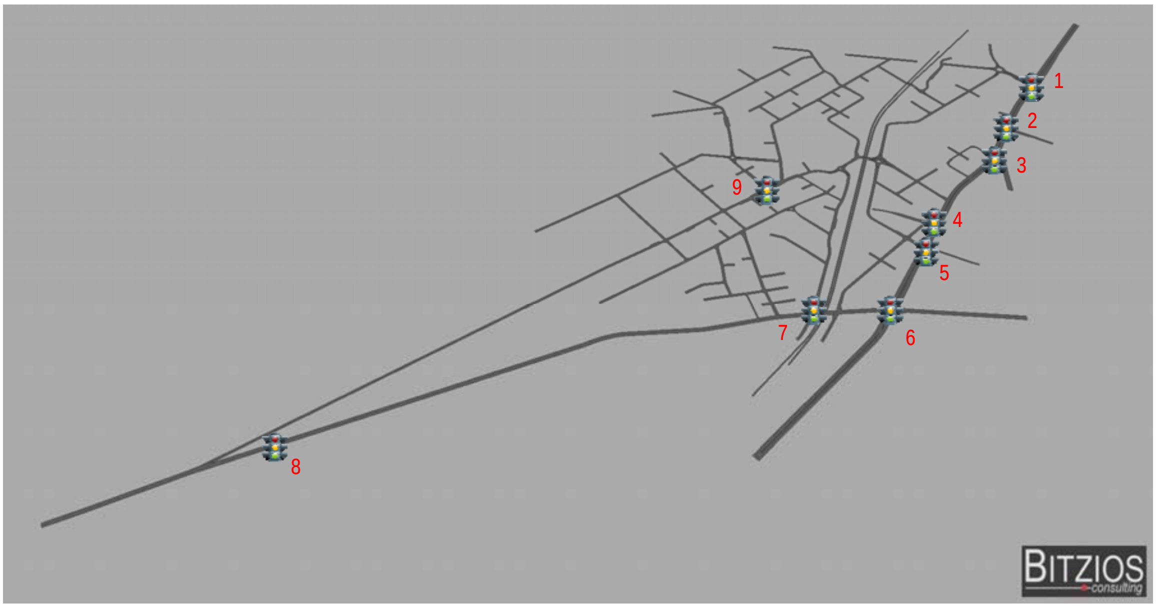


Figure 3.3: Signalised Intersections in the Model

As mentioned in Section 2.5, all signal operation parameters were added to the model in accordance to the data received from RMS. It is important to note that "fixed phase and cycle times" were used in the model while in reality the signal operation is a much more dynamic process controlled by SCATS. As such, the phasing times extracted from the RMS supplied data were used as an indication. During the model calibration stage, minimal adjustments to the phase lengths were added as necessary to ensure that observed conditions were mimicked accurately. Typically, this consisted of adjusting green times by 2 or 3 seconds (while keeping the cycle time invariable). All "signal offsets" were kept unchanged.

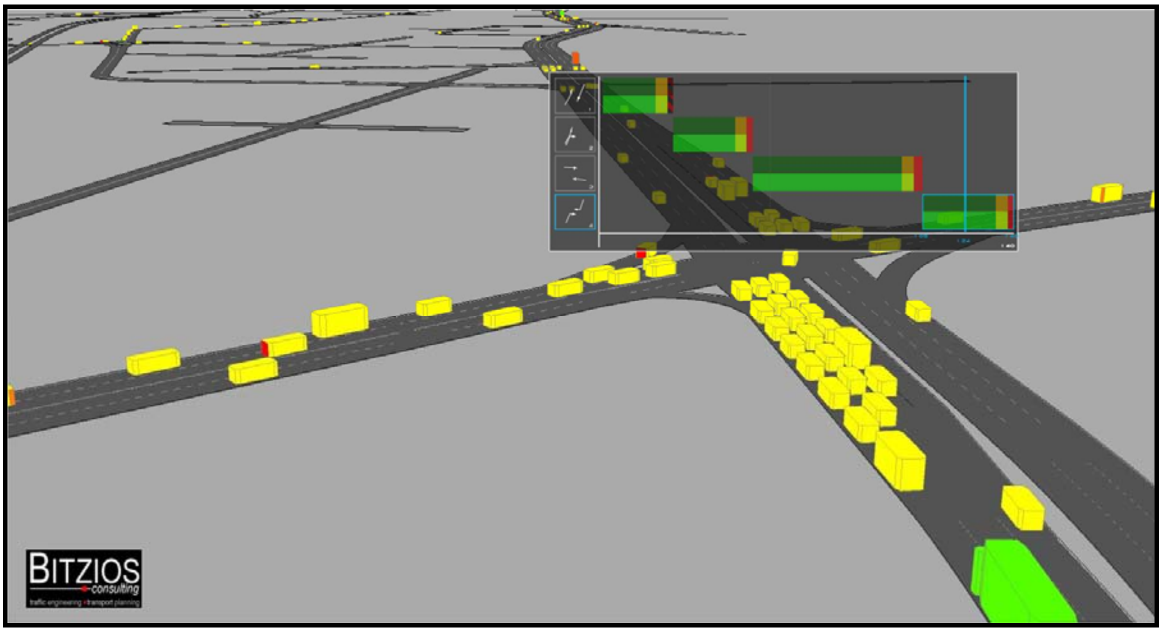


Figure 3.4: Signalised Junction in Operation

3.5 ZONE SYSTEM

The model features 65 traffic zones. Two of these zones are not used in the simulation. These are zones 33 and 34. These zones were added to the model during the initial stages of the model development but became unnecessary. To achieve consistency with other files previously created, it was decided to maintain the zone system and remove zones 33 and 34 from the simulation (i.e. no trips are released or attracted by any of these two zones).

Figure 3.5 illustrates the zone system adopted. The zones shown in green represent "internal zones" while zones shown in orange represent external road connections to the modelled area.

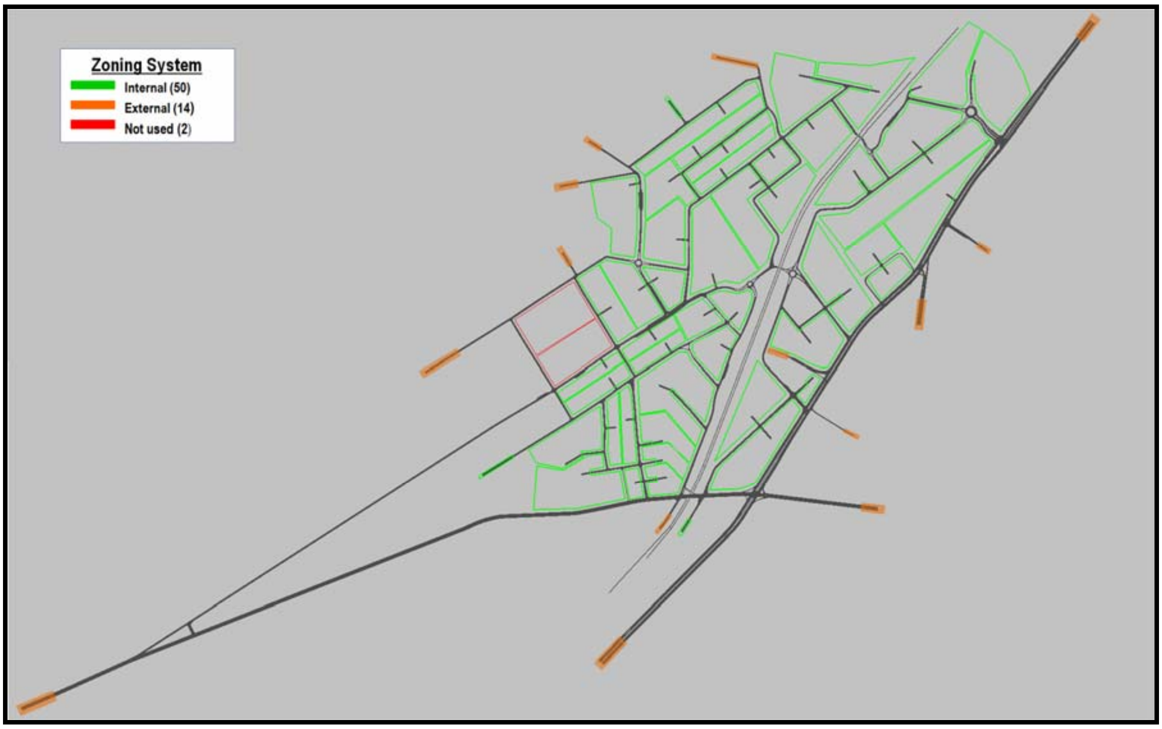
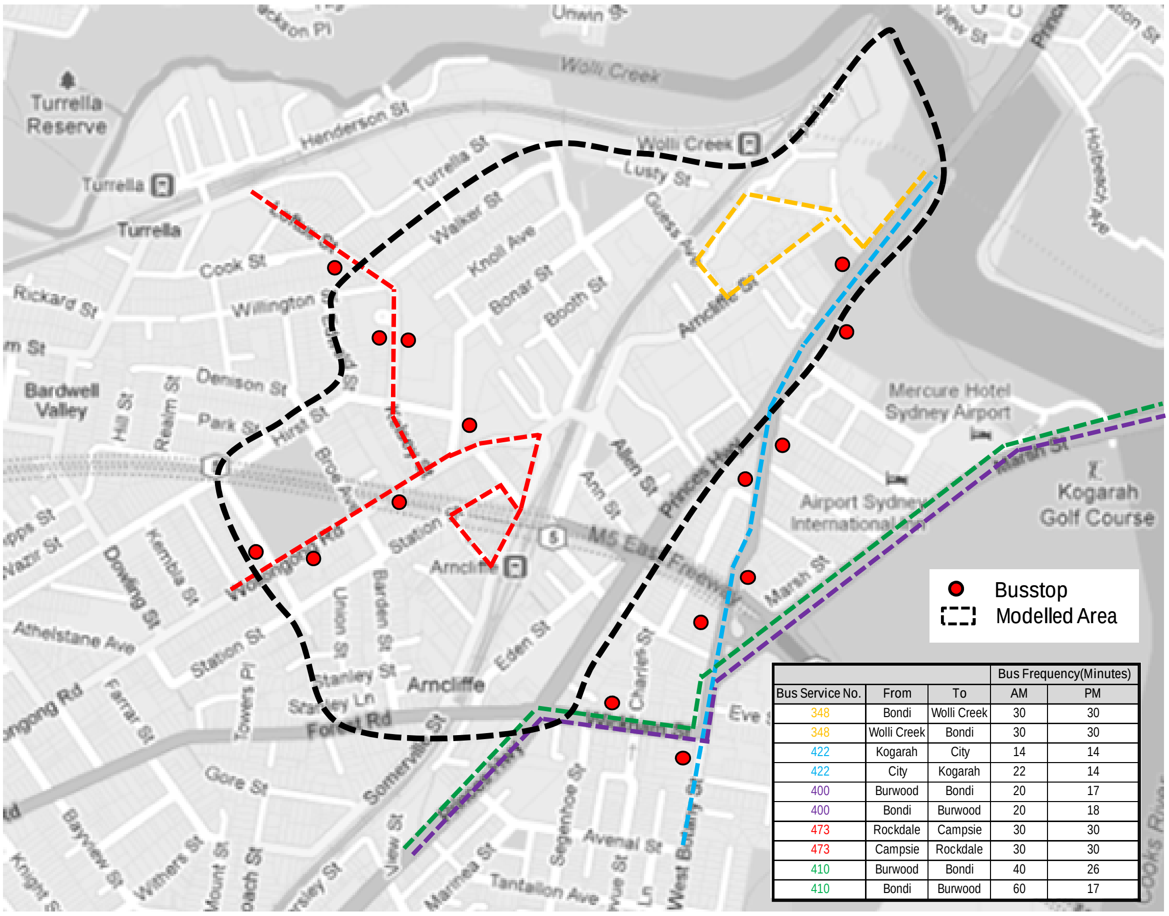


Figure 3.5: Zoning System Adopted

3.6 Bus Routes

The current bus routes and frequencies were added to the model according to the data extracted from "*http://www.sydneybuses.info/*". Bus stops were also coded with the respective length noticed on site.

Figure 3.6 shows the bus routes that service the area and respective frequencies for both peaks and both directions.



			Bus Frequency(Minutes)	
Bus Service No.	From	To	AM	PM
348	Bondi	Wolli Creek	30	30
348	Wolli Creek	Bondi	30	30
422	Kogarah	City	14	14
422	City	Kogarah	22	14
400	Burwood	Bondi	20	17
400	Bondi	Burwood	20	18
473	Rockdale	Campsie	30	30
473	Campsie	Rockdale	30	30
410	Burwood	Bondi	40	26
410	Bondi	Burwood	60	17

Source: Google Maps

Figure 3.6: Bus Routes and Frequencies

Routes 400 and 410 were not modelled since they only use one intersection within the model and effectively these buses wouldn't enter the modelled network.

A specific vehicle type was attributed to all the "fixed route" bus services (vehicle type #8 in the RMS standard "vehicles" file), with the following dimensions:

- Length: 12.20m;
- Height: 3.05m; and
- Width: 2.50m.

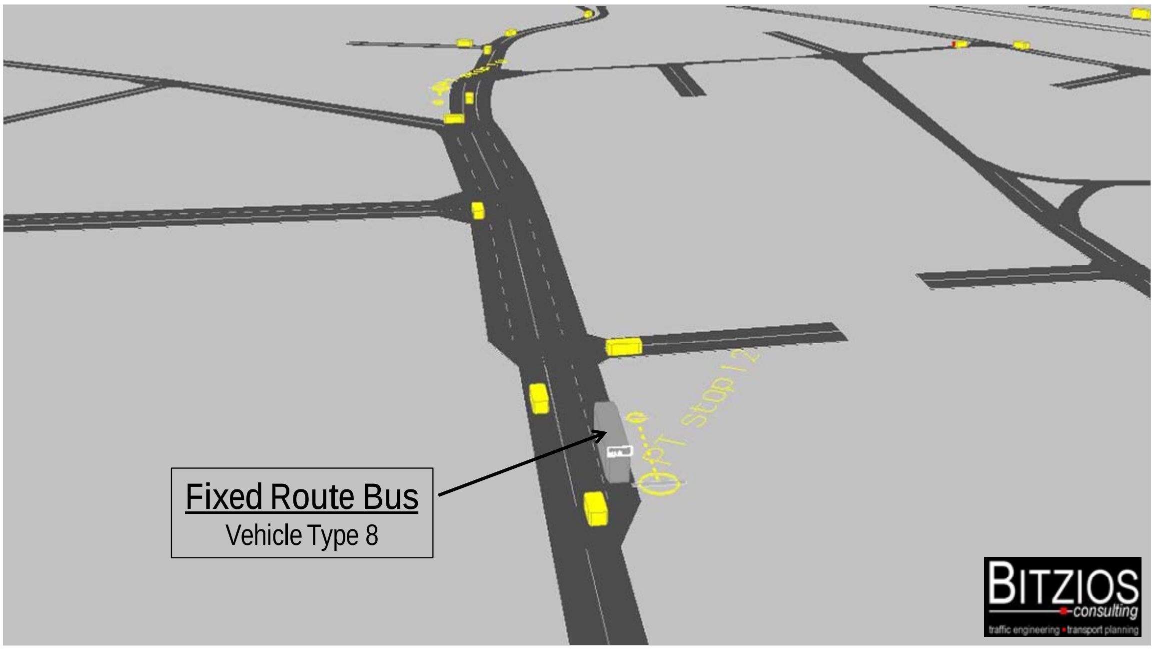


Figure 3.7: Fixed Route Bus

The actual bus services operation is extremely complex to model since it varies significantly and depends on a range of factors. For example, a specific bus service might stop at a particular bus stop for 30 seconds to let passengers on or off but the next service may stop for only 10 seconds or not even stop at all. Similarly, different days often result in significantly different delay patterns throughout the area.

To address this, it has been conservatively assumed that all bus services would stop at all bus stops located along that bus route for a mean time of 15 seconds with a deviation of 5 seconds (15sec ± 5sec).

3.7 SCHOOL ZONES

Three school zones exist within the modelled area. The school zone speed is 40km/h and the periods are as follows:

- 8.00am – 9.30am; and
- 2.30pm – 4.00pm.

The school zones added to the model are shown in Figure 3.8.

Figure 3.8: School Zones

School zones can be coded in detail using a series of Variable Speed Limit (VSL) rules to allocate a different posted speed to the links for different periods. However, for simplicity purposes, the school zones within the Wolli Creek base model were kept as 40km/h zones for the complete duration of the model. This can be further justified by the following reasons:

- The school zones on the northern part of the model (Martin Avenue and Walker Street) are placed on links with a slow speed environment regardless of the time of the day. In other words, vehicles do not travel along those parts of the network faster than 40km/h often;
- The school zone placed on Forest Road is located in a part of the model with adjacent traffic signals, multiple conflicting turn movements and significant congestion levels during peak periods. As a result, the allocation of 40km/h or 50km/h on this section will produce a negligible difference in overall performance and route choice; and
- In the case of this model, the school zones are considered to have a marginal influence on route choice and/or overall network performance. They are a localised safety treatment. Moreover, having these zones as a 40km/h speed environment for the full duration of the model is considered to be a realistic replication of real conditions and expected to produce practically the same outputs.

4. TRAFFIC DEMANDS AND ASSIGNMENT

4.1 O-D DEMANDS

Paramics Estimator was used to assist in the development of the demand matrices based on the 2012 count data. An iterative process was used to check that the demands were appropriately matching the intersection count volumes as discussed in more detail in Section 5.1.

The matrix estimation process took into account the origin-destination survey results. These results together with traffic volumes provided a good indication of external traffic patterns / distribution. For all internal zones, indicative traffic generation figures were developed based on the existing land use and using the “RTA Guide for Traffic Generating Developments”. It must be noted that during the matrix estimation process and also during the validation and calibration stages, these numbers went through a significant number of edits and iterations to achieve a fully validated model. As such, the final trip generation for each internal zone ill not necessarily match the trip generation numbers obtained initially which were only meant to be an indication and a “starting point” for the estimation process.

4.2 VEHICLE PROPORTIONS

Vehicles Categories are based on RMS’s standard vehicles files but have been split into two matrices as detailed in Table 4.1. The proportions have not been changed from the RMS standard file however the demands split across the two matrices have been distributed based on the location of the zone and the types of vehicles expected to use those zones in each peak hour.

Table 4.1: Vehicle Proportions

Vehicle Type	Description	RMS Standard	Modelled
Type 1	small car	26.98% (matrix 1)	28.91% (matrix 1)
Type 2	medium car	36.67% (matrix 1)	39.29% (matrix 1)
Type 3	large car	21.26% (matrix 1)	22.78% (matrix 1)
Type 4	taxi	1.30% (matrix 1)	1.39% (matrix 1)
Type 5	lgv	7.12% (matrix 1)	7.63% (matrix 1)
Type 6	STA Mini Bus	Fixed Route	Fixed Route
Type 7	Non STA Mini Bus	Fixed Route	Fixed Route
Type 8	STA Bus	Fixed Route	Fixed Route
Type 9	Non STA Bus	Fixed Route	Fixed Route
Type 10	OD Bus	0.10% (matrix 1)	1.5% (matrix 2)
Type 11	Rigid (Light)	0.67% (matrix 1)	10.04% (matrix 2)
Type 12	Rigid (Medium)	4.17% (matrix 1)	62.53% (matrix 2)
Type 13	Rigid (Heavy)	0.67% (matrix 1)	10.04% (matrix 2)
Type 14	Semi (Light)	0.13% (matrix 1)	1.95% (matrix 2)
Type 15	Semi (Medium)	0.74% (matrix 1)	11.09% (matrix 2)
Type 16	Semi (Heavy)	0.13% (matrix 1)	1.95% (matrix 2)
Type 17	B-Double (Light)	0.01% (matrix 1)	0.15% (matrix 2)
Type 18	B-Double (Medium)	0.04% (matrix 1)	0.6% (matrix 2)
Type 19	B-Double (Heavy)	0.01% (matrix 1)	0.15% (matrix 2)
Type 20	Train	NA	Fixed Route
Total		100.00% (matrix 1)	100.00% (matrix 1)
		-	100.00% (matrix 2)

4.3 VEHICLE RELEASE PROFILES

The model features a vehicle release rate for the peak periods based on the traffic survey results. The release profiles are for 15 minute intervals that have been as per the survey count intervals. Figures 4.1 and 4.2 show the vehicle release profiles used in the base AM and PM models.

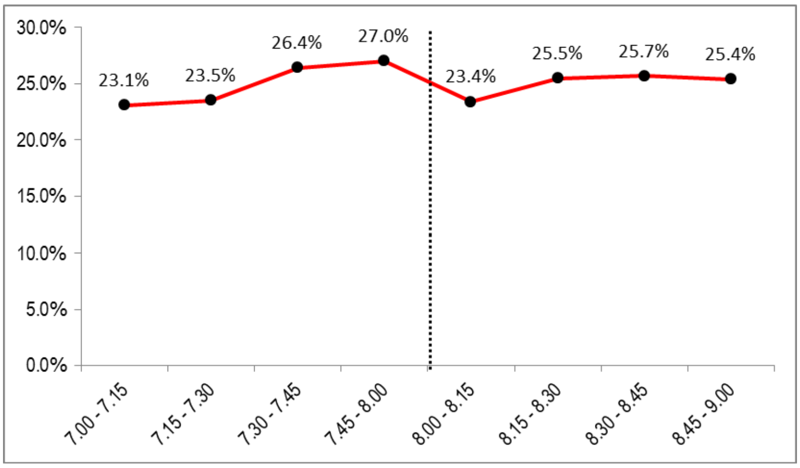


Figure 4.1: AM Base Model Vehicle Release Profile

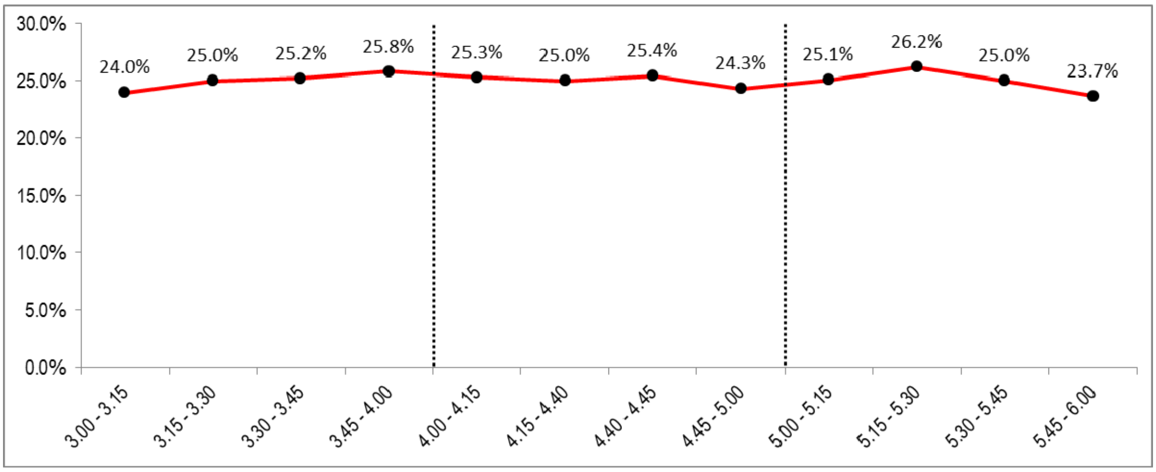


Figure 4.2: PM Base Model Vehicle Release Profile

The base models also include one hour warm-up and one hour cool-down periods. The amount of traffic released during these periods is approximately 87% of the period traffic flow demands. The profiles for the warm-up period and the cool-down period increase and decrease respectively to ensure that the network operation conditions were as close as possible to those actually experienced at the start and end of the peak periods.

To gain a better understanding of the volume of vehicles being released during the full modelled period, Figures 4.3 and 4.4 show the vehicle release profiles influence on the traffic demands. These vehicle release volume figures give a better indication of the peak demand periods.

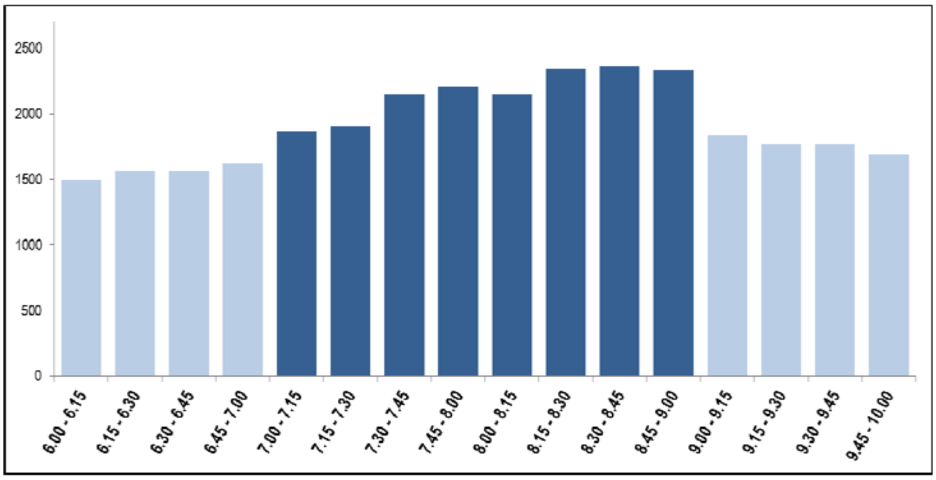


Figure 4.3: AM Base Models Vehicle Release Volumes

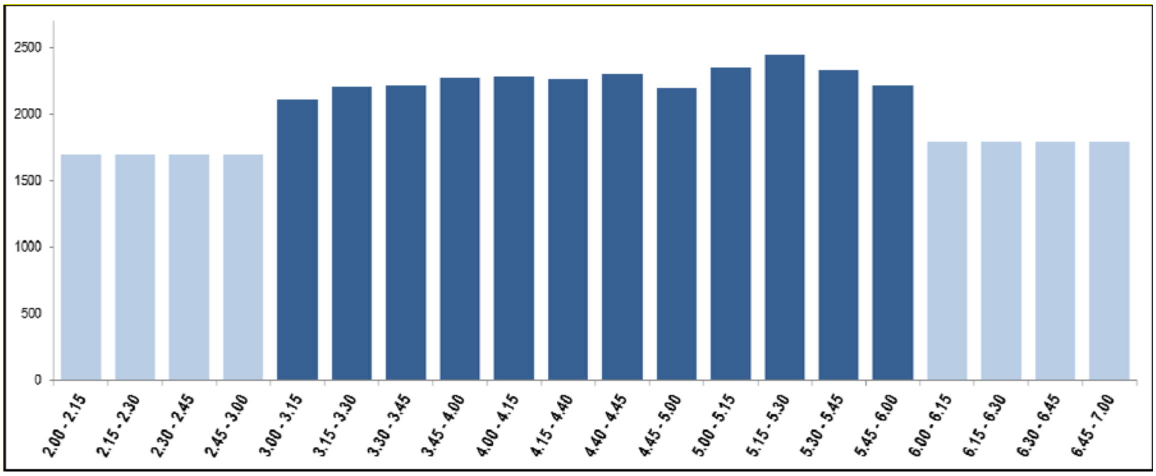


Figure 4.4: PM Base Models Vehicle Release Volumes

4.4 Familiar and Unfamiliar Drivers

All vehicle types need to have their proportion of "familiar" and "unfamiliar" drivers attributed. This influences how the model generates the range of alternative routes for a given origin-destination movement.

The driver familiarity distribution has been applied in accordance with the RMS guidelines (as detailed in the "Paramics Microsimulation Modelling – RMS Manual"). The distribution used is as follows:

- Cars: 50% "familiar drivers";
- Rigid heavy vehicles: 70% "familiar drivers"; and
- Articulated heavy vehicles: 85% "familiar drivers".

4.5 Traffic Assignment Method

Considering the size, route choice availability and operational characteristics of the traffic network, the assignment method used was "dynamic assignment" with perturbation. A range of assignment options were tested ranging from no feedback to 15 minute feedback, 10 minute feedback and 5 minute feedback. The optimum feedback period determined was "10 minutes" and the perturbation algorithm selected was "percentage", with a perturbation factor of "5". The coefficients for the generalised cost equation were extracted from the "Paramics Microsimulation Modelling – RMS Manual" standard files.

Other assignment parameters that may differ from either the Paramics default or the RMS's standard files are as follows:

- Feedback smoothing: 0.600;
- "Force vehicle route choice update" option: active; and
- "Restrict slow lane changes" option active.

Time steps have also been increased from the default value of 2 to 4. Increasing the time steps increases the frequency of model iteration per second. This affects lane changing, merging, and weaving behaviour which for this model was considered to give a more realistic representation of the observed traffic operations in congested conditions. The speed memory of the models was also increased to 6 as a result of the increase in time steps. Speed memory is usually 1.5 times the time step value.

4.6 Seed Values

RMS guidelines stipulate that models should be run for a minimum of 5 seed runs to investigate the robustness of the model and assess its operation under a variety of starting conditions.

There is no reason to use one seed value or group of seed values in particular. They simply represent different vehicle release conditions for the same network and O-D matrix. However, the "Paramics Microsimulation Modelling – RMS Manual" states that "the following ten seed values should be used to provide random variation of results: 560, 28, 7771, 86524, 2849, 5321, 137, 98812, 601027, 559". To comply with that requirement, the first five seeds were selected to be used in the calibration process. In summary, the seed values used were:

- Seed #1: 560;
- Seed #2: 28;
- Seed #3: 7771;
- Seed #4: 86524; and
- Seed #5: 2849.

5. MODEL VALIDATION AND CALIBRATION

The base model validation and calibration process involved detailed comparisons made between the following observed and modelled attributes:

- Calibration
  - turn volume data (GEH statistic);
- Validation
  - travel times;
  - origin-destination (route choice);
  - queue lengths;

5.1 MODEL CALIBRATION

The comparison between the modelled and observed traffic counts data was undertaken using the commonly used GEH statistic, which measures the degree of divergence of the modelled value from the observed value whilst accounting for the relative scale of each movement-volume (i.e. the higher volume movements are more important to match than the lower volume movements).

Three criteria were used to ensure the model was adequately calibrated, as follows:

- Average GEH < 5;
- A minimum of 85% of turn volumes with GEH < 5; and
- No turn movements with GEH > 10.

The calibration comparisons were carried out for all "one hour periods" and all seeds. This results in a total of 25 network assessments. The individual results for each of those comparisons are shown in Appendix D. The data shown in Appendix D contains detailed information for the each movement (survey count, modelled volume and GEH statistic).

A summary of the calibration results is shown in Tables 5.1 to 5.5.

Table 5.1: 7.00am – 8.00am Calibration Statistics

Seed	Average GEH	% GEH < 5	GEH > 10
560	2.4	91.3	0
28	2.2	89.3	0
7771	2.2	91.9	0
86524	2.2	88.6	0
2849	2.3	91.3	0

Table 5.2: 8.00am – 9.00am Calibration Statistics

Seed	Average GEH	% GEH < 5	GEH > 10
560	2.5	87.9	0
28	2.2	94.6	0
7771	2.2	95.3	0
86524	2.3	94.0	0
2849	2.3	92.6	0

Table 5.3: 3.00pm – 4.00pm Calibration Statistics

Seed	Average GEH	% GEH < 5	GEH > 10
560	2.3	91.3	0
28	2.4	91.9	0
7771	2.3	92.6	0
86524	2.3	89.3	0
2849	2.4	92.6	0

Table 5.4: 4.00pm – 5.00pm Calibration Statistics

Seed	Average GEH	% GEH < 5	GEH > 10
560	2.3	87.9	0
28	2.1	91.3	0
7771	2.2	90.6	0
86524	2.5	89.3	0
2849	2.1	89.9	0

Table 5.5: 5.00pm – 6.00pm Calibration Statistics

Seed	Average GEH	% GEH < 5	GEH > 10
560	2.2	91.3	0
28	1.9	93.3	0
7771	2.0	91.9	0
86524	2.0	91.9	0
2849	2.0	93.3	0

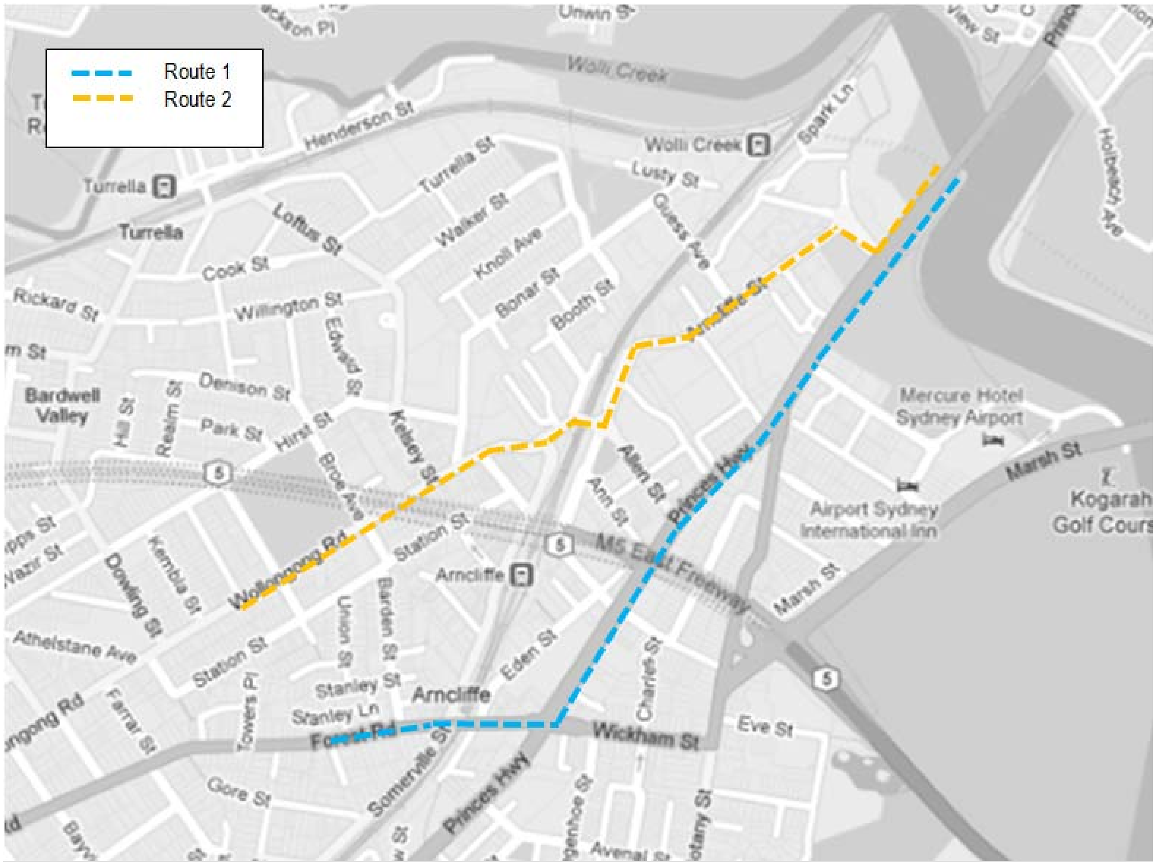
5.2 MODEL VALIDATION

Upon obtaining full model calibration as discussed above, a number of other model parameters and network operation indicators were assessed to investigate the accuracy of the model and ensure that it consists of a realistic representation of real traffic conditions. The three main tools were used in this assessment were "typical queuing" comparisons, travel time comparisons and route choice patterns for selected trips.

In addition, a number of other traffic behaviour and network operation comparisons were undertaken to ensure that the conditions observed during the site inspections were adequately mimicked by the model.

5.2.1 Travel Times

As mentioned in Section 2.3, travel time data was captured for four routes within the study area. However, for validation purposes, two of these routes were considered to be the most adequate to be used. One corresponds to the Wollongong Road / Arncliffe Street alignment while the other follows the Princes Highway / Forest Road corridor, as shown in Figure 5.1.



Source: Google Maps

Figure 5.1: Travel Time Routes Used in the Model Validation

It must be noted that the route numbers shown in Figure 5.1 are different to those shown in Section 2.3.

The results for each route and each peak are shown in Tables 5.6 and 5.7.

Table 5.6: AM Peak Travel Time Comparison

	7.00 - 8.00									
	Seed 560	Seed 28	Seed 7771	Seed 86524	Seed 2849	Average	Survey (Min)	Survey (Average)	Survey (Max)	Comments
Route 1 NB	05:24	05:11	06:12	05:40	05:37	05:37	04:48	05:29	06:10	within "survey range"
Route 1 SB	04:10	03:58	03:57	04:07	04:06	04:04	03:05	03:28	03:47	17 secs higher than "survey max"
Route 2 NB	04:36	04:42	04:42	04:46	04:39	04:41	04:45	05:10	05:25	4 secs lower than "survey (min)
Route 2 SB	04:02	03:57	03:50	04:01	03:57	03:57	03:43	04:14	04:30	within "survey range"

	8.00 - 9.00									
	Seed 560	Seed 28	Seed 7771	Seed 86524	Seed 2849	Average	Survey (Min)	Survey (Average)	Survey (Max)	Comments
Route 1 NB	06:33	05:30	06:36	06:41	05:49	06:14	04:31	05:29	06:21	within "survey range"
Route 1 SB	04:16	04:14	04:29	04:29	04:15	04:21	03:00	03:21	04:01	20 secs higher than "survey max"
Route 2 NB	04:30	04:10	04:12	04:13	04:14	04:16	04:39	05:07	06:12	23 secs lower than "survey (min)
Route 2 SB	03:48	03:49	03:56	03:53	03:53	03:52	04:08	04:34	04:48	16 secs lower than "survey (min)

Table 5.7: PM Peak Travel Time Comparison

	3.00 - 4.00									
	Seed 560	Seed 28	Seed 7771	Seed 86524	Seed 2849	Average	Survey (Min)	Survey (Average)	Survey (Max)	Comments
Route 1 NB	03:12	03:15	03:15	03:14	03:14	03:14	02:20	03:00	03:26	within "survey range"
Route 1 SB	03:52	04:21	04:21	03:48	04:10	04:06	03:10	04:32	06:30	within "survey range"
Route 2 NB	03:26	03:19	03:24	03:21	03:23	03:23	03:09	03:24	03:35	within "survey range"
Route 2 SB	03:29	03:39	03:40	03:34	03:45	03:37	04:16	04:44	05:30	37 secs lower than "survey (min)

	4.00 - 5.00									
	Seed 560	Seed 28	Seed 7771	Seed 86524	Seed 2849	Average	Survey (Min)	Survey (Average)	Survey (Max)	Comments
Route 1 NB	03:23	03:20	03:23	03:24	03:24	03:23	02:28	02:53	03:29	within "survey range"
Route 1 SB	04:07	03:56	03:55	04:19	04:47	04:13	02:59	04:29	06:29	within "survey range"
Route 2 NB	03:24	03:37	03:32	03:27	03:47	03:33	03:10	03:33	04:18	within "survey range"
Route 2 SB	03:45	03:55	03:44	04:11	04:04	03:56	04:06	04:53	05:50	10 secs lower than "survey (min)

	5.00 - 6.00									
	Seed 560	Seed 28	Seed 7771	Seed 86524	Seed 2849	Average	Survey (Min)	Survey (Average)	Survey (Max)	Comments
Route 1 NB	03:27	03:23	03:23	03:26	03:22	03:24	02:11	02:58	03:33	within "survey range"
Route 1 SB	04:24	04:04	04:28	05:58	05:45	04:56	02:28	04:11	07:24	within "survey range"
Route 2 NB	04:18	04:05	03:45	03:48	03:54	03:58	03:22	04:03	04:25	within "survey range"
Route 2 SB	04:08	04:04	04:03	04:55	04:44	04:23	03:51	04:18	05:22	within "survey range"

As part of the survey, an average of 4 sets of travel time data was captured for each hour for each route. These were then converted to “minimum”, “maximum” and “average” to allow for an easier comparison with modelled travel times.

As shown in Tables 4.6 and 4.7, the majority of the comparisons indicate that the average modelled travel times (across all seed values) are contained within the minimum and maximum survey travel times. This is an indication that real conditions are correctly replicated by the model. Moreover, the modelled travel times that are not within the “survey range” generally show a small difference to the “minimum” or “maximum” survey time. The maximum difference is 37 seconds.

In the AM Peak the southbound modelled travel times are higher by some 20 seconds than the maximum observed. This difference is most likely due to the fixed time model not reflecting the benefits of the real world SCATS conditions.

Differences in travel times along route 2 are generally lower than the observed. This can be accounted for by the effect of cars reverse parking on Wollongong Road as well as pedestrian crossings that can create delays from time to time. These effects are not accounted for in the model but given the model limitations travel times are considered acceptable and would make little difference to option testing.

It is important to take in consideration that the surveyed travel times correspond to an average of four trips undertaken within each one hour period. The modelled travelled times are based on hundreds of vehicles undertaking that trip and are influenced by a large number of factors that could easily be missed during the survey.

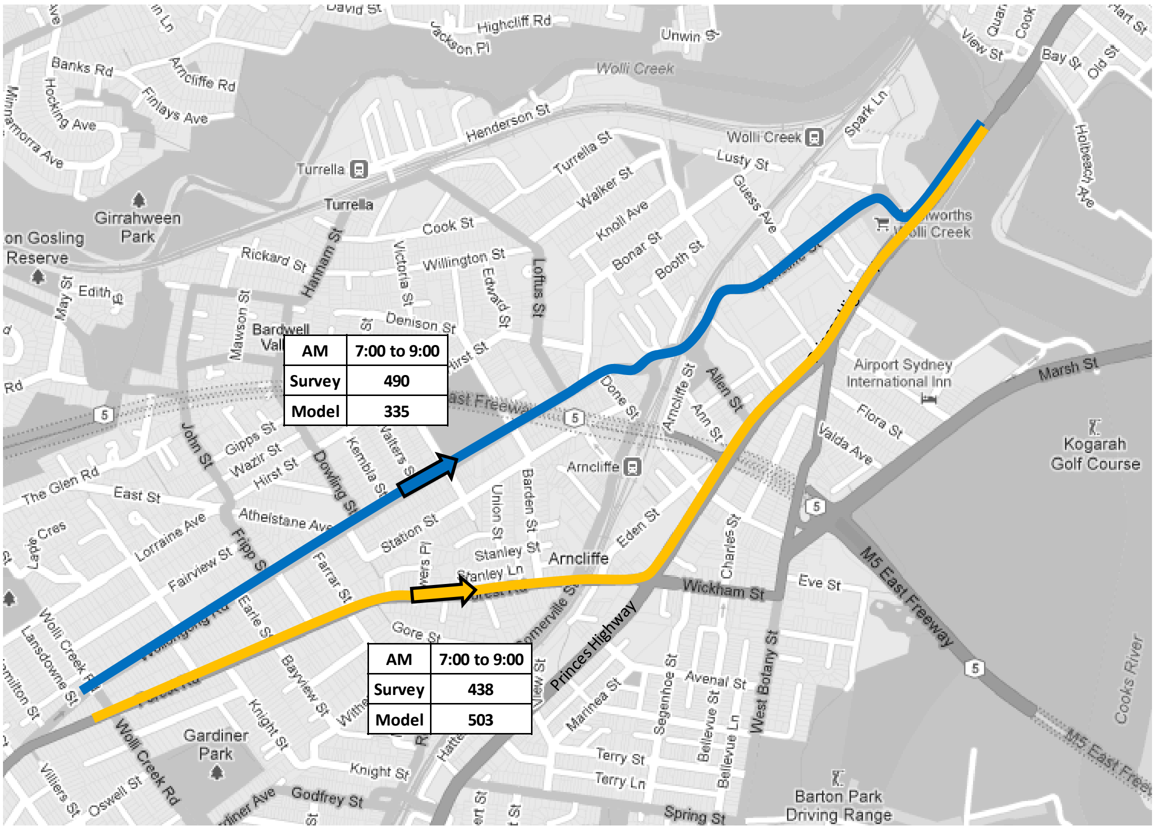
The model results present stability across the random seed values which demonstrates the robustness of the model.

5.2.2 Route Choice / Origin Destination

During the base model development, both Forest Road and Wollongong Road were extended to the west (beyond the "modelled area") to the point where they intersect each other – near Wolli Creek Road. Moreover, a single zone was placed just west of the point where these two links intersect to allow vehicles to choose one link or the other (in both directions, when travelling to/from the northern extremity of the model). This route choice (or the split between the two alternative alignments) was also investigated during the model validation process by comparing actual volumes to the origin-destination results.

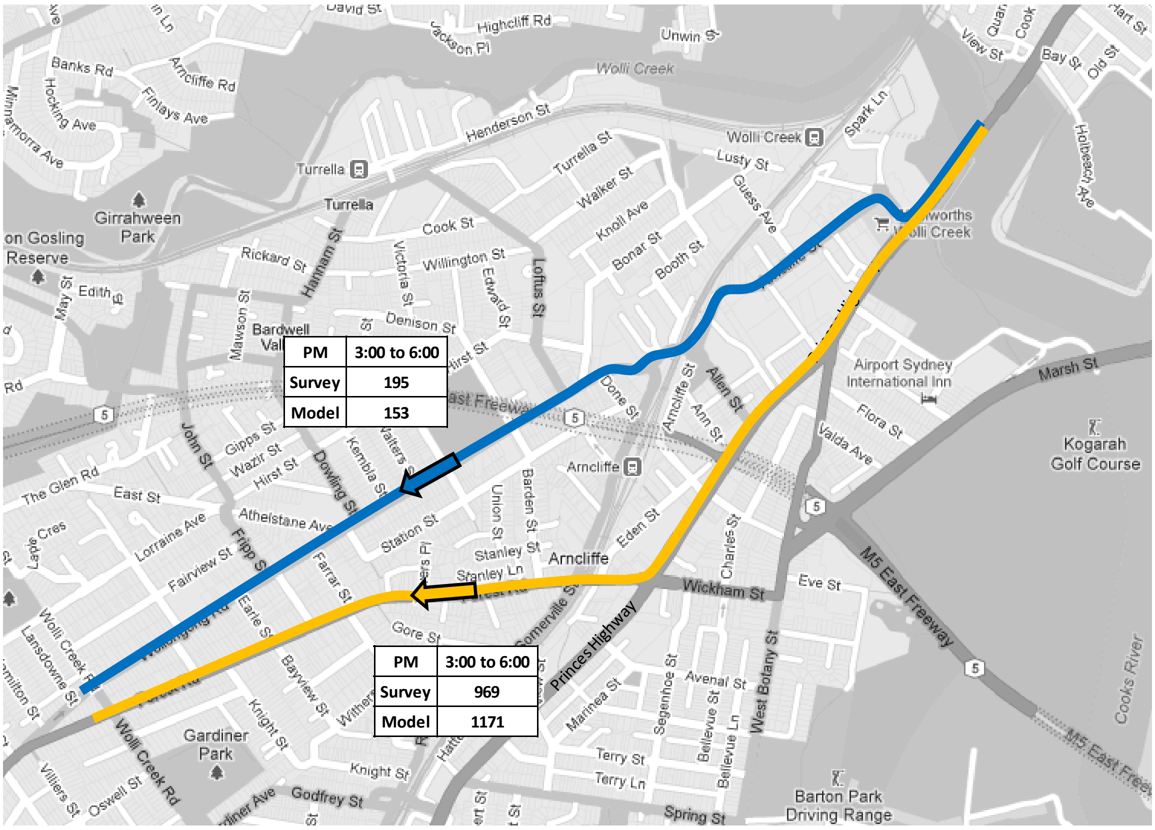
The origin-destination survey results helped to confirm that the diversion from the Princes Highway / Forest Road alignment onto the Arncliffe Road / Wollongong Road route occurs predominantly on the dominant direction of travel. In other words, during the morning peak, a significant number of vehicles heading east along Forest Road to turn left and head north along Princes Highway decides to use Wollongong Road and then Arncliffe Road instead (the reverse direction shows negligible number of vehicles performing the "rat-run" due to the reduced congestion levels). During the afternoon peak, the "rat run" effect is noticed in the southbound / westbound direction, with vehicles turning right onto Brodie Spark Drive to travel south-west using Arncliffe Road and Wollongong Road.

The route choice assessment was therefore performed based on the "dominant direction of traffic". Figures 5.2 and 5.3 provide a comparison between the number of vehciles useing the two alternative routes for the selected direction in each peak.



Source: Google Maps

Figure 5.2: AM Northbound Route Choice



Source: Google Maps

Figure 5.3: PM Southbound Route Choice

As documented by the results shown in Figures 5.2 and 5.3, the total number of vehicles travelling between the two extremities of these routes is identical in the model and in the survey results. A more detailed assessment of the route choice indicates that in both peaks the number of vehicles using the “rat run” in the model is relatively smaller when compared to the survey results. However, the split shown in the model is considered to be within an acceptable range of that shown in the survey day. It is important to note that the comparison shown in Figures 5.2 and 5.3 reflects the result of one seed run only (seed 560).

5.2.3 Back of Queue

The final tool used in the base model validation was a comparison between typicall queuing in the model and the back of queue results obtained during the survey.

During the survey, all intersections were visited a number of times during each hour and the back of queue for each approach was recorded for each observation. To allow for a fair comparison, the survey results were converted to "average back of queue lengths". In the diagrams used for the back of queue validation, this length was attributed to each approach for each hour and the number of observations was also recorded. Subsequently, the 50th percentile queue length was extracted from the model results for each hour and each seed run and added to the same diagrams. Appendix E contains all diagrams used for this comparison.

It must be noted that in some cases the survey staff was unable to record the exact back of queue length due to the large number of vehicles. In these cases, the symbol "+" was used to denote that the back of queue extended past the number of vehicles recorded.

Overall, the results shown in Appendix E demonstrate that the typical queuing shown in the model is a good representation of real queues. Moreover, the results emphasize the stability and robustness of the base model.

5.3 Model Attributes Modified During Calibration and Validation

As part of the calibration and validation stages of the base model, a number of modifications and adjustments were added to the network to reflect real conditions. This process involved several iterations in which the model was gradually modified until acceptable calibration and validation statistics were achieved. The modifications added to the model and respective justifications are discussed below.

5.3.1 Waypoint Routing

During the model validation process, it was observed that once significant congestion occurred along Forest Road (eastbound), a number of vehicles travelling from the western extremity of the model (zone 3 – Forest Road) towards Wickham Road (zone 13) adopted unrealistic routes using predominantly Wollongong Road but also other parts of the network. To eliminate this issue, a "waypoint route" was added to the model, to force vehicles travelling from zone 3 to zone 13 to use Forest Road, as shown in Figure 5.4.

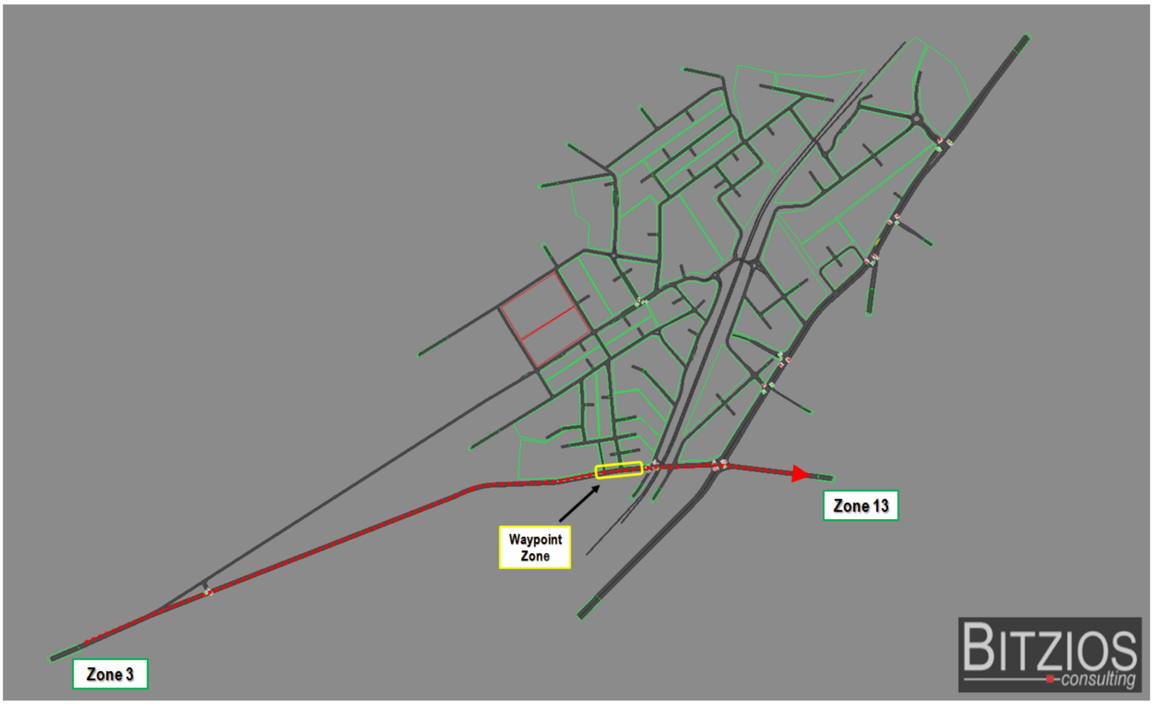


Figure 5.4: Waypoint Route (Zone 3 to Zone 13)

5.3.2 Cost Factors

Link cost factors were used in two small sections of the model as described and justified below.

Eden Street

A significant number of vehicles travelling eastbound along Forest Road were observed attempting to bypass the intersection with Princes Highway to go north by using Eden Street as an alternative. This behaviour was not observed during site inspections and traffic counts clearly indicated that the number of vehicles undertaking that movement in the model was excessive. To overcome this issue, a link cost factor of "1.2" was added to the model to ensure that a more realistic attractiveness factor is attributed to this link, as shown in Figure 5.5.

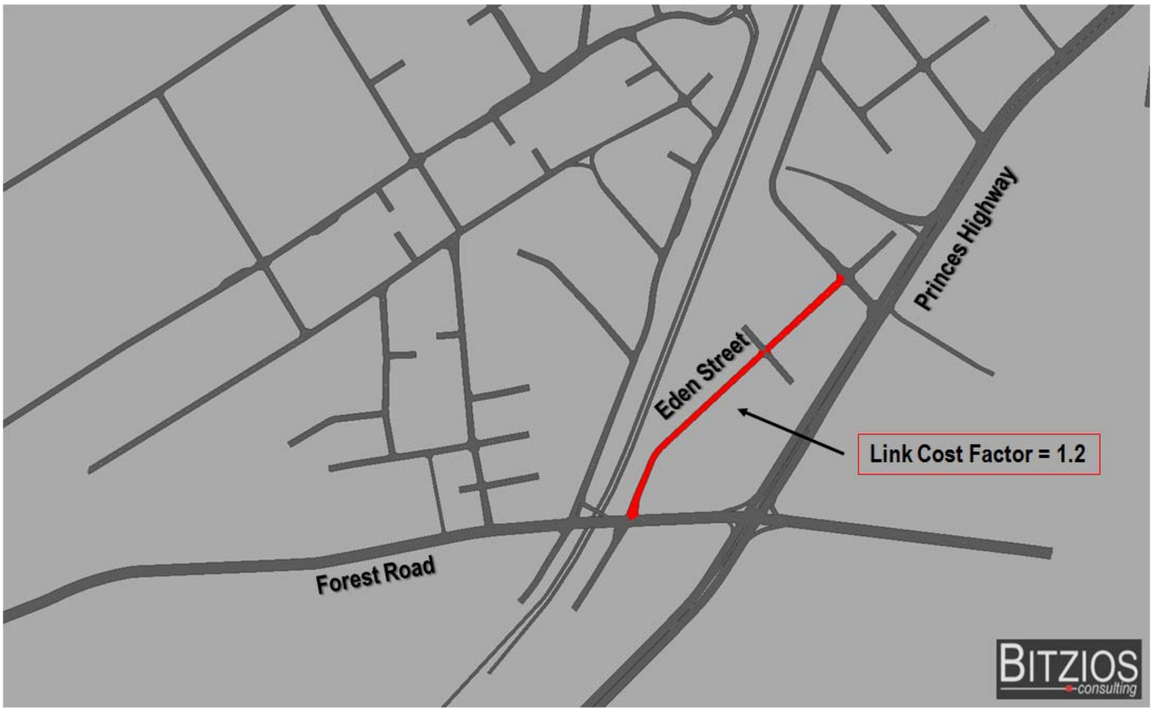


Figure 5.5: Link Cost Factor Applied to Eden Street

Wollongong Road / Allen Street Roundabout

During the base model development, it was observed that the feedback and perturbation factors applied to the model (discussed in Section 4.5) resulted in a small number of vehicles not using the left turn slip lanes provided at the Wollongong Road / Allen Street roundabout. Instead, these vehicles were actually using the roundabout lanes to turn left. While this behaviour has minimal impact in the model operation and overall performance, a cost factor of 0.1 was applied to these two slip lanes as shown in Figure 5.6 as an attempt to eliminate this issue. Since the left turn at the roundabout consists of a combination of three consecutive links, the movement can't be "banned".

The final version of the model still shows a marginal number of vehicles undertaking the movement described above but overall this is not considered to impact the results.

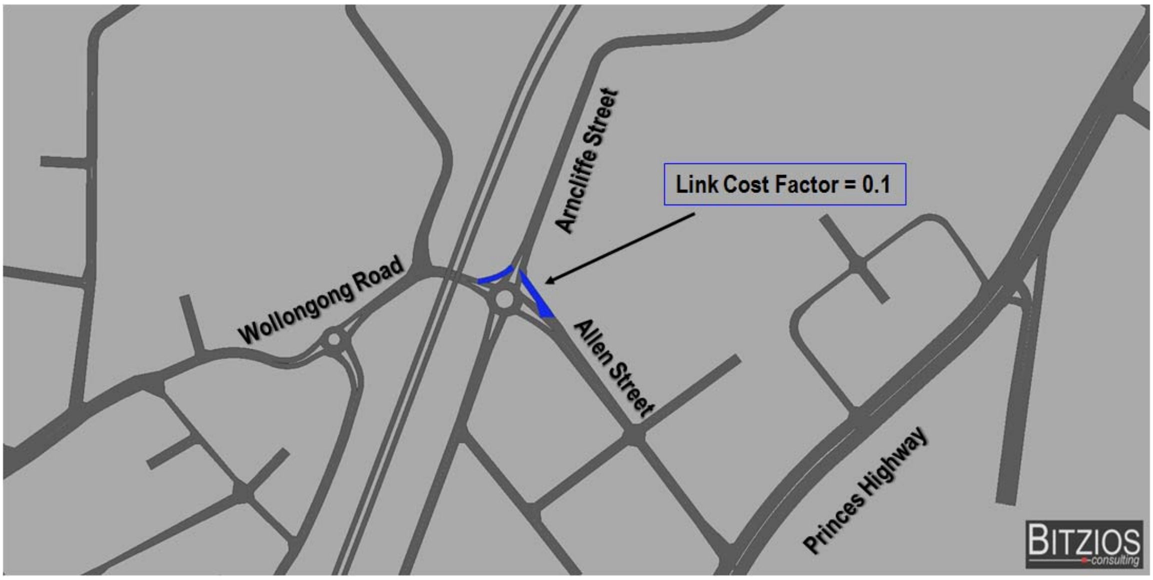


Figure 5.6: Link Cost Factor Applied the Wollongong Road / Allen Street Roundabout

5.3.3 Variable Speed Limits

As part of the site inspections and travel time surveys, it was observed that in some parts of the network the adopted speed was significantly lower than the speed limit or "posted speed" for various reasons. To ensure accuracy, all links were coded according to the respective posted speed and subsequent modifications were added to the locations where it was deemed necessary. The tool used to replicate these conditions was a series of variable speed limit (VSL) rules which allow the link speed attributes to be overwritten. The locations where this technique was adopted are described below:

Princes Highway (North of Brodie Spark Drive)

It has been observed that during the morning peak period, congestion occurring on Princes Highway northbound (north of the study area) created boundary conditions that impacted the travelling speeds and occasionally the throughput capacity of the Princes Highway / Brodie Spark Drive intersection. This was especially noted during the traffic survey due to an accident that occurred north of this intersection. It is important to note that the travel time and back of queue surveys were completed on a different day and were therefore not affected by this issue. Figure 5.7 identifies where this issue occurs and shows two examples of it – one extracted from "google street view" and the other during the traffic count survey.

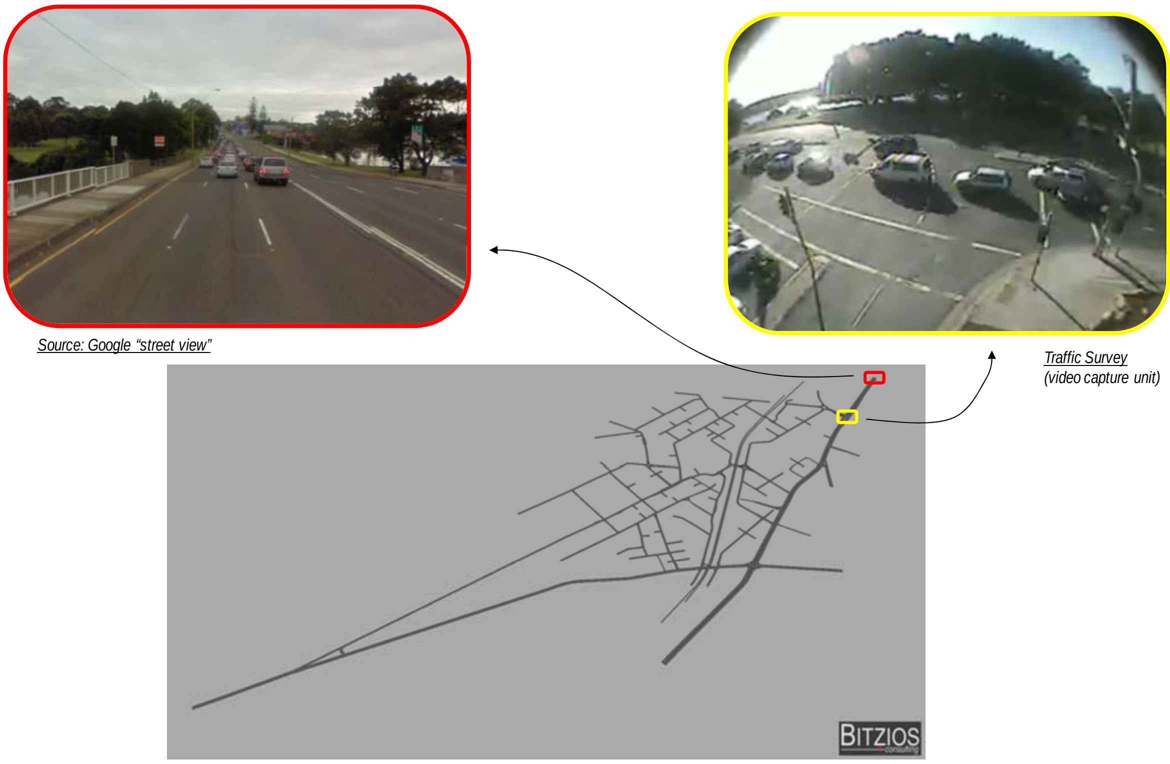


Figure 5.7: Reduced Speed on Princes Highway Northbound

This part of the network is represented by a typical "highway link" and a zone at its northern extremity that generates vehicles (southbound direction) and attracts vehicles (northbound direction). Under normal circumstances, vehicles would travel towards the zone at a speed of approximately 60km/h (posted speed). To better represent the conditions described above, a VSL route was added to this section of the model with the actual speed ranging between 15km/h and 20km/h during the morning peak only. The exact speeds applied, the periods and links selected were obtained via an iterative process until the modelled operation was a good representation of observed conditions and travel times, queue lengths and other validation indicators showed acceptable results (see Section 5.2).

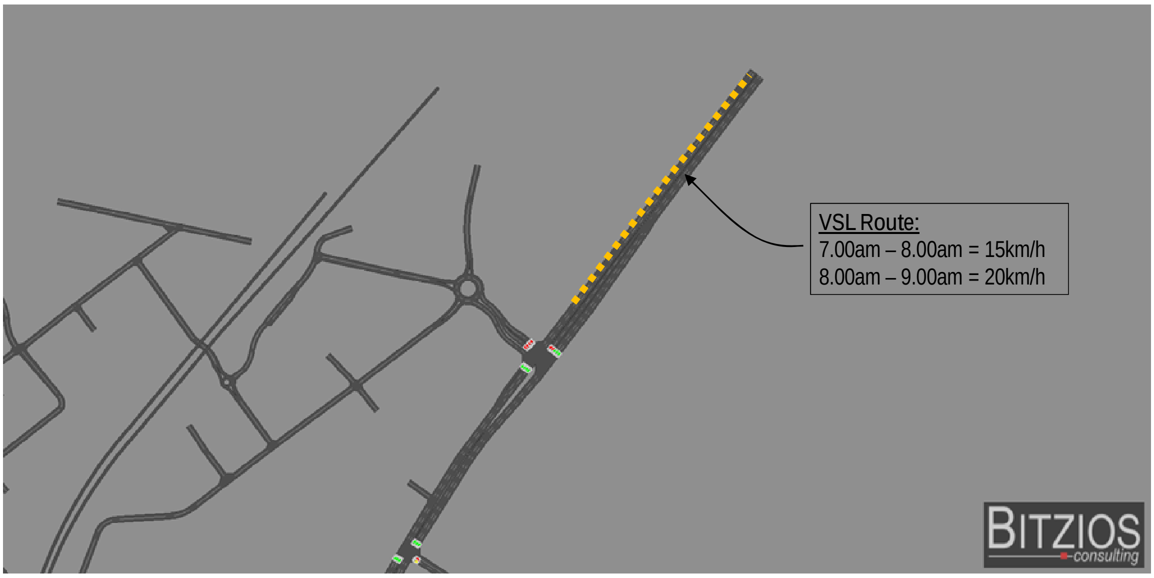


Figure 5.8: VSL Route Applied to Princes Highway Northbound

Arncliffe Street

The section of Arncliffe Street immediately south of Brodie Spark Drive has a speed limit of 50km/h. However, parking is permitted on both sides of the road and the width available for through traffic is relatively narrow, resulting in traffic generally adopting lower speeds due to frictional effects. Figure 5.9 identifies where this issue occurs.

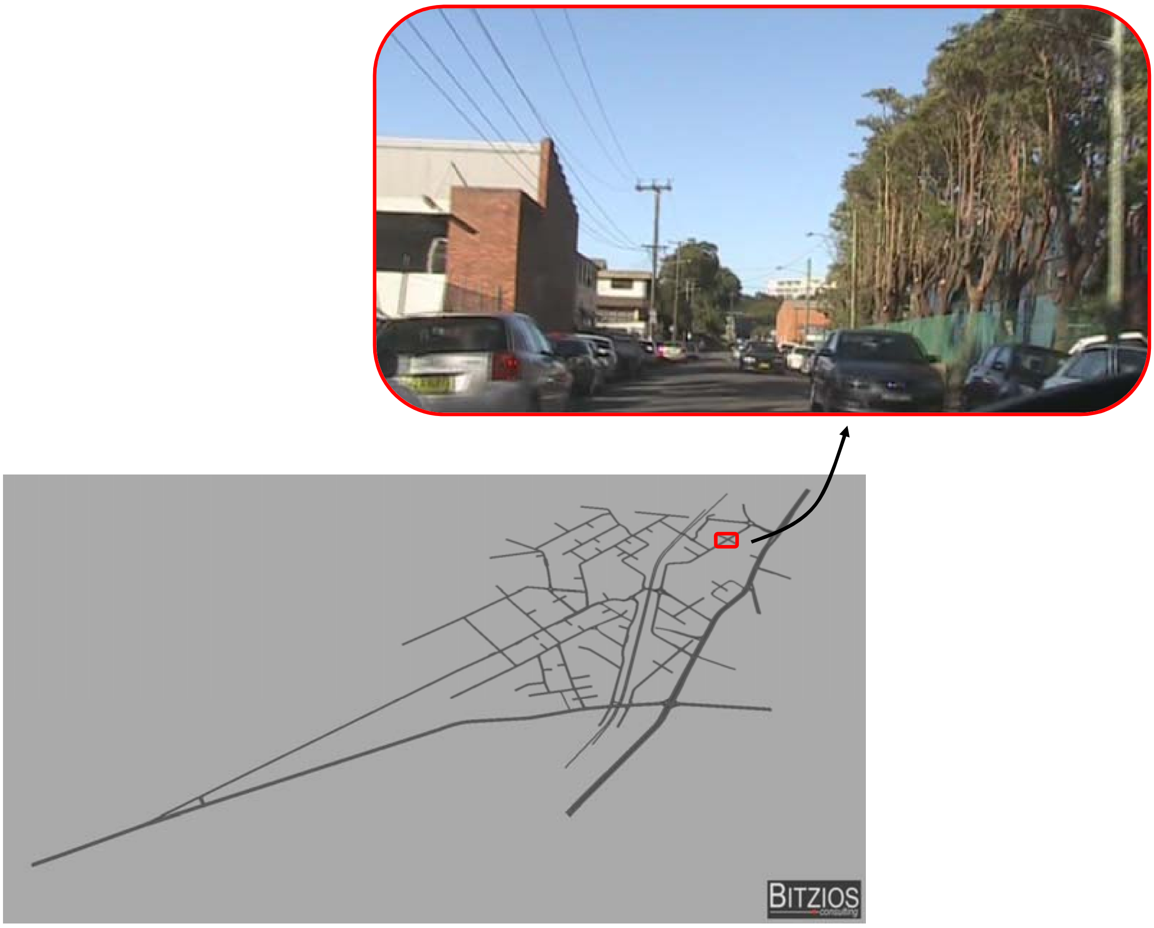


Figure 5.9: Reduced Speed on Arncliffe Street

During the validation of the base model, the travel time comparisons confirmed that a speed lower than 50km/h should be adopted along this section of the model. As such, a VSL route was added to this link converting the “target speed” to 35km/h in both directions, as shown in Figure 5.10.

Figure 5.10: VSL Route Applied to Arncliffe Street

Wollongong Road

Similarly to the conditions described for Arncliffe Street, Wollongong Road also features a section where it is logical to apply a relatively lower speed environment due to the higher impedance levels, higher parking turnover, shop frontages, etc. Figure 5.11 illustrates where the lower speed occurs (near the intersection with Kelsey Street).

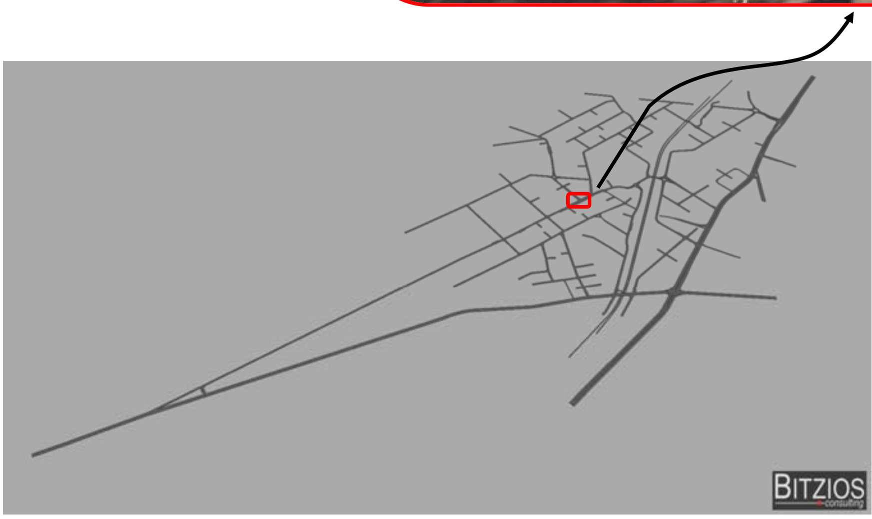


Figure 5.11: Reduced Speed on Wollongong Road

During the validation of the base model, the travel time comparisons confirmed that a speed lower than 50km/h should be adopted along this section of the model. As such, a VSL route was added to this link converting the “target speed” to 35km/h in both directions, as shown in Figure 5.12.

Figure 5.12: VSL Route Applied to Arncliffe Street

Guess Avenue, Mount Olympus Boulevard and Magdalena Terrace

The VSL rules described above resulted in more realistic conditions along the sections in which they were applied, particularly from a travel time perspective. However, they also resulted in a relatively lower attractiveness associated to those links. More specifically, a significantly larger proportion of vehicles changed the route choice from the Wollongong Road / Arncliffe Street corridor to Bonar Street / Guess Avenue. To overcome this issue and achieve consistency across all validation and calibration parameters, the target speed was also modified on Guess Avenue, Mount Olympus Boulevard and Magdalena Terrace, as shown below.

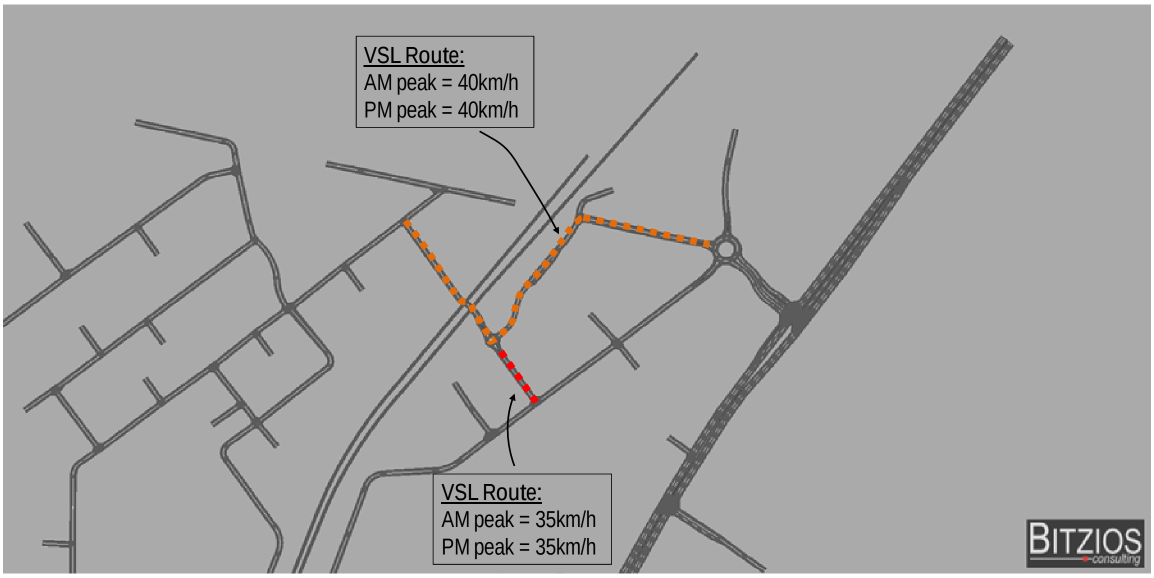


Figure 5.13: VSL Route Applied to Guess Ave, Mount Olympus Blvd and Magdalena Tce

It must be noted that this speed reduction does not result in unrealistic traffic conditions on this part of the network since the typical speeds rarely exceed 40km/h.

5.3.4 Turn Penalties

Turn penalties are typically avoided unless specific network conditions (such as zone placement) justify its use and/or validation statistics dictate that they must added. Three turn penalties were added to the base model with the respective details and justification discussed below.

Forest Road / Princes Highway

During the model validation, it was found that the Forest Road (eastbound) and Princes Highway (northbound) route was excessively attractive when compared to Wollongong Road / Arncliffe Street. All comparisons indicated that despite the congestion observed along Forest Road, the left turn volumes from Forest Road onto Princes Highway were excessive. The route choice comparisons confirmed this scenario. To overcome this problem and ensure that the model reflects real conditions, a turn penalty of 10 secs was applied to all vehicles (familiar and unfamiliar).

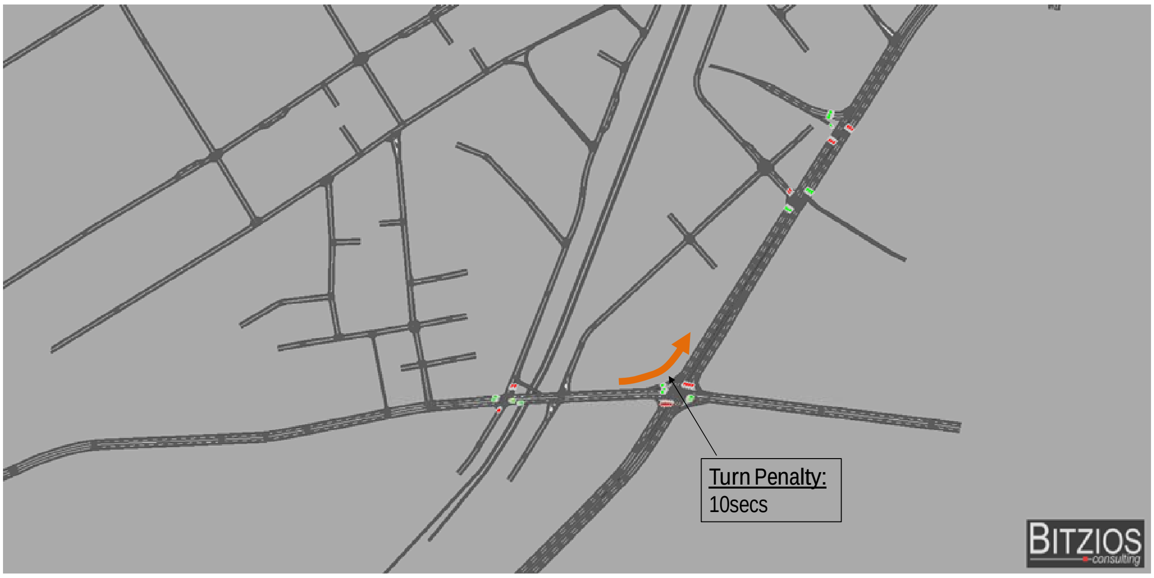


Figure 5.14: Turn Penalty on Forest Road / Princes Highway

This solution was adopted since all alternative tools would have greater influence on other trips and other validation parameters.

Allen Street / Princes Highway

The site inspections and surveys clearly indicated that Wollongong Road / Arncliffe Street correspond to the preferred alternative to Forest Road / Princes Highway for northbound traffic. However, the model initially showed a negligible number of vehicles adopting that route choice. In fact, the vast majority of vehicles diverting from Forest Road onto Wollongong Road preferred to continue on to Allen Street and then turn left to Princes Highway. To eliminate this unrealistic proportion and route choice, a turn penalty of 25 secs was applied to all vehicles (familiar and unfamiliar).

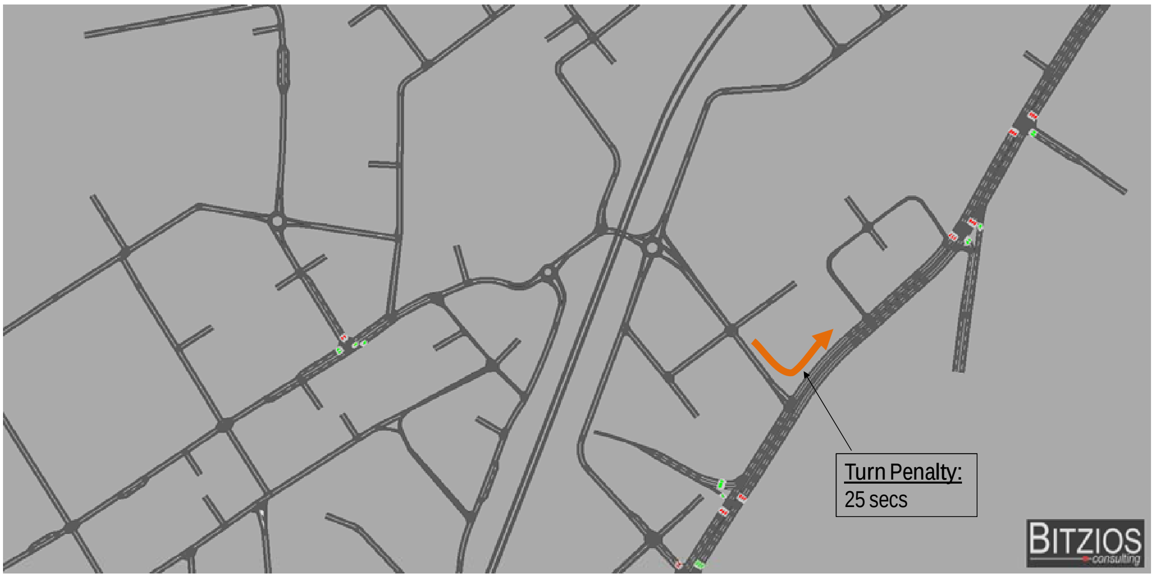


Figure 5.15: Turn Penalty on Allen Street / Princes Highway

This behaviour difference between the model and real conditions is possibly related to the following factors:

- The left turn from Allen Street onto Princes Highway is not signalised and the number of gaps in through traffic can be insufficient at times;
- The left turn from Allen Street onto Princes Highway features a relatively narrow cross section and tight radius; and
- Vehicles adopting this route choice must travel "southeast" before turning left and continue their northbound trip creating the perception of a longer route or "travelling back to go forward".

Monk Avenue / Bonar Street

Due to the zone system adopted, the model featured insufficient vehicles turning right from Thompson Street onto Bonar Street since the majority of vehicles decided to use Monk Avenue instead. This is only a localised issue with no influence whatsoever in the model performance, route choice, etc. However, the intersection of Thompson Street / Bonar Street was part of the list included in the calibration of the model and the elimination of this inconsistency was therefore required. The use of cost factors on Monk Avenue were an alternative possibility to deal with this issue but due to the short length to which the factor could be applied, the turn penalty provides a more effective result.

Figure 5.16: Turn Penalty on Monk Avenue / Bonar Street

5.4 MODEL STABILITY

A good way to assess the stability of a model that uses multiple seed values is to compare the number of vehicles on the network during the modelled period for the different seed values. As shown in Figures 5.17 and 5.18, the total number of vehicles within the modelled area does not vary substantially for different seed values.

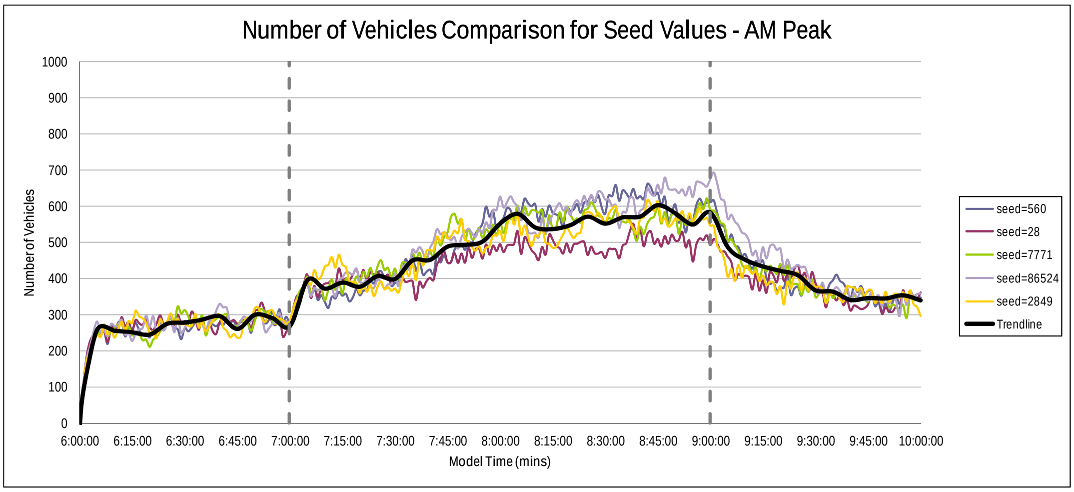


Figure 5.17: Number of Vehicles in the Modelled Area (AM Peak)

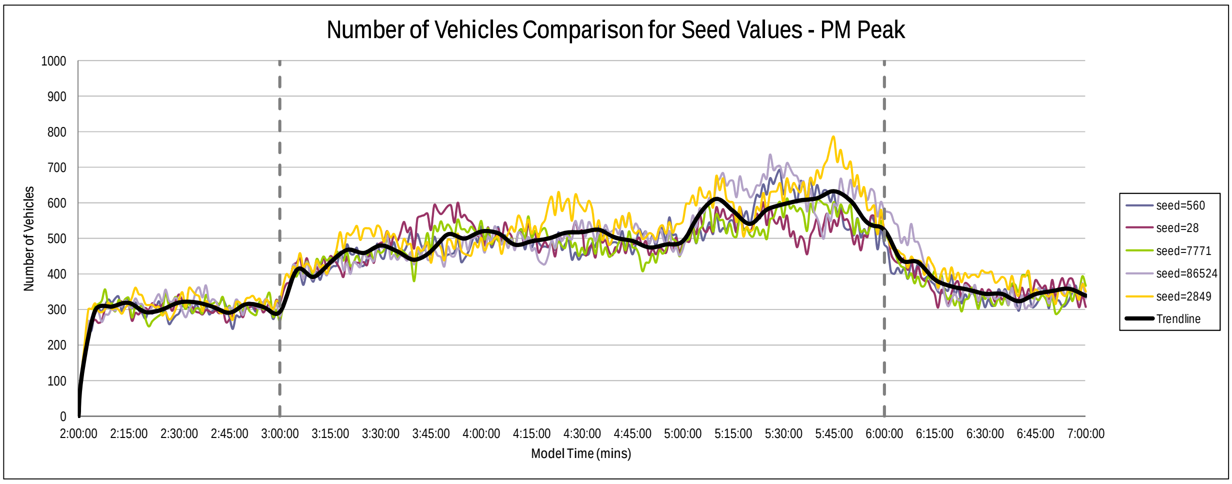


Figure 5.18: Number of Vehicles in the Modelled Area (PM Peak)

6. CONCLUSION

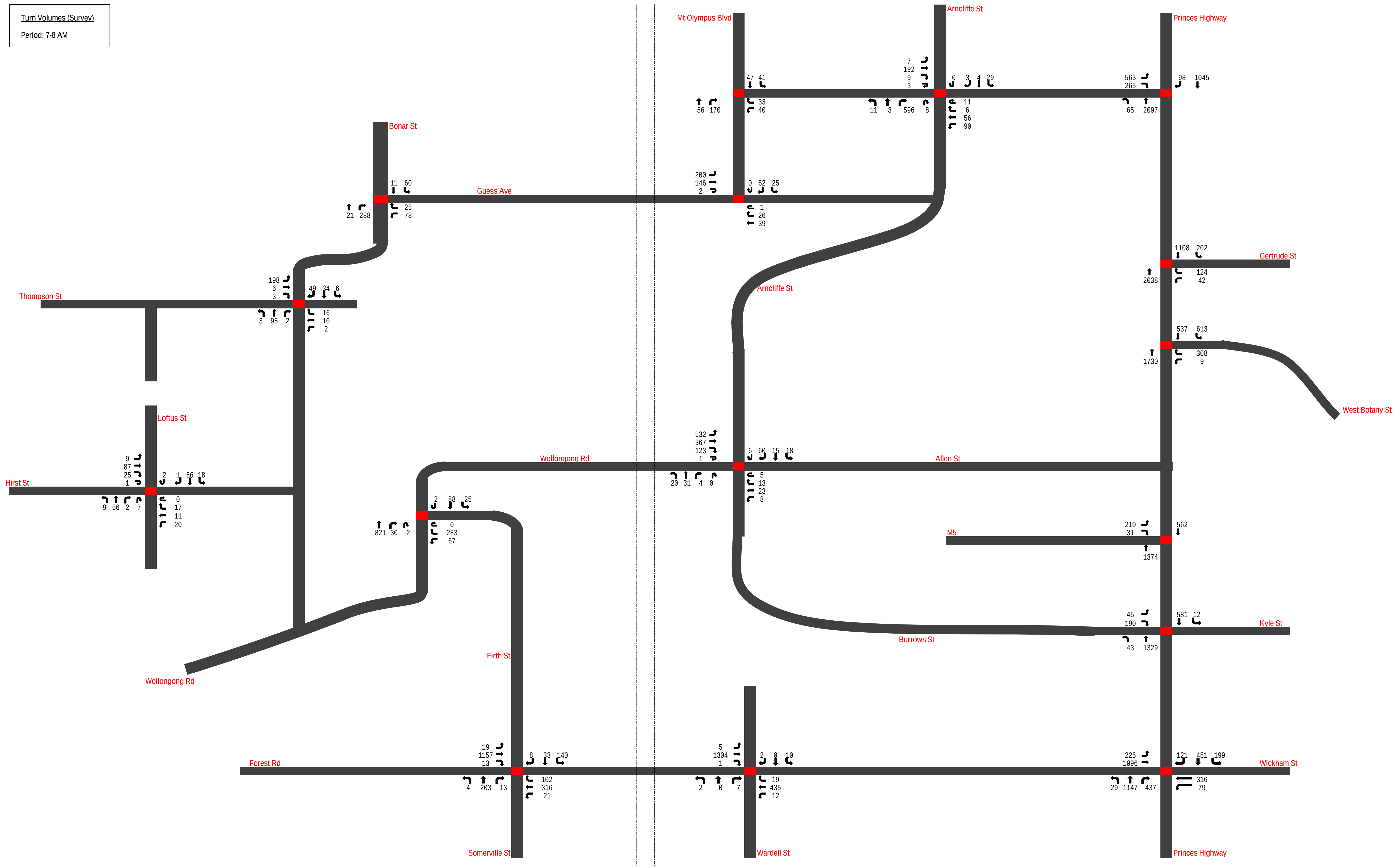
Paramics models for the AM and PM peak periods have been calibrated to meet the requirements established in the RMS's Microsimulation Modelling Manual. Some of travel time validation routes fall outside the maximum/ minimum criteria however these differences can be accounted for by the limitations in the models as discussed previously. Both models correspond to a realistic representation of real network operation.

The extensive model improvement measures and iterations adopted allowed both models to feature high stability and robustness levels, as shown by the outputs extracted for multiple periods and multiple seed values.

The model is deemed suitable for the purpose of testing alternative network configuration options and future traffic demands associated with future development in the study area and forecast background traffic modifications.

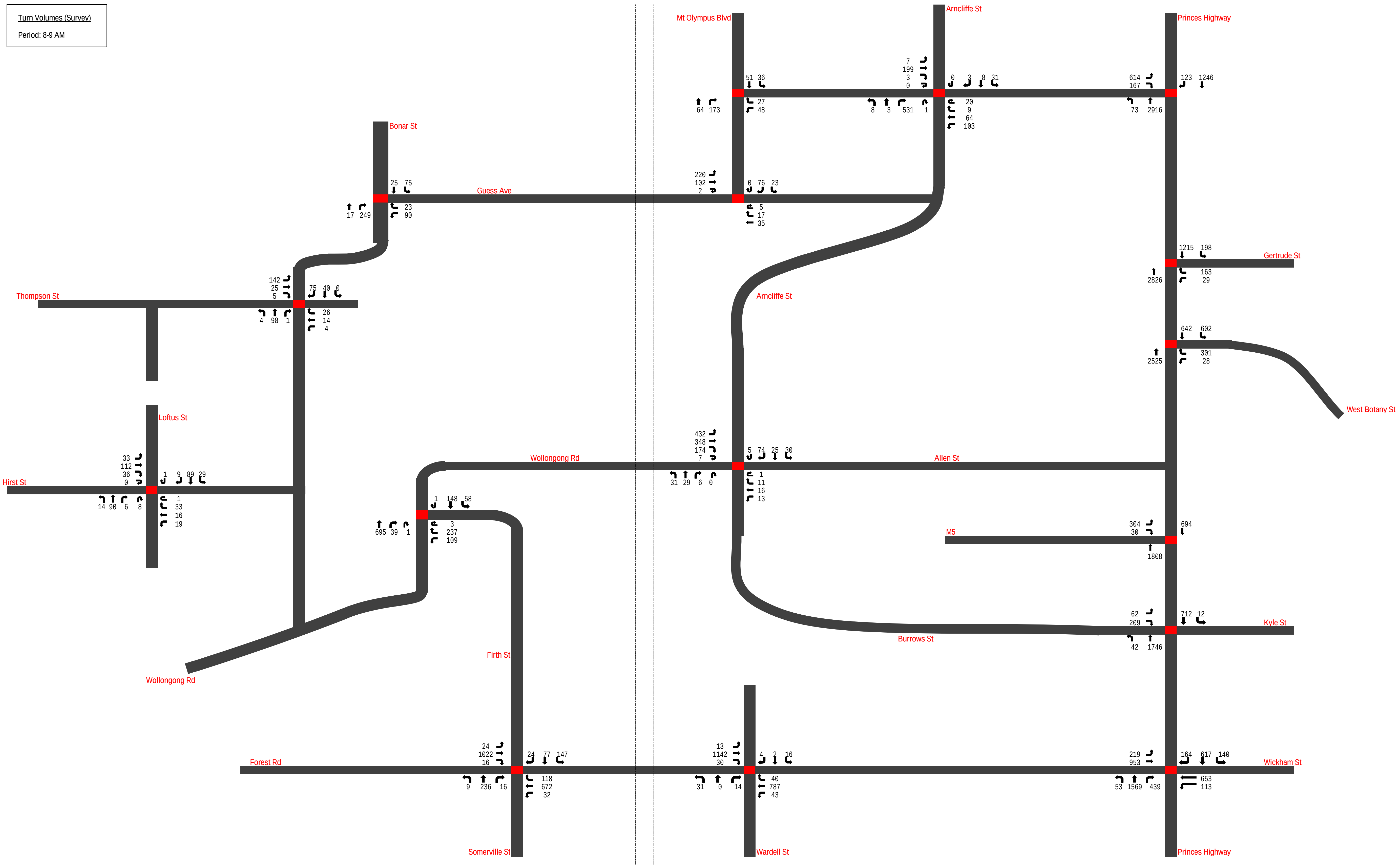
APPENDIX A

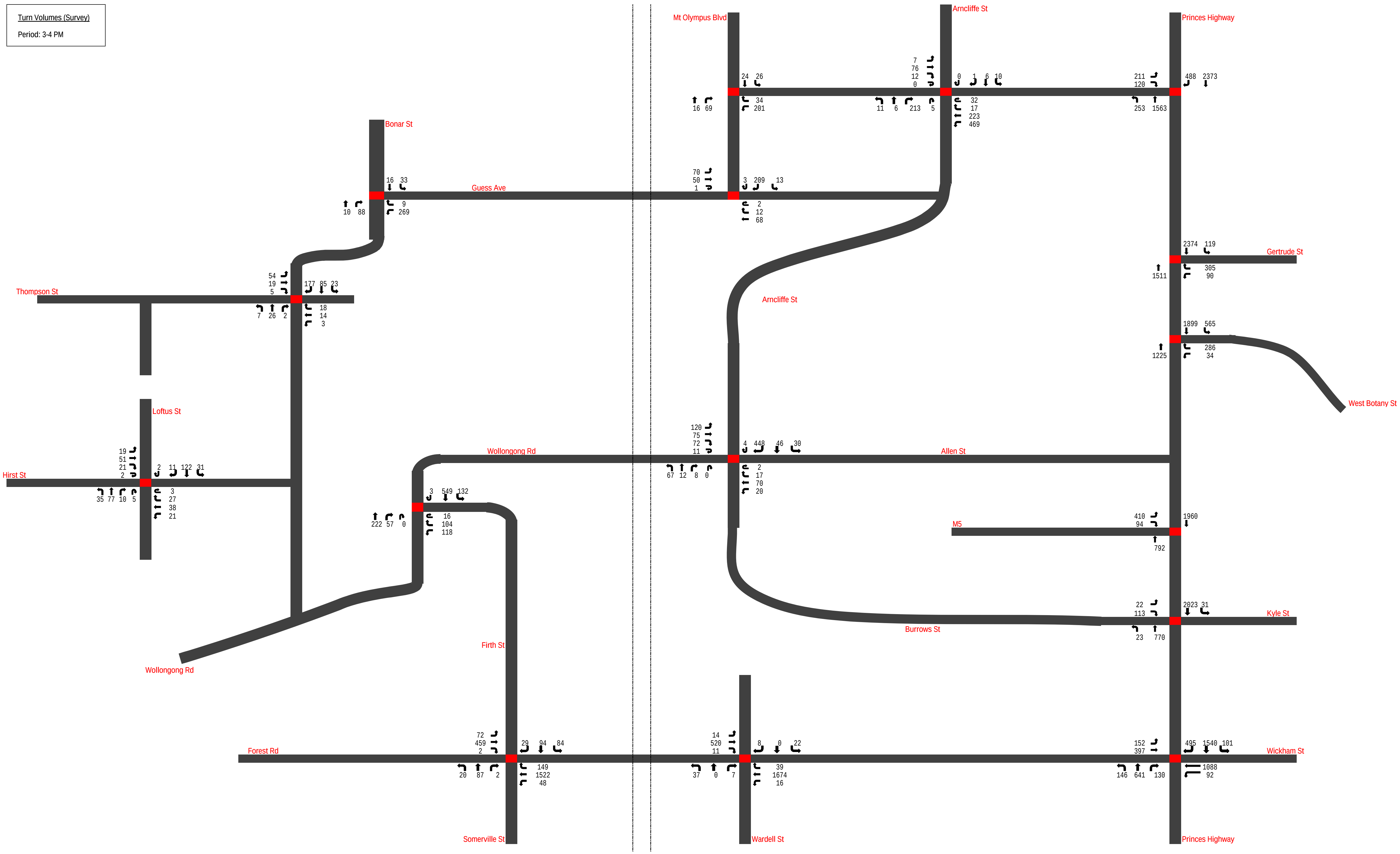
TURN VOLUMES


Turn Volumes (Survey)
Period: 7-8 AM
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Gertrude St
Thompson St
Arncliffe St
West Botany St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

Turn Volumes (Survey)

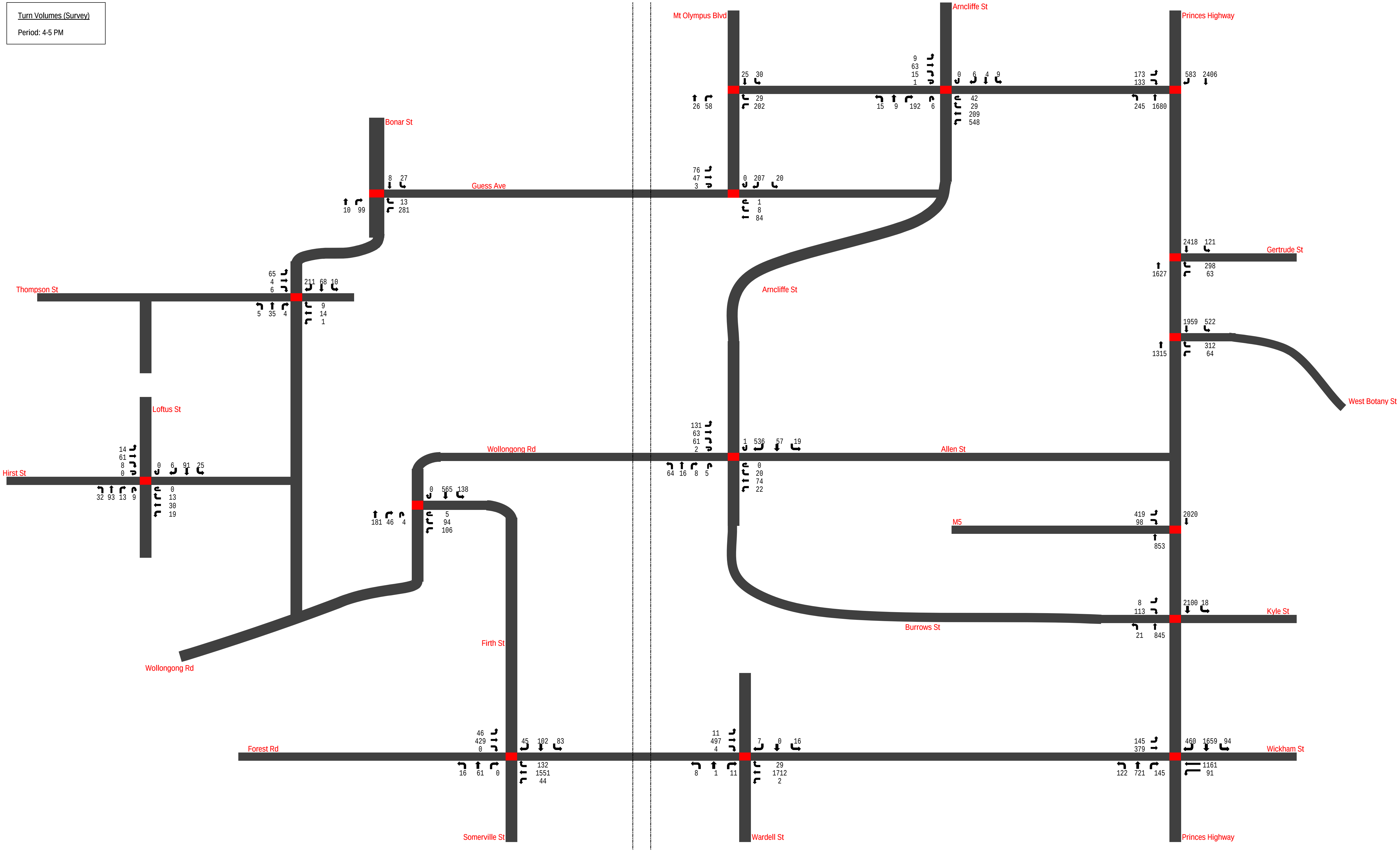
Period: 8-9 AM

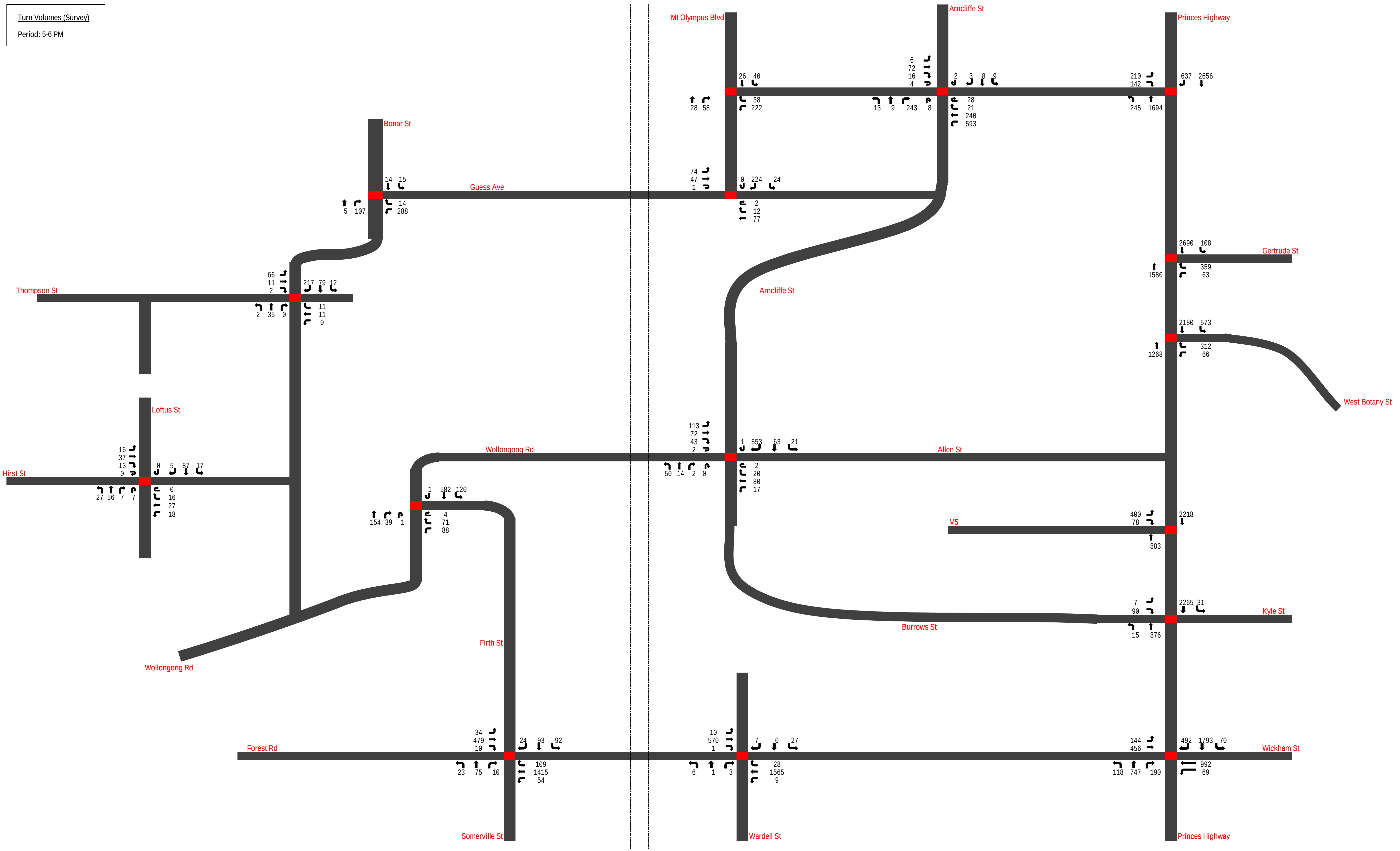



Turn Volumes (Survey)
Period: 3-4 PM
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Gertrude St
Thompson St
Arncliffe St
West Botany St
Loftus St
Wollongong Rd
Allen St
Hirst St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

Turn Volumes (Survey)

Period: 4-5 PM




Turn Volumes (Survey)
Period: 5-6 PM
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Thompson St
Gertrude St
Arncliffe St
West Botany St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

APPENDIX B

SURVEY REPORTS

Wolli Creek Traffic Surveys Report
For
Bitzios Consulting

Prepared by Traffic Data & Control

Document Control Sheet

Issue History

Report Number	Prepared by	Reviewed by	Issued by	Date
T0245.01	Cooper Brooke	Fred Stone	Fred Stone	8/11/12
T0245.02	Cooper Brooke	Deborah Mannion	Deborah Mannion	12/11/12
T0245.03	Deborah Mannion	Steve Brooke	Deborah Mannion	16/11/12
T0245.04	Deborah Mannion	Steve Brooke	Deborah Mannion	21/11/12

CONTENTS

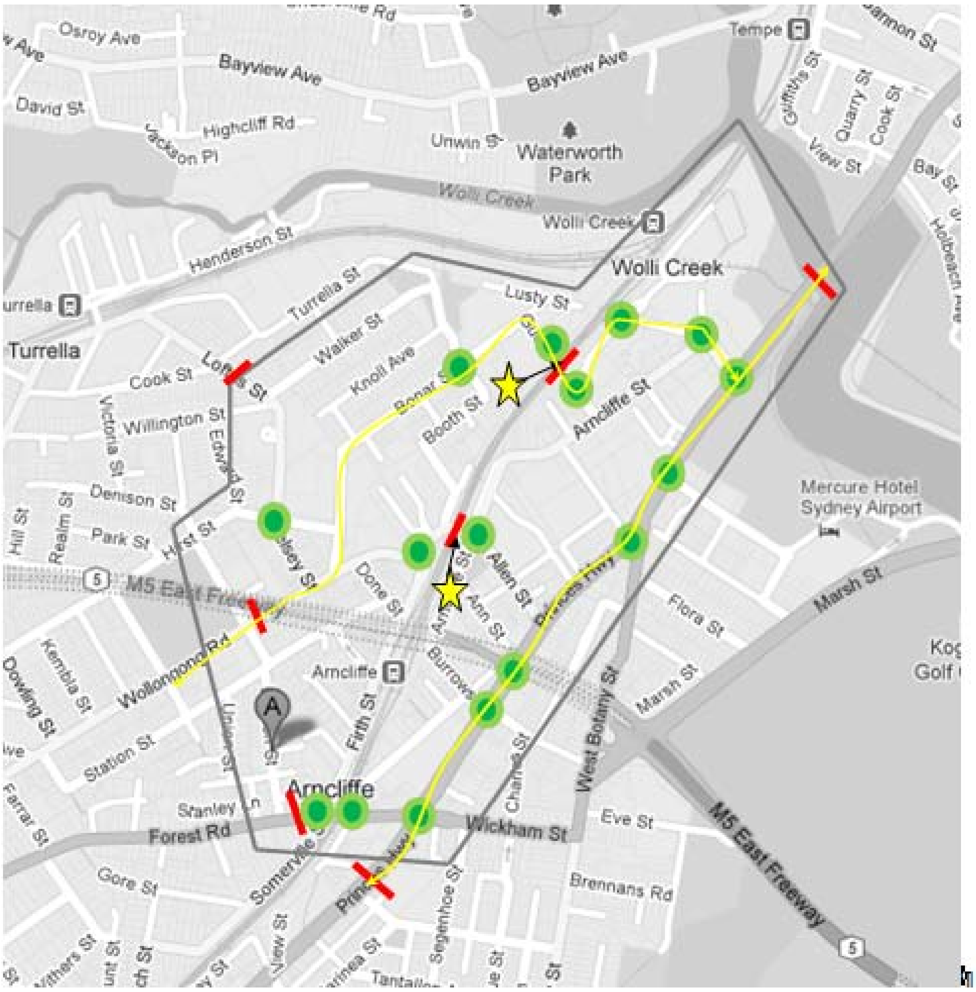
1. Survey Details

Traffic Data and Control (TDC) was commissioned by Bitzios Consulting to undertake traffic surveys in Wolli Creek, New South Wales. The surveys were undertaken over two days - Wednesday 17th and Thursday 18th of October 2012, and included:

- Intersection Counts (16 locations);
- Travel Time Surveys (2 routes); and
- Origin Destination Surveys (7 locations).

Pedestrian Interview surveys were also undertaken by Austraffic for the traffic study. These will be reported separately.

Below is the site map for all surveys;



Morning peak = 0700-0900 | Afternoon Peak = 1500-1800

Numberplate (O-D Survey) + control count where not adjacent to intersection count

Traffic count (pedestrians, cyclists, Buses, AV, RV, Cars/Motorcycles)

Pedestrian interviews (origin, destination, trip purpose, age, gender, safety questions, 2 persons per site)

Travel time survey

2. INTERSECTION COUNTS

The intersections surveys we undertaken using high-mast Video Collection Units (VCU's), with automatic post survey processing.

Sixteen intersections were surveyed as listed below. The surveys were undertaken for a two hour morning peak period (7:00am to 9:00am) and a three hour evening peak period (3:00pm to 6:00pm) on the days listed in the table below. Detailed intersection count reports are presented Appendix A

Site	Location	Survey Date
1	Hirst St & Loftus St/ Kelsey St	Thursday 18th October, 2012
2	Forest Rd & Firth St/ Somerville St	Wednesday 17th October, 2012
3	Forest Rd & Wardell St	Wednesday 17th October, 2012
4	Princes H'way & Forest Rd/ Wickham St	Wednesday 17th October, 2012
5	Princes H'way & Burrows St/ Kyle St	Wednesday 17th October, 2012
6	Princes H'way & M5 East Freeway	Wednesday 17th October, 2012
7[1]	Princes H'way & West Botany St	Wednesday 17th October, 2012[1]
8	Princes H'way & Gertrude St	Wednesday 17th October, 2012
9	Princes H'way & Brodie Spark Dr	Wednesday 17th October, 2012
10	Brodie Spark Dr & Arncliffe St	Thursday 18th October, 2012
11	Magdalene Tce & Mount Olympus Bvd	Thursday 18th October, 2012
12	Mount Olympus Bvd & Guess Ave	Thursday 18th October, 2012
13	Guess Ave & Bonar St	Thursday 18th October, 2012
14	Bonar St & Thompson St	Thursday 18th October, 2012
15	Arncliffe St & Wollongong Rd/ Allen St	Thursday 18th October, 2012
16	Wollongong Rd & Firth St	Thursday 18th October, 2012

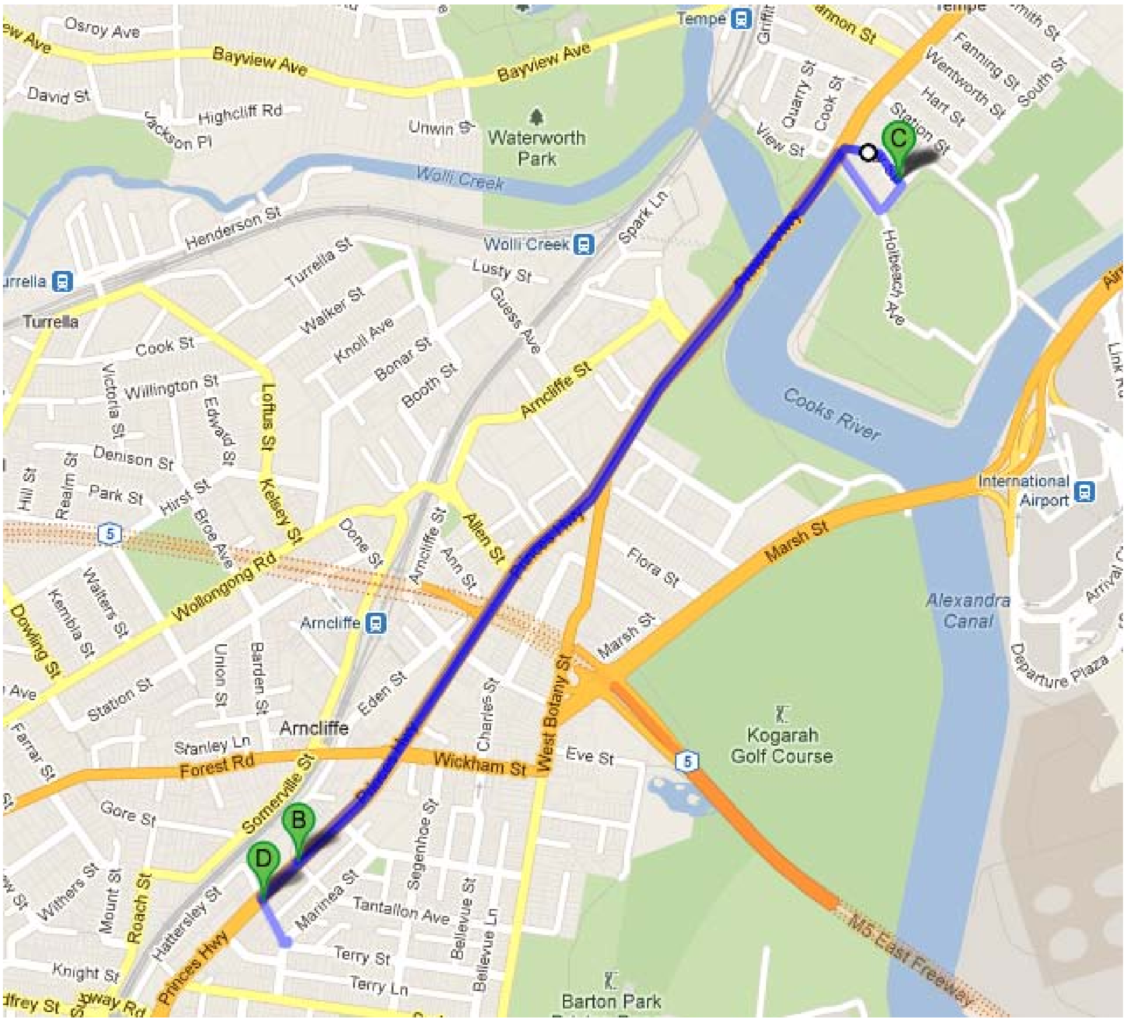
1. Analysis of the video data for the Princess Highway/West Botany Street intersection showed that the video camera was tampered with sometime between the end of the AM survey and the start of the PM survey. This resulted in a slight movement of the camera angle such that the left turn movement from West Botany Street was out of camera range. A manual survey of the left turn movement was subsequently undertaken on Thursday 15th November 2012.

3. TRAVEL TIME SURVEY

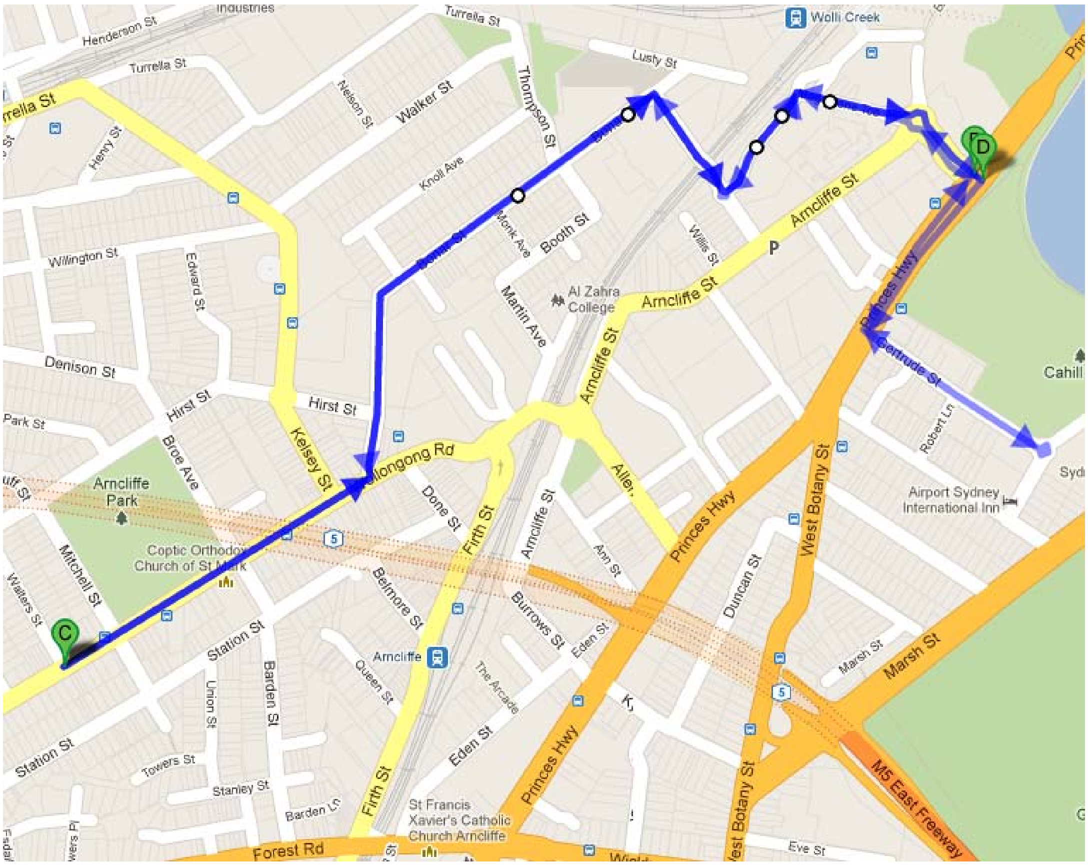
The travel time survey consisted of two separate bidirectional routes. The surveys were undertaken using the floating car method which simulates a car travelling at the same speed as the general traffic. Two vehicles were used to record continuous trips during the AM/PM peak periods of 7:00am to 9:00am and 3:00pm to 6:00pm on Wednesday, 17th October.

Below is map of both travel time routes.

Wolli Creek Travel Time Survey Route - ROUTE 1



Wolli Creek Travel Time Survey Route - ROUTE 2



It should be noted that the travel time runs in the AM shift, Route 1 experienced delays in the northbound direction (city direction) due to an incident closer to the city. In the PM shift the first two runs were impeded by an accident on the corner of Princes Hwy & Terry St.

The travel time GPS data was analysed using Trav Time 2.0 with the routes divided into predefined sections based on key intersection (or waypoints).

Below is a sample heading of the Trav Time 2.0 Report;

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 04/04 1 7:19	Wed 04/04 2 7:46	Wed 04/04 3 7:54	Wed 04/04 4 8:29	Average Travel Time	Average Speed (km/hr)
				Saturday					
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Falconer St	140	60	0:08	00:10	00:47	00:10	00:16	00:21	24.29

The following is a description of each column of the report:

- End point (Falconer St) – End point of each checkpoint segment
- Length – How long from start to finish of this section in metres (140m)
- Limit – Posted speed limit
- Nom. Time – Projected time to complete segment based on the sign posted speed limit
- Wed 04/04 – 1 – 7:19 – Date of run- run number – start of run (7:19am)

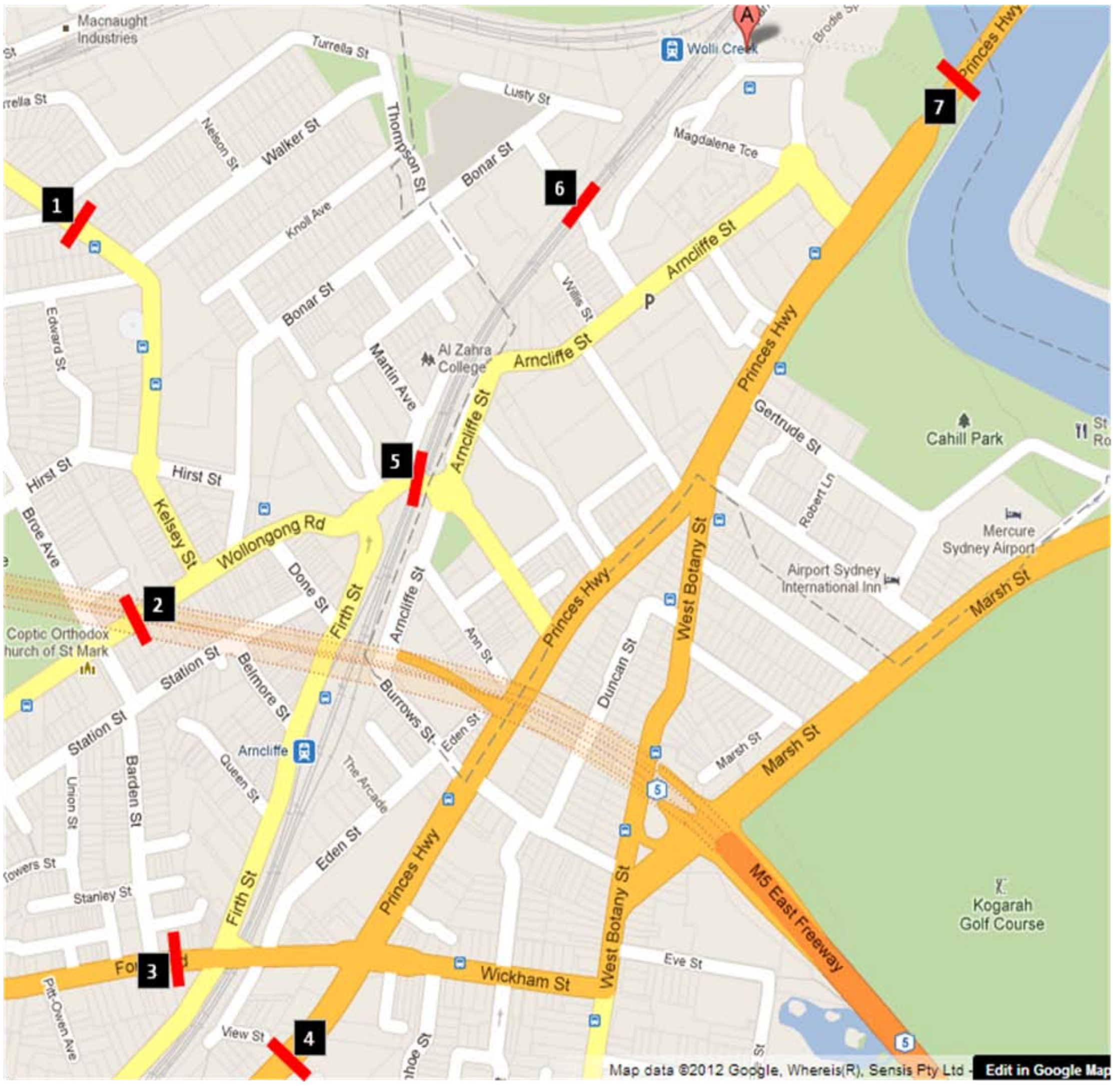
- Average Travel Time – Adds the time taken over all runs for this section and divides by the number of runs
- Average Speed - Adds the average speed per run and divides by the number of runs.
- At the bottom of each run is the total time it took to complete the run.

The Travel Time Report can be found in Appendix B

4. ORIGIN-DESTINATION

The Origin-Destination Survey consisted of seven (7) base sites, surveyed manually by direction and by lane on Thursday 18th of October, 2012. A surveyor was allocated to a single lane and recorded the first four characters of every number plate via a digital audio recorder.

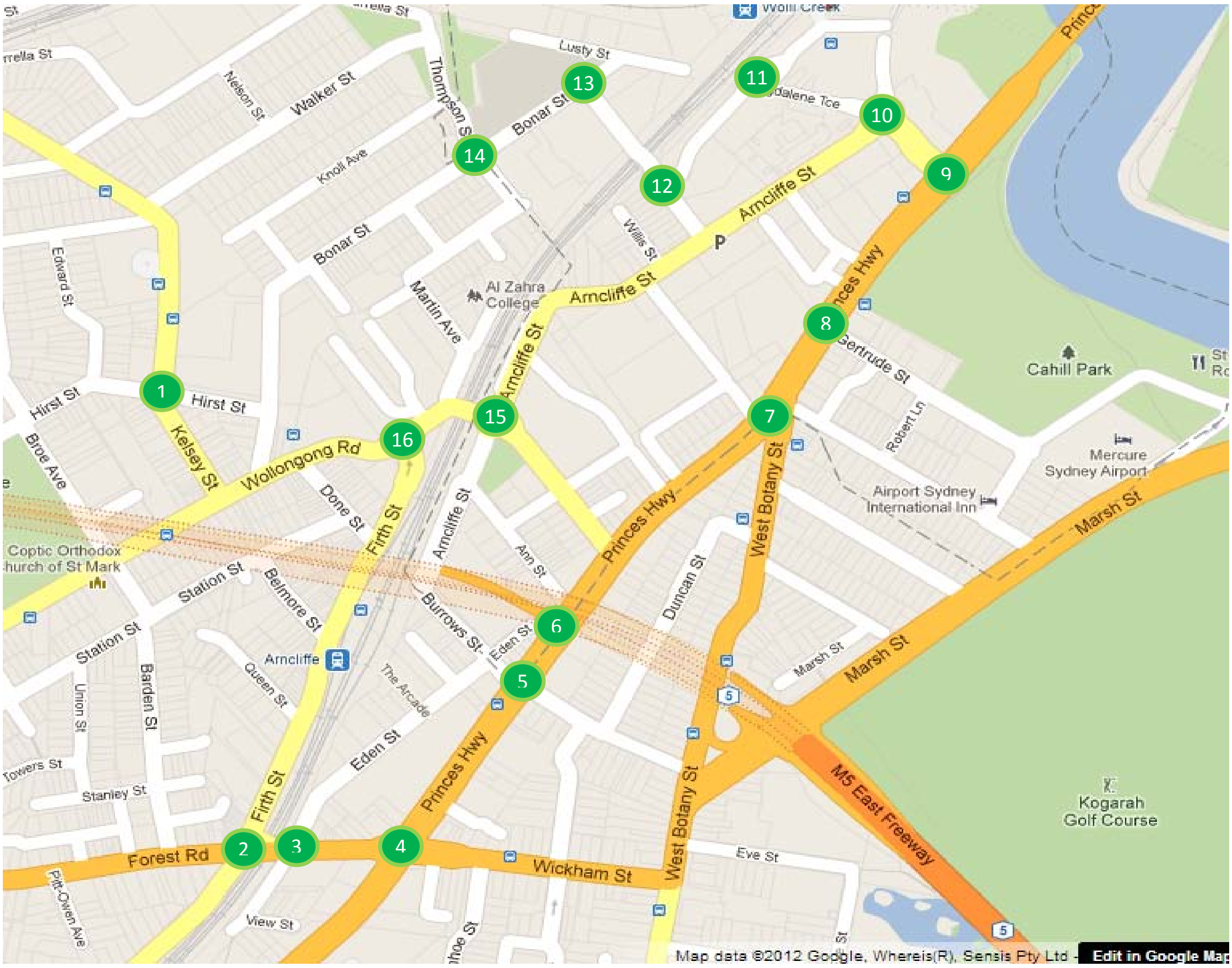
A total of 26 surveyors were used over the seven (7) sites. The survey locations are shown below.



All sites were surveyed at 15 minutes intervals in the hours of 7:00am – 9:00am & 3:00pm – 6:00pm. Raw data was inputted into a plate matching matrix.

The Origin-Destination Report can be found in Appendix C.

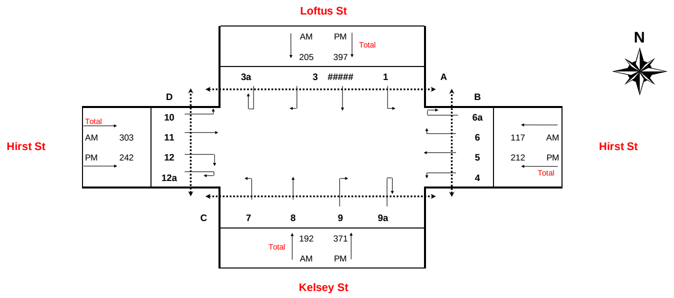
Appendix A
Intersection Counts



Site No.	Type	Location	Survey Date
1	VCU	Hirst St & Loftus St/ Kelsey St, Arncliffe	Thursday 18th October, 2012
2	VCU	Forest Rd & Firth St/ Somerville St, Arncliffe	Wednesday 17th October, 2012
3	VCU	Forest Rd & Wardell St, Arncliffe	Wednesday 17th October, 2012
4	VCU	Princes H'way & Forest Rd/ Wickham St, Arncliffe	Wednesday 17th October, 2012
5	VCU	Princes H'way & Burrows St/ Kyle St, Wolli Creek	Wednesday 17th October, 2012
6	VCU	Princes H'way & M5 East Freeway, Arncliffe	Wednesday 17th October, 2012
7	VCU	Princes H'way & West Botany St, Wolli Creek	Wednesday 17th October, 2012
8	VCU	Princes H'way & Gertrude St, Wolli Creek	Wednesday 17th October, 2012
9	VCU	Princes H'way & Brodie Spark Dr, Wolli Creek	Wednesday 17th October, 2012
10	VCU	Brodie Spark Dr & Arncliffe St, Wolli Creek	Thursday 18th October, 2012
11	VCU	Magdalene Tce & Mount Olympus Bvd, Wolli Creek	Thursday 18th October, 2012
12	VCU	Mount Olympus Bvd & Guess Ave, Wolli Creek	Thursday 18th October, 2012
13	VCU	Guess Ave & Bonar St, Wolli Creek	Thursday 18th October, 2012
14	VCU	Bonar St & Thompson St, Arncliffe	Thursday 18th October, 2012
15	VCU	Arncliffe St & Wollongong Rd/ Allen St, Arncliffe	Thursday 18th October, 2012
16	VCU	Wollongong Rd & Firth St, Arncliffe	Thursday 18th October, 2012

TDC Traffic Data & Control

Site ID: 1
Location: Hirst St & Loftus St
Weather: Fine
Suburb: Arncliffe
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Thursday, 18 October 2012
AM Peak 09:00 (hour ending)
PM Peak 16:00 (hour ending)
Traffic Control: Roundabout
HOME



Loftus St (Southbound)

TIME		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	6	3	0	0	0	4	3	0	1	0	0	0	0	0	0	0	0	0	0	0
2	7:30 AM	2	0	0	0	0	6	1	0	1	0	0	0	0	0	0	0	1	0	0	0
3	7:45 AM	4	0	0	0	0	12	2	0	6	0	1	0	0	0	0	0	1	0	0	0
4	8:00 AM	3	0	0	0	0	14	2	2	2	0	0	0	0	0	0	0	0	0	0	0
5	8:15 AM	8	1	0	0	0	19	3	0	1	0	0	0	0	0	0	0	0	0	0	0
6	8:30 AM	4	1	0	0	0	18	2	1	1	0	3	0	0	0	0	1	0	0	0	0
7	8:45 AM	9	0	0	0	0	12	3	1	1	0	1	0	0	0	0	0	0	0	0	0
8	9:00 AM	6	0	0	0	0	21	4	1	1	0	5	0	0	0	0	0	0	0	0	0
2HR Total		42	5	0	0	0	106	20	5	14	0	10	0	0	0	0	1	2	0	0	0
Peak Hour Total		27	2	0	0	0	70	12	3	4	0	9	0	0	0	0	1	0	0	0	0

Hirst St (Westbound)

TIME		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	6	0	0	0	0	1	1	0	0	0	5	0	0	0	0	0	0	0	0	0
2	7:30 AM	6	0	0	0	0	4	0	0	0	0	1	1	0	0	0	0	0	0	0	0
3	7:45 AM	4	2	1	0	0	4	0	0	0	0	6	0	0	0	0	0	0	0	0	0
4	8:00 AM	1	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0
5	8:15 AM	6	0	0	0	0	3	0	0	0	0	11	0	0	0	0	1	0	0	0	0
6	8:30 AM	5	0	0	0	0	4	0	0	0	0	6	0	0	0	0	0	0	0	0	0
7	8:45 AM	4	0	0	0	0	2	0	0	0	0	7	0	0	0	0	0	0	0	0	0
8	9:00 AM	4	0	0	0	0	7	0	0	0	0	9	0	0	0	0	0	0	0	0	0
2HR Total		36	2	1	0	0	26	1	0	0	0	49	1	0	0	0	1	0	0	0	0
Peak Hour Total		19	0	0	0	0	16	0	0	0	0	33	0	0	0	0	1	0	0	0	0

Kelsey St (Northbound)

TIME		Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	1	1	0	0	0	10	2	1	1	0	0	2	0	0	0	3	0	0	0	0
2	7:30 AM	2	0	0	0	0	13	1	1	0	0	0	0	0	0	0	2	0	0	0	0
3	7:45 AM	0	0	0	0	0	7	1	1	1	0	0	0	0	0	0	1	0	0	0	0
4	8:00 AM	5	0	0	0	0	17	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5	8:15 AM	4	0	0	0	0	15	1	0	0	0	3	0	0	0	0	0	0	0	0	0
6	8:30 AM	3	1	0	0	0	23	2	1	1	0	0	0	0	0	0	2	0	0	0	0
7	8:45 AM	4	0	0	0	0	19	2	1	1	0	1	1	0	0	0	0	0	0	0	0
8	9:00 AM	2	0	0	0	0	21	1	2	0	0	1	0	0	0	0	6	0	0	0	0
2HR Total		21	2	0	0	0	125	10	7	4	0	5	3	0	0	0	15	0	0	0	0
Peak Hour Total		13	1	0	0	0	78	6	4	2	0	5	1	0	0	0	8	0	0	0	0

Hirst St (Eastbound) / **Pedestrians**

TIME		Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South	West
1	7:15 AM	2	0	0	0	0	9	1	0	0	1	6	0	0	0	0	0	0	0	0	0	0	2	1	2
2	7:30 AM	1	0	0	0	0	19	0	0	0	2	1	0	0	0	0	1	0	0	0	0	1	5	2	2
3	7:45 AM	2	1	0	0	0	26	1	0	0	1	11	0	0	0	0	0	0	0	0	0	0	5	1	0
4	8:00 AM	3	0	0	0	0	25	1	0	0	1	7	0	0	0	0	0	0	0	0	0	2	6	1	0
5	8:15 AM	4	0	0	0	0	20	0	0	0	3	8	0	0	0	0	0	0	0	0	0	2	16	7	1
6	8:30 AM	9	0	0	0	0	33	0	0	0	1	11	0	0	0	0	0	0	0	0	0	3	11	2	0
7	8:45 AM	11	0	0	0	0	23	2	0	0	2	9	0	0	0	0	0	0	0	0	0	0	12	0	0
8	9:00 AM	9	0	0	0	0	28	0	0	0	0	8	0	0	0	0	0	0	0	0	0	1	10	3	0
2HR Total		41	1	0	0	0	183	5	0	0	11	61	0	0	0	0	1	0	0	0	0	9	67	17	5
Peak Hour Total		33	0	0	0	0	104	2	0	0	6	36	0	0	0	0	0	0	0	0	0	6	49	12	1

Loftus St (Southbound)

TIME		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	10	0	0	0	0	26	2	1	2	0	4	0	0	0	0	2	0	0	0	0
2	3:30 PM	7	0	0	0	0	19	1	0	0	0	0	0	0	0	0	0	0	0	0	0
3	3:45 PM	10	0	0	0	0	36	0	1	2	0	7	0	0	0	0	0	0	0	0	0
4	4:00 PM	4	0	0	0	0	31	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5	4:15 PM	6	0	0	0	0	25	2	0	1	1	0	0	0	0	0	0	0	0	0	0
6	4:30 PM	4	0	0	0	0	19	0	0	0	0	4	0	0	0	0	0	0	0	0	0
7	4:45 PM	10	0	0	0	0	20	2	0	1	0	1	0	0	0	0	0	0	0	0	0
8	5:00 PM	5	0	0	0	0	17	3	0	0	0	1	0	0	0	0	0	0	0	0	0
9	5:15 PM	7	0	0	0	0	31	1	0	1	0	3	0	0	0	0	0	0	0	0	0
10	5:30 PM	6	0	0	0	0	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11	5:45 PM	1	1	0	0	0	16	0	0	1	2	1	0	0	0	0	0	0	0	0	0
12	6:00 PM	2	0	0	0	0	17	0	0	0	0	1	0	0	0	0	0	0	0	0	0
3HR Total		72	1	0	0	0	274	13	2	8	3	22	0	0	0	0	2	0	0	0	0
Peak Hour Total		31	0	0	0	0	112	4	2	4	0	11	0	0	0	0	2	0	0	0	0

Hirst St (Westbound)

TIME		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	2	0	0	0	0	5	0	0	0	0	8	0	0	0	0	0	0	0	0	0
2	3:30 PM	2	0	0	0	1	8	0	0	0	0	9	0	0	0	1	1	0	0	0	0
3	3:45 PM	15	0	0	0	0	12	0	0	0	0	5	0	0	0	0	1	0	0	0	0
4	4:00 PM	1	0	0	0	0	12	1	0	0	0	3	1	0	0	0	1	0	0	0	0
5	4:15 PM	5	0	0	0	0	4	0	0	0	1	2	0	0	0	0	0	0	0	0	0
6	4:30 PM	4	0	0	0	0	6	0	0	0	2	3	0	0	0	0	0	0	0	0	0
7	4:45 PM	6	0	0	0	0	10	0	0	0	0	3	0	0	0	0	0	0	0	0	0
8	5:00 PM	4	0	0	0	0	7	0	0	0	0	5	0	0	0	0	0	0	0	0	0
9	5:15 PM	5	0	0	0	0	8	0	0	0	0	5	1	0	0	0	0	0	0	0	0
10	5:30 PM	8	0	0	0	0	6	0	0	0	2	1	0	0	0	0	0	0	0	0	0
11	5:45 PM	1	0	0	0	0	5	0	0	0	1	6	0	0	0	0	0	0	0	0	0
12	6:00 PM	4	0	0	0	0	4	0	0	0	1	3	0	0	0	0	0	0	0	0	0
3HR Total		57	0	0	0	1	87	1	0	0	7	53	2	0	0	1	3	0	0	0	0
Peak Hour Total		20	0	0	0	1	37	1	0	0	0	25	1	0	0	1	3	0	0	0	0

Kelsey St (Northbound)

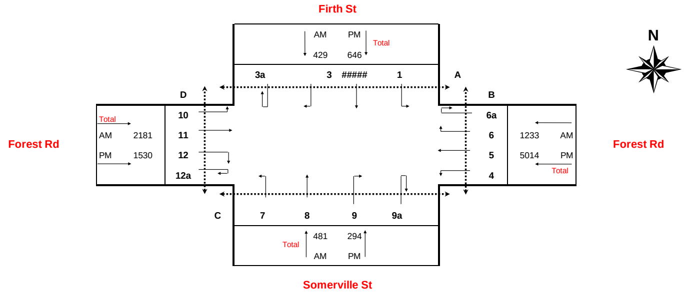
TIME		Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	8	1	0	0	0	8	3	0	1	0	2	0	0	0	0	4	0	0	0	0
2	3:30 PM	7	0	0	0	0	16	2	1	2	0	3	0	0	0	0	0	0	0	0	0
3	3:45 PM	7	1	0	0	0	24	2	2	1	0	2	1	0	0	0	0	0	0	0	0
4	4:00 PM	11	0	0	0	0	10	3	0	2	0	2	0	0	0	0	1	0	0	0	0
5	4:15 PM	9	0	0	0	1	16	3	1	2	0	3	0	0	0	0	3	0	0	0	0
6	4:30 PM	9	0	0	0	0	25	3	0	2	0	5	0	0	0	0	3	0	0	0	0
7	4:45 PM	8	0	0	0	0	16	2	1	2	1	3	0	0	0	0	1	0	0	0	0
8	5:00 PM	5	0	0	0	0	13	1	1	4	0	2	0	0	0	0	2	0	0	0	0
9	5:15 PM	7	1	0	0	0	19	0	0	3	0	0	0	0	0	0	3	0	0	0	0
10	5:30 PM	8	1	0	0	0	10	0	0	3	0	2	0	0	0	0	1	0	0	0	0
11	5:45 PM	6	0	0	0	0	7	1	1	4	0	3	0	0	0	0	2	0	0	0	0
12	6:00 PM	4	0	0	0	0	6	0	0	2	0	2	0	0	0	0	1	0	0	0	0
3HR Total		89	4	0	0	1	170	20	7	28	1	29	1	0	0	0	21	0	0	0	0
Peak Hour Total		33	2	0	0	0	58	10	3	6	0	9	1	0	0	0	5	0	0	0	0

Hirst St (Eastbound) / **Pedestrians**

TIME		Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South	West
1	3:15 PM	8	0	0	0	0	13	0	0	0	0	8	0	0	0	0	0	0	0	0	0	2	7	3	1
2	3:30 PM	8	0	0	0	0	17	0	0	0	0	9	0	0	0	0	1	0	0	0	0	2	14	2	0
3	3:45 PM	2	0	0	0	1	12	0	0	0	0	3	0	0	0	0	1	0	0	0	0	2	17	2	0
4	4:00 PM	0	0	0	0	0	9	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	8	4	2
5	4:15 PM	3	0	0	0	0	11	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	0	2
6	4:30 PM	4	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1
7	4:45 PM	5	0	0	0	0	16	2	0	0	1	2	0	0	0	1	0	0	0	0	0	2	4	0	0
8	5:00 PM	4	0	0	0	0	17	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1
9	5:15 PM	3	0	0	0	0	13	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	10	1	1
10	5:30 PM	3	0	0	0	0	7	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	4	0	2
11	5:45 PM	4	0	0	0	0	6	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	9	0	0
12	6:00 PM	4	0	0	0	0	10	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5	0	0
3HR Total		48	0	0	0	1	145	3	0	0	1	40	1	0	0	1	2	0	0	0	0	9	88	12	10
Peak Hour Total		18	0	0	0	1	51	0	0	0	0	21	0	0	0	0	2	0	0	0	0	6	46	11	3

TDC Traffic Data & Control

Site ID: 2
Location: Forest Rd & Firth St
Weather: Fine
Suburb: Arncliffe
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Wednesday, 17 October 2012
AM Peak 09:00 (hour ending)
PM Peak 16:30 (hour ending)
Traffic Control: Signals
HOME



Column abbreviations used below: Cars = Cars, Utilities & Motorcycles; LT = Light Trucks; HT = Heavy Trucks; Bus = Buses; Cyc = Cyclists.

AM – Firth St (Southbound)

TIME (15 minute period ending)	Movement 1 (Left Turn) Cars	LT	HT	Bus	Cyc	Movement 2 (Through) Cars	LT	HT	Bus	Cyc	Movement 3 (Right Turn) Cars	LT	HT	Bus	Cyc	Movement 3a (U Turn) Cars	LT	HT	Bus	Cyc
1 7:15 AM	19	3	1	0	0	5	1	0	0	0	0	2	0	0	0	0	0	0	0	0
2 7:30 AM	26	5	1	0	1	4	1	0	0	0	1	0	0	0	0	0	0	0	0	0
3 7:45 AM	42	0	2	0	1	9	1	0	0	0	4	0	0	0	0	0	0	0	0	0
4 8:00 AM	37	1	0	0	1	12	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5 8:15 AM	51	3	0	0	0	16	0	0	0	0	5	0	0	0	0	0	0	0	0	0
6 8:30 AM	28	2	2	0	0	19	0	0	0	0	6	0	0	0	0	0	0	0	0	0
7 8:45 AM	29	2	0	0	1	21	0	0	0	0	2	0	0	0	0	0	0	0	0	0
8 9:00 AM	27	2	0	0	0	20	1	0	0	0	11	0	0	0	0	0	0	0	0	0
2HR Total	259	18	6	0	4	106	4	0	0	0	29	3	0	0	0	0	0	0	0	0
Peak Hour Total	135	9	2	0	1	76	1	0	0	0	24	0	0	0	0	0	0	0	0	0

AM – Forest Rd (Westbound)

TIME (15 minute period ending)	Movement 4 (Left Turn) Cars	LT	HT	Bus	Cyc	Movement 5 (Through) Cars	LT	HT	Bus	Cyc	Movement 6 (Right Turn) Cars	LT	HT	Bus	Cyc	Movement 6a (U Turn) Cars	LT	HT	Bus	Cyc
1 7:15 AM	2	0	0	0	0	55	3	6	0	0	25	3	1	0	0	0	0	0	0	0
2 7:30 AM	2	0	0	0	0	56	4	2	0	1	17	2	0	0	0	0	0	0	0	0
3 7:45 AM	6	0	0	0	0	69	5	4	0	0	21	5	1	0	0	0	0	0	0	0
4 8:00 AM	11	0	0	0	0	87	7	6	0	1	25	1	1	0	0	0	0	0	0	0
5 8:15 AM	4	1	0	0	0	102	7	2	1	1	21	2	1	0	0	0	0	0	0	0
6 8:30 AM	4	0	0	0	0	110	8	8	0	1	22	0	0	1	0	0	0	0	0	0
7 8:45 AM	10	0	0	0	0	170	6	4	2	0	40	3	1	0	0	0	0	0	0	0
8 9:00 AM	13	0	0	0	0	192	8	4	2	0	48	4	0	1	0	0	0	0	0	0
2HR Total	52	1	0	0	0	841	48	36	5	4	219	20	5	2	0	0	0	0	0	0
Peak Hour Total	31	1	0	0	0	574	29	18	5	2	131	9	2	2	0	0	0	0	0	0

AM – Somerville St (Northbound)

TIME (15 minute period ending)	Movement 7 (Left Turn) Cars	LT	HT	Bus	Cyc	Movement 8 (Through) Cars	LT	HT	Bus	Cyc	Movement 9 (Right Turn) Cars	LT	HT	Bus	Cyc	Movement 9a (U Turn) Cars	LT	HT	Bus	Cyc
1 7:15 AM	2	0	0	0	0	18	1	0	0	0	1	0	0	0	0	0	0	0	0	0
2 7:30 AM	0	1	0	0	0	41	0	0	0	1	1	0	0	0	1	0	0	0	0	0
3 7:45 AM	0	0	0	0	0	58	1	0	0	1	3	0	0	0	1	0	0	0	0	0
4 8:00 AM	1	0	0	0	0	81	0	0	0	1	5	0	0	0	1	0	0	0	0	0
5 8:15 AM	4	0	0	0	0	63	0	0	2	1	4	1	0	0	0	0	0	0	0	0
6 8:30 AM	1	1	0	0	0	76	1	0	0	0	6	0	0	0	0	0	0	0	0	0
7 8:45 AM	2	0	0	0	0	48	0	0	0	0	4	0	0	0	0	0	0	0	0	0
8 9:00 AM	1	0	0	0	0	45	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2HR Total	11	2	0	0	0	430	3	0	2	4	25	1	0	0	3	0	0	0	0	0
Peak Hour Total	8	1	0	0	0	232	1	0	2	1	15	1	0	0	0	0	0	0	0	0

AM – Forest Rd (Eastbound)

TIME (15 minute period ending)	Movement 10 (Left Turn) Cars	LT	HT	Bus	Cyc	Movement 11 (Through) Cars	LT	HT	Bus	Cyc	Movement 12 (Right Turn) Cars	LT	HT	Bus	Cyc	Movement 12a (U Turn) Cars	LT	HT	Bus	Cyc
1 7:15 AM	2	1	0	0	0	288	16	4	1	2	1	0	0	0	0	0	0	0	0	0
2 7:30 AM	7	1	0	0	0	218	6	3	2	0	0	0	0	0	0	0	0	0	0	0
3 7:45 AM	7	0	0	0	0	306	7	4	4	1	0	0	0	0	0	0	0	0	0	0
4 8:00 AM	1	0	0	0	0	243	7	3	1	3	0	0	0	0	0	0	0	0	0	0
5 8:15 AM	1	0	0	0	0	247	2	3	0	7	1	0	0	0	0	0	0	0	0	0
6 8:30 AM	8	0	0	0	0	221	12	3	0	1	0	0	0	0	0	0	0	0	0	0
7 8:45 AM	3	2	0	0	0	223	7	2	0	2	0	0	0	0	0	0	0	0	0	0
8 9:00 AM	10	0	0	0	0	273	9	1	1	3	0	0	0	0	0	0	0	0	0	0
2HR Total	39	4	0	0	0	2019	66	23	9	19	2	0	0	0	0	0	0	0	0	0
Peak Hour Total	22	2	0	0	0	964	30	9	1	13	1	0	0	0	0	0	0	0	0	0

AM – Pedestrians

TIME (15 minute period ending)	A North	B East	C South	D West
1 7:15 AM	0	2	1	5
2 7:30 AM	2	3	0	0
3 7:45 AM	2	7	1	8
4 8:00 AM	1	7	6	4
5 8:15 AM	1	3	4	6
6 8:30 AM	5	15	2	7
7 8:45 AM	1	35	9	2
8 9:00 AM	2	47	13	7
2HR Total	14	119	36	39
Peak Hour Total	9	100	28	22

PM – Firth St (Southbound)

TIME (15 minute period ending)	Movement 1 (Left Turn) Cars	LT	HT	Bus	Cyc	Movement 2 (Through) Cars	LT	HT	Bus	Cyc	Movement 3 (Right Turn) Cars	LT	HT	Bus	Cyc	Movement 3a (U Turn) Cars	LT	HT	Bus	Cyc
1 3:15 PM	19	0	0	0	0	18	0	0	0	0	4	0	0	0	0	0	0	0	0	0
2 3:30 PM	21	3	0	0	0	25	0	0	0	0	8	0	0	0	0	0	0	0	0	0
3 3:45 PM	25	0	0	0	0	25	0	0	0	1	10	1	0	0	0	0	0	0	0	0
4 4:00 PM	14	2	0	0	0	25	0	0	0	0	6	0	0	0	0	0	0	0	0	0
5 4:15 PM	18	0	0	0	0	33	0	0	0	0	8	1	0	1	0	0	0	0	0	0
6 4:30 PM	20	0	0	0	0	24	0	0	0	0	18	1	0	0	0	0	0	0	0	0
7 4:45 PM	23	1	0	0	0	23	0	0	0	1	6	0	0	0	0	0	0	0	0	0
8 5:00 PM	21	0	0	0	0	21	0	0	0	0	10	0	0	0	0	0	0	0	0	0
9 5:15 PM	34	0	1	0	0	29	0	0	0	0	6	0	0	0	0	0	0	0	0	0
10 5:30 PM	22	2	0	0	0	26	0	0	0	0	5	0	0	0	0	0	0	0	0	0
11 5:45 PM	16	1	0	0	0	16	0	0	0	0	5	0	0	0	0	0	0	0	0	0
12 6:00 PM	15	0	0	0	1	20	1	0	0	1	8	0	0	0	0	0	0	0	0	0
3HR Total	248	9	1	0	1	285	1	0	0	3	94	3	0	1	0	0	0	0	0	0
Peak Hour Total	77	2	0	0	0	107	0	0	0	1	42	3	0	1	0	0	0	0	0	0

PM – Forest Rd (Westbound)

TIME (15 minute period ending)	Movement 4 (Left Turn) Cars	LT	HT	Bus	Cyc	Movement 5 (Through) Cars	LT	HT	Bus	Cyc	Movement 6 (Right Turn) Cars	LT	HT	Bus	Cyc	Movement 6a (U Turn) Cars	LT	HT	Bus	Cyc
1 3:15 PM	14	0	0	0	0	346	26	3	0	2	30	1	1	0	0	0	0	0	0	0
2 3:30 PM	13	0	0	0	0	326	28	5	1	4	44	4	0	0	0	0	0	0	0	0
3 3:45 PM	9	0	0	0	0	381	7	7	1	2	37	3	1	1	0	0	0	0	0	0
4 4:00 PM	12	0	0	0	0	358	14	9	0	2	17	6	1	3	0	0	0	0	0	0
5 4:15 PM	10	0	0	0	0	376	12	1	0	3	29	4	0	0	1	0	0	0	0	0
6 4:30 PM	9	0	0	0	0	403	14	5	1	1	32	0	0	1	0	0	0	0	0	0
7 4:45 PM	12	1	0	0	0	314	11	3	0	1	25	1	1	2	0	0	0	0	0	0
8 5:00 PM	11	1	0	0	0	387	11	5	1	2	32	1	0	3	0	0	0	0	0	0
9 5:15 PM	12	0	0	0	0	316	6	3	2	1	24	2	1	1	0	0	0	0	0	0
10 5:30 PM	17	0	0	0	1	342	7	2	1	6	26	1	0	1	0	0	0	0	0	0
11 5:45 PM	13	0	0	0	0	328	7	3	0	5	28	0	0	0	0	0	0	0	0	0
12 6:00 PM	11	0	0	0	0	361	9	3	2	0	23	0	1	0	1	1	0	0	0	0
3HR Total	143	2	0	0	1	4238	152	49	9	29	347	23	6	12	2	1	0	0	0	0
Peak Hour Total	40	0	0	0	0	1518	47	22	2	8	115	13	2	5	1	0	0	0	0	0

PM – Somerville St (Northbound)

TIME (15 minute period ending)	Movement 7 (Left Turn) Cars	LT	HT	Bus	Cyc	Movement 8 (Through) Cars	LT	HT	Bus	Cyc	Movement 9 (Right Turn) Cars	LT	HT	Bus	Cyc	Movement 9a (U Turn) Cars	LT	HT	Bus	Cyc
1 3:15 PM	5	0	0	0	0	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2 3:30 PM	7	0	0	0	0	28	0	0	0	1	0	0	0	0	0	0	0	0	0	0
3 3:45 PM	5	0	0	0	0	25	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4 4:00 PM	3	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 4:15 PM	1	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 4:30 PM	1	0	0	0	0	14	0	0	0	1	0	0	0	0	0	0	0	0	0	0
7 4:45 PM	9	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 5:00 PM	3	1	1	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 5:15 PM	7	0	0	0	0	20	0	0	0	1	2	0	0	0	0	0	0	0	0	0
10 5:30 PM	7	0	0	0	0	15	0	0	0	0	2	0	0	0	0	0	0	0	0	0
11 5:45 PM	2	0	0	0	0	13	0	0	0	3	4	0	0	0	1	0	0	0	0	0
12 6:00 PM	7	0	0	0	0	22	0	0	0	1	1	0	0	0	0	0	0	0	0	0
3HR Total	57	1	1	0	0	216	0	0	0	7	11	0	0	0	1	0	0	0	0	0
Peak Hour Total	10	0	0	0	0	70	0	0	0	1	1	0	0	0	0	0	0	0	0	0

PM – Forest Rd (Eastbound)

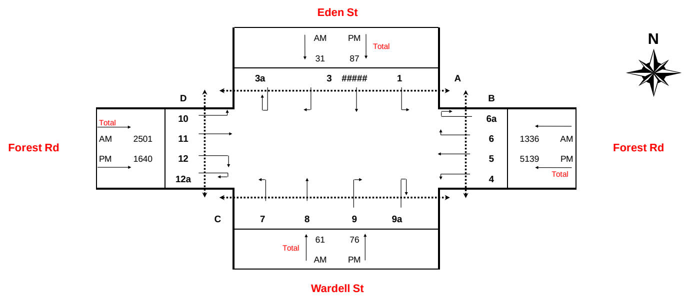
TIME (15 minute period ending)	Movement 10 (Left Turn) Cars	LT	HT	Bus	Cyc	Movement 11 (Through) Cars	LT	HT	Bus	Cyc	Movement 12 (Right Turn) Cars	LT	HT	Bus	Cyc	Movement 12a (U Turn) Cars	LT	HT	Bus	Cyc
1 3:15 PM	19	0	0	0	0	122	4	6	0	2	0	0	0	0	0	0	0	0	0	0
2 3:30 PM	20	0	0	0	0	110	0	2	0	1	0	0	0	0	0	0	0	0	0	0
3 3:45 PM	23	0	0	0	0	98	6	2	0	0	0	0	0	0	0	0	0	0	0	0
4 4:00 PM	10	0	0	0	0	100	4	3	0	1	0	0	0	0	0	0	0	0	0	0
5 4:15 PM	10	0	0	0	0	107	3	1	1	1	0	0	0	0	0	0	0	0	0	0
6 4:30 PM	6	1	0	0	0	101	5	3	0	1	0	0	0	0	0	0	0	0	0	0
7 4:45 PM	19	1	0	0	0	94	3	0	0	1	0	0	0	0	0	0	0	0	0	0
8 5:00 PM	8	1	0	0	0	104	3	0	0	1	0	0	0	0	0	0	0	0	0	0
9 5:15 PM	10	0	0	0	0	97	2	2	0	1	0	0	0	0	0	0	0	0	0	0
10 5:30 PM	7	0	0	0	0	130	4	3	0	2	0	0	0	0	0	0	0	0	0	0
11 5:45 PM	8	0	0	0	0	125	2	2	0	0	1	0	0	0	0	0	0	0	0	0
12 6:00 PM	9	0	0	0	0	110	3	2	0	1	1	0	0	0	0	0	0	0	0	0
3HR Total	149	3	0	0	0	1298	39	26	1	12	2	0	0	0	0	0	0	0	0	0
Peak Hour Total	49	1	0	0	0	406	18	9	1	3	0	0	0	0	0	0	0	0	0	0

PM – Pedestrians

TIME (15 minute period ending)	A North	B East	C South	D West
1 3:15 PM	8	40	21	17
2 3:30 PM	14	90	22	14
3 3:45 PM	5	0	6	8
4 4:00 PM	1	2	4	4
5 4:15 PM	0	2	2	2
6 4:30 PM	3	7	2	3
7 4:45 PM	3	6	3	4
8 5:00 PM	2	4	5	3
9 5:15 PM	2	2	3	2
10 5:30 PM	5	5	2	2
11 5:45 PM	2	8	0	1
12 6:00 PM	3	6	0	2
3HR Total	48	172	70	62
Peak Hour Total	9	11	14	17

TDC Traffic Data & Control

Site ID: 3
Location: Forest Rd & Wardell St
Weather: Fine
Suburb: Arncliffe
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Wednesday, 17 October 2012
AM Peak 09:00 (hour ending)
PM Peak 16:30 (hour ending)
Traffic Control: Give-Way
HOME



	TIME	Eden St (Southbound)																			
		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	7:30 AM	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	7:45 AM	4	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4	8:00 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5	8:15 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
6	8:30 AM	3	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
7	8:45 AM	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8	9:00 AM	3	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	2HR Total	20	0	1	1	0	2	0	0	0	0	6	0	0	0	0	1	0	0	0	0
	Peak Hour Total	11	0	1	0	0	2	0	0	0	0	4	0	0	0	0	1	0	0	0	0

	TIME	Forest Rd (Westbound)																			
		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	1	0	0	0	1	78	8	6	0	0	1	0	0	0	1	0	0	0	0	0
2	7:30 AM	2	0	0	0	0	81	5	2	0	1	3	0	0	0	0	0	0	0	0	0
3	7:45 AM	3	0	0	0	0	97	9	4	0	1	8	0	0	0	0	0	0	0	0	0
4	8:00 AM	5	0	0	0	0	129	6	6	1	1	6	0	0	0	0	0	0	0	0	0
5	8:15 AM	5	0	0	0	0	138	8	3	1	1	8	0	0	0	0	0	0	0	0	0
6	8:30 AM	8	0	0	0	0	139	5	9	1	1	3	0	0	0	0	0	0	0	0	0
7	8:45 AM	13	0	0	0	0	209	8	5	0	2	18	0	0	0	0	0	0	0	0	0
8	9:00 AM	17	0	0	0	0	238	15	2	2	0	11	0	0	0	0	0	0	0	0	0
	2HR Total	54	0	0	0	1	1109	64	37	5	7	58	0	0	0	1	0	0	0	0	0
	Peak Hour Total	43	0	0	0	0	724	36	19	4	4	40	0	0	0	0	0	0	0	0	0

	TIME	Wardell St (Northbound)																			
		Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2	7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
3	7:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
4	8:00 AM	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
5	8:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	8:30 AM	3	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7	8:45 AM	16	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
8	9:00 AM	21	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
	2HR Total	43	1	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0
	Peak Hour Total	41	1	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0

	TIME	Forest Rd (Eastbound)																				Pedestrians			
		Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					A	B	C	D
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South	West
1	7:15 AM	1	0	0	0	1	309	18	5	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	7:30 AM	1	0	0	0	0	244	10	3	3	2	0	0	0	0	0	0	0	0	0	0	1	0	2	0
3	7:45 AM	1	0	0	0	0	360	9	6	4	5	0	0	0	0	0	0	0	0	0	0	2	0	2	0
4	8:00 AM	1	0	0	0	0	300	9	3	1	9	1	0	0	0	0	0	0	0	0	0	0	0	4	0
5	8:15 AM	1	0	0	0	0	312	5	3	0	7	2	0	0	0	0	0	0	0	0	0	4	0	0	0
6	8:30 AM	3	0	0	0	0	253	13	3	0	0	3	0	0	0	0	0	0	0	0	0	4	1	4	0
7	8:45 AM	4	0	0	0	0	231	8	3	0	4	13	0	0	0	0	0	0	0	0	0	4	0	2	0
8	9:00 AM	4	0	0	0	1	289	10	2	1	4	12	0	0	0	0	0	0	0	0	0	4	0	0	0
	2HR Total	16	0	0	0	2	2298	82	28	10	34	31	0	0	0	0	0	0	0	0	0	19	1	14	0
	Peak Hour Total	12	0	0	0	1	1085	36	11	1	15	30	0	0	0	0	0	0	0	0	0	16	1	6	0

	TIME	Eden St (Southbound)																			
		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	3	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
2	3:30 PM	5	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
3	3:45 PM	8	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
4	4:00 PM	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	4:15 PM	5	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
6	4:30 PM	4	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
7	4:45 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5:00 PM	4	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9	5:15 PM	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
10	5:30 PM	7	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0
11	5:45 PM	8	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
12	6:00 PM	6	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	3HR Total	63	1	0	0	1	0	0	0	0	0	20	2	0	0	0	0	0	0	0	0
	Peak Hour Total	23	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0

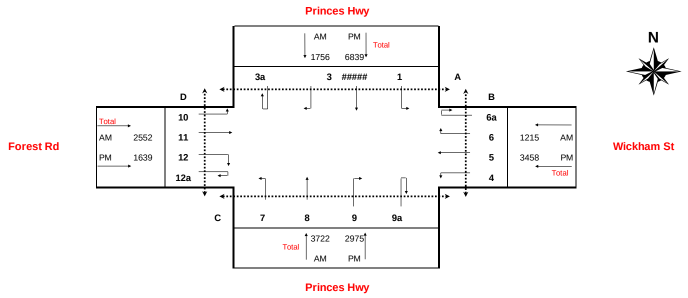
	TIME	Forest Rd (Westbound)																			
		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	7	0	0	0	0	381	23	8	0	4	5	0	0	0	0	0	0	0	0	0
2	3:30 PM	3	1	0	0	0	361	31	7	1	4	13	0	0	0	0	0	0	0	0	0
3	3:45 PM	1	0	0	0	0	417	9	7	2	3	10	1	0	0	0	0	0	0	0	0
4	4:00 PM	4	0	0	0	0	379	22	9	3	3	10	0	0	0	0	0	0	0	0	0
5	4:15 PM	0	0	0	0	0	424	16	1	0	6	2	0	0	0	0	0	0	0	0	0
6	4:30 PM	0	0	0	0	0	447	15	5	2	2	15	0	0	0	0	0	0	0	0	0
7	4:45 PM	2	0	0	0	0	351	15	4	2	3	10	0	0	0	0	0	0	0	0	0
8	5:00 PM	0	0	0	0	0	430	18	2	4	2	8	0	0	0	0	0	0	0	0	0
9	5:15 PM	1	0	0	0	0	360	7	4	3	1	4	0	0	1	0	0	0	0	0	0
10	5:30 PM	3	0	0	0	0	394	8	2	2	6	5	0	0	0	0	0	0	0	0	0
11	5:45 PM	2	0	0	0	0	366	6	3	0	5	5	0	0	0	0	0	0	0	0	0
12	6:00 PM	3	0	0	0	0	404	9	4	2	1	13	0	0	0	0	0	0	0	0	0
	3HR Total	26	1	0	0	0	4714	179	56	21	40	100	1	0	1	0	0	0	0	0	0
	Peak Hour Total	5	0	0	0	0	1667	62	22	7	14	37	1	0	0	0	0	0	0	0	0

	TIME	Wardell St (Northbound)																			
		Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	8	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
2	3:30 PM	25	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
3	3:45 PM	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	4:00 PM	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5	4:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0
6	4:30 PM	2	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0
7	4:45 PM	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
8	5:00 PM	4	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	5:45 PM	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
12	6:00 PM	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3HR Total	52	1	0	0	0	2	0	0	0	0	20	0	0	0	1	0	0	0	0	0
	Peak Hour Total	8	0	0	0	0	1	0	0	0	0	6	0	0	0	1	0	0	0	0	0

	TIME	Forest Rd (Eastbound)																				Pedestrians			
		Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					A	B	C	D
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South	West
1	3:15 PM	6	0	0	0	0	130	4	6	0	2	7	0	0	0	0	0	0	0	0	0	3	0	6	0
2	3:30 PM	4	0	0	0	0	120	3	1	0	1	4	0	0	0	0	0	0	0	0	0	1	1	2	1
3	3:45 PM	4	0	0	0	0	119	7	2	0	0	0	0	0	0	0	0	0	0	0	0	10	0	3	0
4	4:00 PM	0	0	0	0	0	113	6	3	0	1	0	0	0	0	0	0	0	0	0	0	1	2	1	0
5	4:15 PM	2	0	0	0	0	120	3	1	1	2	2	0	0	0	0	0	0	0	0	0	4	0	1	0
6	4:30 PM	3	0	0	0	0	121	5	3	0	1	0	0	0	0	0	0	0	0	0	0	3	0	3	0
7	4:45 PM	2	0	0	0	0	112	6	0	0	3	1	0	0	0	0	0	0	0	0	0	2	1	3	1
8	5:00 PM	3	1	0	0	0	119	2	0	1	1	1	0	0	0	0	0	0	0	0	0	4	0	1	1
9	5:15 PM	5	0	0	0	0	127	2	3	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1
10	5:30 PM	3	0	0	0	0	151	7	3	0	2	1	0	0	0	0	0	0	0	0	0	3	0	6	0
11	5:45 PM	1	0	0	0	0	140	3	2	0	1	0	0	0	0	0	0	0	0	0	0	3	0	4	1
12	6:00 PM	1	0	0	0	0	122	2	2	0	2	0	0	0	0	0	0	0	0	0	0	9	0	4	0
	3HR Total	34	1	0	0	0	1494	50	26	2	17	16	0	0	0	0	0	0	0	0	0	44	4	35	5
	Peak Hour Total	9	0	0	0	0	473	21	9	1	4	2	0	0	0	0	0	0	0	0	0	18	2	8	0

TDC
Traffic Data & Control

Site ID: 4
Location: Wickham St & Princes Hwy
Weather: Fine
Suburb: Arncliffe
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Wednesday, 17 October 2012
AM Peak 09:00 (hour ending)
PM Peak 18:00 (hour ending)
Traffic Control: Signals
HOME



Princes Hwy (Southbound)

TIME		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	45	1	1	6	0	65	6	5	0	0	12	3	1	0	1	0	0	0	0	0
2	7:30 AM	73	3	2	5	2	98	7	4	1	0	22	5	0	0	0	0	0	0	0	0
3	7:45 AM	43	1	0	0	0	129	11	1	0	3	30	2	0	0	0	0	0	0	0	0
4	8:00 AM	47	3	2	5	0	132	13	0	0	0	39	5	1	0	0	0	0	0	0	0
5	8:15 AM	52	2	1	0	2	134	9	0	0	1	45	3	0	0	1	0	0	0	0	0
6	8:30 AM	27	1	0	0	0	142	9	1	0	0	30	5	0	0	0	0	0	0	0	0
7	8:45 AM	28	2	2	0	1	167	8	3	0	0	34	6	0	0	0	0	0	0	0	0
8	9:00 AM	19	1	2	0	0	128	6	7	0	2	36	4	0	0	0	0	0	0	0	0
2HR Total		334	14	10	16	5	995	69	21	1	6	248	33	2	0	2	0	0	0	0	0
Peak Hour Total		126	6	5	0	3	571	32	11	0	3	145	18	0	0	1	0	0	0	0	0

Wickham St (Westbound)

TIME		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	14	1	0	1	1	74	5	5	0	1	0	0	0	0	0	0	0	0	0	0
2	7:30 AM	14	0	0	1	0	57	4	3	0	0	0	0	0	0	0	0	0	0	0	0
3	7:45 AM	29	0	0	0	0	86	3	5	0	2	0	0	0	0	0	0	0	0	0	0
4	8:00 AM	16	0	0	1	1	93	4	4	2	0	0	0	0	0	0	0	0	0	0	0
5	8:15 AM	20	0	0	1	1	92	2	4	0	1	0	0	0	0	0	0	0	0	0	0
6	8:30 AM	34	1	0	2	0	158	5	7	1	2	0	0	0	0	0	0	0	0	0	0
7	8:45 AM	23	1	0	0	2	179	2	5	1	0	0	0	0	0	0	0	0	0	0	0
8	9:00 AM	25	0	0	2	1	200	8	6	1	1	0	0	0	0	0	0	0	0	0	0
2HR Total		175	3	0	8	6	939	33	39	5	7	0	0	0	0	0	0	0	0	0	0
Peak Hour Total		102	2	0	5	4	629	17	22	3	4	0	0	0	0	0	0	0	0	0	0

Princes Hwy (Northbound)

TIME		Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	8	0	0	0	0	279	3	2	0	2	118	2	0	1	0	0	0	0	0	0
2	7:30 AM	10	0	0	0	0	174	5	1	0	2	103	1	1	1	2	0	0	0	0	0
3	7:45 AM	7	0	0	0	0	361	8	1	0	1	84	3	0	1	1	0	0	0	0	0
4	8:00 AM	4	0	0	0	0	288	4	3	0	3	115	1	1	2	0	0	0	0	0	0
5	8:15 AM	3	0	0	0	0	422	8	3	0	3	103	1	2	0	1	0	0	0	0	0
6	8:30 AM	11	0	0	0	0	412	13	6	0	3	110	1	0	2	1	0	0	0	0	0
7	8:45 AM	22	1	0	0	0	427	6	8	1	6	127	1	0	2	1	0	0	0	0	0
8	9:00 AM	21	1	0	0	0	287	9	4	0	3	84	0	1	2	0	0	0	0	0	0
2HR Total		86	2	0	0	0	2650	56	28	1	23	844	10	5	11	6	0	0	0	0	0
Peak Hour Total		57	2	0	0	0	1548	36	21	1	15	424	3	3	6	3	0	0	0	0	0

Forest Rd (Eastbound) / **Pedestrians**

TIME		Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					Pedestrians A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South	West
1	7:15 AM	51	8	0	0	2	258	14	5	1	1	0	0	0	0	0	0	0	0	0	0	1	1	5	5
2	7:30 AM	40	3	0	2	1	238	6	2	2	2	1	0	0	0	0	0	0	0	0	0	0	1	5	1
3	7:45 AM	63	2	1	1	1	262	8	5	2	4	0	0	0	0	0	0	0	0	0	0	12	1	8	5
4	8:00 AM	45	2	1	0	2	274	8	3	1	7	0	0	0	0	0	0	0	0	0	0	7	0	2	8
5	8:15 AM	40	0	1	0	0	231	4	3	0	6	0	0	0	0	0	0	0	0	0	0	6	1	3	3
6	8:30 AM	57	5	0	0	2	225	8	5	0	1	0	0	0	0	0	0	0	0	0	0	4	1	0	3
7	8:45 AM	46	2	0	0	0	208	7	0	0	2	0	0	0	0	0	0	0	0	0	0	6	2	6	5
8	9:00 AM	73	3	0	1	0	280	11	1	0	1	0	0	0	0	0	0	0	0	0	0	2	1	3	10
2HR Total		415	25	3	4	8	1976	66	24	6	24	1	0	0	0	0	0	0	0	0	0	38	8	32	40
Peak Hour Total		216	10	1	1	2	944	30	9	0	10	0	0	0	0	0	0	0	0	0	0	18	5	12	21

Princes Hwy (Southbound)

TIME		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	24	6	3	1	0	362	11	0	0	3	134	7	2	1	1	0	0	0	0	0
2	3:30 PM	24	2	0	0	0	340	8	0	0	3	96	14	3	0	1	0	0	0	0	0
3	3:45 PM	15	1	4	1	0	406	11	6	0	2	127	4	3	0	1	0	0	0	0	0
4	4:00 PM	19	1	0	0	0	373	7	2	1	5	113	4	0	0	2	1	0	0	0	0
5	4:15 PM	24	1	1	0	0	430	6	1	0	3	136	9	0	0	1	0	0	0	0	0
6	4:30 PM	24	1	0	0	0	411	6	0	0	3	96	5	1	0	2	0	0	0	0	0
7	4:45 PM	24	1	1	0	0	409	7	1	1	6	110	10	1	1	0	0	0	0	0	0
8	5:00 PM	16	0	1	0	0	412	8	2	0	5	105	3	0	0	2	0	0	0	0	0
9	5:15 PM	23	0	0	0	0	437	4	0	0	4	118	7	0	0	2	0	0	0	0	0
10	5:30 PM	16	0	0	0	0	469	3	0	0	3	127	5	0	0	1	0	0	0	0	0
11	5:45 PM	15	1	1	0	0	442	6	0	0	6	131	3	1	1	0	0	0	0	0	0
12	6:00 PM	14	0	0	0	0	413	2	0	1	3	132	4	0	1	1	0	0	0	0	0
3HR Total		238	14	11	2	0	4904	79	12	3	46	1425	75	11	4	14	1	0	0	0	0
Peak Hour Total		68	1	1	0	0	1761	15	0	1	16	508	19	1	2	4	0	0	0	0	0

Wickham St (Westbound)

TIME		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	21	1	0	2	0	225	11	1	0	2	0	0	0	0	0	0	0	0	0	0
2	3:30 PM	15	0	0	1	0	243	12	9	1	3	1	1	0	0	0	0	0	0	0	0
3	3:45 PM	23	1	0	2	1	252	9	3	2	2	0	0	0	0	0	0	0	0	0	0
4	4:00 PM	23	0	0	1	1	297	10	6	2	3	0	0	0	0	0	0	0	0	0	0
5	4:15 PM	17	0	0	1	0	252	9	4	0	2	0	0	0	0	0	0	0	0	0	0
6	4:30 PM	23	2	0	2	0	296	5	1	3	2	0	0	0	0	0	0	0	0	0	0
7	4:45 PM	17	0	1	0	0	258	11	5	1	1	0	0	0	0	0	0	0	0	0	0
8	5:00 PM	23	1	0	4	0	237	4	1	4	1	0	0	0	0	0	0	0	0	0	0
9	5:15 PM	12	0	0	2	0	252	3	6	2	2	0	0	0	0	0	0	0	0	0	0
10	5:30 PM	13	0	0	1	0	259	4	1	0	4	0	0	0	0	0	0	0	0	0	0
11	5:45 PM	10	0	1	2	0	224	4	5	0	2	0	0	0	0	0	0	0	0	0	0
12	6:00 PM	24	0	0	2	2	237	5	3	0	1	0	0	0	0	0	0	0	0	0	0
3HR Total		221	5	2	20	4	3032	87	45	15	25	1	1	0	0	0	0	0	0	0	0
Peak Hour Total		59	0	1	7	2	972	16	15	2	9	0	0	0	0	0	0	0	0	0	0

Princes Hwy (Northbound)

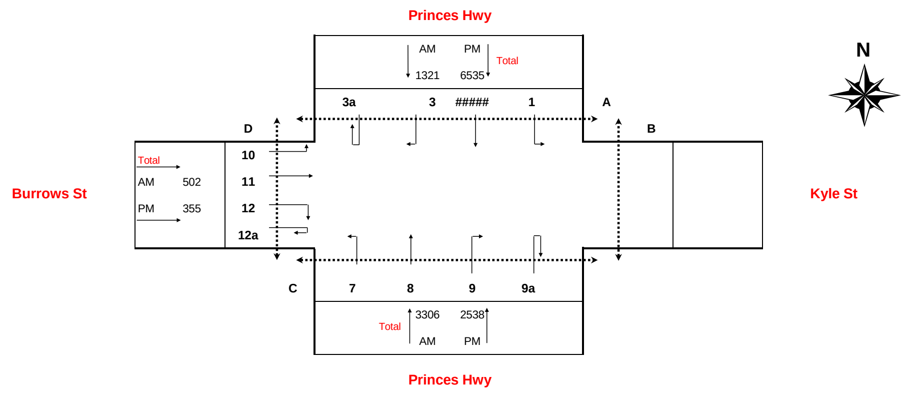
TIME		Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	43	1	1	0	0	141	4	1	2	0	21	3	1	2	0	0	0	0	0	0
2	3:30 PM	37	2	0	0	1	149	7	1	0	1	33	4	1	1	0	0	0	0	0	0
3	3:45 PM	36	1	0	0	0	175	5	1	3	3	37	0	0	3	0	0	0	0	0	0
4	4:00 PM	21	3	0	0	0	149	4	1	0	2	23	0	0	1	0	0	0	0	0	0
5	4:15 PM	14	0	1	0	0	163	4	2	0	3	34	1	0	2	0	0	0	0	0	0
6	4:30 PM	27	0	0	0	0	193	3	1	1	0	36	0	0	1	0	0	0	0	0	0
7	4:45 PM	26	1	0	0	0	153	0	2	2	1	35	0	2	1	0	0	0	0	0	0
8	5:00 PM	40	0	0	0	0	206	0	2	2	1	31	0	0	1	1	0	0	0	0	0
9	5:15 PM	18	1	0	0	0	163	2	0	0	4	46	0	1	2	0	0	0	0	0	0
10	5:30 PM	29	1	0	0	0	208	1	3	0	6	48	1	0	2	0	0	0	0	0	0
11	5:45 PM	36	0	0	0	0	166	3	1	0	4	45	2	1	1	0	0	0	0	0	0
12	6:00 PM	33	0	0	0	0	186	0	1	0	1	38	1	0	2	0	0	0	0	0	0
3HR Total		360	10	2	0	1	2052	33	16	10	26	427	12	6	19	1	0	0	0	0	0
Peak Hour Total		116	2	0	0	0	723	6	5	0	15	177	4	2	7	0	0	0	0	0	0

Forest Rd (Eastbound) / **Pedestrians**

TIME		Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					Pedestrians A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South	West
1	3:15 PM	39	1	1	0	0	88	3	2	0	1	0	0	0	0	0	0	0	0	0	0	4	7	13	15
2	3:30 PM	32	3	0	0	0	109	1	2	0	0	0	0	0	0	0	0	0	0	0	0	5	4	3	4
3	3:45 PM	20	4	0	0	0	86	4	2	0	0	0	0	0	0	0	0	0	0	0	0	5	2	4	3
4	4:00 PM	48	4	0	0	0	92	3	3	0	1	0	0	0	0	0	0	0	0	0	0	4	2	4	3
5	4:15 PM	45	0	0	0	2	80	2	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0
6	4:30 PM	26	2	1	0	0	84	2	2	0	2	0	0	0	0	0	0	0	0	0	0	4	1	4	12
7	4:45 PM	43	0	0	0	0	96	2	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	3	5
8	5:00 PM	25	1	0	0	0	74	1	1	0	1	0	0	0	0	0	0	0	0	0	0	5	0	3	3
9	5:15 PM	34	1	0	0	0	114	4	3	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	5
10	5:30 PM	45	2	0	0	0	110	4	2	0	2	0	0	0	0	0	0	0	0	0	0	3	0	3	4
11	5:45 PM	30	2	0	0	0	110	1	4	0	1	0	0	0	0	0	0	0	0	0	0	5	0	0	3
12	6:00 PM	28	1	1	0	0	93	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	4
3HR Total		415	21	3	0	2	1136	29	21	1	11	0	0	0	0	0	0	0	0	0	0	47	16	47	61
Peak Hour Total		137	6	1	0	0	427	11	9	0	3	0	0	0	0	0	0	0	0	0	0	18	0	13	16

![TDC Traffic Data & Control]

Site ID: 5
Location: Princes Hwy & Burrows St
Weather: Fine
Suburb: Wolli Creek
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Wednesday, 17 October 2012
AM Peak: 08:45 (hour ending)
PM Peak: 18:00 (hour ending)
Traffic Control: Signals
HOME



AM

Princes Hwy (Southbound)

TIME	Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 7:15 AM	4	0	0	0	0	98	8	5	2	2	0	0	0	0	0	0	0	0	0	0
2 7:30 AM	3	1	0	0	0	79	8	5	1	2	0	0	0	0	0	0	0	0	0	0
3 7:45 AM	3	0	0	0	0	143	12	1	0	2	0	0	0	0	0	0	0	0	0	0
4 8:00 AM	1	0	0	0	0	180	16	3	0	2	0	0	0	0	0	0	0	0	0	0
5 8:15 AM	4	0	0	0	0	171	16	1	0	1	0	0	0	0	0	0	0	0	0	0
6 8:30 AM	2	2	0	0	0	156	15	3	0	1	0	0	0	0	0	0	0	0	0	0
7 8:45 AM	0	2	0	0	0	168	14	4	0	1	0	0	0	0	0	0	0	0	0	0
8 9:00 AM	2	0	0	0	0	155	14	6	0	2	0	0	0	0	0	0	0	0	0	0
2HR Total	19	5	0	0	0	1150	103	28	3	13	0	0	0	0	0	0	0	0	0	0
Peak Hour Total	7	4	0	0	0	675	61	11	0	5	0	0	0	0	0	0	0	0	0	0

Princes Hwy (Northbound)

TIME	Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 7:15 AM	12	0	0	0	0	469	16	4	0	7	0	0	0	0	0	0	0	0	0	0
2 7:30 AM	18	0	0	0	0	185	7	1	0	3	0	0	0	0	0	0	0	0	0	0
3 7:45 AM	8	0	0	1	0	330	13	3	0	3	0	0	0	0	0	0	0	0	0	0
4 8:00 AM	4	0	0	0	0	421	7	1	1	4	0	0	0	0	0	0	0	0	0	0
5 8:15 AM	6	0	0	0	0	340	7	4	0	5	0	0	0	0	0	0	0	0	0	0
6 8:30 AM	9	1	0	0	0	467	14	0	1	0	0	0	0	0	0	0	0	0	0	0
7 8:45 AM	14	2	0	0	0	483	12	10	1	7	0	0	0	0	0	0	0	0	0	0
8 9:00 AM	9	0	1	0	0	374	13	4	1	3	0	0	0	0	0	0	0	0	0	0
2HR Total	80	3	1	1	0	3069	89	27	4	32	0	0	0	0	0	0	0	0	0	0
Peak Hour Total	33	3	0	0	0	1711	40	15	3	16	0	0	0	0	0	0	0	0	0	0

Burrows St (Eastbound) and Pedestrians

TIME	Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					Pedestrians A	B	C	D
15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South	West
1 7:15 AM	2	0	0	0	0	1	0	0	0	0	17	1	0	4	1	0	0	0	0	0	2	0	0	2
2 7:30 AM	8	0	0	0	0	1	0	0	0	0	43	2	2	3	0	0	0	0	0	0	5	0	0	0
3 7:45 AM	12	1	0	0	0	0	0	0	0	0	55	1	0	1	0	0	0	0	0	0	7	0	0	0
4 8:00 AM	21	0	0	0	1	2	0	0	0	0	53	3	0	4	0	0	0	0	0	0	5	0	1	1
5 8:15 AM	27	0	0	0	0	1	0	0	0	0	54	1	0	1	1	0	0	0	0	0	3	1	0	0
6 8:30 AM	13	0	0	0	0	0	0	0	0	0	49	1	0	0	1	0	0	0	0	0	11	1	1	3
7 8:45 AM	2	1	0	0	0	0	0	0	0	0	46	3	0	0	0	0	0	0	0	0	7	1	0	7
8 9:00 AM	9	0	0	0	0	1	0	0	0	0	50	2	0	0	0	0	0	0	0	0	6	1	0	2
2HR Total	94	2	0	0	1	6	0	0	0	0	367	14	2	13	3	0	0	0	0	0	46	4	2	15
Peak Hour Total	63	1	0	0	1	3	0	0	0	0	202	8	0	5	2	0	0	0	0	0	26	3	2	11

PM

Princes Hwy (Southbound)

TIME	Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 3:15 PM	6	1	0	0	1	422	28	7	1	6	0	0	0	0	0	0	0	0	0	0
2 3:30 PM	6	1	0	0	0	492	21	0	1	4	4	0	0	0	0	0	0	0	0	0
3 3:45 PM	7	2	0	0	0	467	13	9	1	4	0	0	0	0	0	0	0	0	0	0
4 4:00 PM	5	0	0	1	1	520	18	4	1	4	0	0	0	0	0	0	0	0	0	0
5 4:15 PM	9	0	0	0	0	520	13	4	0	7	1	0	0	0	0	0	0	0	0	0
6 4:30 PM	6	2	0	0	1	519	9	1	0	4	0	0	0	0	0	0	0	0	0	0
7 4:45 PM	7	0	0	0	0	492	17	3	0	6	0	0	0	0	0	0	0	0	0	0
8 5:00 PM	3	1	0	0	0	486	11	2	2	4	0	0	0	0	0	0	0	0	0	0
9 5:15 PM	7	0	0	0	0	551	13	0	1	6	1	0	0	0	0	0	0	0	0	0
10 5:30 PM	6	0	0	0	0	591	7	1	0	7	2	0	0	0	0	0	0	0	0	0
11 5:45 PM	9	3	0	0	0	530	10	1	0	3	2	0	0	0	0	0	0	0	0	0
12 6:00 PM	6	0	0	0	0	574	6	1	2	6	1	0	0	0	0	0	0	0	0	0
3HR Total	77	10	0	1	3	6164	166	33	9	61	11	0	0	0	0	0	0	0	0	0
Peak Hour Total	28	3	0	0	0	2246	36	3	3	22	6	0	0	0	0	0	0	0	0	0

Princes Hwy (Northbound)

TIME	Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 3:15 PM	5	0	0	0	0	165	5	1	2	2	0	0	0	0	0	0	0	0	0	0
2 3:30 PM	8	0	0	0	0	174	4	2	0	0	0	0	0	0	0	1	0	0	0	0
3 3:45 PM	4	0	0	0	0	194	10	1	0	1	0	0	0	0	0	0	0	0	0	0
4 4:00 PM	6	0	0	0	0	179	8	2	3	4	0	0	0	0	0	0	0	0	0	0
5 4:15 PM	6	2	0	0	1	224	5	2	0	1	0	0	0	0	0	0	0	0	0	0
6 4:30 PM	2	0	0	0	0	182	4	1	1	1	0	0	0	0	0	0	0	0	0	0
7 4:45 PM	8	0	0	0	0	221	4	2	0	0	0	0	0	0	0	0	0	0	0	0
8 5:00 PM	2	0	0	0	0	191	0	2	2	2	0	0	0	0	0	0	0	0	0	0
9 5:15 PM	2	0	0	1	0	214	4	1	1	1	0	0	0	0	0	0	0	0	0	0
10 5:30 PM	6	1	0	0	0	199	2	0	1	5	0	0	0	0	0	0	0	0	0	0
11 5:45 PM	3	0	0	0	0	246	2	1	1	7	0	0	0	0	0	0	0	0	0	0
12 6:00 PM	2	0	0	0	0	183	3	2	0	3	0	0	0	0	0	0	0	0	0	0
3HR Total	54	3	0	1	1	2372	51	17	11	27	0	0	0	0	0	1	0	0	0	0
Peak Hour Total	13	1	0	1	0	842	11	4	3	16	0	0	0	0	0	0	0	0	0	0

Burrows St (Eastbound) and Pedestrians

TIME	Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					Pedestrians A	B	C	D
15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South	West
1 3:15 PM	3	0	0	0	0	0	0	0	0	0	37	3	0	0	0	0	0	0	0	0	6	1	0	1
2 3:30 PM	5	0	0	0	0	0	0	0	0	0	21	0	0	0	1	0	0	0	0	0	1	1	0	2
3 3:45 PM	5	0	0	0	0	0	0	0	0	0	25	1	1	0	0	0	0	0	0	0	4	1	0	6
4 4:00 PM	9	0	0	0	0	0	0	0	0	0	23	1	0	0	0	0	0	0	0	0	5	1	0	3
5 4:15 PM	2	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	6	1	0	2
6 4:30 PM	3	0	0	0	0	0	0	0	0	0	31	2	0	0	0	0	0	0	0	0	4	2	0	0
7 4:45 PM	1	0	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	4	0	1	2
8 5:00 PM	2	0	0	0	0	0	0	0	0	0	28	1	0	0	0	0	0	0	0	0	2	0	0	2
9 5:15 PM	3	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0	4	0	0	1
10 5:30 PM	1	0	0	0	0	0	0	0	0	0	21	1	0	0	0	0	0	0	0	0	3	3	1	3
11 5:45 PM	1	0	0	0	0	2	0	0	0	0	28	0	0	0	0	0	0	0	0	0	3	1	0	3
12 6:00 PM	2	0	0	0	0	0	0	0	0	0	12	0	0	0	1	0	0	0	0	0	4	0	0	0
3HR Total	37	0	0	0	0	2	0	0	0	0	304	9	1	0	2	0	0	0	0	0	46	11	2	25
Peak Hour Total	7	0	0	0	0	2	0	0	0	0	88	1	0	0	1	0	0	0	0	0	14	4	1	7

TDC

Traffic Data & Control

Site ID: 6

Location: Princes Hwy & M5 East Freeway

Weather: Fine

Suburb: Arncliffe

Duration: 7:00am - 9:00am & 3:00pm - 6:00pm

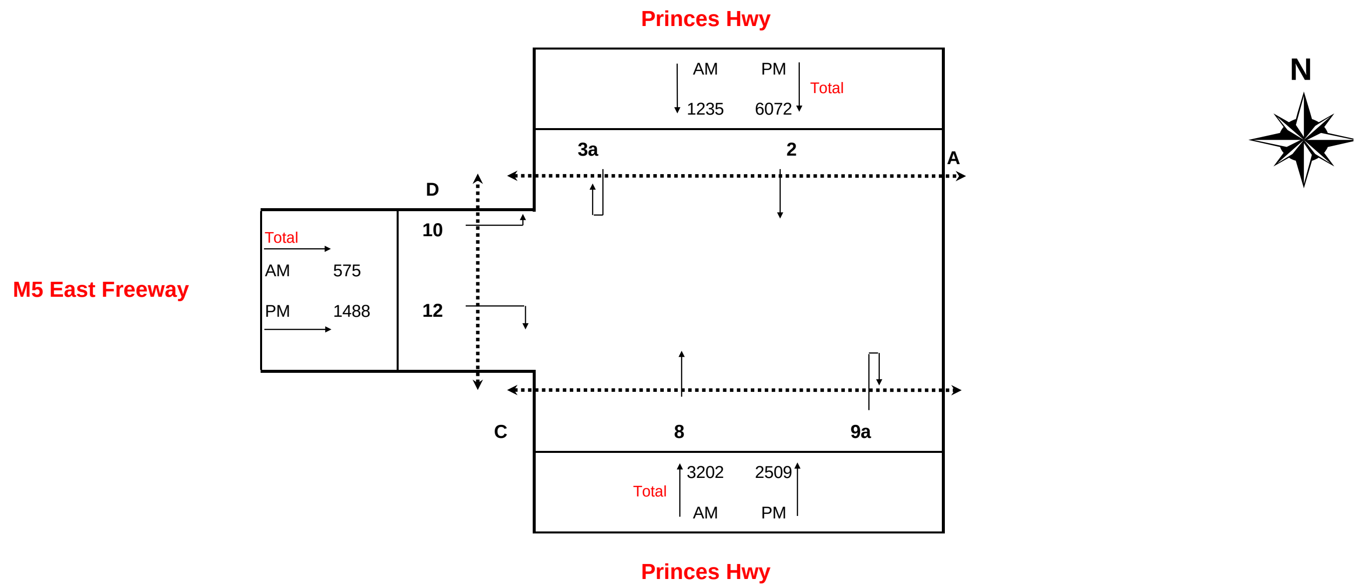
Day/Date: Wednesday, 17 October 2012

AM Peak 08:45 (hour ending)

PM Peak 18:00 (hour ending)

Traffic Control: Signals

HOME



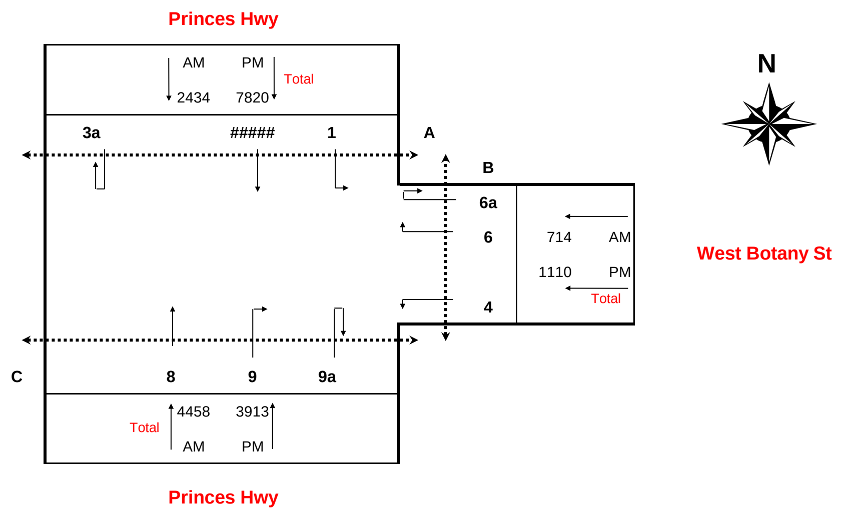
TIME		Princes Hwy (Southbound)										Princes Hwy (Northbound)										M5 East Freeway (Eastbound)										Pedestrians		
		Movement 2 (Through)					Movement 3a (U Turn)					Movement 8 (Through)					Movement 9a (U Turn)					Movement 10 (Left Turn)					Movement 12 (Right Turn)					A	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	South	West
1	7:15 AM	99	5	7	0	1	0	0	0	0	0	310	7	3	0	3	0	0	0	0	0	51	11	6	0	0	3	2	0	0	1	0	0	2
2	7:30 AM	85	6	5	0	3	0	0	0	0	0	215	6	2	0	4	0	0	0	0	0	29	3	4	0	0	5	3	1	0	0	0	0	0
3	7:45 AM	150	9	1	0	0	0	0	0	0	0	396	14	2	1	2	0	0	0	0	0	29	5	11	1	0	3	0	0	0	0	0	0	0
4	8:00 AM	169	20	1	0	1	0	0	0	0	0	395	8	2	0	4	0	0	0	0	0	37	7	16	0	0	13	0	0	0	0	0	0	1
5	8:15 AM	154	11	2	0	2	0	0	0	0	0	454	4	8	0	5	0	0	0	0	0	52	3	12	0	0	5	0	1	0	0	0	2	0
6	8:30 AM	161	18	1	0	0	0	0	0	0	0	464	14	5	1	2	0	0	0	0	0	68	9	5	0	0	7	1	0	0	0	0	1	1
7	8:45 AM	149	12	4	0	1	0	0	0	0	0	476	12	11	1	5	0	0	0	0	0	49	4	11	0	0	7	1	1	0	0	0	2	1
8	9:00 AM	137	12	7	0	2	0	0	0	0	0	348	7	6	0	5	0	0	0	0	0	79	4	8	0	0	7	0	0	0	0	0	0	1
2HR Total		1104	93	28	0	10	0	0	0	0	0	3058	72	39	3	30	0	0	0	0	0	394	46	73	1	0	50	7	3	0	1	0	5	6
Peak Hour Total		633	61	8	0	4	0	0	0	0	0	1789	38	26	2	16	0	0	0	0	0	206	23	44	0	0	32	2	2	0	0	0	5	3

TIME		Princes Hwy (Southbound)										Princes Hwy (Northbound)										M5 East Freeway (Eastbound)										Pedestrians		
		Movement 2 (Through)					Movement 3a (U Turn)					Movement 8 (Through)					Movement 9a (U Turn)					Movement 10 (Left Turn)					Movement 12 (Right Turn)					A	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	South	West
1	3:15 PM	409	19	6	1	3	0	0	0	0	0	174	2	1	2	1	0	0	0	0	0	80	14	15	3	0	20	0	0	0	0	0	1	4
2	3:30 PM	465	20	2	0	6	0	0	0	0	0	187	7	2	0	1	0	0	0	0	0	87	7	11	1	1	22	2	0	0	0	0	1	0
3	3:45 PM	441	11	10	1	2	0	0	0	0	0	193	8	0	1	0	0	0	0	0	0	86	7	10	0	0	20	2	0	0	0	0	5	2
4	4:00 PM	519	12	3	1	5	0	0	0	0	0	206	6	2	2	0	0	0	0	0	0	71	6	11	0	0	27	0	1	0	0	0	0	3
5	4:15 PM	462	11	1	0	2	0	0	0	0	0	210	4	3	0	3	0	0	0	0	0	95	6	11	2	1	32	1	1	0	0	0	1	0
6	4:30 PM	492	10	2	0	5	0	0	0	0	0	200	3	2	1	0	0	0	0	0	0	103	5	5	0	0	23	0	0	0	0	0	1	3
7	4:45 PM	504	11	3	1	5	0	0	0	0	0	212	3	4	0	1	0	0	0	0	0	98	5	10	2	2	17	1	0	0	0	0	0	0
8	5:00 PM	432	8	5	1	3	0	0	0	0	0	197	1	1	4	1	0	0	0	0	0	63	3	6	1	1	12	0	0	0	0	0	0	2
9	5:15 PM	582	7	0	1	6	0	0	0	0	0	224	3	1	0	2	0	0	0	0	0	80	2	8	0	0	18	0	0	0	1	0	1	1
10	5:30 PM	543	6	1	0	4	0	0	0	0	0	184	1	0	2	6	0	0	0	0	0	98	2	9	1	1	18	1	0	0	0	0	1	2
11	5:45 PM	521	9	2	0	1	0	0	0	0	0	249	2	1	0	5	0	0	0	0	0	85	1	5	0	0	14	1	0	0	0	0	0	4
12	6:00 PM	483	6	0	2	4	0	0	0	0	0	177	1	2	0	4	0	0	0	0	0	100	2	5	0	1	25	0	0	0	0	0	1	1
3HR Total		5853	130	35	8	46	0	0	0	0	0	2413	41	19	12	24	0	0	0	0	0	1046	60	106	10	7	248	8	2	0	1	0	12	22
Peak Hour Total		2129	28	3	3	15	0	0	0	0	0	834	7	4	2	17	0	0	0	0	0	363	7	27	1	2	75	2	0	0	1	0	3	8

TDC
Traffic Data & Control

Site ID:	7
Location:	Princes Hwy & West Botany St
Weather:	Fine
Suburb:	Wolli Creek
Duration:	7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date:	Wednesday, 17 October 2012
AM Peak	08:45 (hour ending)
PM Peak	18:00 (hour ending)
Traffic Control:	Signals

HOME



AM

Princes Hwy (Southbound)

TIME		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	88	7	11	3	2	84	4	6	2	1	0	0	0	0	0
2	7:30 AM	110	11	10	2	5	90	7	4	1	1	0	0	0	0	0
3	7:45 AM	162	16	10	5	0	127	11	0	0	1	0	0	0	0	0
4	8:00 AM	171	11	12	1	1	174	21	2	0	1	0	0	0	0	0
5	8:15 AM	127	13	21	0	1	150	10	2	0	0	0	0	0	0	0
6	8:30 AM	123	16	14	2	1	157	14	1	0	1	0	0	0	0	0
7	8:45 AM	119	19	19	1	2	146	16	4	0	1	0	0	0	0	0
8	9:00 AM	102	9	23	0	0	123	12	8	0	2	0	0	0	0	0
2HR Total		1002	102	120	14	12	1051	95	27	3	8	0	0	0	0	0
Peak Hour Total		540	59	66	4	5	627	61	9	0	3	0	0	0	0	0

West Botany St (Westbound)

TIME		Movement 4 (Left Turn)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	3	0	0	0	0	94	3	0	0	1	0	0	0	0	0
2	7:30 AM	1	0	0	0	0	60	3	0	1	1	0	0	0	0	0
3	7:45 AM	3	0	0	0	0	97	4	0	0	3	0	0	0	0	0
4	8:00 AM	2	0	0	0	0	84	1	1	1	2	0	0	0	0	0
5	8:15 AM	4	0	0	0	0	94	3	0	1	6	0	0	0	0	0
6	8:30 AM	5	0	0	0	0	64	5	0	0	1	0	0	0	0	0
7	8:45 AM	5	0	0	0	0	68	3	0	0	0	0	0	0	0	0
8	9:00 AM	14	0	0	0	0	69	4	1	1	1	0	0	0	0	0
2HR Total		37	0	0	0	0	630	26	2	4	15	0	0	0	0	0
Peak Hour Total		16	0	0	0	0	310	12	1	2	9	0	0	0	0	0

Princes Hwy (Northbound) and Pedestrians

TIME		Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)					Pedestrians A	Pedestrians B	Pedestrians C
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South
1	7:15 AM	342	21	11	1	7	0	0	0	0	0	0	0	0	0	0	0	5	0
2	7:30 AM	311	17	6	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
3	7:45 AM	529	24	12	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0
4	8:00 AM	563	18	14	1	6	0	0	0	0	0	0	0	0	0	0	0	3	1
5	8:15 AM	606	13	18	0	7	0	0	0	0	0	0	0	0	0	0	0	3	5
6	8:30 AM	659	22	6	1	3	0	0	0	0	0	0	0	0	0	0	0	3	0
7	8:45 AM	634	18	22	1	9	0	0	0	0	0	0	0	0	0	0	0	1	2
8	9:00 AM	513	16	13	1	4	0	0	0	0	0	0	0	0	0	0	0	1	1
2HR Total		4157	149	102	5	45	0	0	0	0	0	0	0	0	0	0	0	17	9
Peak Hour Total		2462	71	60	3	25	0	0	0	0	0	0	0	0	0	0	0	10	8

PM

Princes Hwy (Southbound)

TIME		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	133	5	7	2	0	397	24	5	1	3	0	0	0	0	0
2	3:30 PM	118	6	11	1	0	448	22	2	0	6	0	0	0	0	0
3	3:45 PM	117	8	10	2	4	433	13	10	1	2	0	0	0	0	0
4	4:00 PM	132	7	14	0	0	526	16	1	1	8	0	0	0	0	0
5	4:15 PM	98	4	14	1	0	465	12	1	0	3	0	0	0	0	0
6	4:30 PM	107	3	15	1	0	489	10	2	0	5	0	0	0	0	0
7	4:45 PM	133	4	7	1	1	498	16	3	1	6	0	0	0	0	0
8	5:00 PM	127	7	7	1	0	444	11	3	1	5	0	0	0	0	0
9	5:15 PM	121	5	8	1	0	586	12	0	1	5	0	0	0	0	0
10	5:30 PM	135	6	4	1	0	581	11	1	0	5	0	0	0	0	0
11	5:45 PM	136	3	5	0	4	528	9	2	0	2	0	0	0	0	0
12	6:00 PM	156	4	2	1	2	468	6	0	2	5	0	0	0	0	0
3HR Total		1513	62	104	12	11	5863	162	30	8	55	0	0	0	0	0
Peak Hour Total		548	18	19	3	6	2163	38	3	3	17	0	0	0	0	0

West Botany St (Westbound)

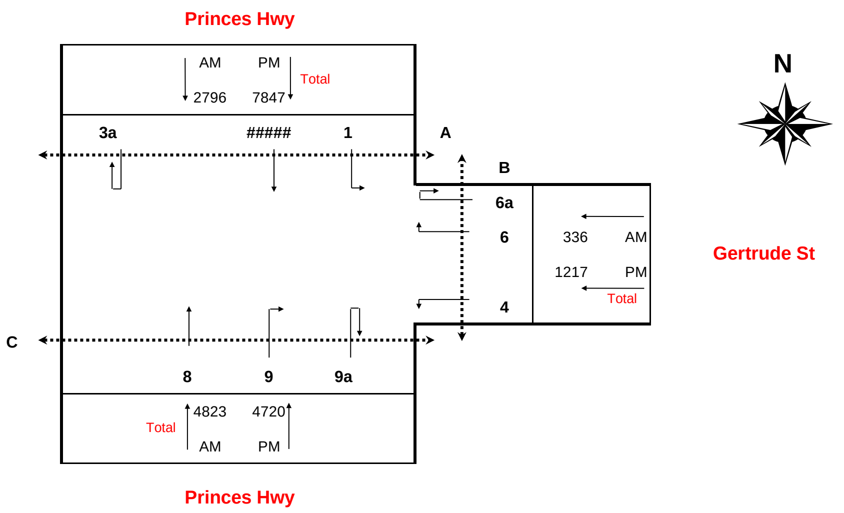
TIME		Movement 4 (Left Turn)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	11	0	0	0	0	75	6	0	1	1	0	0	0	0	0
2	3:30 PM	8	0	1	0	0	70	1	0	0	2	0	0	0	0	0
3	3:45 PM	6	0	0	0	0	65	3	0	1	0	0	0	0	0	0
4	4:00 PM	8	0	0	0	0	72	4	1	2	1	0	0	0	0	0
5	4:15 PM	15	2	0	0	0	77	0	0	2	0	0	0	0	0	0
6	4:30 PM	10	0	0	0	0	47	1	0	1	1	0	0	0	0	0
7	4:45 PM	19	0	0	0	0	87	5	0	0	2	0	0	0	0	0
8	5:00 PM	17	1	0	0	0	85	2	0	1	1	0	0	0	0	0
9	5:15 PM	16	0	0	0	0	62	1	0	0	1	0	0	0	0	0
10	5:30 PM	23	0	0	0	0	97	3	0	1	0	0	0	0	0	0
11	5:45 PM	10	0	1	0	0	81	1	0	0	1	0	0	0	0	0
12	6:00 PM	16	0	0	0	0	77	1	1	0	2	0	0	0	0	0
3HR Total		159	3	2	0	0	895	28	2	9	12	0	0	0	0	0
Peak Hour Total		65	0	1	0	0	317	6	1	1	4	0	0	0	0	0

Princes Hwy (Northbound) and Pedestrians

TIME		Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)					Pedestrians A	Pedestrians B	Pedestrians C
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South
1	3:15 PM	280	15	16	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3:30 PM	288	13	15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
3	3:45 PM	293	15	8	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	4:00 PM	277	11	17	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	4:15 PM	313	10	11	2	4	0	0	0	0	0	0	0	0	0	0	0	1	4
6	4:30 PM	330	8	9	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0
7	4:45 PM	321	8	12	1	3	0	0	0	0	0	0	0	0	0	0	0	1	3
8	5:00 PM	290	5	8	2	2	0	0	0	0	0	0	0	0	0	0	0	4	2
9	5:15 PM	317	5	9	0	3	0	0	0	0	0	0	0	0	0	0	0	4	0
10	5:30 PM	289	3	7	1	9	0	0	0	0	0	0	0	0	0	0	0	2	0
11	5:45 PM	350	3	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0
12	6:00 PM	283	2	7	0	5	0	0	0	0	0	0	0	0	0	0	0	5	0
3HR Total		3631	98	125	15	44	0	0	0	0	0	0	0	0	0	0	0	18	9
Peak Hour Total		1239	13	29	1	23	0	0	0	0	0	0	0	0	0	0	0	11	0

Traffic Data & Control

Site ID: 8
Location: Princes Hwy & Gertrude St
Weather: Fine
Suburb: Wolli Creek
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Wednesday, 17 October 2012
AM Peak 09:00 (hour ending)
PM Peak 18:00 (hour ending)
Traffic Control: Signals
HOME



Princes Hwy (Southbound)

TIME		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	59	4	0	0	0	171	11	19	5	2	0	0	0	0	0
2	7:30 AM	66	2	0	0	0	183	19	15	4	2	0	0	0	0	0
3	7:45 AM	65	1	0	0	0	290	19	11	4	3	0	0	0	0	0
4	8:00 AM	59	1	0	0	2	299	34	15	1	1	0	0	0	0	0
5	8:15 AM	52	2	0	0	0	282	21	21	0	3	0	0	0	0	0
6	8:30 AM	60	0	0	0	0	264	35	13	2	1	0	0	0	0	0
7	8:45 AM	46	2	0	0	0	238	26	22	1	2	0	0	0	0	0
8	9:00 AM	52	0	0	0	0	231	23	29	0	1	0	0	0	0	0
2HR Total		459	12	0	0	2	1958	188	145	17	15	0	0	0	0	0
Peak Hour Total		210	4	0	0	0	1015	105	85	3	7	0	0	0	0	0

Gertrude St (Westbound)

TIME		Movement 4 (Left Turn)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	3	0	0	0	0	33	0	0	0	0	0	0	0	0	0
2	7:30 AM	11	1	0	0	0	27	1	0	1	0	0	0	0	0	0
3	7:45 AM	11	0	0	0	0	27	2	1	0	0	0	0	0	0	0
4	8:00 AM	5	0	0	0	0	31	1	0	0	0	0	0	0	0	0
5	8:15 AM	2	1	0	0	0	33	1	0	0	1	0	0	0	0	0
6	8:30 AM	9	1	0	0	0	40	0	0	0	0	0	0	0	0	0
7	8:45 AM	10	1	0	0	0	32	1	0	0	0	0	0	0	0	0
8	9:00 AM	5	0	0	0	0	44	0	0	0	0	0	0	0	0	0
2HR Total		56	4	0	0	0	267	6	1	1	1	0	0	0	0	0
Peak Hour Total		26	3	0	0	0	149	2	0	0	1	0	0	0	0	0

Princes Hwy (Northbound) / Pedestrians

TIME		Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)					Pedestrians A	Pedestrians B	Pedestrians C
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South
1	7:15 AM	378	20	12	0	6	2	0	0	0	0	0	0	0	0	0	0	0	0
2	7:30 AM	327	19	7	1	7	4	0	0	0	0	1	1	0	0	0	0	0	0
3	7:45 AM	607	26	13	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0
4	8:00 AM	577	16	14	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
5	8:15 AM	658	17	19	1	1	0	0	0	0	0	0	0	0	0	0	0	4	5
6	8:30 AM	665	22	10	1	1	0	0	0	0	0	0	0	0	0	0	0	2	3
7	8:45 AM	624	18	25	1	2	2	0	0	0	0	0	0	0	0	0	0	0	2
8	9:00 AM	675	19	12	2	0	1	0	0	0	0	0	0	0	0	0	0	0	6
2HR Total		4511	157	112	9	22	10	0	0	0	0	1	1	0	0	0	0	6	16
Peak Hour Total		2622	76	66	5	4	3	0	0	0	0	0	0	0	0	0	0	6	16

Princes Hwy (Southbound)

TIME		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	38	0	0	0	0	516	27	13	3	3	0	0	0	0	0
2	3:30 PM	27	1	0	0	0	504	24	15	1	10	0	0	0	0	0
3	3:45 PM	22	0	0	0	1	573	23	22	0	5	0	0	0	0	0
4	4:00 PM	30	0	0	0	0	571	22	14	1	7	0	0	0	0	0
5	4:15 PM	31	0	0	0	0	558	16	15	1	4	0	0	0	0	0
6	4:30 PM	30	1	0	0	0	564	16	18	1	4	0	0	0	0	0
7	4:45 PM	40	0	0	0	0	567	20	7	2	5	0	0	0	0	0
8	5:00 PM	27	0	0	0	0	582	20	11	2	5	0	0	0	0	0
9	5:15 PM	25	0	0	0	0	635	25	7	0	4	0	0	0	0	0
10	5:30 PM	23	0	0	0	0	725	14	5	1	6	0	0	0	0	0
11	5:45 PM	37	0	0	0	0	619	12	6	0	5	0	0	0	0	0
12	6:00 PM	29	0	0	0	0	625	10	2	4	8	0	0	0	0	0
3HR Total		359	2	0	0	1	7039	229	135	16	66	0	0	0	0	0
Peak Hour Total		114	0	0	0	0	2604	61	20	5	23	0	0	0	0	0

Gertrude St (Westbound)

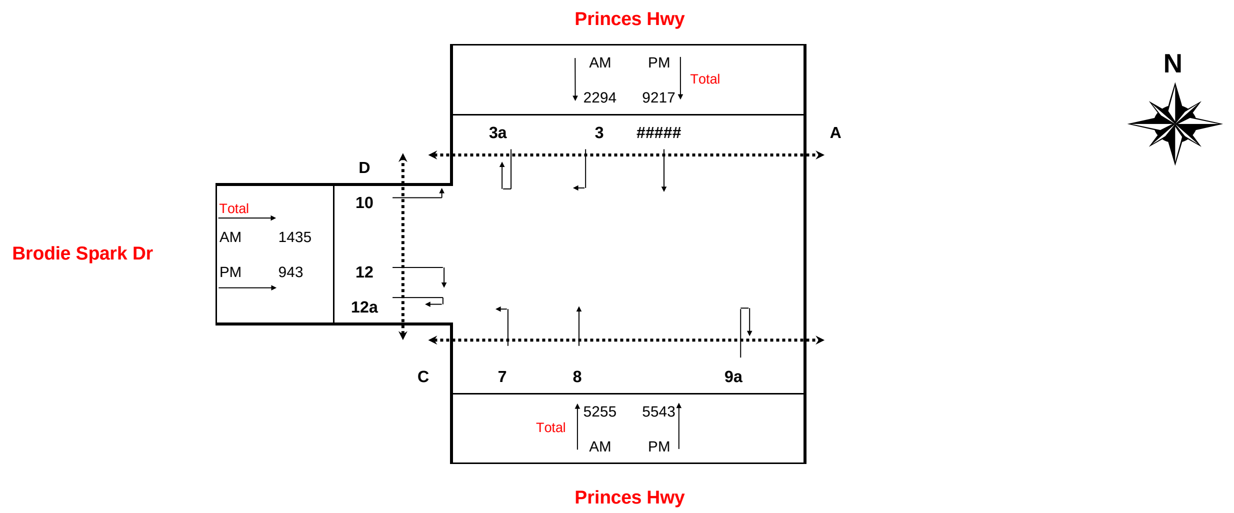
TIME		Movement 4 (Left Turn)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	22	1	0	0	0	70	3	0	0	0	0	0	0	0	0
2	3:30 PM	22	0	0	0	0	82	1	0	1	0	0	0	0	0	0
3	3:45 PM	14	0	0	0	0	65	0	0	0	1	0	0	0	0	0
4	4:00 PM	21	0	0	0	0	105	3	0	0	1	0	0	0	0	0
5	4:15 PM	7	0	0	0	0	76	2	0	0	3	0	0	0	0	0
6	4:30 PM	13	0	0	0	0	72	1	0	0	0	0	0	0	0	0
7	4:45 PM	19	0	0	0	0	76	0	0	0	1	0	0	0	0	0
8	5:00 PM	13	0	0	0	0	84	1	0	0	3	0	0	0	0	0
9	5:15 PM	12	0	0	0	0	96	0	0	0	2	0	0	0	0	0
10	5:30 PM	16	0	0	0	0	89	1	0	0	0	0	0	0	0	0
11	5:45 PM	18	0	0	0	0	93	0	0	0	0	0	0	0	0	0
12	6:00 PM	17	0	0	0	0	85	0	0	1	4	0	0	0	0	0
3HR Total		194	1	0	0	0	993	12	0	2	15	0	0	0	0	0
Peak Hour Total		63	0	0	0	0	363	1	0	1	6	0	0	0	0	0

Princes Hwy (Northbound) / Pedestrians

TIME		Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)					Pedestrians A	Pedestrians B	Pedestrians C
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South
1	3:15 PM	346	20	18	3	2	0	0	0	0	0	0	0	0	0	0	0	1	0
2	3:30 PM	327	14	13	1	3	0	0	0	0	0	0	0	0	0	0	0	0	5
3	3:45 PM	361	16	11	2	2	0	0	0	0	0	1	0	0	0	0	0	2	3
4	4:00 PM	334	16	13	4	5	0	0	0	0	0	0	0	0	0	0	0	2	0
5	4:15 PM	394	9	12	3	4	0	0	0	0	0	0	0	0	0	0	0	1	2
6	4:30 PM	356	12	8	3	1	0	0	0	0	0	0	0	0	0	0	0	2	0
7	4:45 PM	412	11	13	0	3	0	0	0	0	0	0	0	0	0	0	0	4	6
8	5:00 PM	366	4	10	4	2	0	0	0	0	0	0	0	0	0	0	0	2	3
9	5:15 PM	388	8	7	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2
10	5:30 PM	372	6	7	2	4	1	0	0	0	0	0	0	0	0	0	0	2	1
11	5:45 PM	405	3	5	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
12	6:00 PM	351	5	7	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0
3HR Total		4412	124	124	22	36	1	0	0	0	0	1	0	0	0	0	0	17	25
Peak Hour Total		1516	22	26	2	14	1	0	0	0	0	0	0	0	0	0	0	3	6

TDC
Traffic Data & Control

Site ID: 9
Location: Princes Hwy & Brodie Spark Dr
Weather: Fine
Suburb: Wolli Creek
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Wednesday, 17 October 2012
AM Peak 09:00 (hour ending)
PM Peak 18:00 (hour ending)
Traffic Control: Signals
HOME



Princes Hwy (Southbound)

#	TIME (15 Minute Period Ending)	Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	145	7	21	1	0	12	0	0	0	0	0	0	0	0	0
2	7:30 AM	204	14	13	2	0	29	4	0	1	0	0	0	0	0	0
3	7:45 AM	196	16	12	3	0	24	0	1	0	2	0	0	0	0	0
4	8:00 AM	254	18	11	1	0	22	2	0	0	1	0	0	0	0	0
5	8:15 AM	216	25	17	0	0	24	2	0	1	0	0	0	0	0	0
6	8:30 AM	259	29	13	2	0	27	4	1	1	0	0	0	0	0	0
7	8:45 AM	256	27	17	1	2	32	0	1	0	0	0	0	0	0	0
8	9:00 AM	232	25	27	0	1	33	2	0	1	0	0	0	0	0	0
2HR Total		1762	161	131	10	3	203	14	3	4	3	0	0	0	0	0
Peak Hour Total		963	106	74	3	3	116	8	2	3	0	0	0	0	0	0

Princes Hwy (Northbound)

#	TIME (15 Minute Period Ending)	Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9a (U Turn)				
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	12	2	0	0	0	407	20	11	1	8	2	0	0	0	0
2	7:30 AM	14	0	0	0	1	327	18	5	0	6	0	0	0	0	0
3	7:45 AM	13	3	0	0	0	624	27	13	3	1	0	0	0	0	0
4	8:00 AM	19	0	0	0	1	619	21	14	1	6	0	0	0	0	0
5	8:15 AM	22	0	1	0	0	678	21	19	1	10	0	0	0	0	0
6	8:30 AM	20	0	0	0	0	752	25	8	1	7	0	0	0	0	0
7	8:45 AM	12	2	3	0	0	670	25	14	0	9	0	0	0	0	0
8	9:00 AM	19	1	0	0	0	691	21	16	3	5	0	0	0	0	0
2HR Total		131	8	4	0	2	4768	178	100	10	52	2	0	0	0	0
Peak Hour Total		73	3	4	0	0	2791	92	57	5	31	0	0	0	0	0

Brodie Spark Dr (Eastbound) / **Pedestrians**

#	TIME (15 Minute Period Ending)	Movement 10 (Left Turn)					Movement 12 (Right Turn)					Movement 12a (U Turn)					Pedestrians A	Pedestrians B	Pedestrians C
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	South	West
1	7:15 AM	95	7	1	1	4	29	2	1	0	0	0	0	0	0	0	0	9	2
2	7:30 AM	93	3	0	0	3	21	1	1	0	0	0	0	0	0	0	0	16	3
3	7:45 AM	131	5	1	1	2	45	2	0	1	0	0	0	0	0	0	0	11	0
4	8:00 AM	145	4	0	0	2	49	1	0	0	0	0	0	0	0	0	0	25	3
5	8:15 AM	161	3	1	2	2	56	0	0	0	0	0	0	0	0	0	0	7	3
6	8:30 AM	151	1	0	1	2	31	1	0	0	1	0	0	0	0	0	0	16	2
7	8:45 AM	146	2	0	1	2	35	2	2	0	1	0	0	0	0	0	0	15	1
8	9:00 AM	139	2	0	0	1	34	0	4	0	0	0	0	0	0	0	0	5	3
2HR Total		1061	27	3	6	18	300	9	8	1	2	0	0	0	0	0	0	104	17
Peak Hour Total		597	8	1	4	7	156	3	6	0	2	0	0	0	0	0	0	43	9

Princes Hwy (Southbound)

#	TIME (15 Minute Period Ending)	Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	501	23	10	3	3	105	3	1	0	1	0	0	0	0	0
2	3:30 PM	537	21	8	1	4	121	5	0	1	0	0	0	0	0	0
3	3:45 PM	522	22	21	3	6	102	6	0	1	0	0	0	0	0	0
4	4:00 PM	655	17	13	1	2	135	4	1	2	0	1	0	0	0	0
5	4:15 PM	573	16	16	1	5	142	8	0	0	2	0	0	0	0	0
6	4:30 PM	537	17	13	1	5	150	5	0	0	5	0	0	0	0	0
7	4:45 PM	630	16	12	1	3	135	4	0	3	3	0	0	0	0	0
8	5:00 PM	526	15	10	3	6	154	5	0	0	4	0	0	0	0	0
9	5:15 PM	641	17	6	2	5	156	1	1	0	0	0	0	0	0	0
10	5:30 PM	700	15	5	1	3	213	2	0	2	4	0	0	0	0	0
11	5:45 PM	603	11	7	0	0	147	1	0	1	3	0	0	0	0	0
12	6:00 PM	618	11	2	4	5	137	1	0	2	2	0	0	0	0	0
3HR Total		7043	201	123	21	47	1697	45	3	12	24	1	0	0	0	0
Peak Hour Total		2562	54	20	7	13	653	5	1	5	9	0	0	0	0	0

Princes Hwy (Northbound)

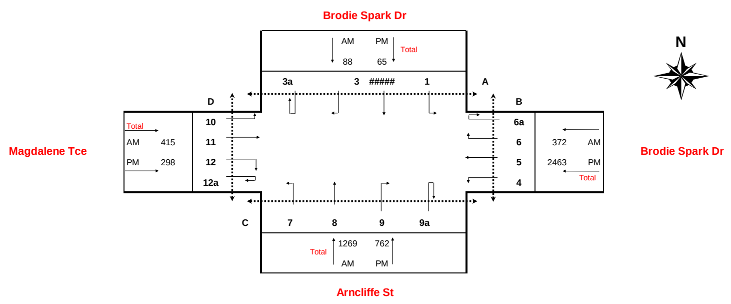
#	TIME (15 Minute Period Ending)	Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9a (U Turn)				
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	38	3	0	0	0	317	18	17	4	4	0	0	0	0	0
2	3:30 PM	63	2	0	0	0	369	10	13	1	2	0	0	0	0	0
3	3:45 PM	54	3	1	0	1	363	16	10	2	5	0	0	0	0	0
4	4:00 PM	63	2	0	1	0	336	12	15	4	6	0	0	0	0	0
5	4:15 PM	58	0	0	0	1	401	17	11	3	5	0	0	0	0	0
6	4:30 PM	68	2	0	0	0	356	9	10	3	2	0	0	0	0	0
7	4:45 PM	59	4	0	0	0	414	7	8	3	5	0	0	0	0	0
8	5:00 PM	52	1	0	0	0	357	9	10	4	5	0	0	0	0	0
9	5:15 PM	53	0	0	0	2	399	6	8	0	5	0	0	0	0	0
10	5:30 PM	53	2	0	0	1	386	6	8	0	6	0	0	0	0	0
11	5:45 PM	66	2	0	0	1	443	4	5	1	11	0	0	0	0	0
12	6:00 PM	61	0	0	1	3	350	5	8	1	7	0	0	0	0	0
3HR Total		688	21	1	2	9	4491	119	123	26	63	0	0	0	0	0
Peak Hour Total		233	4	0	1	7	1578	21	29	2	29	0	0	0	0	0

Brodie Spark Dr (Eastbound) / **Pedestrians**

#	TIME (15 Minute Period Ending)	Movement 10 (Left Turn)					Movement 12 (Right Turn)					Movement 12a (U Turn)					Pedestrians A	Pedestrians B	Pedestrians C
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	South	West
1	3:15 PM	53	1	0	0	0	28	3	2	0	0	0	0	0	0	0	0	10	1
2	3:30 PM	47	0	0	0	2	27	1	2	0	0	0	0	0	0	0	0	11	3
3	3:45 PM	55	2	1	1	1	23	3	0	0	0	0	0	0	0	0	0	12	1
4	4:00 PM	46	0	1	1	0	29	2	0	0	0	0	0	0	0	0	0	12	3
5	4:15 PM	29	1	0	0	0	24	0	0	0	0	0	0	0	0	0	0	5	1
6	4:30 PM	35	2	0	0	0	29	0	1	0	0	0	0	0	0	0	0	12	2
7	4:45 PM	37	0	0	1	0	32	0	0	0	1	0	0	0	0	0	0	13	1
8	5:00 PM	33	1	0	1	0	32	1	0	0	0	0	0	0	0	0	0	9	0
9	5:15 PM	45	0	0	0	0	38	0	0	0	0	0	0	0	0	0	0	11	6
10	5:30 PM	53	2	0	1	0	30	0	0	0	0	0	0	0	0	0	0	17	4
11	5:45 PM	51	0	0	0	0	38	0	0	0	1	0	0	0	0	0	0	17	5
12	6:00 PM	58	0	0	0	0	34	1	0	0	0	0	0	0	0	0	0	9	4
3HR Total		542	9	2	5	3	364	11	5	0	2	0	0	0	0	0	0	138	31
Peak Hour Total		207	2	0	1	0	140	1	0	0	1	0	0	0	0	0	0	54	19

TDC Traffic Data & Control

Site ID: 10
Location: Brodie Spark Dr & Arncliffe St
Weather: Fine
Suburb: Wolli Creek
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Thursday, 18 October 2012
AM Peak 08:00 (hour ending)
PM Peak 18:00 (hour ending)
Traffic Control: Roundabout
HOME



Brodie Spark Dr (Southbound)

TIME		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	7	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2	7:30 AM	9	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
3	7:45 AM	9	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	8:00 AM	9	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5	8:15 AM	10	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0
6	8:30 AM	9	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7	8:45 AM	6	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8	9:00 AM	5	0	0	0	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2HR Total		64	0	0	0	6	11	1	0	0	0	6	0	0	0	0	0	0	0	0	0
Peak Hour Total		34	0	0	0	5	4	0	0	0	0	3	0	0	0	0	0	0	0	0	0

Brodie Spark Dr (Westbound)

TIME		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	19	2	0	0	0	12	2	0	1	0	2	0	0	0	0	4	0	0	0	0
2	7:30 AM	25	1	1	0	0	14	1	0	0	0	2	0	0	0	0	2	0	0	0	0
3	7:45 AM	18	4	0	0	0	9	0	0	0	1	1	0	0	0	0	2	0	0	0	0
4	8:00 AM	27	2	0	0	1	17	0	0	1	1	1	0	0	0	0	2	1	0	0	0
5	8:15 AM	25	1	0	0	0	15	0	0	0	0	3	0	0	0	0	2	0	0	0	0
6	8:30 AM	22	1	0	0	0	10	1	0	1	0	2	0	0	0	0	5	0	0	0	0
7	8:45 AM	24	3	1	0	0	9	0	3	0	0	1	0	0	0	0	6	0	0	0	0
8	9:00 AM	23	2	0	0	1	21	2	0	1	1	3	0	0	0	0	6	1	0	0	0
2HR Total		183	16	2	0	2	107	6	3	4	3	15	0	0	0	0	29	2	0	0	0
Peak Hour Total		89	9	1	0	1	52	3	0	2	2	6	0	0	0	0	10	1	0	0	0

Arncliffe St (Northbound)

TIME		Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	3	1	0	0	0	0	0	0	0	0	132	6	3	1	3	0	1	0	0	0
2	7:30 AM	4	0	1	0	0	0	0	0	0	2	200	4	2	1	0	1	0	0	0	0
3	7:45 AM	1	0	0	0	0	0	0	0	0	1	168	4	0	3	0	0	0	0	0	0
4	8:00 AM	1	0	0	0	0	0	0	0	0	0	169	5	1	2	0	6	0	0	0	0
5	8:15 AM	2	1	0	0	0	0	0	0	0	1	123	2	0	0	8	1	0	0	0	0
6	8:30 AM	1	0	0	0	0	1	0	0	0	0	140	0	0	0	1	0	0	0	0	0
7	8:45 AM	0	0	0	0	0	0	0	0	0	0	118	5	1	1	1	0	0	0	0	0
8	9:00 AM	3	0	1	0	0	1	0	0	0	0	120	4	3	1	3	0	0	0	0	0
2HR Total		15	2	2	0	0	2	0	0	0	4	1170	30	10	9	16	8	1	0	0	0
Peak Hour Total		9	1	1	0	0	0	0	0	0	3	669	19	6	7	3	7	1	0	0	0

Magdalene Tce (Eastbound)

TIME		Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	1	0	0	0	2	47	4	0	0	2	0	0	0	0	0	2	0	0	0	0
2	7:30 AM	0	0	0	0	0	28	1	0	1	0	1	0	0	0	0	0	0	0	0	0
3	7:45 AM	0	0	0	0	0	57	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4	8:00 AM	0	0	0	0	0	50	0	0	1	1	5	0	0	0	0	0	1	0	0	0
5	8:15 AM	1	0	0	0	1	48	2	0	0	1	2	0	0	0	0	0	0	0	0	0
6	8:30 AM	3	1	0	0	0	44	1	0	0	2	0	0	0	0	0	0	0	0	0	0
7	8:45 AM	1	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	9:00 AM	0	0	0	0	0	58	1	0	0	3	1	0	0	0	0	0	0	0	0	0
2HR Total		6	1	0	0	3	372	9	0	2	9	10	0	0	0	0	2	1	0	0	0
Peak Hour Total		1	0	0	0	2	182	5	0	2	3	7	0	0	0	0	2	1	0	0	0

Pedestrians

TIME		A	B	C	D
15 MINUTE PERIOD ENDING		North	East	South	West
1	7:15 AM	6	0	1	0
2	7:30 AM	7	1	10	0
3	7:45 AM	9	1	14	0
4	8:00 AM	10	1	23	0
5	8:15 AM	6	0	10	0
6	8:30 AM	10	0	6	0
7	8:45 AM	7	1	12	2
8	9:00 AM	4	0	2	0
2HR Total		59	4	78	2
Peak Hour Total		32	3	48	0

Brodie Spark Dr (Southbound)

TIME		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2	3:30 PM	6	0	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0
3	3:45 PM	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4	4:00 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5	4:15 PM	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6	4:30 PM	1	0	0	0	0	1	0	0	0	0	3	0	0	0	1	0	0	0	0	0
7	4:45 PM	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5:00 PM	4	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9	5:15 PM	1	0	0	0	0	1	0	0	0	1	3	0	0	0	0	0	0	0	0	0
10	5:30 PM	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	5:45 PM	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	6:00 PM	2	0	0	0	0	3	0	0	0	1	0	0	0	0	0	2	0	0	0	0
3HR Total		31	0	0	0	1	16	0	0	0	2	10	1	0	0	2	2	0	0	0	0
Peak Hour Total		9	0	0	0	0	6	0	0	0	2	3	0	0	0	0	2	0	0	0	0

Brodie Spark Dr (Westbound)

TIME		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	103	10	0	0	2	45	1	0	0	0	2	0	0	0	0	12	0	0	0	0
2	3:30 PM	115	9	0	0	3	53	3	0	1	4	6	0	0	0	0	8	0	0	0	0
3	3:45 PM	103	6	0	0	0	50	1	0	1	1	4	0	0	0	0	8	1	0	0	0
4	4:00 PM	111	7	0	0	0	58	1	0	1	3	5	0	0	0	0	2	1	0	0	0
5	4:15 PM	123	6	0	0	0	59	2	0	0	2	5	0	0	0	0	7	0	0	0	0
6	4:30 PM	134	4	0	1	0	46	0	0	0	1	3	0	0	0	0	10	0	0	1	0
7	4:45 PM	140	2	0	1	1	53	4	0	1	0	1	0	0	0	0	8	0	0	0	0
8	5:00 PM	130	5	0	1	0	49	2	0	0	1	11	0	0	0	0	15	0	0	0	1
9	5:15 PM	123	2	0	1	0	55	2	0	1	2	5	0	0	0	0	6	0	0	0	0
10	5:30 PM	161	3	0	0	1	64	2	0	1	2	4	0	0	0	0	6	0	0	0	0
11	5:45 PM	138	1	1	1	2	68	0	0	0	2	7	0	0	0	0	8	0	0	0	0
12	6:00 PM	136	1	0	2	10	58	0	0	1	2	5	0	0	0	0	8	0	0	0	0
3HR Total		1517	56	1	7	19	658	18	0	7	20	58	0	0	0	0	98	2	0	1	1
Peak Hour Total		558	7	1	4	13	245	4	0	3	8	21	0	0	0	0	28	0	0	0	0

Arncliffe St (Northbound)

TIME		Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	3	0	0	0	0	0	0	0	0	0	54	2	0	1	1	1	0	0	0	0
2	3:30 PM	5	1	0	0	0	3	0	0	0	0	42	3	1	0	0	0	0	0	0	0
3	3:45 PM	4	0	0	0	0	2	0	0	0	0	52	6	0	0	2	1	0	0	0	0
4	4:00 PM	3	0	0	0	0	1	0	0	0	0	47	1	0	1	0	3	0	0	0	0
5	4:15 PM	2	0	0	0	0	1	0	0	0	0	37	6	0	0	1	2	0	0	0	0
6	4:30 PM	5	0	0	0	0	2	0	0	0	0	60	3	0	0	0	1	0	0	0	0
7	4:45 PM	5	0	0	0	0	2	0	0	0	0	44	3	0	1	1	1	0	0	0	0
8	5:00 PM	8	0	0	0	0	4	0	0	0	0	58	0	0	0	0	2	0	0	0	0
9	5:15 PM	1	0	0	0	0	3	0	0	0	0	63	1	1	0	0	1	0	0	0	0
10	5:30 PM	1	0	0	0	0	1	0	0	0	0	59	2	0	1	0	4	0	0	0	0
11	5:45 PM	4	0	0	0	0	3	0	0	0	0	59	0	0	0	0	2	0	0	0	0
12	6:00 PM	7	0	0	0	0	2	0	0	0	0	56	0	0	1	0	1	0	0	0	0
3HR Total		48	1	0	0	0	24	0	0	0	0	631	27	2	5	5	19	0	0	0	0
Peak Hour Total		13	0	0	0	0	9	0	0	0	0	237	3	1	2	0	8	0	0	0	0

Magdalene Tce (Eastbound)

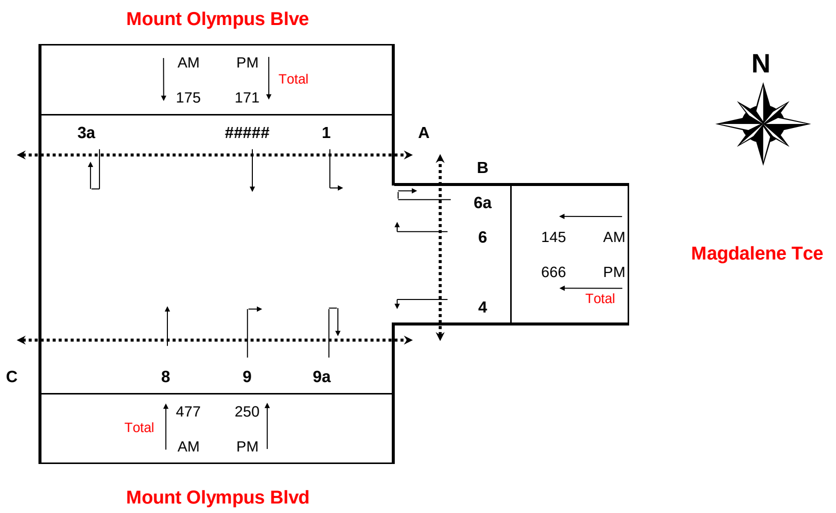
TIME		Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	0	0	0	0	0	14	1	0	0	0	4	0	0	0	0	1	0	0	0	0
2	3:30 PM	2	0	0	0	0	26	1	0	1	0	2	0	0	0	0	0	0	0	0	0
3	3:45 PM	2	0	0	0	0	19	1	0	1	0	3	0	0	0	0	1	0	0	0	0
4	4:00 PM	2	0	0	0	1	13	0	0	0	0	4	0	0	0	0	0	0	0	0	0
5	4:15 PM	1	0	0	0	0	17	1	0	0	0	7	0	0	0	0	0	0	0	0	0
6	4:30 PM	1	0	0	0	0	15	0	0	0	2	2	0	0	0	0	1	0	0	0	0
7	4:45 PM	2	0	0	0	1	15	3	0	0	2	4	0	0	0	0	0	0	0	0	0
8	5:00 PM	2	0	0	0	2	15	0	0	0	0	2	0	0	0	0	0	0	0	0	0
9	5:15 PM	2	0	0	0	0	22	0	0	0	2	4	0	0	0	0	2	0	0	0	0
10	5:30 PM	1	0	0	0	0	17	1	0	0	0	3	0	0	0	0	1	0	0	0	0
11	5:45 PM	1	1	0	0	0	12	1	0	0	1	5	0	0	0	0	1	0	0	0	0
12	6:00 PM	1	0	0	0	0	18	0	0	0	0	8	0	0	0	0	0	0	0	0	0
3HR Total		17	1	0	0	4	203	9	0	2	7	48	0	0	0	0	7	0	0	0	0
Peak Hour Total		5	1	0	0	0	69	2	0	0	3	20	0	0	0	0	4	0	0	0	0

Pedestrians

TIME		A	B	C	D
15 MINUTE PERIOD ENDING		North	East	South	West
1	3:15 PM	4	1	3	1
2	3:30 PM	4	1	1	3
3	3:45 PM	9	0	3	0
4	4:00 PM	10	0	2	3
5	4:15 PM	4	0	7	3
6	4:30 PM	2	0	5	1
7	4:45 PM	3	1	5	1
8	5:00 PM	7	0	15	1
9	5:15 PM	6	0	5	1
10	5:30 PM	6	0	4	2
11	5:45 PM	7	0	8	3
12	6:00 PM	8	2	19	4
3HR Total		70	5	77	23
Peak Hour Total		27	2	36	10

TDC
Traffic Data & Control

Site ID: 11
Location: Mount Olympus Blvd & Magdalene tce
Weather: Fine
Suburb: Wolli Creek
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Thursday, 18 October 2012
AM Peak 08:30 (hour ending)
PM Peak 16:15 (hour ending)
Traffic Control: Give-Way
HOME



Mount Olympus Blve (Southbound)

	TIME	Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	7	0	0	0	1	4	0	2	0	0	0	0	0	0	0
2	7:30 AM	10	0	0	1	0	10	2	2	0	0	0	0	0	0	0
3	7:45 AM	13	0	0	0	0	10	1	0	0	1	0	0	0	0	0
4	8:00 AM	8	0	0	1	0	15	0	0	0	0	0	0	0	0	0
5	8:15 AM	13	1	0	0	0	13	0	0	0	0	0	0	0	0	0
6	8:30 AM	9	0	0	0	0	16	0	0	0	0	0	0	0	0	0
7	8:45 AM	7	0	0	0	1	12	0	2	1	0	0	0	0	0	0
8	9:00 AM	5	0	0	0	0	4	0	2	1	0	0	0	0	0	0
	2HR Total	72	1	0	2	2	84	3	8	2	1	0	0	0	0	0
	Peak Hour Total	43	1	0	1	0	54	1	0	0	1	0	0	0	0	0

Magdalene Tce (Westbound)

	TIME	Movement 4 (Left Turn)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	6	0	0	0	1	8	3	1	0	1	0	0	0	0	0
2	7:30 AM	15	0	0	0	0	8	1	0	0	0	0	0	0	0	0
3	7:45 AM	6	0	0	0	0	4	0	0	0	2	0	0	0	0	0
4	8:00 AM	9	0	0	0	1	4	0	1	0	0	1	0	0	0	0
5	8:15 AM	13	0	0	0	0	6	1	0	0	0	0	0	0	0	0
6	8:30 AM	7	1	0	0	0	5	0	0	1	1	0	0	0	0	0
7	8:45 AM	8	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8	9:00 AM	17	1	0	0	1	6	0	0	1	1	2	0	0	0	0
	2HR Total	81	2	0	0	3	42	5	2	2	5	3	0	0	0	0
	Peak Hour Total	35	1	0	0	1	19	1	1	1	3	1	0	0	0	0

Mount Olympus Blvd (Northbound)

	TIME	Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	5	0	0	0	0	38	3	0	0	4	0	0	0	0	0
2	7:30 AM	11	0	0	0	0	27	1	0	0	2	0	0	0	0	0
3	7:45 AM	20	1	0	0	1	45	0	0	0	1	0	0	0	0	0
4	8:00 AM	16	0	0	0	0	45	1	0	0	3	0	0	0	0	0
5	8:15 AM	21	0	0	0	0	38	1	0	0	4	0	0	0	0	0
6	8:30 AM	22	0	0	0	0	43	2	0	0	4	0	0	0	0	0
7	8:45 AM	14	0	0	0	1	48	1	0	0	2	0	0	0	0	0
8	9:00 AM	6	0	0	0	0	42	1	0	0	3	0	0	0	0	0
	2HR Total	115	1	0	0	2	326	10	0	0	23	0	0	0	0	0
	Peak Hour Total	79	1	0	0	1	171	4	0	0	12	0	0	0	0	0

Pedestrians

	TIME	A	B	C
	15 MINUTE PERIOD ENDING	North	East	South
1	7:15 AM	0	5	0
2	7:30 AM	1	6	1
3	7:45 AM	1	8	2
4	8:00 AM	0	14	4
5	8:15 AM	0	4	3
6	8:30 AM	0	17	2
7	8:45 AM	0	7	2
8	9:00 AM	0	7	1
	2HR Total	2	68	15
	Peak Hour Total	1	43	11

Mount Olympus Blve (Southbound)

	TIME	Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	8	1	0	0	0	2	0	0	0	0	0	0	0	0	0
2	3:30 PM	4	0	0	1	0	8	0	0	0	0	0	0	0	0	0
3	3:45 PM	8	0	0	1	0	7	0	0	0	0	0	0	0	0	0
4	4:00 PM	3	0	0	0	0	6	0	0	1	0	0	0	0	0	0
5	4:15 PM	11	0	0	0	0	5	0	0	0	0	0	0	0	0	0
6	4:30 PM	2	1	0	0	1	5	0	0	0	0	0	0	0	0	0
7	4:45 PM	6	0	0	0	2	5	0	0	1	2	0	0	0	0	0
8	5:00 PM	5	0	0	0	2	7	0	0	0	0	0	0	0	0	0
9	5:15 PM	13	0	0	0	2	6	0	0	1	0	0	0	0	0	0
10	5:30 PM	5	0	0	0	0	6	0	0	1	2	0	0	0	0	0
11	5:45 PM	5	0	0	0	1	5	0	0	0	0	0	0	0	0	0
12	6:00 PM	14	0	0	0	0	4	0	0	1	0	0	0	0	0	0
	3HR Total	84	2	0	2	8	66	0	0	5	4	0	0	0	0	0
	Peak Hour Total	26	0	0	2	0	26	0	0	1	0	0	0	0	0	0

Magdalene Tce (Westbound)

	TIME	Movement 4 (Left Turn)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	38	1	0	0	1	5	0	0	0	0	2	0	0	0	0
2	3:30 PM	51	3	0	0	2	8	0	0	1	2	0	0	0	0	0
3	3:45 PM	43	1	0	0	0	10	0	0	1	1	1	0	0	0	0
4	4:00 PM	57	2	0	0	2	5	0	0	1	0	1	0	0	0	0
5	4:15 PM	55	1	0	0	0	4	0	0	0	1	1	0	0	0	0
6	4:30 PM	51	1	0	0	0	5	0	0	0	0	0	0	0	0	0
7	4:45 PM	49	0	0	0	0	4	0	0	1	0	1	0	0	0	0
8	5:00 PM	45	0	0	0	0	7	0	0	0	0	2	0	0	0	0
9	5:15 PM	46	0	0	0	0	5	0	0	1	2	1	0	0	0	0
10	5:30 PM	47	0	1	0	0	7	0	0	1	1	0	1	0	0	0
11	5:45 PM	36	0	0	0	0	5	0	0	0	0	1	0	0	0	0
12	6:00 PM	28	0	0	0	0	15	0	0	0	1	0	0	0	0	0
	3HR Total	546	9	1	0	5	80	0	0	6	8	10	1	0	0	0
	Peak Hour Total	206	7	0	0	4	27	0	0	3	4	3	0	0	0	0

Mount Olympus Blvd (Northbound)

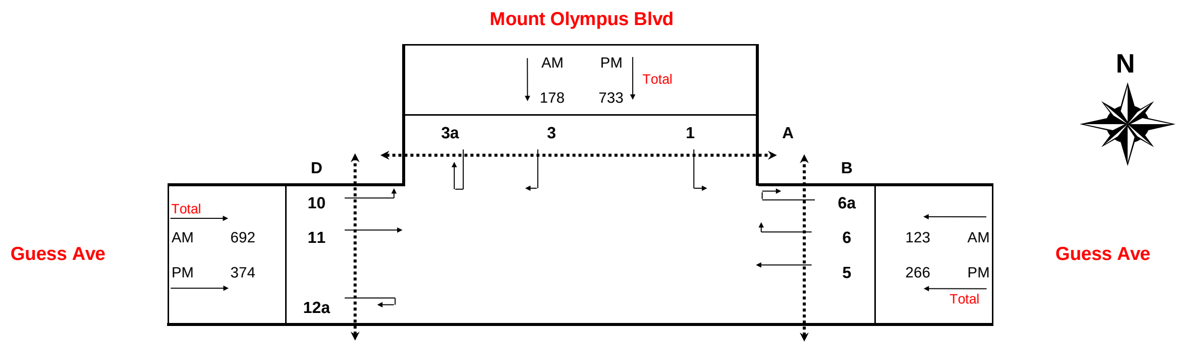
	TIME	Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
	15 MINUTE PERIOD ENDING	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	2	0	0	0	1	16	0	0	0	0	0	0	0	0	0
2	3:30 PM	5	0	0	0	0	20	1	0	0	0	0	0	0	0	0
3	3:45 PM	7	0	0	0	0	17	0	0	0	0	0	0	0	0	0
4	4:00 PM	1	0	0	0	0	13	0	0	0	0	0	0	0	0	0
5	4:15 PM	12	0	0	0	0	11	0	0	0	0	1	0	0	0	0
6	4:30 PM	2	0	0	0	1	14	0	0	0	2	0	0	0	0	0
7	4:45 PM	6	0	0	0	0	16	1	0	0	1	0	0	0	0	0
8	5:00 PM	5	0	0	0	0	10	0	0	0	1	1	0	0	0	0
9	5:15 PM	10	0	0	0	0	14	0	0	0	2	0	0	0	0	0
10	5:30 PM	5	0	0	0	0	16	0	0	0	0	0	0	0	0	0
11	5:45 PM	5	0	0	0	0	13	0	0	0	0	0	0	0	0	0
12	6:00 PM	8	0	0	0	0	10	0	0	0	0	0	0	0	0	0
	3HR Total	68	0	0	0	2	170	2	0	0	6	2	0	0	0	0
	Peak Hour Total	25	0	0	0	0	61	1	0	0	0	1	0	0	0	0

Pedestrians

	TIME	A	B	C
	15 MINUTE PERIOD ENDING	North	East	South
1	3:15 PM	0	18	2
2	3:30 PM	0	9	3
3	3:45 PM	2	11	4
4	4:00 PM	3	12	8
5	4:15 PM	3	10	4
6	4:30 PM	1	11	5
7	4:45 PM	0	15	1
8	5:00 PM	1	13	1
9	5:15 PM	0	14	0
10	5:30 PM	5	18	4
11	5:45 PM	2	24	5
12	6:00 PM	0	19	1
	3HR Total	17	174	38
	Peak Hour Total	8	42	19

TDC
Traffic Data & Control

Site ID: 12
Location: Mount Olympus Blvd & Guess Ave
Weather: Fine
Suburb: Wolli Creek
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Thursday, 18 October 2012
AM Peak 08:30 (hour ending)
PM Peak 18:00 (hour ending)
Traffic Control: Roundabout
HOME



Mount Olympus Blvd (Southbound) — AM

No.	TIME (15 Minute Period Ending)	Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3a (U Turn)				
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	1	0	2	0	0	10	0	0	0	1	0	0	0	0	0
2	7:30 AM	8	1	2	0	0	17	1	0	0	0	0	0	0	0	0
3	7:45 AM	5	1	0	0	1	10	0	0	0	0	0	0	0	0	0
4	8:00 AM	4	0	0	0	0	22	0	0	0	1	0	0	0	0	0
5	8:15 AM	5	0	0	0	0	19	0	0	0	0	0	0	0	0	0
6	8:30 AM	4	0	0	0	0	17	1	0	0	0	0	0	0	0	0
7	8:45 AM	6	0	2	0	0	16	0	0	0	0	0	0	0	0	0
8	9:00 AM	4	0	2	0	0	14	1	0	0	0	0	0	0	0	0
	2HR Total	37	2	8	0	1	125	3	0	0	2	0	0	0	0	0
	Peak Hour Total	18	1	0	0	1	68	1	0	0	1	0	0	0	0	0

Guess Ave (Westbound) — AM

No.	TIME (15 Minute Period Ending)	Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	8	1	0	0	0	2	2	0	0	0	0	0	0	0	0
2	7:30 AM	5	0	0	0	0	7	0	0	0	0	1	0	0	0	0
3	7:45 AM	8	3	0	0	0	8	0	0	0	0	0	0	0	0	0
4	8:00 AM	13	0	0	0	1	6	1	0	0	0	0	0	0	0	0
5	8:15 AM	9	0	0	0	0	5	0	0	0	0	2	0	0	0	0
6	8:30 AM	8	1	0	0	0	5	1	0	0	0	0	0	0	0	0
7	8:45 AM	11	2	0	0	0	5	0	0	0	0	2	0	0	0	0
8	9:00 AM	4	0	0	0	0	1	0	0	0	0	1	0	0	0	0
	2HR Total	66	7	0	0	1	39	4	0	0	0	6	0	0	0	0
	Peak Hour Total	38	4	0	0	1	24	2	0	0	0	2	0	0	0	0

Guess Ave (Eastbound) and Pedestrians — AM

No.	TIME (15 Minute Period Ending)	Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12a (U Turn)					Pedestrians A	Pedestrians B	Pedestrians D
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	West
1	7:15 AM	38	1	0	0	3	29	0	0	0	0	0	0	0	0	0	1	0	2
2	7:30 AM	30	1	0	0	2	36	0	0	0	0	0	0	0	0	0	2	0	2
3	7:45 AM	63	1	0	0	4	42	0	0	0	0	1	0	0	0	0	0	0	2
4	8:00 AM	56	0	0	0	1	36	2	0	0	1	1	0	0	0	0	1	0	1
5	8:15 AM	54	1	0	0	5	18	1	0	0	0	1	0	0	0	0	1	0	0
6	8:30 AM	58	1	0	0	3	41	0	0	0	1	0	0	0	0	0	5	0	1
7	8:45 AM	62	0	0	0	2	20	3	1	0	0	1	0	0	0	0	1	0	1
8	9:00 AM	43	1	0	0	2	24	0	0	0	1	0	0	0	0	0	1	1	1
	2HR Total	404	6	0	0	22	246	6	1	0	3	4	0	0	0	0	12	1	10
	Peak Hour Total	231	3	0	0	13	137	3	0	0	2	3	0	0	0	0	7	0	4

Mount Olympus Blvd (Southbound) — PM

No.	TIME (15 Minute Period Ending)	Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3a (U Turn)				
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	2	0	0	0	0	37	2	0	0	2	0	0	0	0	0
2	3:30 PM	3	0	0	0	0	52	4	0	0	2	2	0	0	0	0
3	3:45 PM	2	0	0	0	0	47	1	0	0	0	0	0	0	0	0
4	4:00 PM	5	0	0	1	0	58	2	0	0	2	1	0	0	0	0
5	4:15 PM	3	0	0	0	0	57	2	0	0	1	0	0	0	0	0
6	4:30 PM	5	0	0	0	0	50	2	0	0	2	0	0	0	0	0
7	4:45 PM	5	0	0	1	0	49	2	0	0	0	0	0	0	0	0
8	5:00 PM	6	0	0	0	0	46	1	0	0	4	0	0	0	0	0
9	5:15 PM	4	0	0	1	0	56	1	0	0	1	0	0	0	0	0
10	5:30 PM	3	1	0	0	0	65	1	0	0	3	0	0	0	0	0
11	5:45 PM	12	0	0	0	0	68	0	0	0	5	0	0	0	0	0
12	6:00 PM	2	0	0	1	0	45	0	0	0	3	0	0	0	0	0
	3HR Total	52	1	0	4	0	630	18	0	0	25	3	0	0	0	0
	Peak Hour Total	21	1	0	2	0	234	2	0	0	12	0	0	0	0	0

Guess Ave (Westbound) — PM

No.	TIME (15 Minute Period Ending)	Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	14	0	0	0	0	1	0	0	0	1	0	0	0	0	0
2	3:30 PM	16	1	0	0	2	4	0	0	0	0	1	0	0	0	0
3	3:45 PM	9	1	0	0	0	4	0	0	0	0	1	0	0	0	0
4	4:00 PM	23	1	0	0	1	2	0	0	0	0	0	0	0	0	0
5	4:15 PM	22	1	0	0	1	5	0	0	0	0	0	0	0	0	0
6	4:30 PM	22	0	0	0	2	1	0	0	0	1	1	0	0	0	0
7	4:45 PM	21	1	0	0	0	1	0	0	0	0	0	0	0	0	0
8	5:00 PM	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0
9	5:15 PM	13	0	0	0	1	5	0	0	0	1	0	0	0	0	0
10	5:30 PM	26	0	0	0	0	3	0	0	0	0	0	0	0	0	0
11	5:45 PM	19	0	0	0	1	2	0	0	0	0	0	0	0	0	0
12	6:00 PM	16	0	0	1	0	1	0	0	0	0	2	0	0	0	0
	3HR Total	214	6	0	1	8	29	0	0	0	3	5	0	0	0	0
	Peak Hour Total	74	0	0	1	2	11	0	0	0	1	2	0	0	0	0

Guess Ave (Eastbound) and Pedestrians — PM

No.	TIME (15 Minute Period Ending)	Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12a (U Turn)					Pedestrians A	Pedestrians B	Pedestrians D
		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	West
1	3:15 PM	18	0	0	0	0	13	0	0	0	0	0	0	0	0	0	6	0	0
2	3:30 PM	19	1	0	0	0	12	2	0	0	0	0	0	0	0	0	6	1	2
3	3:45 PM	20	0	0	0	0	16	2	0	0	0	0	0	0	0	0	3	0	2
4	4:00 PM	12	0	0	0	0	10	0	0	0	0	1	0	0	0	0	3	0	1
5	4:15 PM	20	0	0	0	0	10	1	0	0	0	0	0	0	0	0	2	1	6
6	4:30 PM	15	0	0	0	1	12	2	0	0	0	3	0	0	0	0	7	0	1
7	4:45 PM	22	1	0	0	1	12	0	0	0	0	0	0	0	0	0	8	1	1
8	5:00 PM	16	0	0	0	0	10	0	0	0	0	0	0	0	0	0	8	0	1
9	5:15 PM	18	0	0	0	1	15	1	0	0	0	0	0	0	0	0	7	1	0
10	5:30 PM	19	0	0	0	0	6	0	0	0	0	0	0	0	0	0	8	0	2
11	5:45 PM	17	1	0	0	0	13	0	0	0	0	1	0	0	0	0	11	0	0
12	6:00 PM	18	0	0	0	0	12	0	0	0	0	0	0	0	0	0	9	0	0
	3HR Total	214	3	0	0	3	141	8	0	0	0	5	0	0	0	0	78	4	16
	Peak Hour Total	72	1	0	0	1	46	1	0	0	0	1	0	0	0	0	35	1	2

TDC

Traffic Data & Control

Site ID: 13

Location: Guess Ave & Bonar St

Weather: Fine

Suburb: Wolli Creek

Duration: 7:00am - 9:00am & 3:00pm - 6:00pm

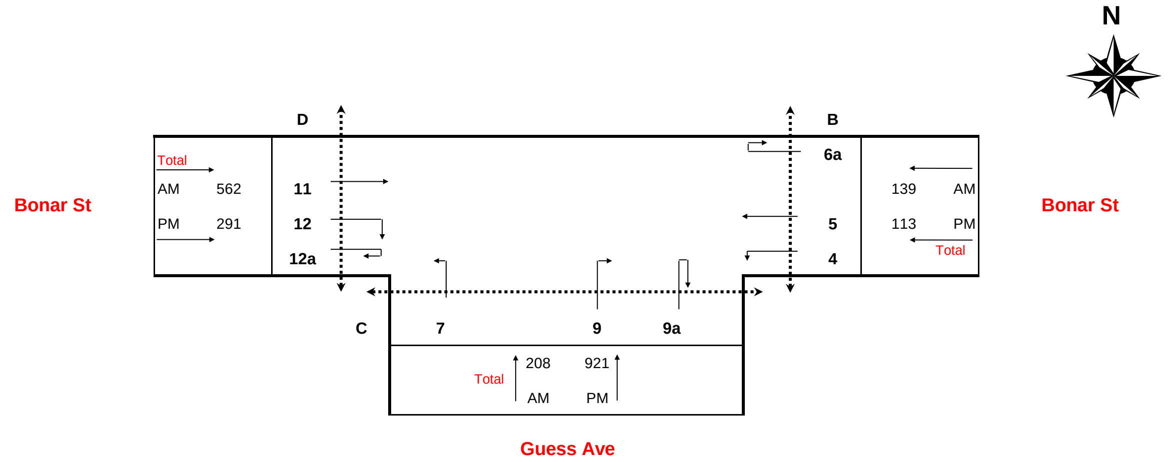
Day/Date: Thursday, 18 October 2012

AM Peak 08:30 (hour ending)

PM Peak 18:00 (hour ending)

Traffic Control: Give-Way

HOME



TIME		Bonar St (Westbound)														
		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	10	0	0	0	1	1	1	0	0	0	0	0	0	0	0
2	7:30 AM	14	0	0	0	0	1	0	0	0	0	0	0	0	0	0
3	7:45 AM	12	0	0	0	1	3	0	0	0	0	0	0	0	0	0
4	8:00 AM	11	0	0	0	1	5	0	0	0	0	0	0	0	0	0
5	8:15 AM	14	1	0	0	0	4	0	0	0	0	0	0	0	0	0
6	8:30 AM	14	0	0	0	1	6	0	0	0	0	0	0	0	0	0
7	8:45 AM	8	1	0	0	0	10	0	0	0	0	0	0	0	0	0
8	9:00 AM	14	0	0	0	0	4	1	0	0	0	0	0	0	0	0
2HR Total		97	2	0	0	4	34	2	0	0	0	0	0	0	0	0
Peak Hour Total		51	1	0	0	3	18	0	0	0	0	0	0	0	0	0

TIME		Guess Ave (Northbound)														
		Movement 7 (Left Turn)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	12	1	0	0	0	2	0	0	0	1	0	0	0	0	0
2	7:30 AM	22	1	0	0	0	3	0	0	0	0	1	0	0	0	0
3	7:45 AM	19	0	0	0	0	1	1	0	0	0	0	0	0	0	0
4	8:00 AM	25	2	0	0	1	4	0	0	0	0	0	0	0	0	0
5	8:15 AM	28	0	0	0	1	1	0	0	0	0	0	0	0	0	0
6	8:30 AM	25	3	0	0	0	4	0	0	0	0	0	0	0	0	0
7	8:45 AM	25	1	0	0	0	3	0	0	0	0	0	0	0	0	0
8	9:00 AM	20	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2HR Total		176	8	0	0	2	19	1	0	0	1	1	0	0	0	0
Peak Hour Total		97	5	0	0	2	10	1	0	0	0	0	0	0	0	0

TIME		Bonar St (Eastbound)															Pedestrians		
		Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	East	South	West
1	7:15 AM	6	0	0	0	0	52	1	0	0	3	0	0	0	0	0	8	3	4
2	7:30 AM	5	1	0	0	0	53	0	0	0	2	1	0	0	0	0	12	5	2
3	7:45 AM	4	0	0	0	1	78	1	0	0	1	0	0	0	0	0	13	6	0
4	8:00 AM	4	0	0	0	0	79	2	0	0	2	0	0	0	0	0	29	6	0
5	8:15 AM	4	0	0	0	0	50	3	0	0	4	0	0	0	0	0	23	1	2
6	8:30 AM	3	1	0	0	0	68	0	0	0	3	0	0	0	0	0	22	4	1
7	8:45 AM	3	1	0	0	0	62	1	0	0	3	0	0	0	0	0	19	1	0
8	9:00 AM	3	2	0	0	0	50	2	0	0	3	0	0	0	0	0	8	4	0
2HR Total		32	5	0	0	1	492	10	0	0	21	1	0	0	0	0	134	30	9
Peak Hour Total		15	1	0	0	1	275	6	0	0	10	0	0	0	0	0	87	17	3

TIME		Bonar St (Westbound)														
		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	8	0	0	0	0	4	0	0	0	0	0	0	0	0	0
2	3:30 PM	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0
3	3:45 PM	11	0	0	0	0	6	0	0	0	0	0	0	0	0	0
4	4:00 PM	5	0	0	0	0	2	1	0	0	0	0	0	0	0	0
5	4:15 PM	6	1	0	0	0	2	1	0	0	0	0	0	0	0	0
6	4:30 PM	9	0	0	0	0	3	0	0	0	0	0	0	0	0	0
7	4:45 PM	8	0	0	0	0	6	0	0	0	0	0	0	0	0	0
8	5:00 PM	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0
9	5:15 PM	2	0	0	0	1	2	0	0	0	0	0	0	0	0	0
10	5:30 PM	2	1	0	0	0	2	0	0	0	0	0	0	0	0	0
11	5:45 PM	3	0	0	0	0	7	0	0	0	0	0	0	0	0	0
12	6:00 PM	6	0	0	0	0	2	1	0	0	0	0	0	0	0	0
3HR Total		66	2	0	0	1	41	3	0	0	0	0	0	0	0	0
Peak Hour Total		13	1	0	0	1	13	1	0	0	0	0	0	0	0	0

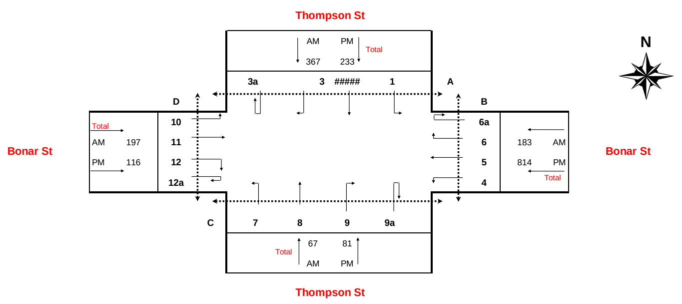
TIME		Guess Ave (Northbound)														
		Movement 7 (Left Turn)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	52	2	0	0	0	2	0	0	0	0	0	0	0	0	0
2	3:30 PM	67	3	0	0	5	3	0	0	0	0	0	0	0	0	0
3	3:45 PM	60	3	0	0	0	3	1	0	0	0	0	0	0	0	0
4	4:00 PM	74	2	0	0	1	0	0	0	0	0	1	0	0	0	0
5	4:15 PM	77	3	0	0	4	1	0	0	0	1	0	0	0	0	0
6	4:30 PM	71	1	0	0	5	3	0	0	0	0	0	0	0	0	0
7	4:45 PM	73	3	0	0	1	5	0	0	0	0	0	0	0	0	0
8	5:00 PM	57	2	0	0	1	2	1	0	0	0	0	0	0	0	0
9	5:15 PM	64	2	0	0	4	3	0	0	0	0	0	0	0	0	0
10	5:30 PM	88	1	0	0	7	3	0	0	0	0	1	0	0	0	0
11	5:45 PM	82	0	0	0	6	4	0	0	0	0	0	0	0	0	0
12	6:00 PM	60	0	0	0	2	4	0	0	0	0	0	0	0	0	0
3HR Total		825	22	0	0	36	33	2	0	0	1	2	0	0	0	0
Peak Hour Total		294	3	0	0	19	14	0	0	0	0	1	0	0	0	0

TIME		Bonar St (Eastbound)															Pedestrians		
		Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	East	South	West
1	3:15 PM	3	0	0	0	0	17	0	0	0	0	1	0	0	0	0	4	2	0
2	3:30 PM	3	0	0	0	0	23	2	0	0	0	0	0	0	0	0	10	1	0
3	3:45 PM	2	0	0	0	0	25	2	0	0	1	0	0	0	0	0	10	1	0
4	4:00 PM	1	1	0	0	0	13	0	0	0	0	0	0	0	0	0	9	0	0
5	4:15 PM	2	0	0	0	0	24	0	0	0	0	0	0	0	0	0	9	5	0
6	4:30 PM	2	0	0	0	0	16	1	0	0	1	0	0	0	0	0	3	0	1
7	4:45 PM	4	0	0	0	0	21	2	0	0	0	0	0	0	0	0	7	0	0
8	5:00 PM	0	0	0	0	0	20	0	0	0	1	0	0	0	0	0	11	0	0
9	5:15 PM	1	0	0	0	0	30	0	0	0	0	0	0	0	0	0	17	0	0
10	5:30 PM	0	1	0	0	0	17	0	0	0	0	0	0	0	0	0	10	1	0
11	5:45 PM	2	0	0	0	0	24	1	0	0	0	0	0	0	0	0	19	0	0
12	6:00 PM	1	0	0	0	0	25	0	0	0	0	1	0	0	0	0	14	0	2
3HR Total		21	2	0	0	0	255	8	0	0	3	2	0	0	0	0	123	10	3
Peak Hour Total		4	1	0	0	0	96	1	0	0	0	1	0	0	0	0	60	1	2

TDC

Traffic Data & Control

Site ID: 14
Location: Thompson St & Bonar St
Weather: Fine
Suburb: Arncliffe
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Thursday, 18 October 2012
AM Peak 08:30 (hour ending)
PM Peak 16:15 (hour ending)
Traffic Control: Give-Way
HOME



TIME		Thompson St (Southbound)																			
		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	43	1	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2	7:30 AM	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	7:45 AM	60	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
4	8:00 AM	47	2	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5	8:15 AM	28	3	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0
6	8:30 AM	36	1	0	0	1	9	0	0	0	0	2	1	0	0	0	0	0	0	0	0
7	8:45 AM	28	3	0	0	2	9	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8	9:00 AM	31	2	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2HR Total		308	12	0	0	8	30	1	0	0	0	7	1	0	0	0	0	0	0	0	0
Peak Hour Total		171	6	0	0	2	17	1	0	0	0	5	1	0	0	0	0	0	0	0	0

TIME		Bonar St (Westbound)																			
		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	0	1	0	0	0	2	1	0	0	0	10	0	0	0	0	0	0	0	0	0
2	7:30 AM	2	0	0	0	0	5	0	0	0	0	12	1	0	0	0	0	0	0	0	0
3	7:45 AM	0	0	0	0	0	9	0	0	0	0	12	0	0	0	0	0	0	0	0	0
4	8:00 AM	3	0	0	0	0	11	0	0	0	0	10	2	0	0	1	0	0	0	0	0
5	8:15 AM	0	0	0	0	0	4	0	0	0	0	20	0	0	0	1	0	0	0	0	0
6	8:30 AM	0	0	0	0	0	8	1	0	0	0	22	2	0	0	0	0	0	0	0	0
7	8:45 AM	0	0	0	0	0	9	0	0	0	0	11	2	0	0	0	0	0	0	0	0
8	9:00 AM	0	0	0	0	0	12	1	0	0	0	7	1	0	0	0	0	0	0	0	0
2HR Total		5	1	0	0	0	60	3	0	0	0	104	8	0	0	2	0	0	0	0	0
Peak Hour Total		3	0	0	0	0	32	1	0	0	0	64	4	0	0	2	0	0	0	0	0

TIME		Thompson St (Northbound)																			
		Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	0	0	0	0	0	3	0	0	0	0	2	0	0	0	1	0	0	0	0	0
2	7:30 AM	2	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
3	7:45 AM	0	0	0	0	0	3	0	0	0	0	6	0	0	0	0	0	0	0	0	0
4	8:00 AM	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5	8:15 AM	0	0	0	0	0	5	0	0	0	0	6	0	0	0	0	0	0	0	0	0
6	8:30 AM	3	0	0	0	0	3	0	0	0	0	5	0	0	0	0	0	0	0	0	0
7	8:45 AM	0	0	0	0	0	6	0	0	0	0	8	0	0	0	0	0	0	0	0	0
8	9:00 AM	1	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	0	0	0	0
2HR Total		6	0	0	0	0	24	0	0	0	0	35	1	0	0	1	0	0	0	0	0
Peak Hour Total		3	0	0	0	0	14	0	0	0	0	18	0	0	0	0	0	0	0	0	0

TIME		Bonar St (Eastbound)																				Pedestrians			
		Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South	West
1	7:15 AM	1	0	0	0	0	8	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	4	0
2	7:30 AM	1	0	0	0	0	21	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0
3	7:45 AM	1	0	0	0	0	23	1	0	0	1	1	0	0	0	0	0	0	0	0	0	4	2	5	0
4	8:00 AM	0	0	0	0	0	29	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	4	0
5	8:15 AM	0	0	0	0	0	18	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	3	0	0
6	8:30 AM	0	0	1	0	0	33	0	0	0	2	1	0	0	0	0	0	0	0	0	0	7	1	0	0
7	8:45 AM	2	0	0	0	0	29	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
8	9:00 AM	1	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2HR Total		6	0	1	0	0	172	4	0	0	11	3	0	0	0	0	0	0	0	0	0	16	7	15	0
Peak Hour Total		1	0	1	0	0	103	1	0	0	7	2	0	0	0	0	0	0	0	0	0	15	6	9	0

TIME		Thompson St (Southbound)																			
		Movement 1 (Left Turn)					Movement 2 (Through)					Movement 3 (Right Turn)					Movement 3a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	12	0	0	0	1	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0
2	3:30 PM	20	3	0	0	0	4	0	0	0	0	3	0	0	0	0	0	0	0	0	0
3	3:45 PM	11	1	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	4:00 PM	5	0	0	0	0	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5	4:15 PM	18	0	0	0	0	2	0	1	0	0	2	0	0	0	0	1	0	0	0	0
6	4:30 PM	12	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7	4:45 PM	16	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8	5:00 PM	16	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0
9	5:15 PM	22	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	5:30 PM	13	1	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11	5:45 PM	17	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	6:00 PM	12	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
3HR Total		174	8	0	0	3	33	0	1	0	0	12	1	0	0	0	1	0	0	0	0
Peak Hour Total		54	4	0	0	1	17	0	1	0	0	6	0	0	0	0	1	0	0	0	0

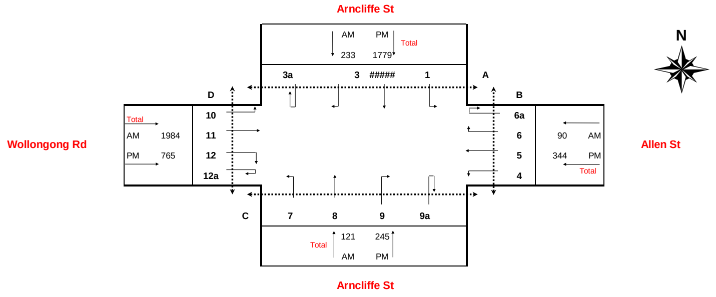
TIME		Bonar St (Westbound)																			
		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6 (Right Turn)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	6	0	0	0	0	10	0	0	0	0	33	1	0	0	0	1	0	0	0	0
2	3:30 PM	2	0	0	0	0	17	1	0	0	1	45	3	0	0	3	0	0	0	0	0
3	3:45 PM	3	0	0	0	0	13	0	0	0	0	38	3	0	0	0	1	0	0	0	0
4	4:00 PM	6	0	0	0	0	17	0	0	0	0	48	1	0	0	2	0	0	0	0	0
5	4:15 PM	2	0	0	0	0	10	0	0	0	0	55	4	0	0	1	1	0	0	0	0
6	4:30 PM	2	0	0	0	0	15	0	0	0	0	42	1	0	0	3	0	0	0	0	0
7	4:45 PM	4	0	0	0	0	14	0	0	0	1	56	2	0	0	0	0	0	0	0	0
8	5:00 PM	2	0	0	0	0	11	1	0	0	0	38	1	0	0	1	0	0	0	0	0
9	5:15 PM	0	0	0	0	0	12	0	0	0	0	42	2	0	0	4	0	0	0	0	0
10	5:30 PM	5	0	0	0	0	13	0	0	0	5	61	1	0	0	2	1	0	0	0	0
11	5:45 PM	2	0	0	0	0	22	0	0	0	5	54	0	0	0	1	0	0	0	0	0
12	6:00 PM	4	1	0	0	0	15	0	0	0	1	37	0	0	1	1	0	0	0	0	0
3HR Total		38	1	0	0	0	169	2	0	0	13	549	19	0	1	18	4	0	0	0	0
Peak Hour Total		13	0	0	0	0	57	1	0	0	1	186	11	0	0	6	2	0	0	0	0

TIME		Thompson St (Northbound)																			
		Movement 7 (Left Turn)					Movement 8 (Through)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	1	0	0	0	0	2	0	0	0	0	5	0	0	0	0	0	0	0	0	0
2	3:30 PM	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0
3	3:45 PM	2	0	0	0	0	4	0	0	0	0	7	0	0	0	0	0	0	0	0	0
4	4:00 PM	0	0	0	0	0	3	2	0	0	0	2	1	0	0	0	0	0	0	0	0
5	4:15 PM	0	1	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0
6	4:30 PM	0	0	0	0	0	5	0	0	0	0	3	0	0	0	0	0	0	0	0	0
7	4:45 PM	0	0	0	0	0	3	0	0	0	0	4	0	0	0	0	0	0	0	0	0
8	5:00 PM	0	0	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9	5:15 PM	0	0	0	0	0	2	0	0	0	0	3	0	0	0	0	0	0	0	0	0
10	5:30 PM	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0
11	5:45 PM	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12	6:00 PM	0	0	0	0	0	3	0	0	0	0	4	0	0	0	0	0	0	0	0	0
3HR Total		3	1	0	0	0	37	2	0	0	0	37	1	0	0	0	0	0	0	0	0
Peak Hour Total		2	1	0	0	0	12	2	0	0	0	13	1	0	0	0	0	0	0	0	0

TIME		Bonar St (Eastbound)																				Pedestrians			
		Movement 10 (Left Turn)					Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					A	B	C	D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	North	East	South	West
1	3:15 PM	1	1	0	0	0	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	3	0
2	3:30 PM	2	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4	0
3	3:45 PM	2	0	0	0	0	9	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6	1	2	0
4	4:00 PM	1	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3	0
5	4:15 PM	1	1	0	0	0	9	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0	4	0
6	4:30 PM	1	0	0	0	0	6	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	2	0
7	4:45 PM	1	0	0	0	0	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0
8	5:00 PM	1	0	0	0	0	7	0	0	0	1	2	0	0	0	0	0	0	0	0	0	1	2	2	1
9	5:15 PM	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	6	0
10	5:30 PM	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
11	5:45 PM	1	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	5	1
12	6:00 PM	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	2
3HR Total		12	2	0	0	0	93	1	0	0	2	6	0	0	0	0	0	0	0	0	0	23	11	39	4
Peak Hour Total		6	1	0	0	0	30	0	0	0	0	2	0	0	0	0	0	0	0	0	0	13	3	13	0

TDC
Traffic Data & Control

Site ID: 15
Location: Arncliffe St & Wollongong Rd
Weather: Fine
Suburb: Arncliffe
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Thursday, 18 October 2012
AM Peak 08:15 (hour ending)
PM Peak 17:30 (hour ending)
Traffic Control: Roundabout
HOME



Arncliffe St (Southbound)

TIME / 15 MINUTE PERIOD ENDING	Movement 1 (Left Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 2 (Through) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 3 (Right Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 3a (U Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 7:15 AM	5	1	0	0	0	2	1	0	0	0	8	0	0	0	0	0	0	0	0	0
2 7:30 AM	3	0	0	0	0	3	1	0	0	0	12	0	1	0	0	2	1	0	0	0
3 7:45 AM	4	0	0	0	0	5	0	0	0	0	17	4	0	0	0	2	0	0	0	0
4 8:00 AM	5	0	0	0	0	3	0	0	0	0	17	0	0	0	1	0	1	0	0	0
5 8:15 AM	11	2	0	0	0	3	1	0	0	0	14	0	0	0	0	2	0	0	0	0
6 8:30 AM	7	0	0	0	0	4	1	0	0	0	15	1	0	0	0	0	0	0	0	0
7 8:45 AM	4	1	0	0	0	7	0	0	0	0	16	2	1	0	0	2	0	0	0	0
8 9:00 AM	5	0	0	0	0	7	1	1	0	0	22	3	0	0	0	1	0	0	0	0
2HR Total	44	4	0	0	0	34	5	1	0	0	121	10	2	0	1	9	2	0	0	0
Peak Hour Total	23	2	0	0	0	14	2	0	0	0	60	4	1	0	1	6	2	0	0	0

Allen St (Westbound)

TIME / 15 MINUTE PERIOD ENDING	Movement 4 (Left Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 5 (Through) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 6 (Right Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 6a (U Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 7:15 AM	1	0	0	0	0	10	3	0	0	0	1	0	0	0	0	1	0	0	0	0
2 7:30 AM	2	0	0	0	0	4	1	0	0	0	4	0	1	0	0	1	0	0	0	0
3 7:45 AM	4	0	0	0	0	2	0	0	0	0	1	1	0	0	0	2	0	0	0	0
4 8:00 AM	1	0	0	0	0	3	0	0	0	0	5	0	0	0	0	1	0	0	0	0
5 8:15 AM	4	1	0	0	0	2	0	0	0	0	4	0	0	0	0	0	0	0	0	0
6 8:30 AM	2	0	0	0	0	7	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7 8:45 AM	0	2	0	0	0	4	0	0	0	0	2	0	0	0	0	0	0	0	0	0
8 9:00 AM	2	2	0	0	0	2	0	0	0	0	4	0	0	0	0	1	0	0	0	0
2HR Total	16	5	0	0	0	34	5	0	0	0	22	1	1	0	0	6	0	0	0	0
Peak Hour Total	11	1	0	0	0	11	1	0	0	0	14	1	1	0	0	4	0	0	0	0

Arncliffe St (Northbound)

TIME / 15 MINUTE PERIOD ENDING	Movement 7 (Left Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 8 (Through) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 9 (Right Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 9a (U Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 7:15 AM	2	0	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0
2 7:30 AM	9	0	0	0	0	7	1	0	0	0	2	1	0	0	0	0	0	0	0	0
3 7:45 AM	6	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4 8:00 AM	3	0	0	0	0	9	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5 8:15 AM	3	0	0	0	0	4	0	0	0	2	2	0	0	0	0	0	0	0	0	0
6 8:30 AM	6	0	0	0	0	4	0	0	0	0	2	0	0	0	0	0	0	0	0	0
7 8:45 AM	11	0	0	0	0	5	1	0	0	1	0	0	0	0	0	0	0	0	0	0
8 9:00 AM	10	1	0	0	0	10	1	1	0	0	2	0	0	0	0	0	0	0	0	0
2HR Total	50	1	0	0	0	49	6	1	0	4	9	1	0	0	0	0	0	0	0	0
Peak Hour Total	21	0	0	0	0	24	1	0	0	3	5	1	0	0	0	0	0	0	0	0

Wollongong Rd (Eastbound)

TIME / 15 MINUTE PERIOD ENDING	Movement 10 (Left Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 11 (Through) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 12 (Right Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 12a (U Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 7:15 AM	112	3	1	0	0	75	0	0	0	2	25	0	0	0	0	1	0	0	0	0
2 7:30 AM	139	0	0	0	7	87	0	0	0	4	30	1	0	1	0	0	0	0	0	0
3 7:45 AM	140	3	0	2	3	75	1	1	0	2	26	1	0	1	0	0	0	0	0	0
4 8:00 AM	118	0	1	2	1	119	1	0	0	0	36	2	0	0	0	0	0	0	0	0
5 8:15 AM	109	2	0	0	9	106	1	0	0	2	38	0	0	0	0	3	0	0	0	0
6 8:30 AM	114	0	0	0	0	98	2	0	0	2	37	1	0	0	0	2	0	0	0	0
7 8:45 AM	97	4	0	0	1	72	1	0	0	1	46	0	0	0	1	2	0	0	0	0
8 9:00 AM	90	2	0	0	4	60	3	0	0	0	48	3	0	0	0	0	0	0	0	0
2HR Total	919	14	2	4	25	692	9	1	0	13	286	8	0	2	1	8	0	0	0	0
Peak Hour Total	506	5	1	4	20	387	3	1	0	8	130	4	0	2	0	3	0	0	0	0

Pedestrians

TIME / 15 MINUTE PERIOD ENDING	A North	B East	C South	D West
1 7:15 AM	0	0	0	0
2 7:30 AM	0	0	1	0
3 7:45 AM	0	0	4	0
4 8:00 AM	0	3	2	0
5 8:15 AM	5	3	0	1
6 8:30 AM	3	2	2	1
7 8:45 AM	0	0	1	0
8 9:00 AM	1	1	1	2
2HR Total	9	9	11	4
Peak Hour Total	5	6	7	1

Arncliffe St (Southbound)

TIME / 15 MINUTE PERIOD ENDING	Movement 1 (Left Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 2 (Through) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 3 (Right Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 3a (U Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 3:15 PM	4	3	1	0	0	9	0	0	0	2	102	4	0	0	0	0	0	0	0	0
2 3:30 PM	7	2	3	0	0	9	1	0	0	0	111	5	0	0	1	1	1	1	0	0
3 3:45 PM	5	2	0	0	0	8	1	0	0	0	98	3	0	0	1	1	0	0	0	0
4 4:00 PM	3	0	0	0	0	16	0	0	0	0	114	9	0	0	0	0	0	0	0	0
5 4:15 PM	3	1	0	0	0	12	0	0	0	0	128	6	0	0	1	0	0	0	0	0
6 4:30 PM	7	0	0	0	0	11	0	0	0	0	131	4	1	0	1	1	0	0	0	0
7 4:45 PM	3	1	0	0	0	20	0	0	0	0	122	1	0	0	4	0	0	0	0	0
8 5:00 PM	5	0	0	0	0	14	0	0	0	0	130	4	1	0	2	0	0	0	0	0
9 5:15 PM	4	0	0	0	0	12	1	0	0	3	135	4	0	0	1	0	0	0	0	0
10 5:30 PM	8	0	0	0	0	17	1	0	0	0	143	1	0	0	1	1	0	0	0	0
11 5:45 PM	5	0	0	0	0	15	0	0	0	0	143	1	1	1	5	0	0	0	0	0
12 6:00 PM	3	1	0	0	0	14	0	0	0	0	107	1	0	0	9	0	0	0	0	0
3HR Total	57	9	4	0	0	157	4	0	0	5	1464	43	3	1	26	4	1	1	0	0
Peak Hour Total	20	1	0	0	0	63	2	0	0	3	530	10	1	0	8	1	0	0	0	0

Allen St (Westbound)

TIME / 15 MINUTE PERIOD ENDING	Movement 4 (Left Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 5 (Through) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 6 (Right Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 6a (U Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 3:15 PM	9	0	0	0	0	10	1	0	1	0	5	0	0	0	0	0	0	0	0	0
2 3:30 PM	4	2	0	0	0	19	1	0	1	0	1	2	0	0	0	1	0	0	0	0
3 3:45 PM	2	0	0	0	0	21	2	0	0	0	6	1	0	0	0	1	0	0	0	0
4 4:00 PM	3	0	0	0	0	13	1	0	0	0	2	0	0	0	0	0	0	0	0	0
5 4:15 PM	5	0	0	0	0	14	1	0	0	0	2	1	0	0	0	0	0	0	0	0
6 4:30 PM	5	0	0	0	0	21	3	0	0	0	5	0	0	0	1	0	0	0	0	0
7 4:45 PM	3	0	0	0	0	20	2	0	0	0	8	0	0	0	0	0	0	0	0	0
8 5:00 PM	9	0	0	0	0	13	0	0	0	0	3	0	0	0	0	0	0	0	0	0
9 5:15 PM	2	0	0	1	0	17	1	0	1	0	9	1	0	0	0	2	0	0	0	0
10 5:30 PM	5	0	0	0	0	19	1	0	2	1	6	0	0	0	0	0	0	0	0	0
11 5:45 PM	4	0	0	0	0	18	1	0	1	0	1	0	0	0	0	0	0	0	0	0
12 6:00 PM	5	0	0	0	0	15	1	0	2	0	3	0	0	0	0	0	0	0	0	0
3HR Total	56	2	0	1	0	200	15	0	8	1	51	5	0	0	1	4	0	0	0	0
Peak Hour Total	19	0	0	1	0	69	4	0	3	1	26	1	0	0	0	2	0	0	0	0

Arncliffe St (Northbound)

TIME / 15 MINUTE PERIOD ENDING	Movement 7 (Left Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 8 (Through) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 9 (Right Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 9a (U Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 3:15 PM	13	1	0	0	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0
2 3:30 PM	24	1	0	0	1	2	0	0	0	0	3	0	0	0	0	0	0	0	0	0
3 3:45 PM	12	1	0	0	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0
4 4:00 PM	13	1	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5 4:15 PM	17	0	0	0	0	6	0	0	0	1	0	0	0	0	0	1	0	0	0	0
6 4:30 PM	11	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7 4:45 PM	18	1	0	1	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0
8 5:00 PM	15	1	0	0	0	3	0	0	0	0	5	0	0	0	0	3	0	0	0	0
9 5:15 PM	12	0	0	1	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0
10 5:30 PM	14	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11 5:45 PM	13	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 6:00 PM	9	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3HR Total	171	6	0	3	1	41	0	0	0	1	18	0	0	0	0	4	0	0	0	0
Peak Hour Total	59	2	0	2	0	12	0	0	0	0	9	0	0	0	0	3	0	0	0	0

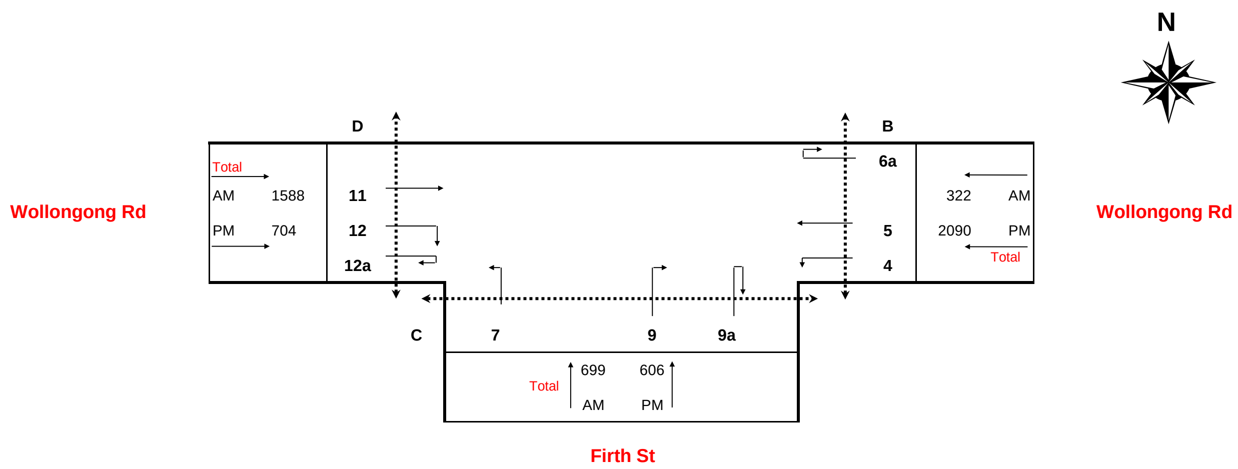
Wollongong Rd (Eastbound)

TIME / 15 MINUTE PERIOD ENDING	Movement 10 (Left Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 11 (Through) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 12 (Right Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Movement 12a (U Turn) Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1 3:15 PM	25	1	0	1	0	13	1	0	1	0	27	0	0	0	0	1	0	0	0	0
2 3:30 PM	30	0	0	0	1	20	0	0	0	0	11	0	0	0	0	2	0	0	0	0
3 3:45 PM	28	0	0	0	0	23	0	0	0	0	16	2	0	0	0	6	0	0	0	0
4 4:00 PM	34	0	0	0	0	16	0	0	0	1	16	0	0	0	0	2	0	0	0	0
5 4:15 PM	26	1	0	0	0	16	0	0	0	0	12	0	0	0	0	1	0	0	0	0
6 4:30 PM	29	0	0	0	0	16	0	0	0	0	18	0	0	0	0	1	0	0	0	0
7 4:45 PM	31	1	0	0	1	17	1	0	0	0	14	0	0	0	0	0	0	0	0	0
8 5:00 PM	42	0	0	0	0	13	0	0	0	0	17	0	0	0	0	0	0	0	0	0
9 5:15 PM	37	0	0	0	0	17	1	0	0	0	17	0	0	0	0	1	0	0	0	0
10 5:30 PM	23	0	0	0	0	16	1	0	0	0	10	1	0	0	0	1	0	0	0	0
11 5:45 PM	26	0	0	0	0	13	0	0	0	0	7	0	0	0	0	0	0	0	0	0
12 6:00 PM	26	1	0	0	0	23	0	0	1	0	8	0	0	0	0	0	0	0	0	0
3HR Total	357	4	0	1	2	203	4	0	2	1	173	3	0	0	0	15	0	0	0	0
Peak Hour Total	133	1	0	0	1	63	3	0	1	0	58	1	0	0	0	2	0	0	0	0

Pedestrians

TIME / 15 MINUTE PERIOD ENDING	A North	B East	C South	D West
1 3:15 PM	0	2	1	0
2 3:30 PM	0	2	0	1
3 3:45 PM	0	0	1	4
4 4:00 PM	0	0	1	1
5 4:15 PM	0	1	2	2
6 4:30 PM	0	1	0	1
7 4:45 PM	0	7	3	2
8 5:00 PM	0	1	0	0
9 5:15 PM	2	2	3	0
10 5:30 PM	1	4	3	1
11 5:45 PM	0	3	0	0
12 6:00 PM	0	0	1	0
3HR Total	3	23	15	12
Peak Hour Total	3	14	9	3

Site ID: 16
Location: Wollongong Rd & Firth St
Weather: Fine
Suburb: Arncliffe
Duration: 7:00am - 9:00am & 3:00pm - 6:00pm
Day/Date: Thursday, 18 October 2012
AM Peak 08:30 (hour ending)
PM Peak 16:00 (hour ending)
Traffic Control: Roundabout
HOME



Wollongong Rd (Westbound) — AM

TIME		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	8	2	0	0	0	15	1	0	0	0	2	0	0	0	0
2	7:30 AM	3	0	0	0	0	25	1	1	0	0	0	0	0	0	0
3	7:45 AM	4	0	0	0	0	26	1	0	0	0	0	0	0	0	0
4	8:00 AM	8	0	0	0	0	17	0	0	0	1	0	0	0	0	0
5	8:15 AM	7	0	0	0	0	22	0	0	0	0	1	0	0	0	0
6	8:30 AM	19	1	0	0	0	37	1	0	0	0	0	0	0	0	0
7	8:45 AM	12	0	0	0	0	41	2	1	0	0	0	0	0	0	0
8	9:00 AM	19	0	0	0	0	41	2	0	0	1	0	0	0	0	0
2HR Total		80	3	0	0	0	224	8	2	0	2	3	0	0	0	0
Peak Hour Total		38	1	0	0	0	102	2	0	0	1	1	0	0	0	0

Firth St (Northbound) — AM

TIME		Movement 7 (Left Turn)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	7:15 AM	6	0	0	1	0	56	1	0	0	3	0	0	0	0	0
2	7:30 AM	15	0	0	1	0	61	0	0	0	1	0	0	0	0	0
3	7:45 AM	19	0	1	2	0	76	1	0	0	1	0	0	0	0	0
4	8:00 AM	20	0	0	1	1	80	0	0	0	3	0	0	0	0	0
5	8:15 AM	17	4	1	1	0	79	1	0	0	1	2	0	0	0	0
6	8:30 AM	23	1	1	2	0	67	0	0	0	0	0	0	0	0	0
7	8:45 AM	25	2	3	1	0	43	0	0	0	0	1	0	0	0	0
8	9:00 AM	18	5	2	3	0	45	0	0	0	1	0	0	0	0	0
2HR Total		143	12	8	12	1	507	3	0	0	10	3	0	0	0	0
Peak Hour Total		79	5	3	6	1	302	2	0	0	5	2	0	0	0	0

Wollongong Rd (Eastbound) and Pedestrians — AM

TIME		Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					Pedestrians B	Pedestrians C	Pedestrians D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	East	South	West
1	7:15 AM	184	1	4	3	6	4	2	0	1	0	0	1	0	0	0	3	0	0
2	7:30 AM	204	4	0	3	4	3	0	0	1	0	0	0	0	0	0	0	1	1
3	7:45 AM	205	6	0	2	3	4	0	1	2	0	1	0	0	0	0	2	1	1
4	8:00 AM	182	2	1	2	5	12	0	0	0	0	0	0	0	0	0	2	3	8
5	8:15 AM	200	1	0	0	5	6	1	0	1	0	0	0	0	0	0	2	0	4
6	8:30 AM	176	4	0	0	2	9	1	1	2	0	0	0	0	0	0	0	0	3
7	8:45 AM	165	8	0	0	3	8	0	1	1	0	0	0	0	0	0	1	0	1
8	9:00 AM	125	2	1	1	2	6	0	1	1	0	1	0	0	0	0	2	0	1
2HR Total		1441	28	6	11	30	52	4	4	9	0	2	1	0	0	0	12	5	19
Peak Hour Total		763	13	1	4	15	31	2	2	5	0	1	0	0	0	0	6	4	16

Wollongong Rd (Westbound) — PM

TIME		Movement 4 (Left Turn)					Movement 5 (Through)					Movement 6a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	37	2	0	0	0	124	6	0	0	1	0	0	0	0	0
2	3:30 PM	20	0	0	0	0	117	6	0	1	1	2	0	0	0	0
3	3:45 PM	39	0	0	0	0	136	5	0	0	0	1	0	0	0	0
4	4:00 PM	33	1	0	0	0	143	9	0	0	0	0	0	0	0	0
5	4:15 PM	37	1	1	0	0	131	4	0	0	1	0	0	0	0	0
6	4:30 PM	35	0	0	0	0	136	6	1	2	3	0	0	0	0	0
7	4:45 PM	28	0	0	0	0	129	5	0	0	2	0	0	0	0	0
8	5:00 PM	35	0	0	0	1	139	2	0	3	1	0	0	0	0	0
9	5:15 PM	38	1	0	0	0	138	3	0	1	1	0	0	0	0	0
10	5:30 PM	24	0	0	0	0	161	2	1	2	4	0	0	0	0	0
11	5:45 PM	27	0	0	1	0	128	4	0	2	3	1	0	0	0	0
12	6:00 PM	28	0	0	1	0	119	2	0	1	10	0	0	0	0	0
3HR Total		381	5	1	2	1	1601	54	2	12	27	4	0	0	0	0
Peak Hour Total		129	3	0	0	0	520	26	0	1	2	3	0	0	0	0

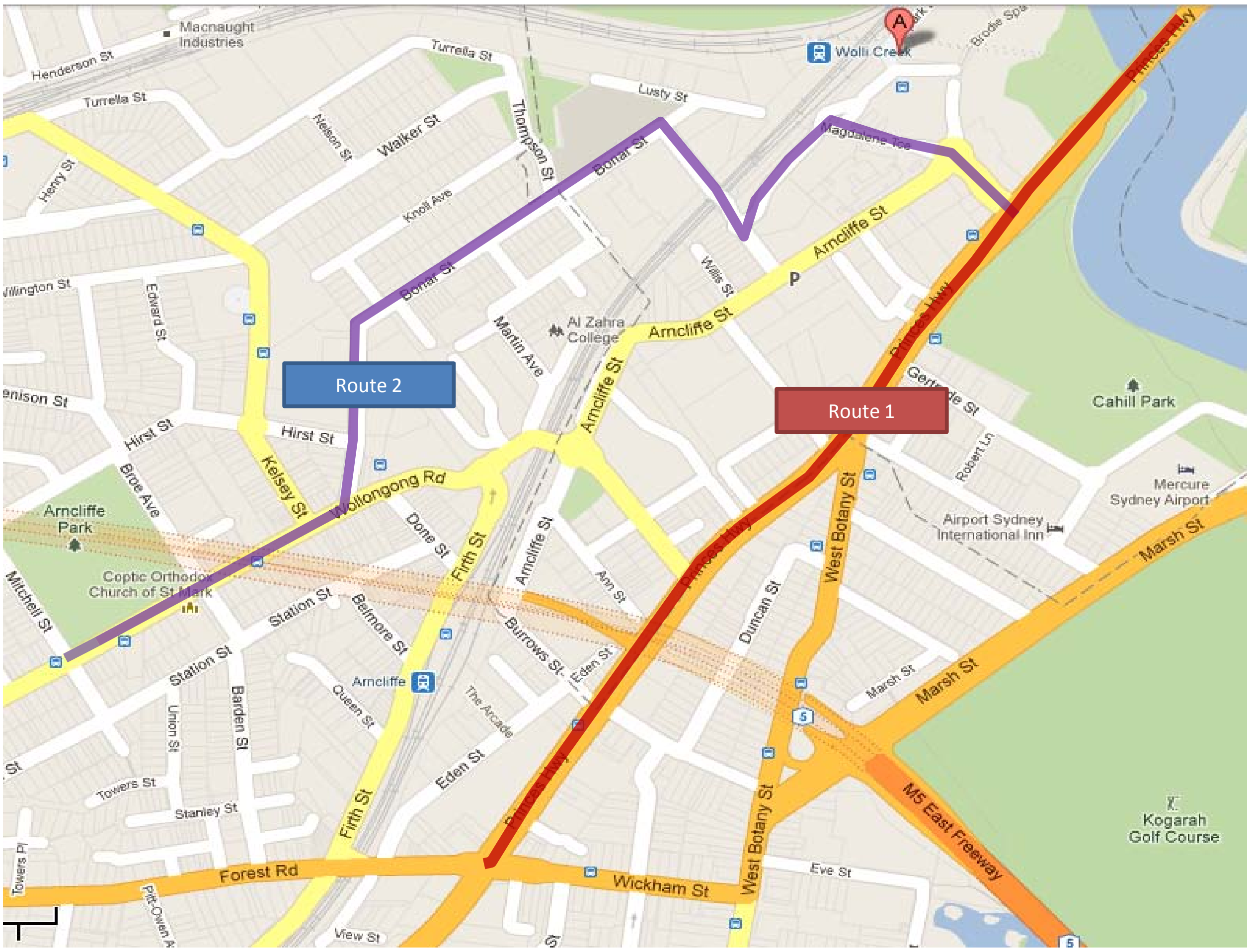
Firth St (Northbound) — PM

TIME		Movement 7 (Left Turn)					Movement 9 (Right Turn)					Movement 9a (U Turn)				
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists
1	3:15 PM	27	1	1	1	0	27	1	0	0	0	7	0	0	0	0
2	3:30 PM	30	2	0	1	0	35	0	0	0	0	3	0	0	0	0
3	3:45 PM	26	2	0	3	0	17	0	0	0	0	3	0	0	0	0
4	4:00 PM	20	3	0	1	0	23	1	0	0	0	3	0	0	0	0
5	4:15 PM	30	0	1	3	0	25	0	0	0	0	1	0	0	0	0
6	4:30 PM	21	2	1	1	0	20	1	0	0	0	1	0	0	0	0
7	4:45 PM	17	1	1	1	0	22	0	0	0	0	0	0	0	0	0
8	5:00 PM	23	1	0	3	0	26	0	0	0	0	3	0	0	0	0
9	5:15 PM	21	1	0	1	0	20	1	0	0	0	2	0	0	0	0
10	5:30 PM	26	0	0	1	0	23	0	0	0	0	1	0	0	0	0
11	5:45 PM	17	1	0	1	0	14	0	0	1	0	1	0	0	0	0
12	6:00 PM	17	0	0	2	0	12	0	0	0	0	0	0	0	0	0
3HR Total		275	14	4	19	0	264	4	0	1	0	25	0	0	0	0
Peak Hour Total		103	8	1	6	0	102	2	0	0	0	16	0	0	0	0

Wollongong Rd (Eastbound) and Pedestrians — PM

TIME		Movement 11 (Through)					Movement 12 (Right Turn)					Movement 12a (U Turn)					Pedestrians B	Pedestrians C	Pedestrians D
15 MINUTE PERIOD ENDING		Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	Cars, Utilities & Motorcycles	Light Trucks	Heavy Trucks	Buses	Cyclists	East	South	West
1	3:15 PM	56	2	0	1	1	10	2	0	1	0	0	0	0	0	0	3	1	1
2	3:30 PM	52	1	0	0	0	15	0	0	1	0	0	0	0	0	0	2	0	5
3	3:45 PM	70	0	0	0	0	9	1	1	3	0	0	0	0	0	0	1	1	2
4	4:00 PM	38	1	0	0	0	12	1	0	1	0	0	0	0	0	0	1	0	3
5	4:15 PM	44	0	0	0	0	12	0	0	2	0	3	0	0	0	0	2	0	0
6	4:30 PM	36	1	0	0	0	9	0	0	2	0	0	0	0	0	0	2	0	2
7	4:45 PM	53	1	0	0	1	10	0	0	1	0	0	0	0	0	0	0	1	1
8	5:00 PM	45	0	0	0	0	7	2	0	1	0	1	0	0	0	0	1	0	2
9	5:15 PM	38	1	0	0	0	10	0	0	1	0	1	0	0	0	0	0	1	2
10	5:30 PM	37	1	0	0	0	9	1	0	1	0	0	0	0	0	0	4	0	2
11	5:45 PM	34	1	0	0	0	6	0	0	1	0	0	0	0	0	0	1	0	1
12	6:00 PM	42	0	0	0	0	9	0	0	1	0	0	0	0	0	0	0	0	0
3HR Total		545	9	0	1	2	118	7	1	16	0	5	0	0	0	0	17	4	21
Peak Hour Total		216	4	0	1	1	46	4	1	6	0	0	0	0	0	0	7	2	11

Appendix B
Travel Time Survey



Route 2
Route 1
Wolli Creek
Arncliffe
Cahill Park
Kogarah Golf Course
Arncliffe Park
Princes Hwy
Arncliffe St
Wollongong Rd
West Botany St
Marsh St
M5 East Freeway
Forest Rd
Wickham St
Firth St
Bonar St
Magdalene Tce
Mercure Sydney Airport
Airport Sydney International Inn
Coptic Orthodox Church of St Mark
Al Zahra College

TDC Traffic Data & Control

Wolli Creek Route 1 - Princes Hwy - Avenal St to Cooks River

Route 1 Travel Time
AM - NB

Survey times - 7:00am to 9:00am

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 17/10 1 7:00	Wed 17/10 2 7:19	Wed 17/10 3 7:42	Wed 17/10 4 8:01	Wed 17/10 5 8:20	Wed 17/10 6 8:34	Wed 17/10 7 8:47	Wed 17/10 8 8:58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Average Travel Time	Average Speed (km/hr)
				Wednesday																		
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wickham St	200	60	0:12	00:17	01:53	01:50	03:40	01:13	01:32	00:20	00:48										01:27	8.31
Burrows St	260	60	0:16	00:17	02:41	02:32	00:26	00:22	00:23	00:17	00:19										00:55	17.14
M5 Motorway	100	60	0:06	00:06	01:20	00:43	00:12	00:29	00:12	00:07	00:07										00:24	14.69
West Botany St	400	60	0:24	00:28	06:39	01:57	02:51	02:07	02:03	00:34	00:37										02:10	11.12
Gertrude St	110	60	0:07	00:09	00:14	00:17	00:27	00:18	00:16	00:25	00:10										00:17	23.29
Brodie Spark Dr	260	60	0:16	00:22	00:46	00:38	00:27	00:40	00:45	01:21	00:29										00:41	22.83
Cooks River	240	60	0:14	03:01	00:41	00:22	00:45	00:19	00:28	00:22	00:34										00:49	17.63
total	1570		01:34	04:40	14:14	08:19	08:48	05:28	05:39	03:26	03:04											

Route 1 Travel Time
PM - NB

Survey times - 3:00pm to 6:00pm

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 17/10 1 15:01	Wed 17/10 2 15:16	Wed 17/10 3 15:28	Wed 17/10 4 15:37	Wed 17/10 5 15:51	Wed 17/10 6 16:01	Wed 17/10 7 16:10	Wed 17/10 8 16:19	Wed 17/10 9 16:28	Wed 17/10 10 16:40	Wed 17/10 11 16:51	Wed 17/10 12 17:01	Wed 17/10 13 17:11	Wed 17/10 14 17:25	Wed 17/10 15 17:34	Wed 17/10 16 17:46	Wed 17/10 17 17:58	Average Travel Time	Average Speed (km/hr)
				Wednesday																		
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wickham St	200	60	0:12	01:27	01:14	00:51	00:59	00:53	00:46	00:34	00:49	00:50	00:19	00:58	00:49	00:29	00:26	00:37	00:23	00:16	00:45	16.11
Burrows St	260	60	0:16	00:20	00:17	00:18	00:19	00:17	00:22	00:20	00:20	00:19	00:18	00:20	00:19	00:20	00:18	00:20	00:20	00:18	00:19	48.96
M5 Motorway	100	60	0:06	00:07	00:06	00:07	00:07	00:06	00:07	00:07	00:07	00:07	00:06	00:07	00:07	00:07	00:06	00:07	00:07	00:07	00:07	53.22
West Botany St	400	60	0:24	00:28	00:27	00:26	00:26	00:23	01:01	00:27	00:27	00:58	00:27	00:25	00:26	01:02	01:13	00:59	01:13	00:54	00:41	34.87
Gertrude St	110	60	0:07	00:08	00:37	00:41	00:32	00:43	00:09	00:40	00:41	00:13	00:41	00:07	00:27	00:14	00:09	00:09	00:10	00:12	00:23	17.13
Brodie Spark Dr	260	60	0:16	00:49	00:22	00:18	00:21	00:18	00:16	00:19	00:18	00:17	00:20	00:42	00:19	00:19	00:16	00:17	00:19	00:17	00:22	43.36
Cooks River	240	60	0:14	00:17	00:14	00:13	00:15	00:12	00:12	00:13	00:14	00:13	00:13	00:17	00:15	00:15	00:13	00:13	00:14	00:12	00:14	62.50
total	1570		01:34	03:36	03:17	02:54	02:59	02:52	02:53	02:40	02:56	02:57	02:24	02:56	02:42	02:46	02:41	02:42	02:46	02:16		

TDC
Traffic Data & Control

Wolli Creek Route 1 - Princes Hwy - Broe Ave to Princes Hwy

Route 1 Travel Time
AM - SB

Survey times - 7:00am to 9:00am

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 17/10 1 7:11	Wed 17/10 2 7:36	Wed 17/10 3 7:53	Wed 17/10 4 8:13	Wed 17/10 5 8:28	Wed 17/10 6 8:42	Wed 17/10 7 8:53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Average Travel Time	Average Speed (km/hr)
										Wednesday											
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Brodie Spark Dr	240	60	0:14	00:14	00:15	00:43	00:16	00:50	00:14	00:14										00:24	36.43
Gertrude St	260	60	0:16	00:17	00:16	00:19	00:18	00:18	00:46	00:16										00:21	43.68
West Botany St	110	60	0:07	00:34	00:10	00:08	00:08	00:08	00:10	00:10										00:13	31.50
M5 Motorway	400	60	0:24	00:32	00:40	00:34	00:32	00:41	00:58	01:01										00:43	33.83
Burrows St	100	60	0:06	00:07	00:07	00:13	00:08	00:11	00:13	00:06										00:09	38.77
Wickham St	260	60	0:16	01:27	00:44	02:30	02:07	00:24	00:26	01:17										01:16	12.25
Avenal St	200	60	0:12	00:19	00:16	00:14	00:15	00:17	00:17	00:14										00:16	45.00
total	1570		01:34	03:30	02:28	04:41	03:44	02:49	03:04	03:18											

Route 1 Travel Time
PM - SB

Survey times - 3:00pm to 6:00pm

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 17/10 1 15:07	Wed 17/10 2 15:23	Wed 17/10 3 15:33	Wed 17/10 4 15:45	Wed 17/10 5 15:56	Wed 17/10 6 16:06	Wed 17/10 7 16:15	Wed 17/10 8 16:24	Wed 17/10 9 16:35	Wed 17/10 10 16:46	Wed 17/10 11 16:57	Wed 17/10 12 17:06	Wed 17/10 13 17:19	Wed 17/10 14 17:29	Wed 17/10 15 17:39	Wed 17/10 16 17:54	Average Travel Time	Average Speed (km/hr)
										Wednesday											
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Brodie Spark Dr	240	60	0:14	00:14	00:16	00:16	00:16	00:15	00:15	00:15	00:14	00:14	00:52	00:16	00:16	00:15	00:16	00:14	00:53	00:20	43.61
Gertrude St	260	60	0:16	00:15	00:16	00:17	00:50	00:16	00:18	00:16	00:16	00:16	00:20	00:19	00:16	00:16	00:16	00:16	00:20	00:19	49.43
West Botany St	110	60	0:07	00:08	00:07	00:09	00:10	00:08	00:10	00:07	00:08	00:08	00:10	00:10	00:08	00:08	00:07	00:07	00:09	00:08	47.28
M5 Motorway	400	60	0:24	00:28	00:31	00:29	00:26	00:28	00:28	00:28	00:27	00:28	00:29	00:26	00:29	00:29	00:31	01:34	00:27	00:32	44.48
Burrows St	100	60	0:06	00:08	00:09	00:08	00:23	00:06	00:07	00:07	00:07	00:08	00:08	00:07	00:07	00:24	00:08	00:23	00:07	00:10	34.49
Wickham St	260	60	0:16	00:46	01:26	01:08	01:55	00:50	01:14	01:26	01:36	01:55	01:32	01:04	01:25	01:56	01:34	01:23	00:31	01:21	11.51
Avenal St	200	60	0:12	00:31	00:14	00:15	00:13	00:13	00:14	00:14	00:14	00:16	00:14	00:14	00:14	00:14	00:16	00:14	00:13	00:15	47.41
total	1570		01:34	02:30	02:59	02:42	04:13	02:16	02:46	02:53	03:02	03:25	03:45	02:36	02:55	03:42	03:08	04:11	02:40		

TDC Traffic Data & Control

Wolli Creek Route 2 - Bonar St - Avenal St to Cooks River

Route 2 Travel Time
AM - NB

Survey times - 7:00am to 9:00am

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 17/10 1 7:00	Wed 17/10 2 7:31	Wed 17/10 3 7:44	Wed 17/10 4 8:05	Wed 17/10 5 8:20	Wed 17/10 6 8:32	Wed 17/10 7 8:49	N/A	N/A	N/A	N/A	N/A	N/A	Average Travel Time	Average Speed (km/hr)
				Wednesday														
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bonar St	210	50	0:15	00:25	00:18	00:49	00:29	00:44	00:49	00:26							00:34	22.05
Thompson St	570	50	0:41	00:55	00:51	00:50	00:55	00:55	00:55	00:55							00:54	38.20
Guess Ave	160	50	0:12	00:17	00:16	00:16	00:16	00:17	00:15	00:16							00:16	35.68
Mt Olympus Blvd	170	50	0:12	00:25	00:20	00:21	00:19	00:19	00:19	00:20							00:20	29.96
Magdalene Dr	170	50	0:12	00:32	00:18	00:20	00:19	00:19	00:17	00:18							00:20	29.96
Brodie Spark Dr	170	50	0:12	00:30	00:23	05:23	02:43	01:19	00:19	02:40							01:54	5.38
Princes Hwy	110	50	0:08	00:54	00:12	00:20	00:26	00:15	00:02	00:15							00:21	19.25
total	1560		01:52	03:58	02:38	08:19	05:27	04:08	02:56	05:10								

Route 2 Travel Time
PM - NB

Survey times - 3:00pm to 6:00pm

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 17/10 1 15:00	Wed 17/10 2 15:11	Wed 17/10 3 15:29	Wed 17/10 4 15:44	Wed 17/10 5 16:01	Wed 17/10 6 16:11	Wed 17/10 7 16:31	Wed 17/10 8 16:43	Wed 17/10 9 16:54	Wed 17/10 10 17:11	Wed 17/10 11 17:23	Wed 17/10 12 17:38	Wed 17/10 13 17:50	Average Travel Time	Average Speed (km/hr)
				Wednesday														
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bonar St	210	50	0:15	00:40	00:34	00:34	00:18	00:26	00:19	00:19	00:28	00:19	00:41	00:19	00:23	00:41	00:28	27.22
Thompson St	570	50	0:41	00:54	00:59	00:51	00:51	00:56	00:55	01:02	00:53	00:50	00:56	00:52	00:50	00:57	00:54	37.78
Guess Ave	160	50	0:12	00:17	00:17	00:16	00:17	00:17	00:16	00:16	00:18	00:15	00:16	00:18	00:16	00:16	00:17	34.83
Mt Olympus Blvd	170	50	0:12	00:21	00:20	00:18	00:19	00:20	00:19	00:22	00:19	00:20	00:18	00:21	00:21	00:19	00:20	30.96
Magdalene Dr	170	50	0:12	00:22	00:20	00:18	00:19	00:21	00:20	00:23	00:19	00:23	00:19	00:19	00:21	00:17	00:20	30.48
Brodie Spark Dr	170	50	0:12	00:22	00:21	00:18	00:22	00:19	00:20	00:24	00:19	00:22	00:18	00:21	00:20	00:20	00:20	29.91
Princes Hwy	110	50	0:08	00:20	00:23	00:41	00:17	00:36	00:19	00:12	00:15	00:14	00:15	00:17	00:15	00:17	00:20	19.72
total	1560		01:52	03:16	03:14	03:16	02:43	03:15	02:48	02:58	02:51	02:43	03:03	02:47	02:46	03:07		

TDC Traffic Data & Control

Wolli Creek Route 2 - Bonar St - Avenal St to Cooks River

Route 2 Travel Time
AM - SB

Survey times - 7:00am to 9:00am

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 17/10 1 7:26	Wed 17/10 2 7:39	Wed 17/10 3 7:59	Wed 17/10 4 8:16	Wed 17/10 5 8:27	Wed 17/10 6 8:41	Wed 17/10 7 8:57	N/A	N/A	N/A	N/A	N/A	N/A	Average Travel Time	Average Speed (km/hr)
				Wednesday														
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Arncliffe St	110	50	0:08	00:16	00:22	00:24	00:16	00:14	00:13	00:20							00:18	22.18
Mt Olympus Blvd	170	50	0:12	00:34	00:58	00:21	00:20	00:21	00:17	00:16							00:27	22.91
Guess Ave	170	50	0:12	00:23	00:20	00:22	00:21	00:22	00:20	00:19							00:21	29.14
Bonar St	170	50	0:12	00:20	00:21	00:26	00:25	00:23	00:24	00:23							00:23	26.44
Thompson St	160	50	0:12	00:16	00:16	00:19	00:17	00:18	00:18	00:17							00:17	33.32
Wollongong Rd	570	50	0:41	01:02	01:14	01:44	01:02	00:58	01:22	00:55							01:11	28.90
Broe Ave	210	50	0:15	00:29	00:19	00:40	00:28	00:19	00:22	00:23							00:26	29.40
total	1560		01:52	03:20	03:50	04:16	03:09	02:55	03:16	02:53								

Route 2 Travel Time
PM - SB

Survey times - 3:00pm to 6:00pm

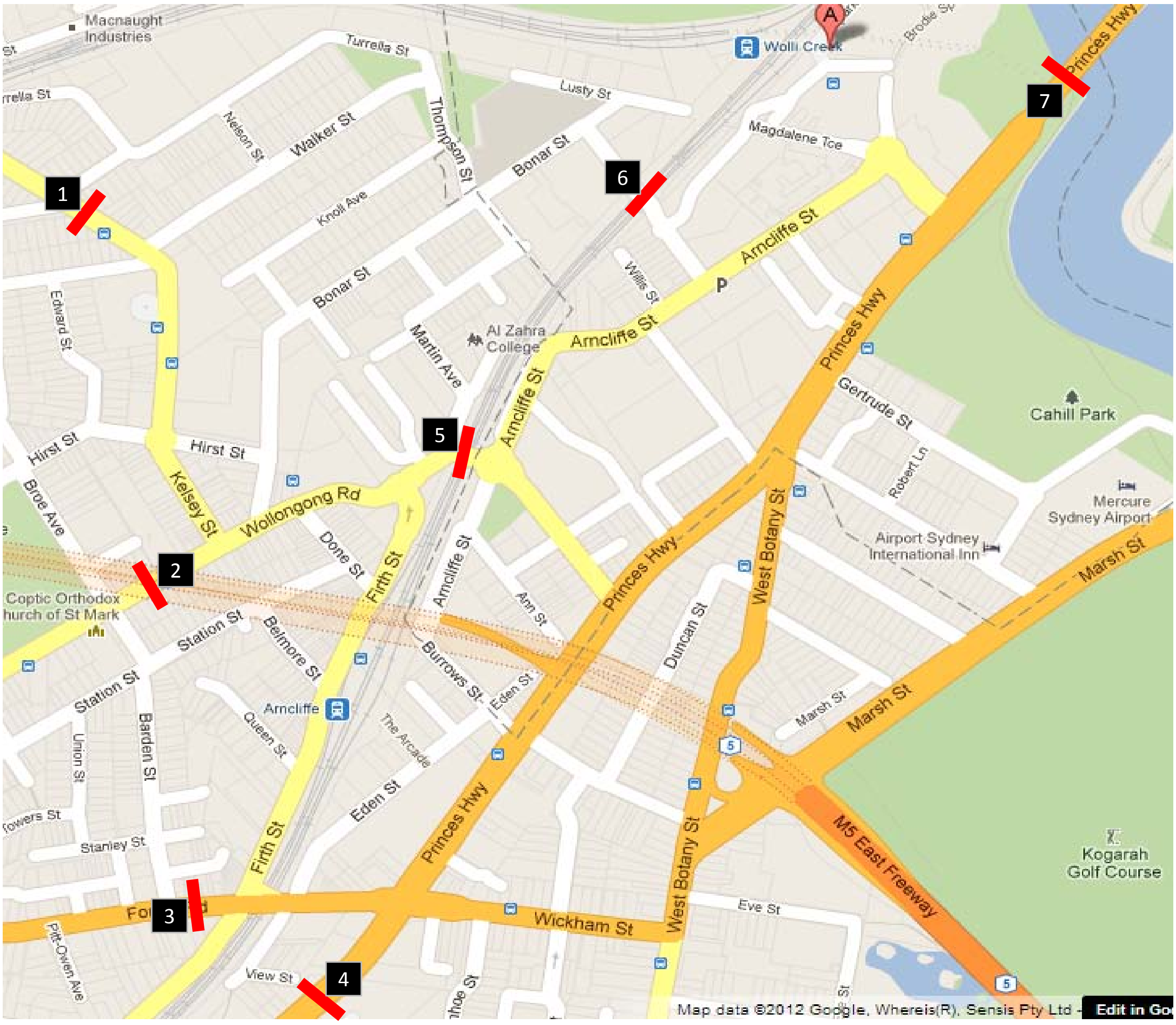
End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 17/10 1 15:07	Wed 17/10 2 15:19	Wed 17/10 3 15:35	Wed 17/10 4 15:51	Wed 17/10 5 16:07	Wed 17/10 6 16:19	Wed 17/10 7 16:38	Wed 17/10 8 16:49	Wed 17/10 9 17:01	Wed 17/10 10 17:17	Wed 17/10 11 17:29	Wed 17/10 12 17:45	Wed 17/10 13 17:57	Average Travel Time	Average Speed (km/hr)
				Wednesday														
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Arncliffe St	110	50	0:08	00:14	00:15	00:13	00:16	00:13	00:13	00:12	00:14	00:14	00:21	00:13	00:15	00:17	00:15	27.09
Mt Olympus Blvd	170	50	0:12	00:19	00:20	00:18	00:18	00:17	00:20	00:18	00:17	00:19	00:19	00:16	00:16	00:19	00:18	33.71
Guess Ave	170	50	0:12	00:21	00:23	00:19	00:23	00:20	00:19	00:22	00:22	00:22	00:20	00:19	00:19	00:19	00:21	29.69
Bonar St	170	50	0:12	00:23	00:20	00:20	00:26	00:22	00:26	00:24	00:23	00:24	00:23	00:22	00:22	00:24	00:23	26.61
Thompson St	160	50	0:12	00:18	00:17	00:19	00:17	00:17	00:19	00:18	00:19	00:19	00:17	00:17	00:18	00:17	00:18	32.28
Wollongong Rd	570	50	0:41	01:04	02:11	01:02	01:19	01:07	00:57	01:16	00:55	00:59	01:32	01:22	00:56	00:52	01:12	28.62
Broe Ave	210	50	0:15	00:31	00:20	00:19	00:23	00:19	00:35	00:48	00:19	00:19	00:35	00:31	00:22	00:17	00:26	29.08
total	1560		01:52	03:10	04:06	02:50	03:22	02:55	03:09	03:38	02:49	02:56	03:47	03:20	02:48	02:45		

Appendix C
Origin-Destination Survey

TDC
Traffic Data & Control

Wolli Creek Origin - Destination Site Map

Site	Location	Raw Matrix No.
1	Loftus St, South of Turella St, Turrella	1 & 2
2	Wollongong Rd, East of Broe Ave, Arncliffe	3 & 4
3	Forest Rd, East of Bardon St, Arncliffe	5 & 6
4	Princes H'way, South of Wickham, Arncliffe	7 & 8
5	Allen St, near railway bridge, Arncliffe	9 & 10
6	21 Guess Ave, Wolli Creek	11 & 12
7	Princes H'way, North of Brodie Spark Dr, Wolli Creek	13 & 14



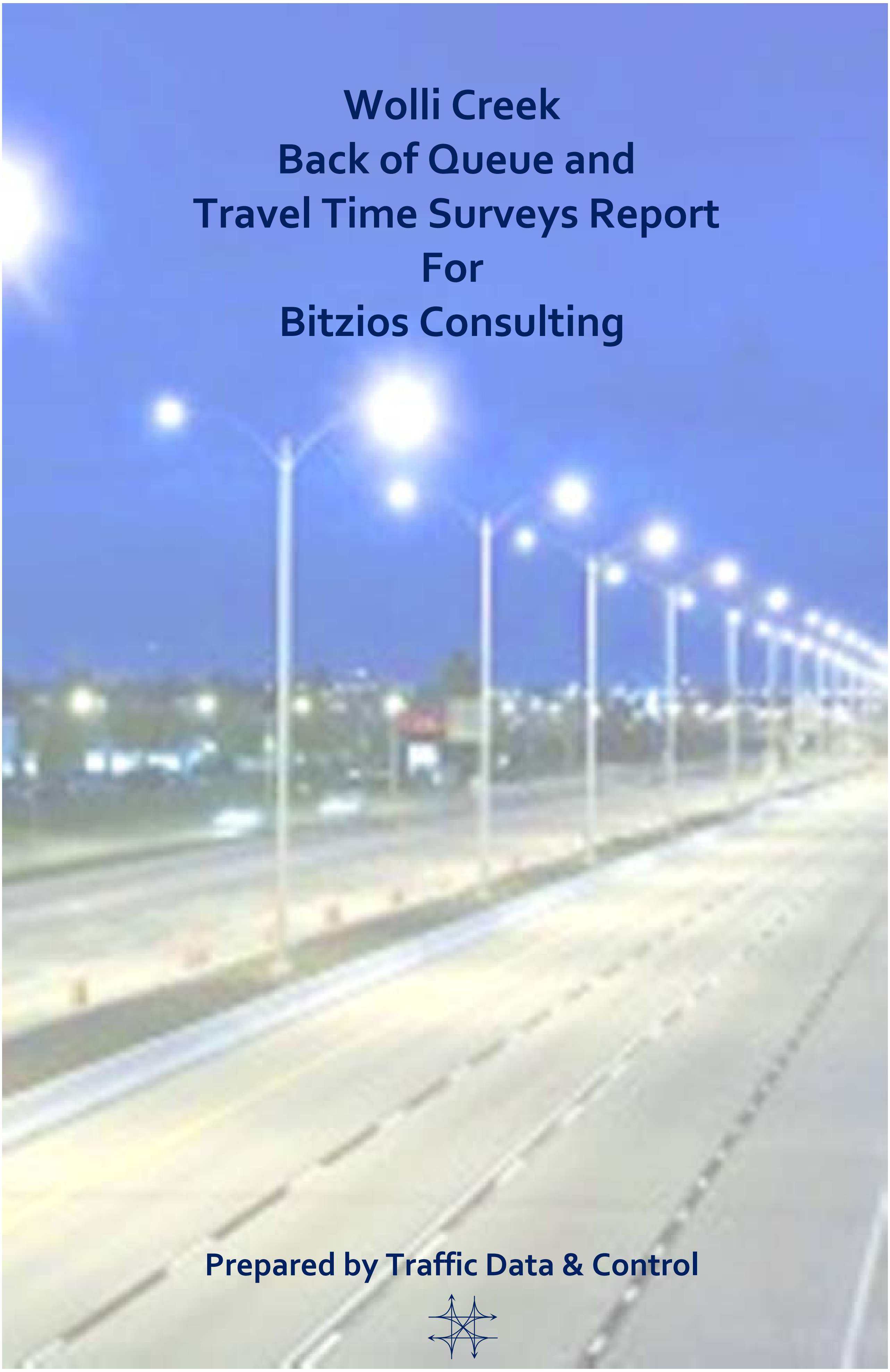
T0245 Wolli Creek Origin Destination Survey - AM Period 18th October, 2012

Location	Site	Loftus St - NB	Loftus St - SB	Wollongong Rd - EB	Wollongong Rd - WB	Forest Rd - EB	Forest Rd - WB	Princes Hwy South - NB	Princes Hwy South - SB	Allen St - NB	Allen St - SB	Guess Ave - NB	Guess Ave - SB	Princes Hwy North - NB	Princes Hwy North - SB	Total Recorded	Total Matched	Percentage Matched
Location	Site	1	2	3	4	5	6	7	8	9	10	11	12	13	14			
Loftus St - NB	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	148		
Loftus St - SB	2	0	0	0	4	0	3	0	3	0	13	0	1	13	0	121	**37**	**31%**
Wollongong Rd - EB	3	12	0	0	0	0	30	0	37	0	645	0	31	490	0	1238	**1245**	**101%**
Wollongong Rd - WB	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	306		
Forest Rd - EB	5	0	0	0	12	0	0	0	52	12	89	11	32	438	0	2280	**646**	**28%**
Forest Rd - WB	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	938		
Princes Hwy South - NB	7	11	0	0	30	0	64	0	0	35	0	16	0	1595	0	3580	**1751**	**49%**
Princes Hwy South - SB	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1422		
Allen St - NB	9	7	0	0	50	0	7	0	0	0	0	4	0	0	0	230	**68**	**30%**
Allen St - SB	10	0	0	0	0	0	39	0	82	0	0	0	27	803	0	1947	**951**	**49%**
Guess Ave - NB	11	2	0	0	9	0	2	0	0	0	29	0	0	0	0	208	**42**	**20%**
Guess Ave - SB	12	0	0	0	0	0	9	0	10	10	0	0	0	250	0	658	**279**	**42%**
Princes Hwy North - NB	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6014		
Princes Hwy North - SB	14	10	0	0	29	0	158	0	428	56	0	46	0	0	0	2185	**727**	**33%**
Total Recorded		148	121	1238	306	2280	938	3580	1422	230	1947	208	658	6014	2185	**21275**		
Total Matched		**42**			**134**		**312**		**612**	**113**	**776**	**77**	**91**	**3589**			**5746**	**43%**
Percentage Matched		**28%**			**44%**		**33%**		**43%**	**49%**	**40%**	**37%**	**14%**	**60%**			**39%**	

Percentage high due to majority of vehicles matched being matched to more than 1 location

T0245 Wolli Creek Origin Destination Survey - PM Period 18th October, 2012

	Location	Loftus St - NB	Loftus St - SB	Wollongong Rd - EB	Wollongong Rd - WB	Forest Rd - EB	Forest Rd - WB	Princes Hwy South - NB	Princes Hwy South - SB	Allen St - NB	Allen St - SB	Guess Ave - NB	Guess Ave - SB	Princes Hwy North - NB	Princes Hwy North - SB	Total Recorded	Total Matched	Percentage Matched
Location	**Site**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**			
Loftus St - NB	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	211		
Loftus St - SB	**2**	0	0	0	7	0	2	0	10	0	16	0	0	11	0	200	**46**	**23%**
Wollongong Rd - EB	**3**	4	0	0	0	0	40	0	34	0	26	0	7	62	0	683	**173**	**25%**
Wollongong Rd - WB	**4**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1821		
Forest Rd - EB	**5**	2	0	0	43	0	0	0	67	50	16	15	7	364	0	1604	**564**	**35%**
Forest Rd - WB	**6**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4525		
Princes Hwy South - NB	**7**	10	0	0	56	0	326	0	0	149	0	28	0	1329	0	2976	**1898**	**64%**
Princes Hwy South - SB	**8**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4417		
Allen St - NB	**9**	23	0	0	350	0	110	0	0	0	0	17	0	0	0	1959	**500**	**26%**
Allen St - SB	**10**	0	0	0	0	0	34	0	65	0	0	0	2	244	0	763	**345**	**45%**
Guess Ave - NB	**11**	9	0	0	24	0	26	0	0	0	28	0	0	0	0	881	**87**	**10%**
Guess Ave - SB	**12**	0	0	0	0	0	16	0	28	29	0	0	0	114	0	364	**187**	**51%**
Princes Hwy North - NB	**13**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5822		
Princes Hwy North - SB	**14**	19	0	0	194	0	969	0	1699	731	0	263	0	0	0	7516	**3875**	**52%**
Total Recorded		211	200	683	1821	1604	4525	2976	4417	1959	763	881	364	5822	7516	**33742**		
Total Matched		**67**			**674**		**1523**		**1903**	**959**	**86**	**323**	**16**	**2124**			**7675**	**37%**
Percentage Matched		**32%**			**37%**		**34%**		**43%**	**49%**	**11%**	**37%**	**4%**	**36%**			**31%**	



Wolli Creek
Back of Queue and
Travel Time Surveys Report
For
Bitzios Consulting

Prepared by Traffic Data & Control

DOCUMENT CONTROL SHEET

Issue History

Report Number	Prepared by	Reviewed by	Issued by	Date
T0245.01	Paul Arditto	Steve Brooke	Paul Arditto	4/12/12

CONTENTS

Appendices

1. SURVEY DETAILS

Traffic Data and Control (TDC) was commissioned by Bitzios Consulting to undertake traffic surveys in Wolli Creek, New South Wales. The surveys were undertaken over two days – Tuesday 27th and Wednesday 28th November 2012, and included:

- Back of Queue (16 locations);
- Travel Time Surveys (2 routes);

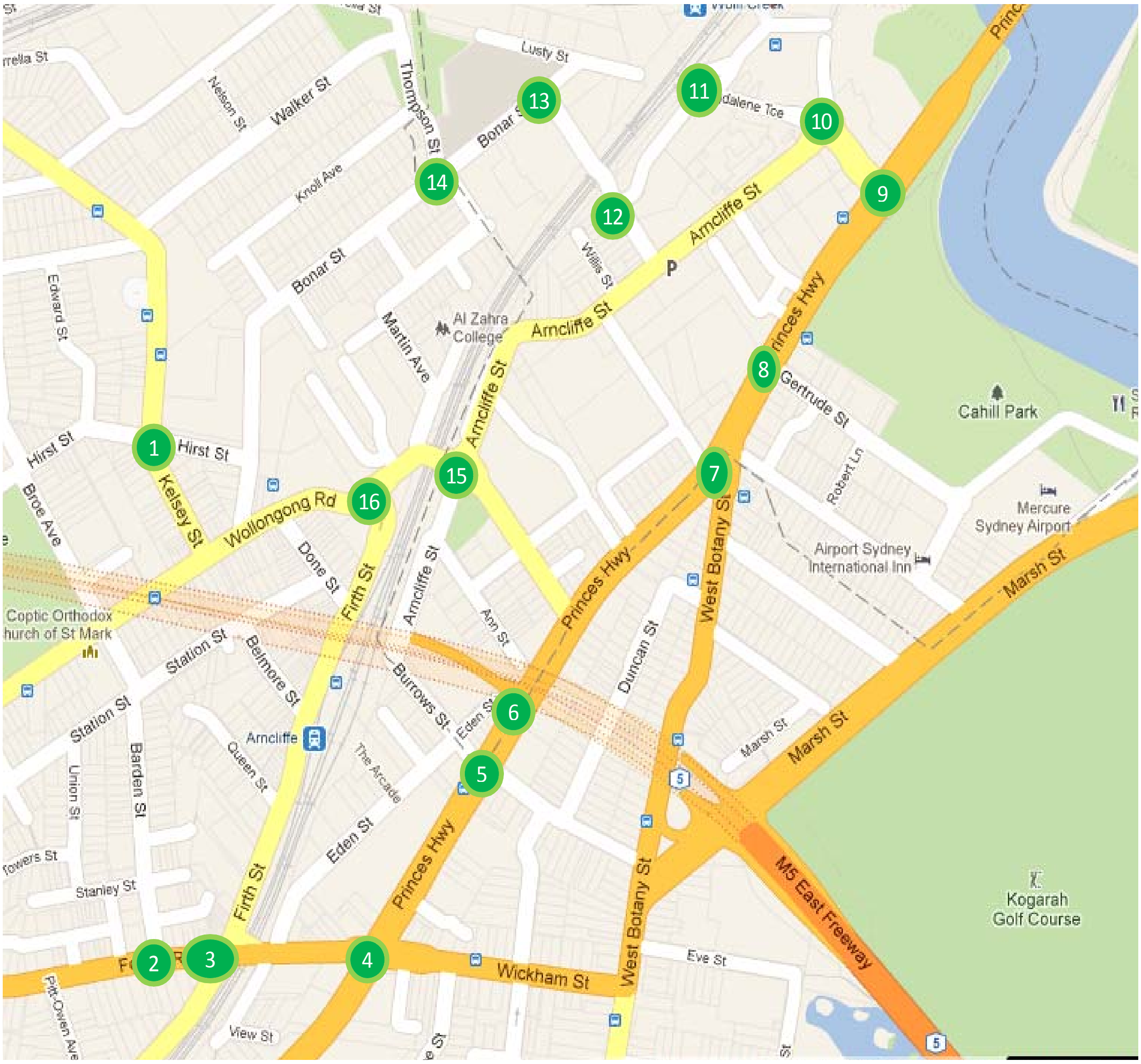
2. BACK OF QUEUE SURVEY

The Back of Queue surveys were undertaken for a two hour morning peak period (7:00am to 9:00am) on Wednesday 28th November and a three hour evening peak period (3:00pm to 6:00pm), on Tuesday 27th November 2012.

The sites for the Back of queue surveys are as follows.

Site No.	Type	Location
1	Back of Queue	Hirst St & Loftus St/ Kelsey St, Arncliffe
2	Back of Queue	Forest Rd & Firth St/ Somerville St, Arncliffe
3	Back of Queue	Forest Rd & Wardell St, Arncliffe
4	Back of Queue	Princes H'way & Forest Rd/ Wickham St, Arncliffe
5	Back of Queue	Princes H'way & Burrows St/ Kyle St, Wolli Creek
6	Back of Queue	Princes H'way & M5 East Freeway, Arncliffe
7	Back of Queue	Princes H'way & West Botany St, Wolli Creek
8	Back of Queue	Princes H'way & Gertrude St, Wolli Creek
9	Back of Queue	Princes H'way & Brodie Spark Dr, Wolli Creek
10	Back of Queue	Brodie Spark Dr & Arncliffe St, Wolli Creek
11	Back of Queue	Magdalene Tce & Mount Olympus Bvd, Wolli Creek
12	Back of Queue	Mount Olympus Bvd & Guess Ave, Wolli Creek
13	Back of Queue	Guess Ave & Bonar St, Wolli Creek
14	Back of Queue	Bonar St & Thompson St, Arncliffe
15	Back of Queue	Arncliffe St & Wollongong Rd/ Allen St, Arncliffe
16	Back of Queue	Wollongong Rd & Firth St, Arncliffe

Following is the site map for the back of queue surveys.



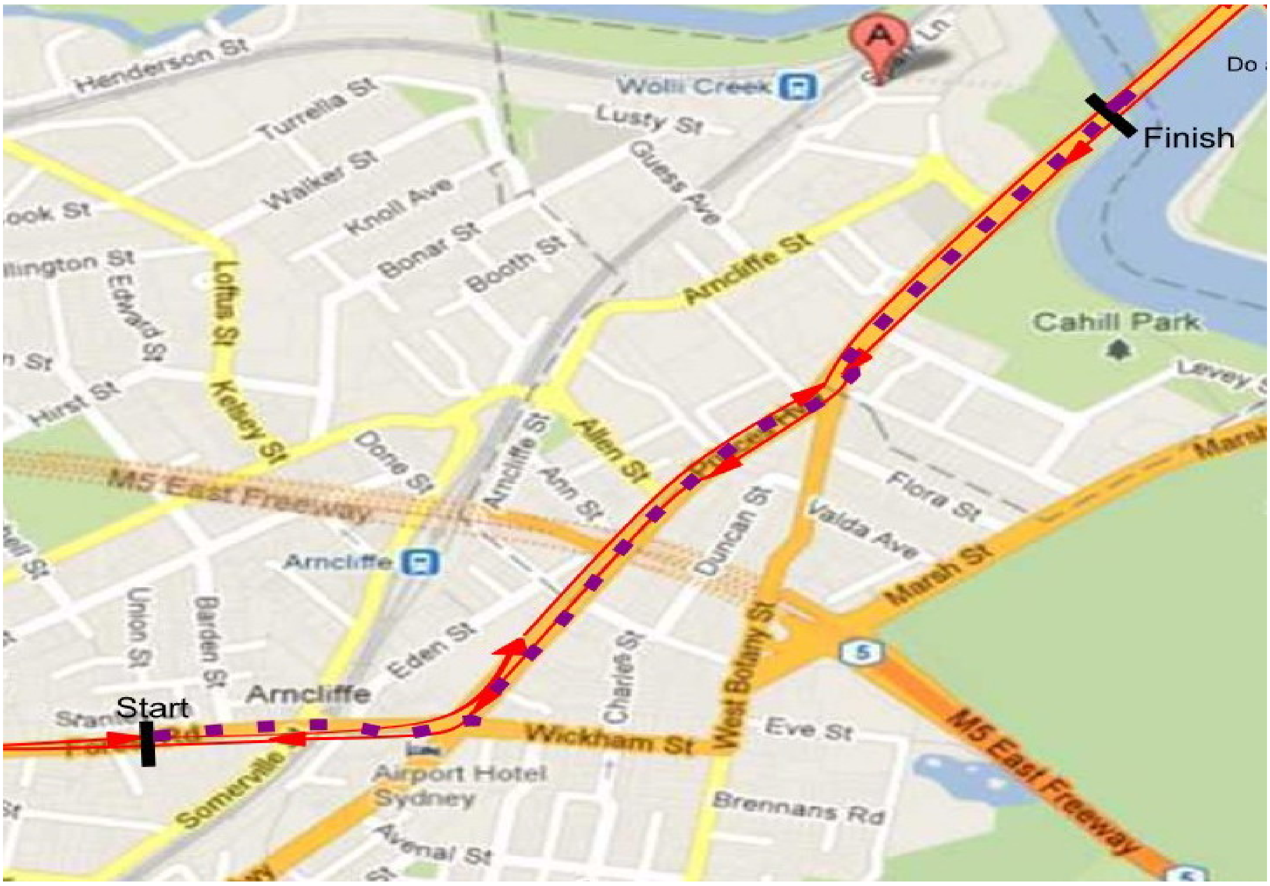
Detailed back of queue count reports are presented in Appendix A

3. TRAVEL TIME SURVEY

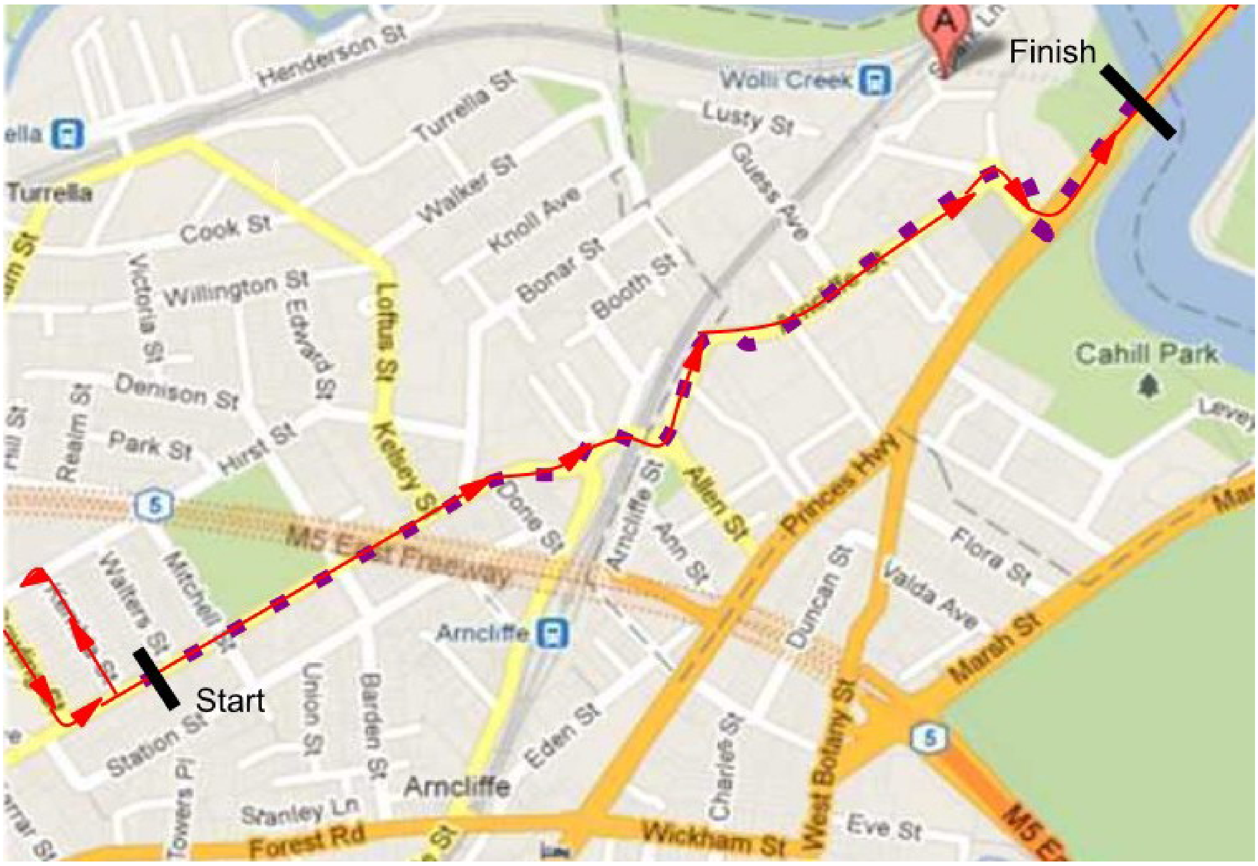
The travel time survey consisted of two separate bidirectional routes. The surveys were undertaken using the floating car method which simulates a car travelling at the same speed as the general traffic. Two vehicles were used to record continuous trips during the AM/PM peak periods of 7:00am to 9:00am on Wednesday 17th October 2012 and 3:00pm to 6:00pm on Tuesday 16th October 2012.

Below is map of both travel time routes.

Wolli Creek Travel Time Survey Route - ROUTE 1



Wolli Creek Travel Time Survey Route - ROUTE 2



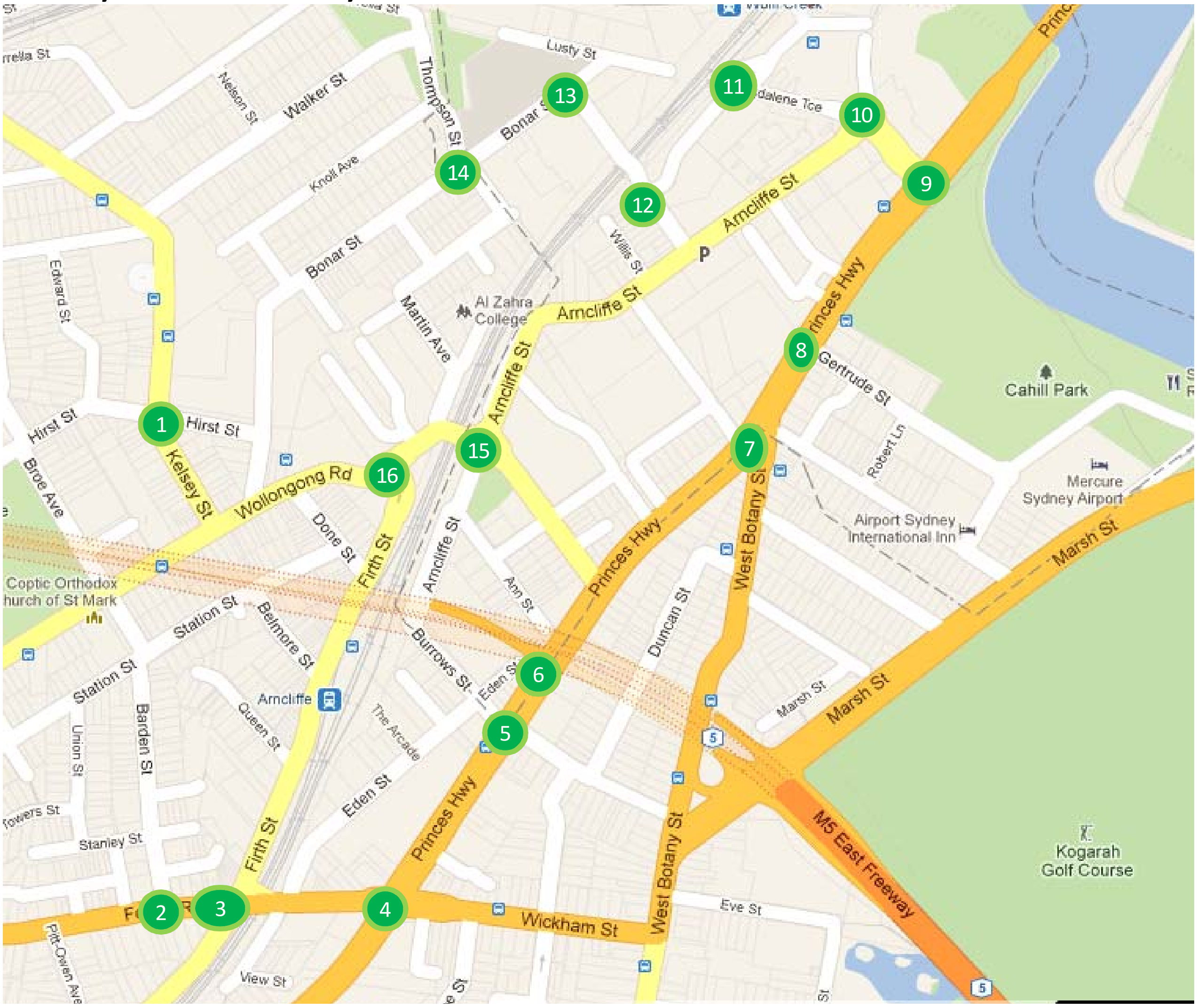
Both route one and route two had no issues during the survey.

The Travel Time Report is presented in Appendix B

Appendix A
Back of Queue Data

Wolli Creek Back of Queue Survey

Tuesday 27th & Wednesday 28th of November



Site No.	Type	Location
1	Back of Queue	Hirst St & Loftus St/ Kelsey St, Arncliffe
2	Back of Queue	Forest Rd & Firth St/ Somerville St, Arncliffe
3	Back of Queue	Forest Rd & Wardell St, Arncliffe
4	Back of Queue	Princes H'way & Forest Rd/ Wickham St, Arncliffe
5	Back of Queue	Princes H'way & Burrows St/ Kyle St, Wolli Creek
6	Back of Queue	Princes H'way & M5 East Freeway, Arncliffe
7	Back of Queue	Princes H'way & West Botany St, Wolli Creek
8	Back of Queue	Princes H'way & Gertrude St, Wolli Creek
9	Back of Queue	Princes H'way & Brodie Spark Dr, Wolli Creek
10	Back of Queue	Brodie Spark Dr & Arncliffe St, Wolli Creek
11	Back of Queue	Magdalene Tce & Mount Olympus Bvd, Wolli Creek
12	Back of Queue	Mount Olympus Bvd & Guess Ave, Wolli Creek
13	Back of Queue	Guess Ave & Bonar St, Wolli Creek
14	Back of Queue	Bonar St & Thompson St, Arncliffe
15	Back of Queue	Arncliffe St & Wollongong Rd/ Allen St, Arncliffe
16	Back of Queue	Wollongong Rd & Firth St, Arncliffe

TDC
Traffic Data & Control

Site : 1

Location: Hirst St/ Loftus St/ Kelsey St, Arncliffe

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm											
Hirst St EB			Loftus St SB			Hirst St WB			Kelsey St NB		
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane
5:24	1		3:04	2		5:23	1		4:14	1	
			3:04	1							
			4:14	1							
			4:20	1							

AM Period - 7:00am to 9:00am											
Hirst St EB			Loftus St SB			Hirst St WB			Kelsey St NB		
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane
8:03	2					8:05	1				

TDC
Traffic Data & Control

Site : 2

Location: Forest Rd/ Firth St/ Somerville St, Arncliffe

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm									
Forest Rd EB			Somerville St NB		Forest Rd WB			Firth St SB	
Time	Left lane	Right Lane	Time	Left lane	Time	Left lane	Right Lane	Time	Left lane
3:08	4	3	3:10	3	3:08	1	3	3:08	1
3:11	1	2	3:11	6	3:11	5	3	3:11	4
3:12	2	2	3:12	1	3:12	3	3	3:12	5
3:19	2		3:17	3	3:19	2		3:17	2
3:47	3	4	3:21	2	3:47	1	2	3:21	1
3:49			3:47	3	3:49	1	5	3:47	5
3:51	1	1	3:49	3	3:51	3	5	3:49	6
4:28	11		3:51		4:26	6		3:51	6
4:30	7		4:25	6	4:28	2		4:25	4
5:30	1	1	4:28	7	4:30	4		4:28	7
5:34	3		4:30	3	5:30	1	3	4:30	9
5:36	9		5:30	3	5:34	4		5:30	5
			5:33	2	5:36	1		5:33	3
			5:36	5				5:36	4

AM Period - 7:00am to 9:00am									
Forest Rd EB			Somerville St NB		Forest Rd WB			Firth St SB	
Time	Left lane	Right Lane	Time	NB	Time	Left lane	Right Lane	Time	SB
7:10	20+		7:10	3	7:10	1		7:10	1
7:15	20+		7:15	8	7:15	3		7:15	2
7:54	18	18	7:54	3	7:54	3	2	7:54	3
7:56	18	18	7:56	3	7:56	2	2	7:56	2
7:58	18	18	7:58	4	7:58	3	1	7:58	5
8:11	20+		8:13	10	8:11	2		8:13	5
8:14	20+		8:16	10	8:14	5		8:16	1

TDC
Traffic Data & Control

Site : 3

Location: Forest Rd/ Wardell St, Arncliffe

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm							
Forest Rd EB		Wardell St NB		Forest Rd WB		Eden St SB	
Time	EB	Time	NB	Time	WB	Time	SB
		3:22	15+	3:24	8	4:35	1
		3:25	11			5:38	3
		4:34	2				

AM Period - 7:00am to 9:00am							
Forest Rd EB		Wardell St NB		Forest Rd WB		Eden St SB	
Time	EB	Time	NB	Time	WB	Time	SB
8:18	3	7:18	1	7:18	1		
		8:18	3	8:19	1		
		8:20	1	8:20	4		

TDC
Traffic Data & Control

Site : 4

Location: Forest Rd/ Princes H'way/ Wickham St, Arncliffe

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm														
Forest Rd EB			Princes H'way NB				Wickham St WB			Princes H'way SB				
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Right Turn	Time	Left lane	Right Lane	Time	Left lane	Right Lane	Right Turn
3:29	5		3:27	15+			3:08	9		3:14			34
3:30	6		3:29	15+			3:30	10		3:15			33
4:05	5	5	4:05	15	11		4:05	18	18	3:27	15		
4:06	4	3	4:06	12	13	2	4:06	14	15	3:29	7		
4:07	5	3	4:07	10	4	3	4:07	14	11	4:05	28	30	30
4:38	2		4:37	12			4:38	20		4:06	27	25	24
4:40	3		4:39	9			4:40	20		4:07	10	12	19
4:55	4	0	4:42	10			4:55	20	20	4:37	40		
4:57	7	3	4:55	15	15	7	4:57	27	20	4:39	20		
4:59	3	6	4:57	15	15	2	4:59	20	20	4:41	40		
5:24	4	3	4:59	15	15	8	5:24	20	20	4:55	12	16	30
5:26	5	5	5:24	15	15	6	5:26	20	20	4:57	30	30	30
5:44	13		5:26	15	15	4	5:46	20		4:59	30	30	23
5:47	6		5:44	3			5:48	20		5:24	30	30	23
5:51	10		5:47	5						5:26	28	20	10
										5:45	40		
										5:50	40		

AM Period - 7:00am to 9:00am													
Forest Rd EB			Princes H'way NB				Wickham St WB			Princes H'way SB			
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Right Turn	Time	Left lane	Right Lane	Time	Left lane	Right Lane	Right Turn
7:23	40+		7:25	10			7:23	4		7:23	3		
7:26	40+		7:28	20			7:26	7		7:28	8		
8:00	22	22	8:00	15	15	9	8:00	7	4	8:00	9	5	10
8:02	22	22	8:02	15	15	12	8:02	2	1	8:02	8	8	6
8:04	22	22	8:04	15	15	13	8:04	3	3	8:04	12	16	3
8:26	40+		8:24	20			8:26	2		8:24	16		
8:29	40		8:28	20			8:29	2		8:28	15		

TDC
Traffic Data & Control

Site : 5

Location: Burrows St / Kyle St, Arncliffe

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm									
Burrows St EB			Princes H'way NB		Kyle St WB		Princes H'way SB		
Time	Left lane	Right Lane	Time	Left lane	Time	Left lane	Time	Left lane	Right Lane
3:13		2	3:41	3			3:13	1	
3:15	4	2	4:51	1			3:15	1	1
3:41	3		5:57	1			3:41	3	
3:43	2						3:44	4	
3:45	3						4:51	1	
4:50	3						4:52	9	
4:52	5						4:53	12	
4:55	4						4:54	6	
5:56	1						4:55	12	
5:59	5						5:57	2	

AM Period - 7:00am to 9:00am									
Burrows St EB			Princes H'way NB		Kyle St WB		Princes H'way SB		
7:32	6		7:33	6			7:33	4	
7:35	4		7:36	2			7:36	3	
8:34	6		8:34	4			8:34	6	
8:37	7		8:37	3			8:37	6	

TDC
Traffic Data & Control

Site : 6

Location: Princes H'way & M5 East Freeway, Arncliffe

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm								
M5 EB			Princes H'way NB			Princes H'way SB		
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane
3:17	7	3	3:17	1	1	3:17		
3:19	4	7	3:19			3:19	4	4
3:21	3	3	3:21	3	2	3:21	4	3
3:47	12		3:48	2		3:48	1	
3:49	20		3:51	2		3:51	1	
4:56	13		5:00	1		4:57	5	
4:59	10					4:59	11	
5:00	10							

AM Period - 7:00am to 9:00am								
M5 EB			Princes H'way NB			Princes H'way SB		
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane
7:38	4		7:41	1		7:38	2	
7:40	4		7:41	1		7:38	2	
7:42	8		8:39	3		7:42	3	
8:39	5		8:39	3		8:44	1	
8:42	6		8:42	4				
8:44	4							

Site : 7

Location: Princes H'way & West Botany St, Wolli Creek

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm								
Princes H'way NB			West Botany St WB			Princes H'way SB		
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane
3:02	8		3:01	6		3:02	1	
3:04	6		3:03	5		3:04	2	
4:12	2		3:05	6		4:12		1
4:15	2		4:14	9		4:15	0	
4:17	3		4:16	5		4:17	0	3
5:15	1		5:15	2	1	5:15	2	2
5:18			5:18	10	8	5:18		
5:23	10		5:22	10		5:23	4	
5:25	9		5:24	5		5:25	2	
5:27	10		5:26	18		5:27	1	
5:29	13		5:28	6		5:29	2	

AM Period - 7:00am to 9:00am								
Princes H'way NB			West Botany St WB			Princes H'way SB		
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane
7:00	4		7:02	7	6	7:00	1	
7:03	5		7:04	4	6	7:03	3	2
7:05	2		7:30	7	8	7:05	2	2
7:30	9	11	7:32	14	6	7:30	1	1
7:32	3	6	8:04	4	5	7:32	1	1
8:03	10		8:06	7	5	8:03	2	2
8:05	4		8:07	7	8	8:05	3	5
8:07	7		8:32	6	2	8:07	2	1
8:09	10		8:32	9	8	8:09	3	2
8:32	4	3	8:36	5	4	8:32	2	2
8:32	3	3				8:32	2	3
8:36	3	5				8:36	1	2

TDC
Traffic Data & Control

Site : 8

Location: Princes H'way & West Botany St, Wolli Creek

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm								
Princes H'way NB			Gertrude St WB			Princes H'way SB		
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane
3:08		16	3:07		10	3:08	1	
3:10		6	3:09		9	3:10	1	
3:12		11	3:11		11	3:12	3	
3:32	15	14	3:13		4	3:32	6	3
3:34	8	7	3:32	6	3	3:34	4	3
4:20		11	3:34	6	3	4:20	4	
4:22		9	4:21		9	4:22	6	
4:24		11	4:23		12	4:24	2	
5:07	7	11	4:25		14	5:07	3	4
5:09	6	7	5:00	3	11	5:09	1	
5:11	5	6	5:07	6	7	5:11	1	1
5:14	8	4	5:11	8	7	5:32	5	
5:32	17		5:31		12	5:34		3
5:34	11	16	5:33		13	5:36	3	
5:36		11	5:35	10				

AM Period - 7:00am to 9:00am								
Princes H'way NB			Gertrude St WB			Princes H'way SB		
Time	# of Cars	#of Cars	Time	# of Cars	#of Cars	Time	# of Cars	#of Cars
7:08	4		7:07		6	7:08	9	
7:10	2		7:09	2	1	7:10	4	2
7:12		2	7:11	2	4	7:12	5	3
8:13		8	8:12	2	6	8:13	8	
8:15		6	8:14	1	1	8:15	8	
8:24	4	3	8:16	6	1	8:24	5	4
8:26	9	5	8:24	6	5	8:26	5	6
8:28	7	8	8:26	3	1	8:28	6	7
			8:28	3	4			

Site : 9

Location: Princes H'way & Brodie Spark Dr, Wolli Creek

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm										
Brodie Spark Dr EB			Princes H'way NB			Princes H'way SB				
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane	Right Turn
3:07	3		3:08	4	4	3:08	23		
3:08		8	3:09	7	5	3:09	6		11
3:09	4	3	3:10	6	5	3:10	9		9
3:10	1	2	3:20	3		3:20	8		
3:19		5	3:22	3		3:22	10		
3:21	4		3:24	7		3:24	9		
3:23		5	3:26	6		3:26			
3:25		3	4:18	2	2	4:18	5	3	15
4:18	3	4	4:20	4	4	4:20	7	6	12
4:20	2	7	4:22	10	6	4:22	3	7	11
4:22	2	5	4:31	4		4:31	4		
4:32			4:33	5	5	4:33			
4:35	2	7	4:36	5		4:36	4		
5:45		5	5:46	5		5:46	6		15
5:47		8	5:48	8		5:48			19
5:49		4	5:50	5		5:50	2		

AM Period - 7:00am to 9:00am									
Brodie Spark Dr EB			Princes H'way NB			Princes H'way SB			
Time	Left lane	Right Lane	Time	Left lane	Right Lane	Time	Left lane	Right Lane	Right Turn
7:19	8	3	7:20	16	12	7:20	8		
7:21	9		7:22	12		7:22	12		4
7:23	10	3	7:24	18		7:24	1		3
7:25	10		7:26	15		7:26	3		1
7:40	15	5	7:40	8	3	7:40	3	1	3
7:42	13	3	7:42	11	8	7:42	5	3	1
7:44	7	4	7:44	6	5	7:44	3	3	1
8:24	9	3	8:25	16		8:25	3		
8:26	8	3	8:27	10		8:27			3
8:28	10	3	8:29	10		8:29	5		4
8:48	7	6	8:48	4	5	8:48	3	4	2
8:50	11	5	8:50	9	9	8:50	5	3	5
8:52	8	5	8:52	12	5	8:52	3	4	2

TDC
Traffic Data & Control

Site : 10

Location: Magdelene Tce, Arncliff St & Brodie Spark Dr, Wolli Creek

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm							
Magdelene Tce Eb		Arncliff St NB		Brodie Sparks Dr WB		Brodie Sparks Dr SB	
Time	EB	Time	NB	Time	WB	Time	SB
3:30	1	3:28	1	3:30		3:35	1
3:37		3:29	1	3:37		3:37	3
3:38		3:31	4	3:38		3:38	
4:26	1	3:37		4:26	2	4:26	
4:27		3:38		4:27		4:27	
4:42	1	4:26	4	4:39	4	5:53	2
5:54	1	4:27	1	4:40		5:56	3
		4:37	7	5:52	4		
		4:37	2	5:53	4		
		4:40	2	5:54	1		
		4:41	1	5:57	5		
		4:42	1				
		5:52	1				
		5:53	1				
		5:57	4				

AM Period - 7:00am to 9:00am							
Magdelene Tce Eb		Arncliff St NB		Brodie Sparks Dr WB		Brodie Sparks Dr SB	
Time	EB	Time	NB	Time	WB	Time	SB
7:12	2	7:12	2	7:12		7:14	1
7:28	1	7:28	1	8:16		7:15	4
7:30	1	7:29	2	8:18	1	7:30	1
8:16	7	7:29	8			8:34	1
8:17	6	7:31	6			8:35	
8:33	4	8:16	9				
8:35	1	8:17	16				
		8:20	10				
		8:32	2				
		8:33	2				
		8:34	2				
		8:34	3				
		8:36	3				

TDC
Traffic Data & Control

Site : 11

Location: Magdelene Tce & Mount Olympus Bvd, Wolli Creek

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm					
Mnt Olympus NB		Magdelene Tce WB		Mnt Olympus SB	
Time	NB	Time	WB	Time	SB
3:39	2				
3:40	2				
4:49	3				

AM Period - 7:00am to 9:00am					
Mnt Olympus NB		Magdelene Tce WB		Mnt Olympus SB	
Time	NB	Time	WB	Time	SB
No Queing Road Closed					

Site : 12

Location: Guess Ave & Mount Olympus Bvd, Wolli Creek

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm					
Guess Ave NB		Mnt Olympus Bvd WB		Guess Ave SB	
Time	NB	Time	WB	Time	SB
3:45	1	3:45	2		
3:45	1	3:46	1		
3:46	1	3:48	3		
3:47	1	3:48	2		
3:49	2	4:57	2		
3:50	1	4:58	3		
4:56	1				
4:58	1				

AM Period - 7:00am to 9:00am					
Guess Ave NB		Mnt Olympus Bvd WB		Guess Ave SB	
Time	NB	Time	WB	Time	SB
7:40	1	7:36	2		
		8:41	1		
		8:43	1		

TDC
Traffic Data & Control

Site : 13

Location: Princes H'way & Brodie Spark Dr, Wolli Creek

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm					
Bonar St EB		Guess Ave NB		Bonar St WB	
Time	EB	Time	NB	Time	WB
5:04	1	3:57	1		
5:07	1	5:04	2		
		5:06	1		

AM Period - 7:00am to 9:00am					
Bonar St EB		Guess Ave NB		Bonar St WB	
Time	EB	Time	NB	Time	WB
7:44	2				
7:44	1				
7:45	2				
7:46	1				

TDC
Traffic Data & Control

Site : 14

Location: Bonar St & Thompson St, Arncliffe

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm							
Bonar St EB		Thompson St NB		Bonar St WB		Bonar St SB	
Time	EB	Time	NB	Time	WB	Time	SB
5.11	1					5.14	1
5.14	2					5.15	1
5.15	1						

AM Period - 7:00am to 9:00am							
Bonar St EB		Thompson St NB		Bonar St WB		Bonar St SB	
Time	EB	Time	NB	Time	WB	Time	SB
7.51	2	7.54	1				
7.52	1	7.55	1				
8.54	1	8.56	1				
8.55	1						

TDC
Traffic Data & Control

Site : 15

Location: Arncliffe St & Wollongong Rd & Allen St, Arncliff

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

Weather: Fine

PM Period - 3:00pm to 6:00pm							
Wollongong Rd EB		Arncliff Rd NB		Allen St WB		Arncliff Rd SB	
Time	EB	Time	NB	Time	WB	Time	SB
		3:41		3:41		3:41	3
		3:45	1	3:42	2	3:42	1
		3:59	1	3:45	3	3:45	3
		4:00	1	3:57	1	3:57	5
		4:01	1	3:58	1	4:00	2
		4:32	2	3:59	7	4:01	2
		4:35	1	4:00	2	4:31	2
		5:06	3	4:00	1	4:31	3
		5:08	2	4:01	2	4:33	1
		5:09	2	5:06	5	4:34	6
				5:07	7	5:05	6
				5:09	2	5:09	1

AM Period - 7:00am to 9:00am							
Wollongong Rd EB		Arncliff Rd NB		Allen St WB		Arncliff Rd SB	
Time	EB	Time	NB	Time	WB	Time	SB
7:46	4	7:47	1	7:50	1	7:47	1
7:47	3	7:48	1	8:50	1	7:48	1
7:48	1	8:11	1	8:52	1	8:48	1
7:49	2	8:52	1			8:50	1
8:10	1					8:51	2
8:11	1						
8:47	1						
8:49	1						

TDC
Traffic Data & Control

Site : 16

Location: Wollongong Rd & Firth St Arncliffe

Time/ Day/ Date : 3:00pm - 6:00pm Tuesday 27th November 2012

Time/ Day/ Date : 7:00am -9:00am Wednesday 28th November 2012

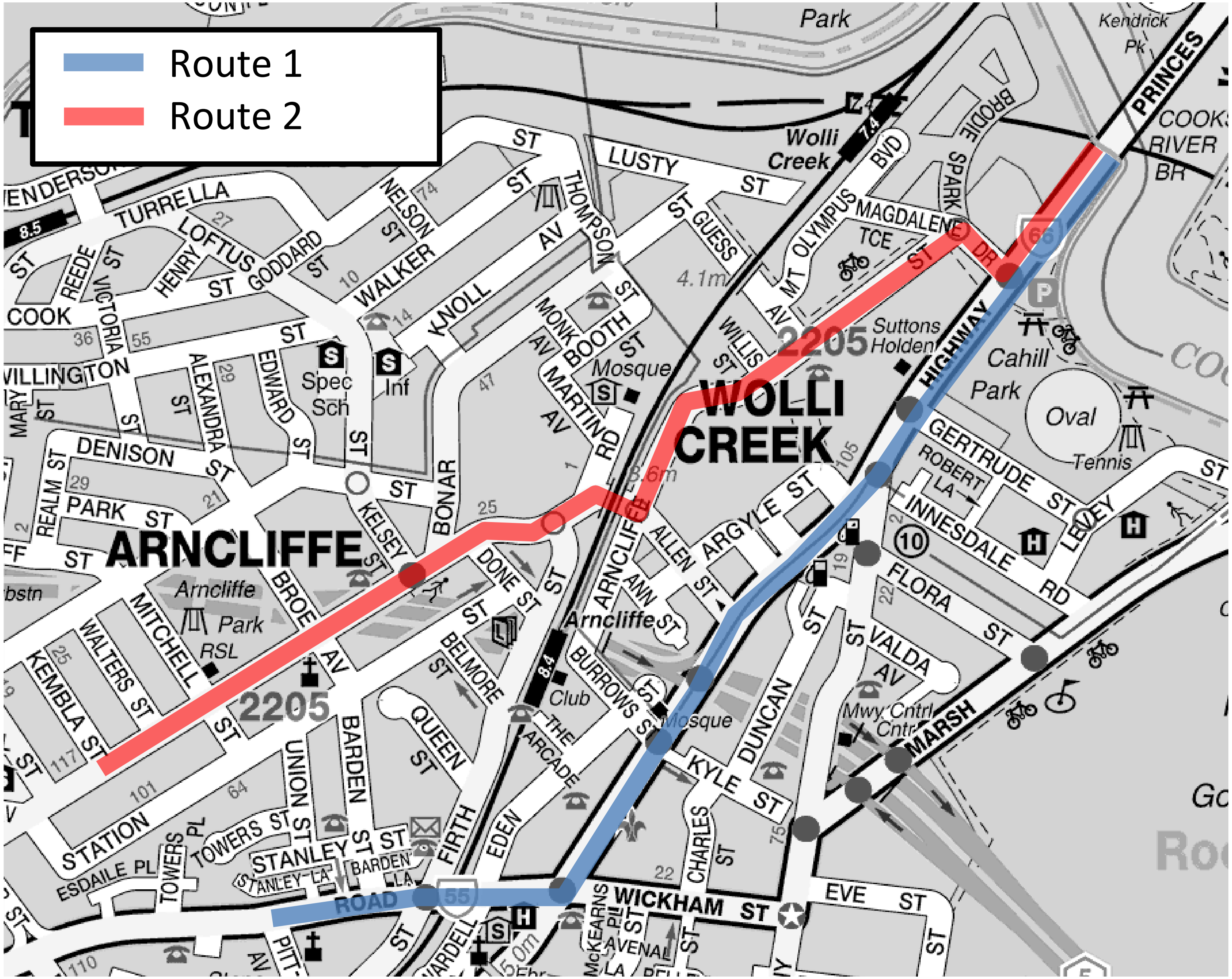
Weather: Fine

PM Period - 3:00pm to 6:00pm					
Wollongong Rd EB		Firth St NB		Wollongong Rd SB	
Time	EB	Time	NB	Time	SB
4:05	1	4:04	2	4:06	3
4:09	2	4:05	1	4:09	2
4:38	2	4:06	1	5:13	6
		4:36	1	5:15	11
		4:38	1	5:16	1
		4:39	1		
		4:40	2		
		5:12	1		
		5:13	1		
		5:13	2		
		5:16	2		
		5:57	1		

AM Period - 7:00am to 9:00am					
Wollongong Rd EB		Firth St NB		Wollongong Rd SB	
Time	EB	Time	NB	Time	SB
7:18	7	7:19	2	7:19	1
7:19	9			7:53	1
7:19	11				
7:22	7				
7:53	6				
7:54	8				
7:54	1				
7:56	7				
7:57	3				
7:57	5				
8:55	1				
8:56	1				
8:56	2				
8:57	2				
8:57	1				

Appendix B
Travel Time Survey

TDC
Traffic Data & Control



TDC
Traffic Data & Control

Wolli Creek Route 1 - Princes Hwy - Barden St to Cooks River

Route 1 Travel Time
AM - NB

Survey times - 7:00am to 9:00am (Wednesday, 28th November 2012)

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 28/11 1 7:01	Wed 28/11 2 7:18	Wed 28/11 3 7:33	Wed 28/11 4 7:49	Wed 28/11 5 8:05	Wed 28/11 6 8:22	Wed 28/11 7 8:36	Wed 28/11 8 8:51	N/A	N/A	N/A	N/A	N/A	N/A	Average Travel Time	Average Speed (km/hr)
									Wednesday										
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barden St	140	60	0:08	00:46	00:23	01:40	01:50	01:18	01:35	00:40	00:11							01:03	8.02
Somerville St	90	60	0:05	01:41	02:03	01:21	01:37	00:44	00:58	01:05	00:46							01:17	4.21
Eden St	60	60	0:04	00:09	00:05	00:26	00:11	00:07	00:43	00:20	00:07							00:16	13.50
Wickham St	140	60	0:08	00:12	00:13	00:14	00:15	01:37	00:13	00:29	00:45							00:30	16.94
Burrows St	260	60	0:16	00:25	00:19	00:43	00:35	00:17	00:49	00:42	00:19							00:31	30.07
M5 Motorway	100	60	0:06	00:08	00:07	00:08	00:08	00:06	00:08	00:08	00:45							00:12	29.39
West Botany St	440	60	0:26	00:36	00:36	00:47	00:40	00:31	00:47	00:59	00:53							00:44	36.31
Gertrude St	80	60	0:05	00:18	00:15	00:10	00:12	00:05	00:12	00:10	00:07							00:11	25.89
Brodie Spark Dr	260	60	0:16	00:24	00:31	00:21	00:26	00:20	00:25	00:22	00:22							00:24	39.20
Cooks River	240	60	0:14	00:15	00:16	00:14	00:16	00:50	00:31	00:14	00:16							00:22	40.19
total	1810		01:49	04:54	04:48	06:04	06:10	05:55	06:21	05:09	04:31								

Route 1 Travel Time
PM - NB

Survey times - 3:00pm to 6:00pm (Tuesday, 27th November 2012)

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Tue 27/11 1 15:00	Tue 27/11 2 15:12	Tue 27/11 3 15:25	Tue 27/11 4 15:38	Tue 27/11 5 15:54	Tue 27/11 6 16:08	Tue 27/11 7 16:21	Tue 27/11 8 16:36	Tue 27/11 9 16:50	Tue 27/11 10 17:03	Tue 27/11 11 17:15	Tue 27/11 12 17:26	Tue 27/11 13 17:42	Tue 27/11 14 17:52	Average Travel Time	Average Speed (km/hr)
									Tuesday										
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barden St	140	60	0:08	00:10	00:11	00:10	00:10	00:10	00:10	00:08	00:10	00:11	00:21	00:10	00:10	00:09	00:10	00:11	47.04
Somerville St	90	60	0:05	00:07	00:07	00:06	00:17	00:08	00:07	00:05	00:06	00:27	00:07	00:48	00:05	00:06	00:07	00:12	27.83
Eden St	60	60	0:04	00:05	00:05	00:05	00:06	00:05	00:05	00:04	00:05	00:07	00:05	00:05	00:05	00:05	00:04	00:05	42.59
Wickham St	140	60	0:08	00:12	00:50	00:12	00:14	00:53	00:14	00:11	00:43	00:13	00:11	00:12	00:11	00:17	00:12	00:20	24.76
Burrows St	260	60	0:16	00:43	00:19	00:47	00:19	00:19	00:18	00:19	00:19	00:18	00:37	00:17	00:34	00:17	00:38	00:26	36.00
M5 Motorway	100	60	0:06	00:09	00:07	00:08	00:07	00:07	00:06	00:37	00:06	00:06	00:08	00:06	00:08	00:07	00:08	00:09	38.77
West Botany St	440	60	0:26	00:29	00:40	00:28	00:31	00:42	00:28	00:31	00:43	00:40	00:31	00:31	00:31	00:34	00:30	00:34	47.28
Gertrude St	80	60	0:05	00:05	00:06	00:05	00:06	00:07	00:05	00:06	00:12	00:06	00:05	00:05	00:06	00:06	00:05	00:06	47.44
Brodie Spark Dr	260	60	0:16	01:04	00:17	01:11	00:17	00:17	00:41	01:13	00:19	00:17	01:15	00:17	01:10	00:17	00:56	00:41	22.95
Cooks River	240	60	0:14	00:15	00:13	00:14	00:13	00:13	00:14	00:15	00:13	00:13	00:13	00:13	00:19	00:13	00:14	00:14	62.03
total	1810		01:49	03:19	02:55	03:26	02:20	03:01	02:28	03:29	02:56	02:38	03:33	02:44	03:19	02:11	03:04		

TDC
Traffic Data & Control

Wolli Creek Route 1 - Princes Hwy - Barden St to Cooks River

Route 1 Travel Time
AM - SB

Survey times - 7:00am to 9:00am (Wednesday, 28th November 2012)

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 28/11 1 7:08	Wed 28/11 2 7:25	Wed 28/11 3 7:41	Wed 28/11 4 7:57	Wed 28/11 5 8:14	Wed 28/11 6 8:32	Wed 28/11 7 8:46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Average Travel Time	Average Speed (km/hr)
									Wednesday										
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Brodie Spark Dr	240	60	0:14	00:15	00:16	00:16	00:16	00:14	00:14	00:14								00:15	57.60
Gertrude St	260	60	0:16	00:16	00:15	00:17	00:16	00:16	00:15	00:15								00:16	59.56
West Botany St	80	60	0:05	00:05	00:06	00:05	00:05	00:05	00:05	00:05								00:05	56.00
M5 Motorway	440	60	0:26	00:29	00:53	00:29	00:28	00:59	00:26	01:08								00:42	37.97
Burrows St	100	60	0:06	00:07	00:05	00:07	00:06	00:05	00:05	00:06								00:06	61.46
Wickham St	260	60	0:16	01:41	01:02	01:49	01:17	01:03	01:10	00:41								01:15	12.53
Eden St	140	60	0:08	00:12	00:13	00:12	00:15	00:21	00:23	00:11								00:15	32.97
Somerville St	60	60	0:04	00:05	00:38	00:05	00:05	00:41	00:07	00:05								00:15	14.26
Barden St	90	60	0:05	00:07	00:08	00:07	00:07	00:08	00:07	00:07								00:07	44.47
Pitt-Owen Ave	140	60	0:08	00:08	00:11	00:09	00:10	00:09	00:08	00:09								00:09	55.13
total	1810		01:49	03:25	03:47	03:36	03:05	04:01	03:00	03:01									

Route 1 Travel Time
PM - SB

Survey times - 3:00pm to 6:00pm (Tuesday, 27th November 2012)

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Tue 27/11 1 15:06	Tue 27/11 2 15:20	Tue 27/11 3 15:32	Tue 27/11 4 15:46	Tue 27/11 5 16:02	Tue 27/11 6 16:14	Tue 27/11 7 16:27	Tue 27/11 8 16:44	Tue 27/11 9 16:58	Tue 27/11 10 17:10	Tue 27/11 11 17:21	Tue 27/11 12 17:33	Tue 27/11 13 17:48	Tue 27/11 14 17:57	Average Travel Time	Average Speed (km/hr)
									Tuesday										
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Brodie Spark Dr	240	60	0:14	00:52	00:14	00:35	00:14	00:35	00:47	00:55	00:33	00:49	00:52	00:50	00:47	00:19	00:24	00:38	23.00
Gertrude St	260	60	0:16	00:17	00:16	00:17	00:46	00:19	00:18	00:17	00:16	00:19	00:17	00:19	00:19	00:17	00:17	00:20	47.82
West Botany St	80	60	0:05	00:05	00:05	00:06	00:07	00:05	00:05	00:05	00:04	00:05	00:05	00:05	00:05	00:05	00:05	00:05	56.00
M5 Motorway	440	60	0:26	00:28	00:31	00:32	00:30	00:28	00:26	00:28	00:26	00:28	00:29	00:28	00:39	00:28	00:27	00:29	54.35
Burrows St	100	60	0:06	00:06	00:45	00:08	00:39	00:05	00:07	00:17	00:07	00:07	00:08	00:07	01:02	00:11	00:08	00:17	21.27
Wickham St	260	60	0:16	01:29	00:40	01:45	03:43	01:19	02:13	03:49	02:32	00:38	01:51	00:39	03:17	00:38	01:42	01:53	8.32
Eden St	140	60	0:08	00:14	00:15	00:15	00:14	00:13	00:15	00:17	00:13	00:13	00:11	00:34	00:16	00:12	00:11	00:15	33.13
Somerville St	60	60	0:04	00:06	00:08	00:37	00:04	00:08	00:36	00:06	00:05	00:05	00:04	00:05	00:23	00:04	00:04	00:11	19.51
Barden St	90	60	0:05	00:10	00:07	00:08	00:06	00:08	00:07	00:07	00:07	00:07	00:05	00:07	00:25	00:06	00:06	00:08	39.10
Pitt-Owen Ave	140	60	0:08	00:10	00:09	00:08	00:07	00:08	00:07	00:08	00:07	00:08	00:07	00:08	00:11	00:08	00:08	00:08	61.89
total	1810		01:49	03:57	03:10	04:31	06:30	03:28	05:01	06:29	04:30	02:59	04:09	03:22	07:24	02:28	03:32		

TDC Traffic Data & Control

Wolli Creek Route 2 - Wollongong Rd - Kembla St to Cooks River

Route 2 Travel Time
AM - NB

Survey times - 7:00am to 9:00am (Wednesday, 28th November 2012)

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 28/11 **1** 7:00	Wed 28/11 **2** 7:14	Wed 28/11 **3** 7:28	Wed 28/11 **4** 7:42	Wed 28/11 **5** 7:54	Wed 28/11 **6** 8:07	Wed 28/11 **7** 8:22	Wed 28/11 **8** 8:36	Wed 28/11 **9** 8:50	**N/A**	**N/A**	**N/A**	**N/A**	**Average Travel Time**	**Average Speed (km/hr)**
				Wednesday														
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bonar St	580	60	0:35	01:33	02:31	00:52	01:10	01:21	00:56	00:57	01:14	01:09					01:18	26.73
Firth St	190	60	0:11	00:24	00:18	00:32	00:17	00:49	00:56	00:37	00:34	00:20					00:32	21.45
Allen St	140	60	0:08	00:16	00:19	00:15	00:20	00:17	00:15	00:16	00:15	00:14					00:16	30.86
Guess Ave	390	60	0:23	00:34	00:33	00:34	00:35	00:32	00:34	00:35	00:34	00:33					00:34	41.57
Magdalene Tce	280	60	0:17	00:25	01:06	01:07	00:37	00:46	01:31	00:31	00:31	00:26					00:47	21.60
Brodie Spark Dr	110	60	0:07	01:40	00:16	01:35	01:31	01:21	01:31	01:22	01:07	01:59					01:22	4.80
Cooks River	240	60	0:14	00:15	00:19	00:17	00:15	00:19	00:29	00:24	00:24	00:16					00:20	43.69
total	1930		01:56	05:07	05:22	05:12	04:45	05:25	06:12	04:42	04:39	04:57						

Route 2 Travel Time
PM - NB

Survey times - 3:00pm to 6:00pm (Tuesday, 27th November 2012)

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Tue 27/11 **1** 14:59	Tue 27/11 **2** 15:12	Tue 27/11 **3** 15:26	Tue 27/11 **4** 15:41	Tue 27/11 **5** 15:54	Tue 27/11 **6** 16:06	Tue 27/11 **7** 16:19	Tue 27/11 **8** 16:32	Tue 27/11 **9** 16:46	Tue 27/11 **10** 17:00	Tue 27/11 **11** 17:12	Tue 27/11 **12** 17:26	Tue 27/11 **13** 17:40	**Average Travel Time**	**Average Speed (km/hr)**
				Tuesday														
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bonar St	580	60	0:35	01:04	01:02	01:19	01:20	00:55	01:10	00:49	00:56	00:52	01:01	00:54	01:21	00:52	01:03	33.31
Firth St	190	60	0:11	00:17	00:20	00:19	00:19	00:23	00:20	00:17	00:28	00:22	00:17	00:29	00:17	00:18	00:20	33.43
Allen St	140	60	0:08	00:14	00:14	00:14	00:14	00:14	00:14	00:16	00:15	00:14	00:14	00:14	00:13	00:14	00:14	35.61
Guess Ave	390	60	0:23	00:36	00:34	00:34	00:31	00:31	00:38	00:37	00:35	00:33	00:34	00:33	00:33	00:36	00:34	41.02
Magdalene Tce	280	60	0:17	00:25	00:29	00:26	00:32	00:35	00:37	00:31	00:34	00:35	00:47	00:37	01:11	00:35	00:36	27.65
Brodie Spark Dr	110	60	0:07	00:16	00:39	00:25	00:14	00:25	00:16	01:32	00:11	00:18	00:14	00:58	00:29	01:34	00:35	11.41
Cooks River	240	60	0:14	00:17	00:17	00:16	00:14	00:15	00:14	00:16	00:14	00:16	00:15	00:17	00:17	00:16	00:16	55.06
total	1930		01:56	03:09	03:35	03:33	03:24	03:18	03:29	04:18	03:13	03:10	03:22	04:02	04:21	04:25		

TDC Traffic Data & Control

Wolli Creek Route 2 - Wollongong Rd - Kembla St to Cooks River

Route 2 Travel Time AM - SB

Survey times - 7:00am to 9:00am (Wednesday, 28th November 2012)

End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Wed 28/11 1 7:08	Wed 28/11 2 7:22	Wed 28/11 3 7:36	Wed 28/11 4 7:48	Wed 28/11 5 8:02	Wed 28/11 6 8:16	Wed 28/11 7 8:30	Wed 28/11 8 8:44	N/A	N/A	N/A	N/A	N/A	Average Travel Time	Average Speed (km/hr)
									Wednesday									
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Brodie Spark Dr	240	60	0:14	01:22	00:59	00:56	00:37	01:14	01:26	01:03	01:30						01:08	12.64
Magdalene Tce	110	60	0:07	00:18	00:13	00:14	00:14	00:14	00:17	00:17	00:16						00:15	25.76
Guess Ave	280	60	0:17	00:37	00:30	00:33	00:25	00:32	00:37	00:28	00:28						00:31	32.26
Allen St	390	60	0:23	00:42	00:36	01:10	00:34	00:39	00:51	00:45	00:37						00:44	31.73
Firth St	140	60	0:08	00:19	00:20	00:20	00:17	00:20	00:20	00:23	00:19						00:20	25.52
Bonar St	190	60	0:11	00:17	00:19	00:18	00:20	00:18	00:17	00:31	00:19						00:20	34.42
Kembla St	580	60	0:35	00:55	01:19	00:55	01:16	00:51	00:57	01:21	01:05						01:05	32.18
total	1930		01:56	04:30	04:16	04:26	03:43	04:08	04:45	04:48	04:34							

Route 2 Travel Time PM - SB

Survey times - 3:00pm to 6:00pm (Tuesday, 27th November 2012)

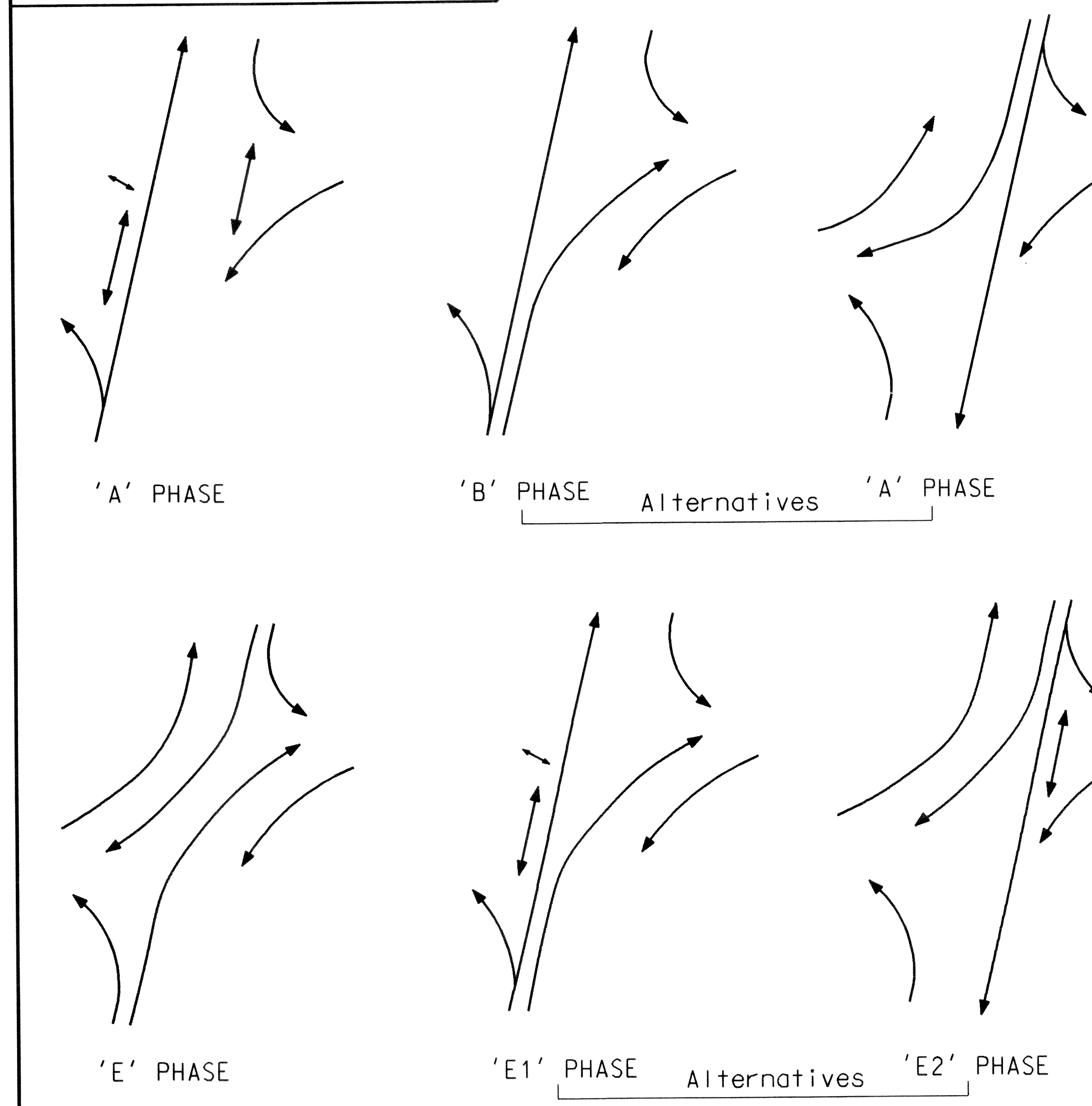
End Point	Length (m)	Limit (km/hr)	Nom. Time (mm.ss)	Tue 27/11 1 15:06	Tue 27/11 2 15:20	Tue 27/11 3 15:34	Tue 27/11 4 15:48	Tue 27/11 5 16:00	Tue 27/11 6 16:14	Tue 27/11 7 16:26	Tue 27/11 8 16:40	Tue 27/11 9 16:53	Tue 27/11 10 17:07	Tue 27/11 11 17:21	Tue 27/11 12 17:35	Tue 27/11 13 17:49	Average Travel Time	Average Speed (km/hr)
									Tuesday									
Start	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Brodie Spark Dr	240	60	0:14	00:32	00:24	02:10	01:56	01:47	00:18	01:35	01:44	02:06	00:16	00:14	00:19	02:10	01:12	12.06
Magdalene Tce	110	60	0:07	00:20	00:28	00:13	00:12	00:16	00:25	00:13	00:13	00:12	00:27	00:20	00:29	00:15	00:19	21.19
Guess Ave	280	60	0:17	00:32	00:29	00:24	00:23	00:28	00:32	00:28	00:26	00:38	00:38	00:46	00:41	00:27	00:32	31.81
Allen St	390	60	0:23	00:48	00:49	00:31	00:31	00:37	00:44	00:34	00:32	00:49	00:42	00:35	00:42	00:47	00:40	35.03
Firth St	140	60	0:08	00:22	00:26	00:19	00:19	00:19	00:19	00:24	00:17	00:19	00:19	00:22	00:20	00:16	00:20	25.10
Bonar St	190	60	0:11	00:26	00:48	00:55	00:25	00:17	00:39	00:19	00:36	00:42	00:23	00:34	00:17	00:17	00:31	22.34
Kembla St	580	60	0:35	01:16	01:02	00:58	00:59	01:12	01:09	01:10	01:02	01:04	01:18	01:00	01:08	01:10	01:07	31.27
total	1930		01:56	04:16	04:26	05:30	04:45	04:56	04:06	04:43	04:50	05:50	04:03	03:51	03:56	05:22		

APPENDIX C

SIGNAL PHASING DATA

0001.386.VV.0118

DRAWN BY CADD
DO NOT AMEND MANUALLY



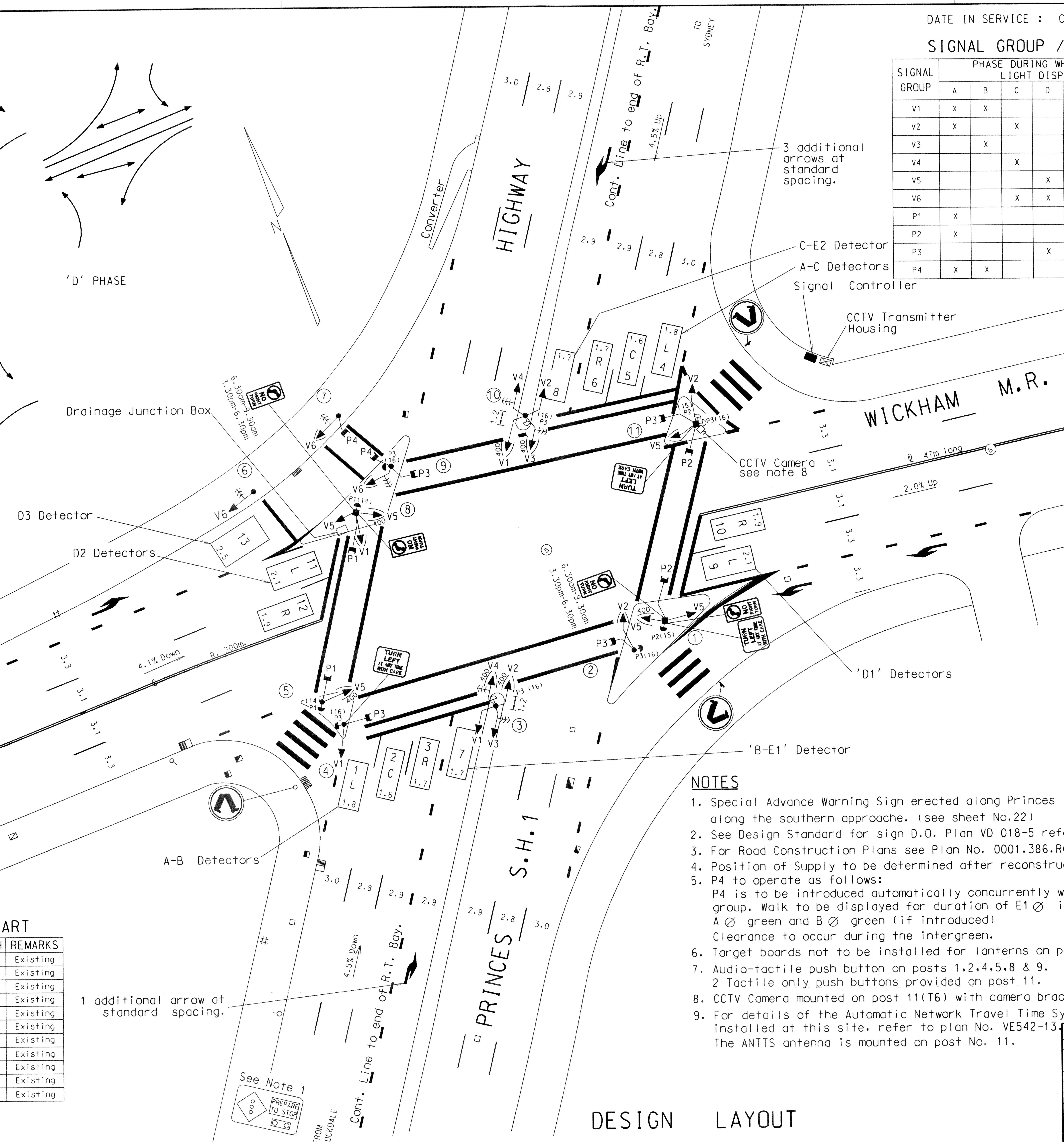
MOVEMENT DIAGRAMS

DATE IN SERVICE : 00/00/00

SIGNAL GROUP / PHASE CHART

SIGNAL GROUP	PHASE DURING WHICH GREEN LIGHT DISPLAYED							OVERLAPS PERMITTED
	A	B	C	D	E	E1	E2	
V1	X	X				X		E1-A-B B-A
V2	X		X				X	E2-A-C C-A
V3		X			X	X		E-E1 B-E
V4			X		X		X	E-E2 C-E
V5				X				
V6			X	X	X		X	C-D-E-E2
P1	X					X		E1-A
P2	X						X	E2-A
P3				X				
P4	X	X				X		E1-A*-B

* See note 5



VARIATION TO CONTROLLER SPECIFICATION SCHEDULE

Detector	Specification		
		FN	D(PR)	D(E1)
D3	SG/PS	V6	D
	DS	-	-

POST CHART

POST	TYPE	LENGTH	REMARKS
1	6	-	Existing
2	2	4.1	Existing
3	2	4.1	Existing
4	1	3.2	Existing
5	2	4.1	Existing
6	2	4.1	Existing
7	2	3.2	Existing
8	6	-	Existing
9	2	3.2	Existing
10	2	4.1	Existing
11	6	-	Existing

NOTES

1. Special Advance Warning Sign erected along Princes Highway 120m along along the southern approache. (see sheet No.22)
2. See Design Standard for sign D.O. Plan VD 018-5 refers.
3. For Road Construction Plans see Plan No. 0001.386.RC.2567.
4. Position of Supply to be determined after reconstruction of intersection.
5. P4 to operate as follows:
   P4 is to be introduced automatically concurrently with the V1 signal group. Walk to be displayed for duration of E1 ∅ if introduced and A ∅ green and B ∅ green (if introduced)
   Clearance to occur during the intergreen.
6. Target boards not to be installed for lanterns on posts 3 & 10.
7. Audio-tactile push button on posts 1,2,4,5,8 & 9.
   2 Tactile only push buttons provided on post 11.
8. CCTV Camera mounted on post 11(T6) with camera bracket.
9. For details of the Automatic Network Travel Time System (ANTTS) installed at this site, refer to plan No. VE542-13.
   The ANTTS antenna is mounted on post No. 11.

PUBLIC UTILITY LEGEND		REFERENCE PLANS	
HYDRANT	□	SYMBOLS/ABBS.	VD003-6
STOP VALVE	▲	STD POSIT	VD001-5
GAS VALVE	#	DET SCHED EXP	VD018-10
SEWER MANHOLE	⊗	PRES. DETECT	VC005-17
TELECOM PIT	◪	SSG DIS. SEQ.	VD018-8
ELECT LIGHT POLE	○		
POWER POLE	○		
STAY POLE	⊘		
TELEPHONE BOX	◫	SURVEYOR : N/A	
TELECOM PILLAR	◕	DATE : N/A	

DESIGN LAYOUT

A	ORIGINAL ISSUE
"B" Issue J/I ME983 9/6/82	Independent pcd. movements across S.H. 1 changed to operate simultaneously. G.V. 1-11-80
C Issue ME 2617 22/2/83	Note 4 ammended. Signal group/phase chart altered.
'D' Issue MES 2696	P4 PUSH BUTTONS REMOVED. DETECTOR NUMBERS ADDED.
'E' Issue J/I SD04180 2-3-89	Advance Warning Sign added. Notes renumbered P.L.
F ISSUE 12-4-91	J.I. CRO 3784 Note 7 re ANTTS facs. added. CNJ
G ISSUE J/I SW 211 21-10-93	PLAN UPDATED. A.C. 05-11-93
'H' ISSUE:- WAE.	CCTV CAMERA FACILITIES NOTE 8 ADDED. LC 4-9-98
I OLYMPIC ISSUE	Removed time restrictions from N.R.T signs on posts 1 & 8. GAP 23/05/00
'J' Issue JISC 475 07/07/00	Added audio tactile pushbuttons posts 2&4. Altered Notes. Reverted to Pre-Olympic status. W.A.E. GAP 18/10/00
'K' Issue JI SC633 06.07.01	Refer to sheet 16 Issue K for original signatures. Drawing converted to Microstation format. Added: Audio tactile push buttons to post 1 & 9; 2 Tactile only push buttons on post 11 T.K. 29-8-02

U.B.D. Ref. Map 274 M9
I.S.G. CO-ORDS E: 313 565 N:1 243 110
DESIGNED B.LAPHAM
CHECKED
SITE CHECKED
RECOMMENDED

THESE DRAWINGS HAVE BEEN TAKEN TO THE SITE OF THE WORK AND ARE RECOMMENDED.
SUPERVISING ENGINEER DATE 18-9-89

APPROVED
DIVISIONAL ENGINEER DATE 20-9-89

Roads and Traffic Authority, N.S.W

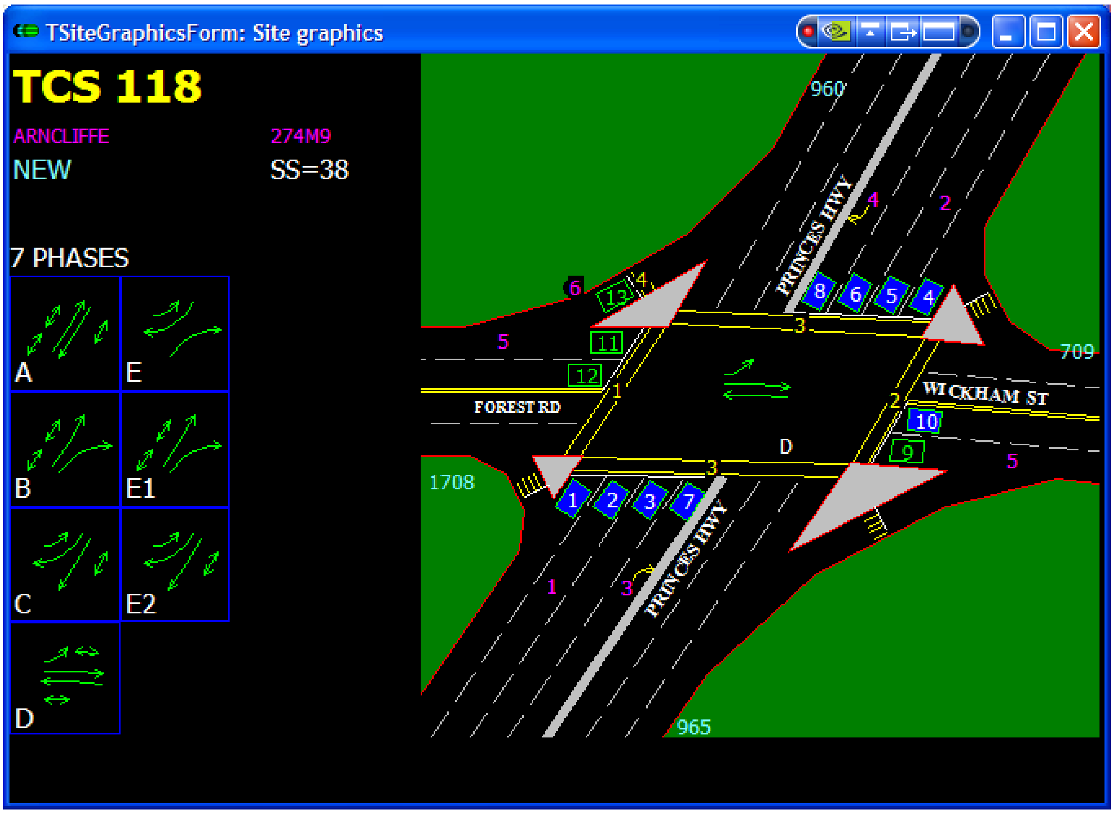
ROCKDALE CITY COUNCIL
TRAFFIC SIGNALS AT PACIFIC HWY, FOREST ROAD AND WICKHAM STREET
ARNCLIFFE

DESIGN LAYOUT TCS No 0118

EXISTING ☒ PROPOSED ☐
CADD FILE: K:/Signals/TSC/.../vv0118_12K.dgn
SCALE (1:200)
FILE 386 TS 153
SUPERSEDES SHEET/ISSUE 16/J
ISSUE K
REGN. 0001.386.VV.0118
SHEET 16

20/07/2004 08:26:35 AM.*vv0118*vv0118_16k.dgn

TCS 118 – Princes Hwy, Forest Rd, Wickham St : Arncliffe



Statistics

Statistics for I=118 from THU 18-OCT-2012 06:01 to THU 18-OCT-2012 06:17 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	10	15	47	32	30	323	10	1			
B	7	13	19	15	10	108	7				
C											
D	10	28	56	44	41	440	10				
E	10	13	30	21	19	210	10				
F											
G											
Act. Cycle	10	87	134	108							
Nom. Cycle	10	98	119	107							

Plan	#SP	#LP
1		
2		
3		
4	4	10
5	6	
6		
7		
8		

Ped	Occ.
1	
2	1
3	
4	10
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 06:17 to THU 18-OCT-2012 06:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	18	64	36	28	288	8	1			
B	5	15	22	18	9	94	5				
C											
D	8	47	64	51	40	415	8				
E	8	21	48	29	23	239	8				
F											
G											
Act. Cycle	8	114	155	129							
Nom. Cycle	8	119	137	124							

Plan	#SP	#LP
1		
2		
3	1	
4		8
5	7	
6		
7		
8		

Ped	Occ.
1	2
2	2
3	1
4	9
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 06:31 to THU 18-OCT-2012 06:45 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	20	70	39	29	273	7				
B	2	19	19	19	4	38	2				
C											
D	7	47	73	56	42	397	7				
E	7	18	46	32	24	228	7				
F											
G											
Act. Cycle	7	118	155	133							
Nom. Cycle	7	127	137	132							

Plan	#SP	#LP
1		
2		
3		
4		7
5	7	
6		
7		
8		

Ped	Occ.
1	
2	1
3	5
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 06:45 to THU 18-OCT-2012 07:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	20	42	33	24	268	8				
B	2	12	19	15	3	31	2				
C											
D	8	55	73	62	45	500	8				
E	8	18	49	40	29	323	8				
F											
G											
Act. Cycle	8	130	152	140							
Nom. Cycle	8	133	140	139							

Plan	#SP	#LP
1		
2		
3		
4		8
5	8	
6		
7		
8		

Ped	Occ.
1	1
2	3
3	3
4	9
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 07:01 to THU 18-OCT-2012 07:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	29	53	39	28	273	7				
B											
C											
D	7	56	62	61	44	428	7				
E	7	25	48	39	28	278	7				
F											
G											
Act. Cycle	7	139	141	139							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4		7
5	7	
6		
7		
8		

Ped	Occ.
1	2
2	3
3	3
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 07:15 to THU 18-OCT-2012 07:32 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	29	78	43	30	345	8	1			
B	1	35	35	35	3	35	1				
C											
D	8	34	62	52	37	423	8				
E	8	25	56	41	29	331	8				
F											
G											
Act. Cycle	8	132	154	141							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2		
3	2	
4	2	8
5	3	
6		
7	1	
8		

Ped	Occ.
1	2
2	1
3	4
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 07:32 to THU 18-OCT-2012 07:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	18	77	38	27	271	7	3			
B	4	14	35	26	11	107	4				
C											
D	7	55	62	56	40	392	7				
E	7	17	49	31	22	219	7				
F											
G											
Act. Cycle	7	120	167	141							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4		7
5	1	
6	2	
7	4	
8		

Ped	Occ.
1	3
2	1
3	6
4	8
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 07:46 to THU 18-OCT-2012 08:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	18	50	39	28	273	7				
B											
C											
D	7	44	62	53	38	372	7				
E	7	42	56	46	34	328	7				
F											
G											
Act. Cycle	7	129	147	139							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		
3	2	
4	2	7
5	3	
6		
7		
8		

Ped	Occ.
1	
2	3
3	3
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 08:00 to THU 18-OCT-2012 08:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	29	50	39	29	315	8				
B											
C											
D	8	48	62	56	41	453	8				
E	8	30	49	42	30	337	8				
F											
G											
Act. Cycle	8	126	141	138							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4	2	8
5	6	
6		
7		
8		

Ped	Occ.
1	1
2	2
3	4
4	8
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 08:16 to THU 18-OCT-2012 08:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	29	48	40	29	283	7				
B											
C											
D	7	48	62	52	37	370	7				
E	7	41	56	47	34	334	7				
F											
G											
Act. Cycle	7	139	147	141							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		
3	3	
4		7
5	4	
6		
7		
8		

Ped	Occ.
1	1
2	4
3	6
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 08:30 to THU 18-OCT-2012 08:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	15	84	39	28	315	8	1			
B	4	12	35	27	10	109	4				
C											
D	8	43	55	50	35	400	8				
E	8	27	56	38	27	310	8				
F											
G											
Act. Cycle	8	132	169	141							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2		
3	4	
4		8
5		
6	1	
7	3	
8		

Ped	Occ.
1	4
2	3
3	6
4	8
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 08:46 to THU 18-OCT-2012 09:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	36	84	52	37	365	7				
B	1	12	12	12	1	12	1				
C											
D	7	43	55	49	35	349	7				
E	7	30	44	38	27	269	7				
F											
G											
Act. Cycle	7	133	169	142							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		
3	3	
4	2	7
5		
6	2	
7		
8		

Ped	Occ.
1	5
2	2
3	4
4	8
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 09:00 to THU 18-OCT-2012 09:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	50	78	60	43	485	8				
B											
C											
D	8	44	55	49	35	394	8				
E	8	23	36	31	22	253	8				
F											
G											
Act. Cycle	8	132	154	141							
Nom. Cycle	8	139	140	139							

Plan	#SP	#LP
1		
2		
3	1	
4	3	8
5		
6	4	
7		
8		

Ped	Occ.
1	5
2	4
3	2
4	8
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 09:16 to THU 18-OCT-2012 09:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	35	66	54	42	436	8				
B	2	12	14	13	2	26	2				
C											
D	8	38	53	42	33	343	8				
E	8	24	35	29	23	238	8				
F											
G											
Act. Cycle	8	111	145	130							
Nom. Cycle	8	126	139	131							

Plan	#SP	#LP
1		
2		
3	6	
4		8
5		
6	2	
7		
8		

Ped	Occ.
1	
2	
3	2
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 09:31 to THU 18-OCT-2012 09:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	31	70	47	37	376	8		2		
B	6	12	18	15	9	91	6				
C											
D	8	37	47	41	33	332	8				
E	8	14	35	26	21	215	8				
F											
G											
Act. Cycle	8	111	139	126							
Nom. Cycle	8	122	133	128							

Plan	#SP	#LP
1		
2		
3	6	
4	2	8
5		
6		
7		
8		

Ped	Occ.
1	3
2	1
3	2
4	9
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 09:46 to THU 18-OCT-2012 10:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	42	81	58	46	470	8				
B	1	16	16	16	2	16	1				
C											
D	8	32	47	39	31	317	8				
E	8	14	42	27	21	219	8				
F											
G											
Act. Cycle	8	117	135	127							
Nom. Cycle	8	122	128	124							

Plan	#SP	#LP
1		
2		
3		
4	4	8
5		
6	4	
7		
8		

Ped	Occ.
1	1
2	1
3	5
4	9
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 15:00 to THU 18-OCT-2012 15:17 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	21	101	41	30	332	8				
B											
C											
D	8	32	62	52	38	423	8				
E	8	37	56	44	32	359	8				
F											
G											
Act. Cycle	8	126	171	139							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2		8
3	3	
4	1	
5	4	
6		
7		
8		

Ped	Occ.
1	5
2	4
3	6
4	8
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 15:17 to THU 18-OCT-2012 15:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	27	57	40	29	283	7				
B											
C											
D	7	48	62	53	38	373	7				
E	7	26	56	45	33	321	7				
F											
G											
Act. Cycle	7	133	150	139							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		7
3	4	
4		
5	3	
6		
7		
8		

Ped	Occ.
1	2
2	1
3	4
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 15:30 to THU 18-OCT-2012 15:45 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	19	64	46	34	327	7				
B											
C											
D	7	47	62	53	39	376	7				
E	7	34	49	38	28	272	7				
F											
G											
Act. Cycle	7	130	154	139							
Nom. Cycle	7	138	140	139							

Plan	#SP	#LP
1		
2		7
3	1	
4	2	
5	1	
6	3	
7		
8		

Ped	Occ.
1	3
2	1
3	3
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 15:45 to THU 18-OCT-2012 16:02 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	19	81	52	34	418	8				
B											
C	2	23	35	29	5	58	2				
D	8	29	62	50	33	407	8				
E	8	29	56	44	29	356	8				
F											
G											
Act. Cycle	8	130	200	154							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2	2	8
3	2	
4	2	
5	2	
6		
7		
8		

Ped	Occ.
1	5
2	2
3	3
4	8
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 16:02 to THU 18-OCT-2012 16:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	6	15	80	31	21	188	6				
B											
C	6	23	35	32	22	197	6				
D	6	39	62	54	37	328	6				
E	6	27	41	30	21	184	6				
F											
G											
Act. Cycle	6	133	199	149							
Nom. Cycle	6	140	140	140							

Plan	#SP	#LP
1	3	
2	3	6
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	4
2	3
3	5
4	6
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 16:15 to THU 18-OCT-2012 16:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	15	58	24	18	199	8	2			
B											
C	8	20	35	30	21	240	8				
D	8	29	62	57	41	463	8				
E	8	20	32	28	20	226	8				
F											
G											
Act. Cycle	8	131	153	141							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	8	
2		8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	4
2	2
3	5
4	8
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 16:31 to THU 18-OCT-2012 16:45 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	15	78	34	24	242	7	2			
B											
C	5	26	35	30	15	154	5				
D	7	55	62	57	40	399	7				
E	7	29	35	30	21	215	7				
F											
G											
Act. Cycle	7	132	168	144							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	2	
2	3	7
3		
4		
5		
6	2	
7		
8		

Ped	Occ.
1	1
2	1
3	4
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 16:45 to THU 18-OCT-2012 17:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	36	50	43	32	351	8				
B											
C											
D	8	55	55	55	40	440	8				
E	8	35	42	40	29	321	8				
F											
G											
Act. Cycle	8	133	140	139							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2		8
3		
4	6	
5		
6	2	
7		
8		

Ped	Occ.
1	1
2	
3	3
4	8
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 17:01 to THU 18-OCT-2012 17:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	15	71	41	29	287	7				
B											
C											
D	7	48	62	56	40	392	7				
E	7	33	56	42	30	294	7				
F											
G											
Act. Cycle	7	126	161	139							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		7
3	1	
4	1	
5	2	
6	3	
7		
8		

Ped	Occ.
1	3
2	1
3	5
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 17:16 to THU 18-OCT-2012 17:32 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	18	74	43	28	305	7				
B											
C	3	35	35	35	10	105	3				
D	7	48	62	54	35	378	7				
E	7	25	56	42	27	297	7				
F											
G											
Act. Cycle	7	126	200	155							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	3	
2		7
3	4	
4		
5		
6		
7		
8		

Ped	Occ.
1	3
2	2
3	3
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 17:32 to THU 18-OCT-2012 17:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	15	28	17	13	125	7				
B											
C	7	30	35	33	24	236	7				
D	7	55	62	61	43	427	7				
E	7	25	29	28	20	199	7				
F											
G											
Act. Cycle	7	136	146	141							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	6	
2	1	7
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	2
3	2
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 17:46 to THU 18-OCT-2012 18:02 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	21	78	32	23	261	8				
B											
C	6	34	35	34	18	209	6				
D	8	37	55	52	37	421	8				
E	8	29	47	32	23	262	8				
F											
G											
Act. Cycle	8	140	167	144							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2	6	8
3		
4		
5		
6	2	
7		
8		

Ped	Occ.
1	2
2	
3	1
4	8
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 18:02 to THU 18-OCT-2012 18:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	32	52	46	34	322	7				
B											
C											
D	7	40	55	50	37	351	7				
E	7	35	49	41	30	287	7				
F											
G											
Act. Cycle	7	125	141	137							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		7
3		
4	2	
5	2	
6	3	
7		
8		

Ped	Occ.
1	2
2	2
3	4
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 18:16 to THU 18-OCT-2012 18:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	45	84	60	43	425	7				
B											
C											
D	7	28	54	41	29	291	7				
E	7	16	56	40	28	283	7				
F											
G											
Act. Cycle	7	137	147	142							
Nom. Cycle	7	132	140	138							

Plan	#SP	#LP
1		
2		7
3	2	
4	2	
5	1	
6	2	
7		
8		

Ped	Occ.
1	3
2	
3	4
4	7
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 18:30 to THU 18-OCT-2012 18:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	9	36	61	44	37	397	9				
B											
C	6	14	20	18	10	109	6				
D	9	24	54	36	30	328	9				
E	9	20	41	27	23	245	9				
F											
G											
Act. Cycle	9	112	137	119							
Nom. Cycle	9	110	132	117							

Plan	#SP	#LP
1		
2		9
3	5	
4	2	
5		
6	2	
7		
8		

Ped	Occ.
1	
2	
3	1
4	9
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=118 from THU 18-OCT-2012 18:46 to THU 18-OCT-2012 19:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	9	31	64	43	38	389	9				
B											
C	6	17	21	19	11	116	6				
D	9	23	39	32	28	291	9				
E	9	18	41	25	22	226	9				
F											
G											
Act. Cycle	9	106	121	113							
Nom. Cycle	9	103	124	113							

Plan	#SP	#LP
1		
2		9
3	8	
4	1	
5		
6		
7		
8		

Ped	Occ.
1	2
2	3
3	1
4	9
5	
6	
7	
8	

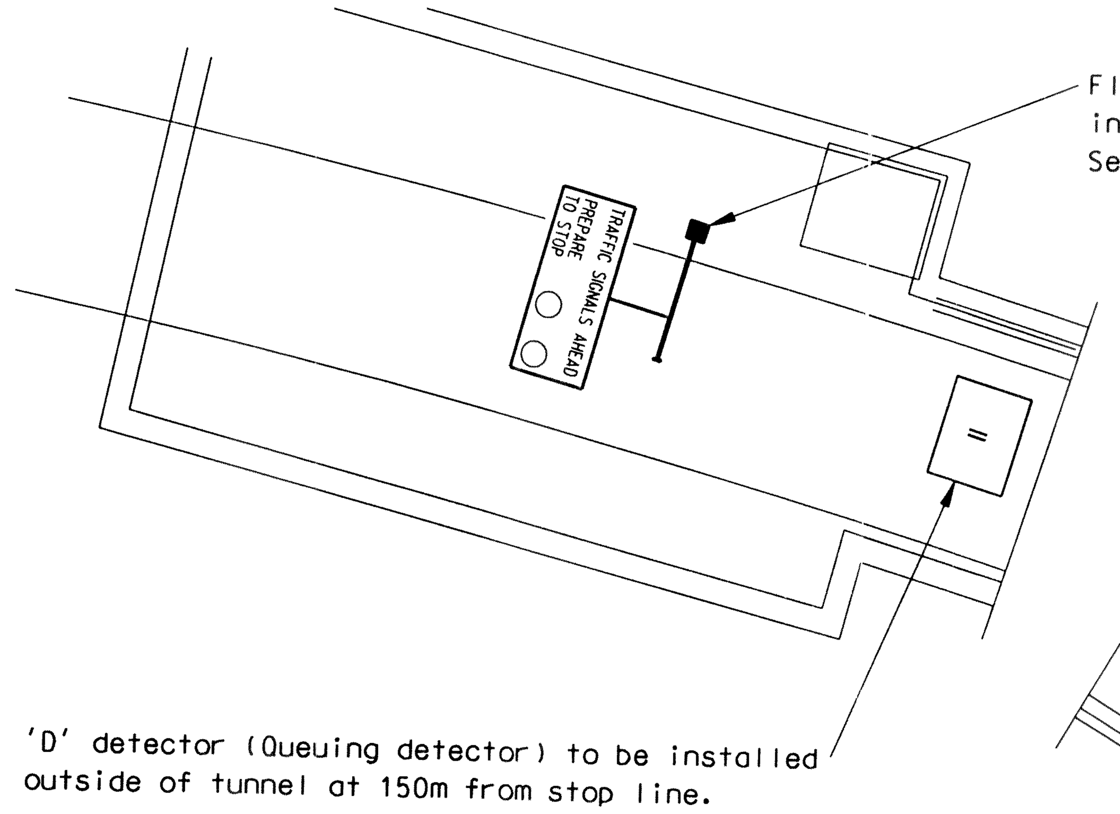
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

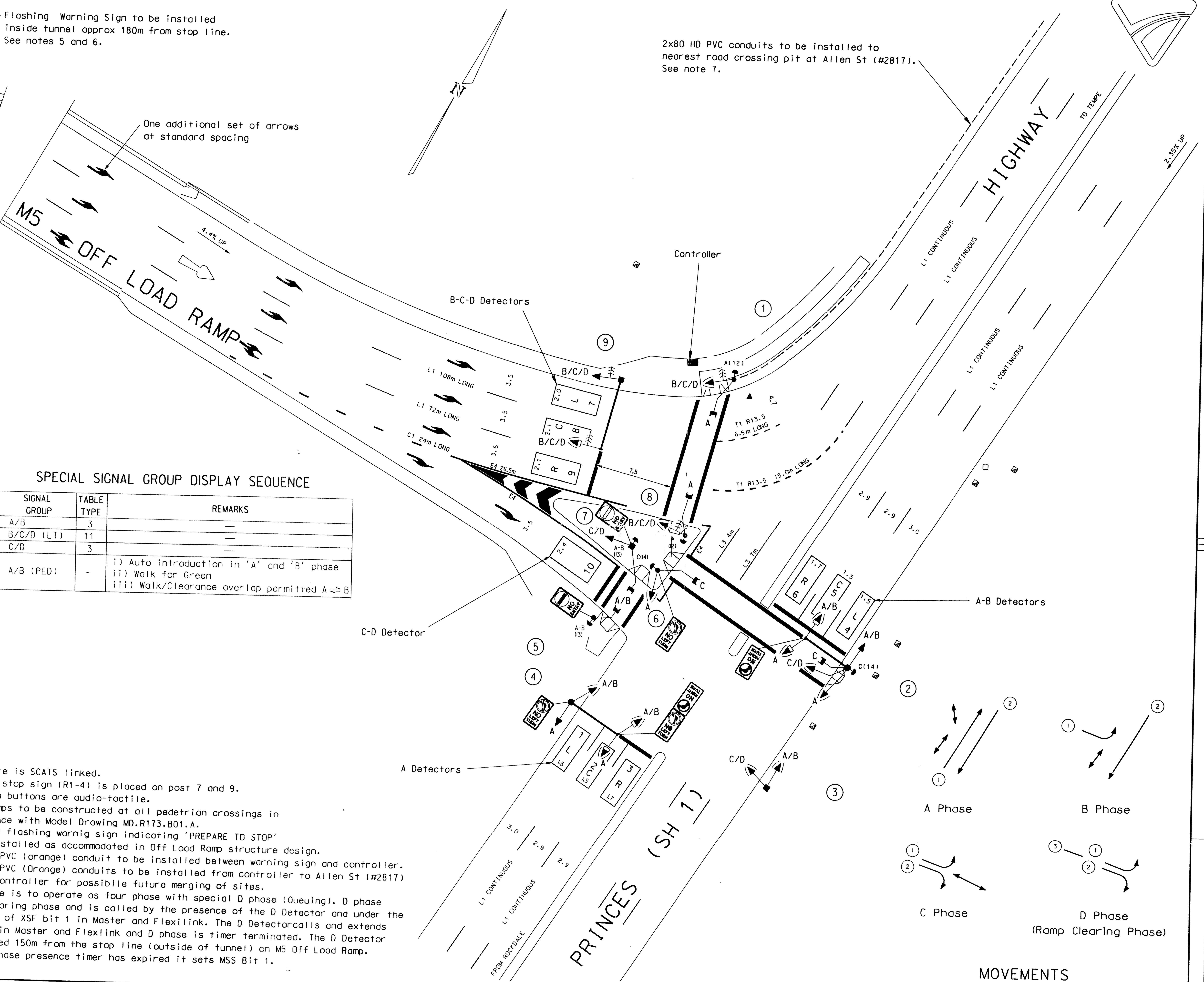
OK Print

DRAWN BY CADD
DO NOT AMEND MANUALLY

DATE IN SERVICE : 10/12/2001

RTA





DETECTOR SPECIFICATION

Detector		Specifications		
A	FN	A(L)	A(E1)	
	SG/PS	$\overline{A}$	A	
	DS	–	–	
A-B	FN	A(L)	A(E2)	B(E2)
	SG/PS	$\overline{A}.\overline{B}$	A	B
	DS	–	B(NEXT)	A(NEXT)
B-C-D	FN	B(L)	B(E1)	
	SG/PS	$\overline{B}.\overline{C}.\overline{D}$	B	
	DS	$\overline{C}.\overline{D}$	C(NEXT).D(NEXT)	
CONT'D B-C-D	FN	C(E1)	D(E1)	
	SG/PS	C	D	
	DS	B(NEXT).$\overline{D}$(NEXT)	B(NEXT).C(NEXT)	
C-D	FN	C(L)	C(E2)	D(E2)
	SG/PS	$\overline{C}.\overline{D}$	C	D
	DS	$\overline{D}$	D(NEXT)	C(NEXT)
D	FN	D(PR)	D(E3)	
	SG/PS	$\overline{D}$	D	
	DS	XSF Bit 1	–	
A PB	FN	A(PB)	Reintroduce WALK	
	SG/PS	A(WALK)	A.A(WALK)	
	DS	–	$\overline{B}.\overline{C}.\overline{D}$	
A-B PB	FN	A(PB)		Auto Introduction in A and B phase WALK for GREEN
	SG/PS	A/B.A/B(WALK)		
	DS	$\overline{B}$		
C PB	FN	C(PB)	A(L)	
	SG/PS	C(WALK)	C.C(WALK)	
	DS	–	$\overline{A}.\overline{B}.\overline{D}$	

SPECIAL SIGNAL GROUP DISPLAY SEQUENCE

SIGNAL GROUP	TABLE TYPE	REMARKS
A/B	3	—
B/C/D (LT)	11	—
C/D	3	—
A/B (PED)	-	i) Auto introduction in 'A' and 'B' phase ii) Walk for Green iii) Walk/Clearance overlap permitted A ⇌ B

POSTS

POST	TYPE	LENGTH	OFFSET	REMARKS
1	2	4.1	1.0	EXISTING
2	5L	–	1.0	EXISTING
3	6	–	1.0	EXISTING
4	5XL	5.5	1.0	EXISTING
5	2	3.2	1.0	EXISTING
6	2	4.1	1.0	EXISTING
7	6	–	2.0	EXISTING
8	2	4.1	1.0	EXISTING
9	9	7.0	1.0	EXISTING

NOTES

1. This site is SCATS linked.
2. Special stop sign (R1-4) is placed on post 7 and 9.
3. All push buttons are audio-tactile.
4. Kerb ramps to be constructed at all pedetrian crossings in accordance with Model Drawing MD.R173.B01.A.
5. Overhead flashing warnig sign indicating 'PREPARE TO STOP' to be installed as accommodated in Off Load Ramp structure design.
6. 1x50 HD PVC (orange) conduit to be installed between warning sign and controller.
7. 2x80 HD PVC (Orange) conduits to be installed from controller to Allen St (#2817) signal controller for possible future merging of sites.
8. This site is to operate as four phase with special D phase (Queuing). D phase is a clearing phase and is called by the presence of the D Detector and under the presence of XSF bit 1 in Master and Flexilink. The D Detectorcalls and extends D phase in Master and Flexlink and D phase is timer terminated. The D Detector is located 150m from the stop line (outside of tunnel) on M5 Off Load Ramp.
9. When D phase presence timer has expired it sets MSS Bit 1.

ISSUE	
A	ORIGINAL ISSUE
B	ISSUE J/1 SC 1002 16/4/04 AMENDED: DET SPECS UPDATED DRAWING BMC 13/9/04

PUBLIC UTILITY LEGEND	
HYDRANT	
STOP VALVE	
GAS VALVE	
SEWER MANHOLE	
TELECOM PIT	
ELECT LIGHT POLE	
POWER POLE	
STAY POLE	
TELEPHONE BOX	
TELECOM PILLAR	

REFERENCE PLANS	
SYMBOLS/ABBS.	VD003-6
STD POSIT	VD001-5
DET SCHED EXP	VD018-10
PRES. DETECT	VC005-17
SSG DIS. SEQ.	VD018-8
SURVEYOR : HYDER	
DATE : 1999	

U.B.D.Ref 274 N8
I.S.G. CO-ORDS E: 313 721 N: 1 243 406
DESIGNED J BATES
CHECKED T LAWRENCE
J BATES SITE CHECKED
RECOMMENDED

APPROVED
TRANSPORT & URBAN PLANNING
NAME T Lawrence
POSITION Director
DATE 28-11-00

THIS DRAWING IS RECOMMENDED FOR ACCEPTANCE
NETWORK OPERATIONS TEAM LEADER
DATE 5-12-00
ACCEPTED
DATE

Roads and Traffic Authority, N.S.W
ROCKDALE CITY COUNCIL AREA
TRAFFIC SIGNALS AT INTERSECTION OF (SH 1) PRINCES HIGHWAY & M5 OFF LOAD RAMP
ARNCLIFFE
DESIGN LAYOUT TCS No 2010

DESIGN OFFICE PARRAMATTA - SYDNEY TECHNICAL SERVICES
CADD FILE: K:/Signals/TCS/.../vv2010_1B.dgn
SCALE (1:200)
ISSUE B
FILE 386 TS 304
SUPERSEDES SHEET/ISSUE 1/A
REGN. 0001.386.VV.2010
SHEET 1

0001.386.VV.2010

11/22/2004 09:07:25 AM .#vv2010#vv2010_01b.dgn

TCS 2010 – Princes Hwy, M5 Motorway Off Ramp : Arncliffe

Statistics

Statistics for I=2010 from THU 18-OCT-2012 06:01 to THU 18-OCT-2012 06:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	10	46	111	76	70	763	10	7	2		
B	6	16	39	27	15	167	6				
C	4	25	48	39	15	158	4				
D											
E											
F											
G											
Act. Cycle	10	85	134	108							
Nom. Cycle	10	98	119	107							

Plan	#SP	#LP
1		
2		
3		
4	10	10
5		
6		
7		
8		

Ped	Occ.
1	
2	3
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK   Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 06:16 to THU 18-OCT-2012 06:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	94	141	108	83	871	8	5	1		
B	4	18	26	21	8	86	4				
C	4	19	25	23	9	92	4				
D											
E											
F											
G											
Act. Cycle	8	117	160	131							
Nom. Cycle	8	119	137	124							

Plan	#SP	#LP
1		
2		
3		
4	8	8
5		
6		
7		
8		

Ped	Occ.
1	
2	3
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 06:31 to THU 18-OCT-2012 06:47 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	85	141	112	81	899	8	5	2		
B	4	22	31	25	9	101	4				
C	4	19	33	26	9	104	4				
D											
E											
F											
G											
Act. Cycle	8	107	161	138							
Nom. Cycle	8	127	140	133							

Plan	#SP	#LP
1		
2	1	
3	6	
4	1	8
5		
6		
7		
8		

Ped	Occ.
1	1
2	3
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 06:47 to THU 18-OCT-2012 07:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	89	128	111	78	777	7	4	1		
B	3	23	37	29	9	87	3				
C	4	25	36	32	13	128	4				
D											
E											
F											
G											
Act. Cycle	7	126	161	141							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2	1	
3	6	
4		7
5		
6		
7		
8		

Ped	Occ.
1	
2	3
3	1
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 07:01 to THU 18-OCT-2012 07:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	105	120	113	80	794	7	2	1		
B	2	26	33	29	6	59	2				
C	5	23	34	27	14	135	5				
D											
E											
F											
G											
Act. Cycle	7	136	145	141							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2	2	
3	5	
4		7
5		
6		
7		
8		

Ped	Occ.
1	
2	5
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 07:15 to THU 18-OCT-2012 07:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	106	126	114	81	912	8	4	3		
B	3	16	28	22	6	67	3				
C	5	28	30	28	13	144	5				
D											
E											
F											
G											
Act. Cycle	8	134	143	140							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	2	
2	6	
3		
4		8
5		
6		
7		
8		

Ped	Occ.
1	1
2	4
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 07:31 to THU 18-OCT-2012 07:45 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	92	132	110	79	775	7	5	5		
B	5	21	44	28	14	140	5				
C	2	28	34	31	6	62	2				
D											
E											
F											
G											
Act. Cycle	7	130	153	139							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	3	
2	3	
3	1	
4		7
5		
6		
7		
8		

Ped	Occ.
1	
2	2
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 07:45 to THU 18-OCT-2012 08:02 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	105	124	111	80	894	8	3	1		
B	3	24	33	28	8	84	3				
C	5	22	34	28	13	142	5				
D											
E											
F											
G											
Act. Cycle	8	136	146	140							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	2	
2	5	
3	1	
4		8
5		
6		
7		
8		

Ped	Occ.
1	1
2	5
3	1
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 08:02 to THU 18-OCT-2012 08:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	109	130	116	83	813	7	3			
B	3	18	27	22	7	67	3				
C	4	21	34	25	10	102	4				
D											
E											
F											
G											
Act. Cycle	7	136	148	140							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2	5	
3	2	
4		7
5		
6		
7		
8		

Ped	Occ.
1	1
2	4
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 08:16 to THU 18-OCT-2012 08:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	107	119	113	81	796	7	2	2		
B	3	19	25	22	7	66	3				
C	4	26	33	29	12	117	4				
D											
E											
F											
G											
Act. Cycle	7	137	142	139							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2	7	
3		
4		7
5		
6		
7		
8		

Ped	Occ.
1	
2	5
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 08:30 to THU 18-OCT-2012 08:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	104	122	112	80	899	8	2	1		
B	2	33	34	33	6	67	2				
C	6	22	33	26	14	157	6				
D											
E											
F											
G											
Act. Cycle	8	137	144	140							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	5	
2	3	
3		
4		8
5		
6		
7		
8		

Ped	Occ.
1	1
2	6
3	1
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 08:46 to THU 18-OCT-2012 09:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	99	115	106	77	748	7	2	5		
B	3	31	33	32	10	96	3				
C	4	26	36	30	13	122	4				
D											
E											
F											
G											
Act. Cycle	7	135	142	138							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2	5	
3	2	
4		7
5		
6		
7		
8		

Ped	Occ.
1	1
2	5
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 09:00 to THU 18-OCT-2012 09:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	93	121	108	77	864	8	2	4		
B	3	32	40	34	9	104	3				
C	5	26	35	29	13	148	5				
D											
E											
F											
G											
Act. Cycle	8	133	147	139							
Nom. Cycle	8	139	140	139							

Plan	#SP	#LP
1		
2		
3	3	
4	5	8
5		
6		
7		
8		

Ped	Occ.
1	
2	6
3	1
4	
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6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 09:16 to THU 18-OCT-2012 09:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	76	108	90	70	724	8	2	1		
B	2	38	47	42	8	85	2				
C	6	31	41	38	22	228	6				
D											
E											
F											
G											
Act. Cycle	8	113	143	129							
Nom. Cycle	8	126	139	131							

Plan	#SP	#LP
1		
2		
3	3	
4	5	8
5		
6		
7		
8		

Ped	Occ.
1	
2	6
3	2
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 09:31 to THU 18-OCT-2012 09:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	66	103	84	66	677	8	1			
B	1	45	45	45	4	45	1				
C	7	39	46	43	29	301	7				
D											
E											
F											
G											
Act. Cycle	8	110	149	127							
Nom. Cycle	8	122	133	128							

Plan	#SP	#LP
1		
2		
3		
4	8	8
5		
6		
7		
8		

Ped	Occ.
1	
2	7
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7	
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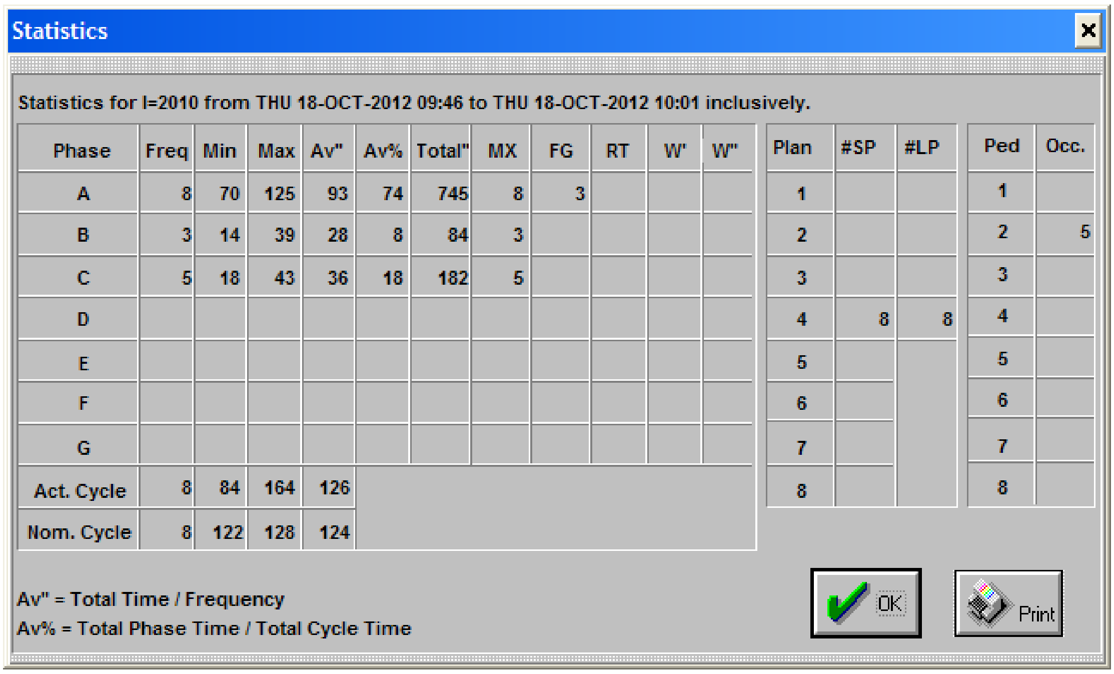
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print



Statistics

Statistics for I=2010 from THU 18-OCT-2012 09:46 to THU 18-OCT-2012 10:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	70	125	93	74	745	8	3			
B	3	14	39	28	8	84	3				
C	5	18	43	36	18	182	5				
D											
E											
F											
G											
Act. Cycle	8	84	164	126							
Nom. Cycle	8	122	128	124							

Plan	#SP	#LP
1		
2		
3		
4	8	8
5		
6		
7		
8		

Ped	Occ.
1	
2	5
3	
4	
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Av" = Total Time / Frequency

Av% = Total Phase Time / Total Cycle Time

OK

Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 15:00 to THU 18-OCT-2012 15:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	97	147	111	79	888	8	2	2		
B	2	14	31	22	4	45	2				
C	6	26	35	31	17	190	6				
D											
E											
F											
G											
Act. Cycle	8	111	180	140							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	1	
2	3	8
3	2	
4	2	
5		
6		
7		
8		

Ped	Occ.
1	1
2	4
3	
4	
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6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 15:16 to THU 18-OCT-2012 15:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	96	141	110	81	776	7	2	2		
B	2	14	34	24	5	48	2				
C	5	24	30	27	14	139	5				
D											
E											
F											
G											
Act. Cycle	7	110	169	137							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	3	
2	4	7
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	4
3	
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7	
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Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 15:30 to THU 18-OCT-2012 15:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	96	119	109	80	874	8		2		
B	1	14	14	14	1	14	1				
C	7	24	34	29	19	208	7				
D											
E											
F											
G											
Act. Cycle	8	110	143	137							
Nom. Cycle	8	138	140	139							

Plan	#SP	#LP
1	3	
2	5	8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	2
2	6
3	3
4	
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6	
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Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 15:46 to THU 18-OCT-2012 16:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	119	130	124	87	868	7		1		
B											
C	7	14	24	18	13	127	7				
D											
E											
F											
G											
Act. Cycle	7	139	144	142							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	7	
2		7
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	2
2	6
3	1
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 16:00 to THU 18-OCT-2012 16:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	105	130	118	85	827	7	2	2		
B	1	28	28	28	3	28	1				
C	6	14	28	19	12	114	6				
D											
E											
F											
G											
Act. Cycle	7	133	144	138							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	7	
2		7
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	
2	4
3	2
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 16:15 to THU 18-OCT-2012 16:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	95	114	106	77	849	8	1	2		
B	1	40	40	40	4	40	1				
C	7	26	38	31	20	220	7				
D											
E											
F											
G											
Act. Cycle	8	135	143	138							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	1	
2	4	8
3	3	
4		
5		
6		
7		
8		

Ped	Occ.
1	2
2	6
3	1
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 16:31 to THU 18-OCT-2012 16:45 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	98	116	107	76	750	7	1	2		
B	1	37	37	37	4	37	1				
C	6	26	38	33	20	198	6				
D											
E											
F											
G											
Act. Cycle	7	136	146	140							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	1	
2	5	7
3	1	
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	4
3	
4	
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6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 16:45 to THU 18-OCT-2012 17:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	102	119	113	80	904	8	1	4		
B	1	37	37	37	3	37	1				
C	7	24	31	27	17	193	7				
D											
E											
F											
G											
Act. Cycle	8	136	150	141							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	6	
2	2	8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	
2	4
3	
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6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 17:01 to THU 18-OCT-2012 17:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	101	119	112	80	789	7	1			
B											
C	7	21	31	27	20	193	7				
D											
E											
F											
G											
Act. Cycle	7	122	150	140							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	2	
2	4	7
3	1	
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	7
3	
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7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 17:15 to THU 18-OCT-2012 17:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	109	123	115	83	926	8	1	2		
B											
C	8	20	28	24	17	196	8				
D											
E											
F											
G											
Act. Cycle	8	135	145	140							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	8	
2		8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	6
3	
4	
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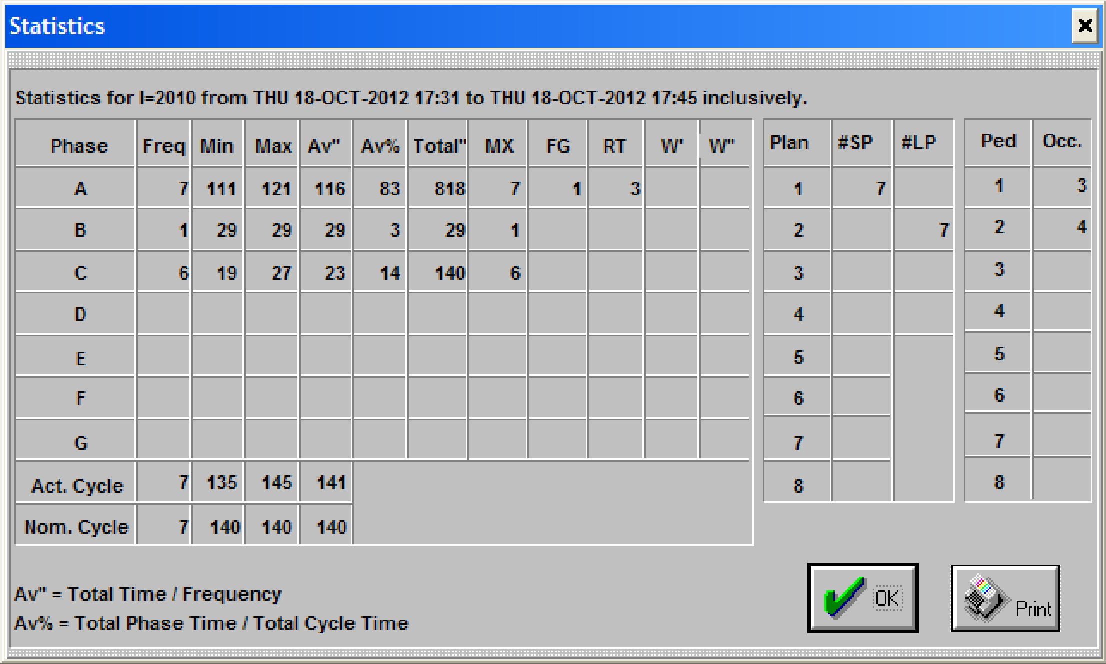
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print



Statistics

Statistics for I=2010 from THU 18-OCT-2012 17:31 to THU 18-OCT-2012 17:45 inclusively.

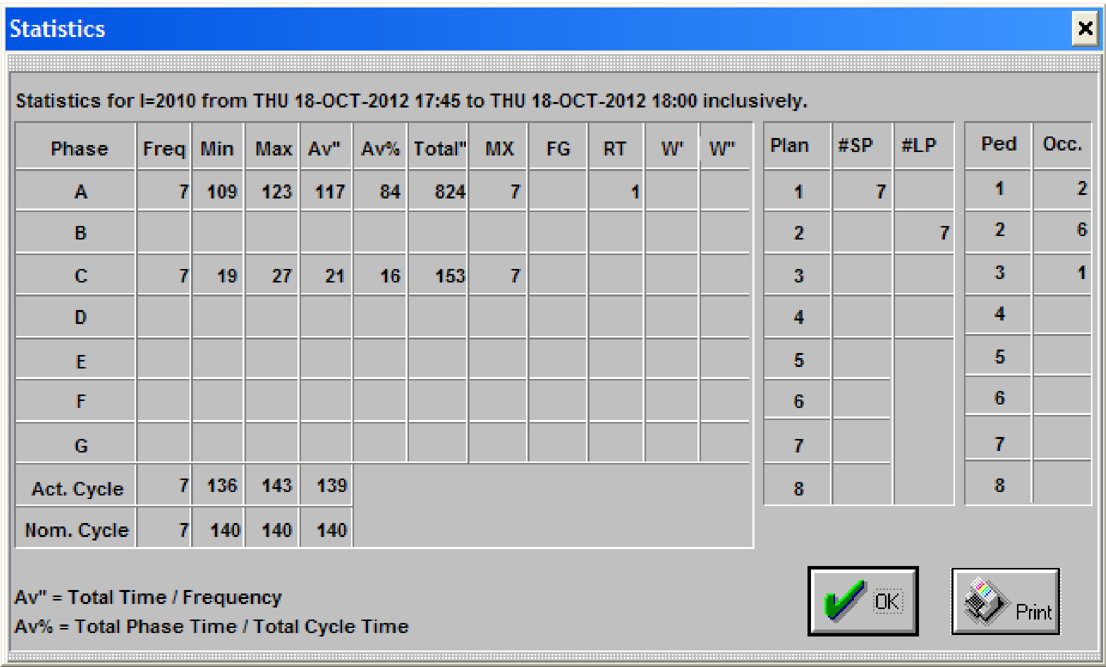
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	111	121	116	83	818	7	1	3		
B	1	29	29	29	3	29	1				
C	6	19	27	23	14	140	6				
D											
E											
F											
G											
Act. Cycle	7	135	145	141							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	7	
2		7
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	3
2	4
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print



Statistics

Statistics for I=2010 from THU 18-OCT-2012 17:45 to THU 18-OCT-2012 18:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	109	123	117	84	824	7		1		
B											
C	7	19	27	21	16	153	7				
D											
E											
F											
G											
Act. Cycle	7	136	143	139							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	7	
2		7
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	2
2	6
3	1
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 18:00 to THU 18-OCT-2012 18:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	109	119	112	81	899	8		3		
B											
C	8	22	31	26	19	215	8				
D											
E											
F											
G											
Act. Cycle	8	135	144	139							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	3	
2	5	8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	5
3	1
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 18:16 to THU 18-OCT-2012 18:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	96	119	111	80	782	7	1	3		
B	1	33	33	33	3	33	1				
C	6	24	31	27	17	165	6				
D											
E											
F											
G											
Act. Cycle	7	129	146	140							
Nom. Cycle	7	132	140	138							

Plan	#SP	#LP
1	6	
2	1	7
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	
2	3
3	1
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 18:30 to THU 18-OCT-2012 18:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	9	82	107	91	77	819	9		4		
B	1	33	33	33	3	33	1				
C	8	22	29	26	20	208	8				
D											
E											
F											
G											
Act. Cycle	9	109	129	117							
Nom. Cycle	9	113	132	118							

Plan	#SP	#LP
1	1	
2	3	9
3	4	
4	1	
5		
6		
7		
8		

Ped	Occ.
1	2
2	5
3	
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=2010 from THU 18-OCT-2012 18:46 to THU 18-OCT-2012 19:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	9	69	99	85	75	768	9	1	3		
B	1	26	26	26	3	26	1				
C	8	23	34	28	22	226	8				
D											
E											
F											
G											
Act. Cycle	9	101	124	113							
Nom. Cycle	9	105	124	114							

Plan	#SP	#LP
1		
2		9
3	1	
4	8	
5		
6		
7		
8		

Ped	Occ.
1	
2	5
3	
4	
5	
6	
7	
8	

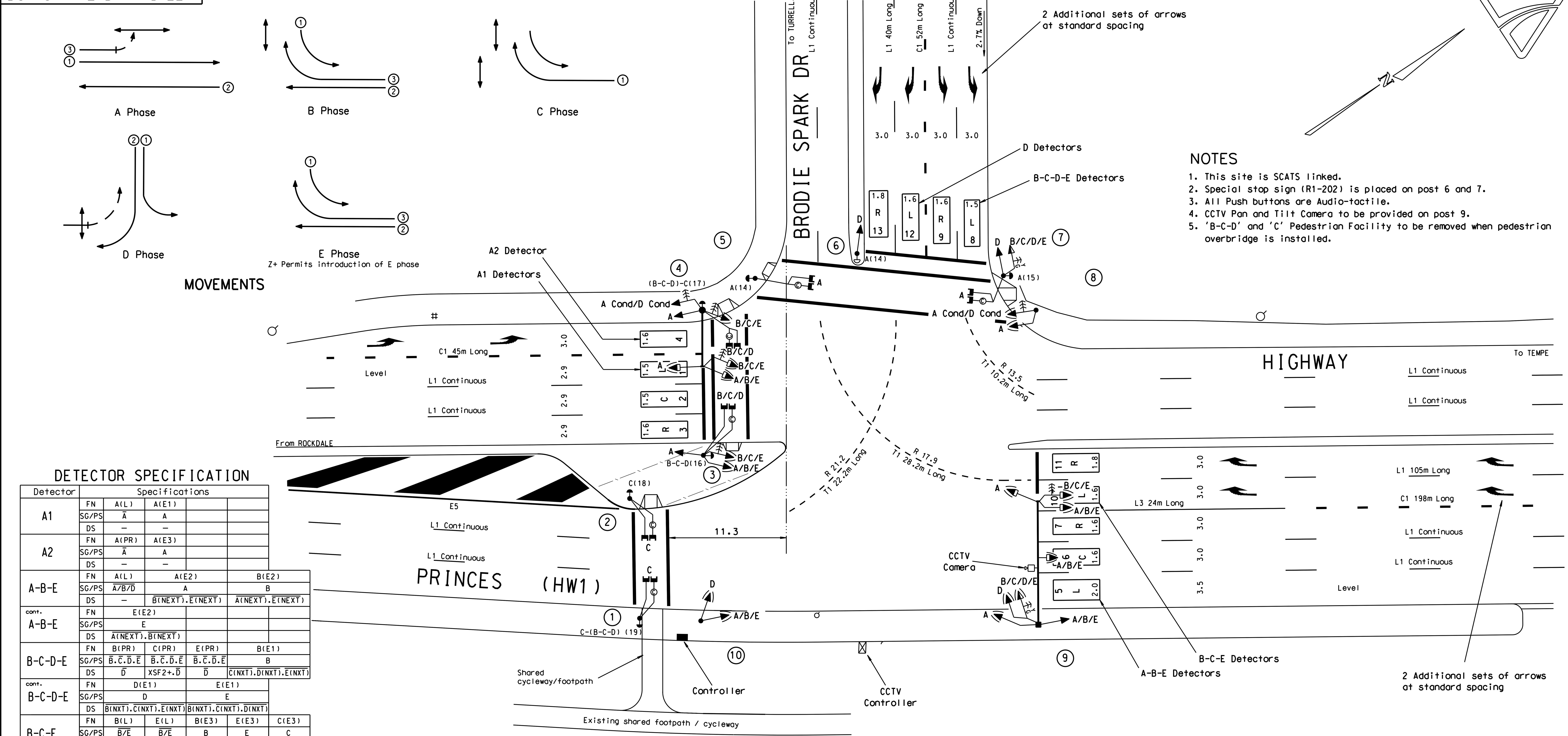
Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

DRAWN BY CADD
DO NOT AMEND MANUALLY

0001.386.VV.3437

DATE IN SERVICE : 27/05/03
DATE OF RECONSTRUCTION :00/00/00



NOTES

1. This site is SCATS linked.
2. Special stop sign (R1-202) is placed on post 6 and 7.
3. All Push buttons are Audio-tactile.
4. CCTV Pan and Tilt Camera to be provided on post 9.
5. 'B-C-D' and 'C' Pedestrian Facility to be removed when pedestrian overbridge is installed.

DETECTOR SPECIFICATION

Detector		Specifications				
A1	FN	A(L)	A(E1)			
	SG/PS	$\overline{A}$	A			
	DS	–	–			
A2	FN	A(PR)	A(E3)			
	SG/PS	$\overline{A}$	A			
	DS	–	–			
A-B-E	FN	A(L)	A(E2)		B(E2)	
	SG/PS	$\overline{A/B/D}$	A		B	
	DS	–	$\overline{B(NEXT)}.\overline{E(NEXT)}$		$\overline{A(NEXT)}.\overline{E(NEXT)}$	
cont. A-B-E	FN	E(E2)				
	SG/PS	E				
	DS	$\overline{A(NEXT)}.\overline{B(NEXT)}$				
B-C-D-E	FN	B(PR)	C(PR)	E(PR)	B(E1)	
	SG/PS	$\overline{B}.\overline{C}.\overline{D}.\overline{E}$	$\overline{B}.\overline{C}.\overline{D}.\overline{E}$	$\overline{B}.\overline{C}.\overline{D}.\overline{E}$	B	
	DS	$\overline{D}$	XSF2+.$\overline{D}$	$\overline{D}$	$\overline{C(NXT)}.\overline{D(NXT)}.\overline{E(NXT)}$	
cont. B-C-D-E	FN	D(E1)		E(E1)		
	SG/PS	D		E		
	DS	$\overline{B(NXT)}.\overline{C(NXT)}.\overline{E(NXT)}$		$\overline{B(NXT)}.\overline{C(NXT)}.\overline{D(NXT)}$		
B-C-E	FN	B(L)	E(L)	B(E3)	E(E3)	C(E3)
	SG/PS	$\overline{B/E}$	$\overline{B/E}$	B	E	C
	DS	–	Z+	$\overline{E(NEXT)}$	$\overline{B(NEXT)}$	XSF2
D	FN	D(L)	D(E2)			
	SG/PS	$\overline{D}$	D			
	DS	–	–			
A P.B.	FN	A(PB)	D(L)			
	SG/PS	$\overline{A(WALK)}$	A.$\overline{A(WALK)}$			
	DS	–	$\overline{B}.\overline{C}$			
B-C-D P.B.	FN	B(PB)		Reintroduce WALK		
	SG/PS	$\overline{B/C/D}.\overline{B/C/D(WLK)}$		B/C/D.$\overline{B/C/D(WALK)}$		
	DS	–		$\overline{A}.\overline{E}$		
(B-C-D)-C P.B.	FN	B(PB).C(PB)*		Reintroduce WALK		A(L)
	SG/PS	$\overline{B/C/D}.\overline{B/C/D(WLK)}$		B/C/D.$\overline{B/C/D(WALK)}$		$\overline{C(WALK)}$
	DS	–		$\overline{A}.\overline{E}$		–
C P.B.	FN	C(PB)	A(L)			
	SG/PS	$\overline{C(WALK)}$	C.C(WALK)			
	DS	–	$\overline{B}.\overline{D}.\overline{E}$			
C-(B-C-D) P.B.	FN	C(PB).B(PB)*				
	SG/PS	$\overline{C(WALK)}$				
	DS	–				

*Indicates that this call is stored until the WALK for the first PB demand is displayed.

SPECIAL SIGNAL GROUP DISPLAY SEQUENCE

SIGNAL GROUP	TABLE TYPE	REMARKS
A/B/E	3	—
B/C/E (RT)	34	No Filter
B/C/D/E (LT)	10	—
A COND / D COND (LT)	79	Timed R.A protection for 'A' pedestrian P.B. on post 4 extends protection subject to timer.
A (Ped)	2	
C (Ped)	1	
B/C/D (Ped)	-	(i) Walk/Clearance Overlap permitted B ⇌ C ⇌ D (ii) Timer terminated except under masterlink (iii) Uses alternative WALK timesetting when introduced after C phase.

POSTS

POST	TYPE	LENGTH	OFFSET	REMARKS
1	2	3.2	1.0	EXISTING
2	2	3.2	1.0	EXISTING
3	2	4.1	1.0	EXISTING
4	5XL	–	1.0	EXISTING
5	2	3.2	1.0	EXISTING
6	2	4.1	–	EXISTING
7	2	4.1	1.0	EXISTING
8	2	4.1	1.0	EXISTING
9	11	–	1.0	EXISTING 12.0m OUTREACH
10	2	4.1	1.0	EXISTING

A ORIGINAL ISSUE

PUBLIC UTILITY LEGEND		REFERENCE PLANS	
HYDRANT		SYMBOLS/ABBS.	VD003-6
STOP VALVE		STD POSIT	VD001-5
GAS VALVE		DET SCHED EXP	VD018-10
SEWER MANHOLE		PRES. DETECT	VC005-17
TELECOM PIT		SSG DIS. SEQ.	VD018-8
ELECT LIGHT POLE		CABLE INSTALL	SHEET 3
POWER POLE		CABLE CHART	SHEET 4
STAY POLE			
TELEPHONE BOX		SURVEYOR : N/A	
TELECOM PILLAR		DATE : N/A	

U.B.D. Ref. Map 274 05
I.S.G. CO-ORDS E: 314 208 N: 1 244 017
DESIGNED T.KLOBUCAR
CHECKED R.J. LUHR
R.J LUHR
SITE CHECKED
R.J LUHR
RECOMMENDED

DESIGN APPROVAL
APPROVED
MANAGER
PROJECT DESIGN SERVICES
DATE 12-7-01
DESIGN PREPARED BY
PROJECT DESIGN SERVICES
RTA OPERATIONS

RTA ACCEPTANCE
RECOMMENDED
TEAM LEADER
NETWORK OPERATIONS
DATE 16/7/01
ACCEPTED
STATE NETWORK LEADER
DATE 19/7/01

Roads and Traffic Authority.N.S.W

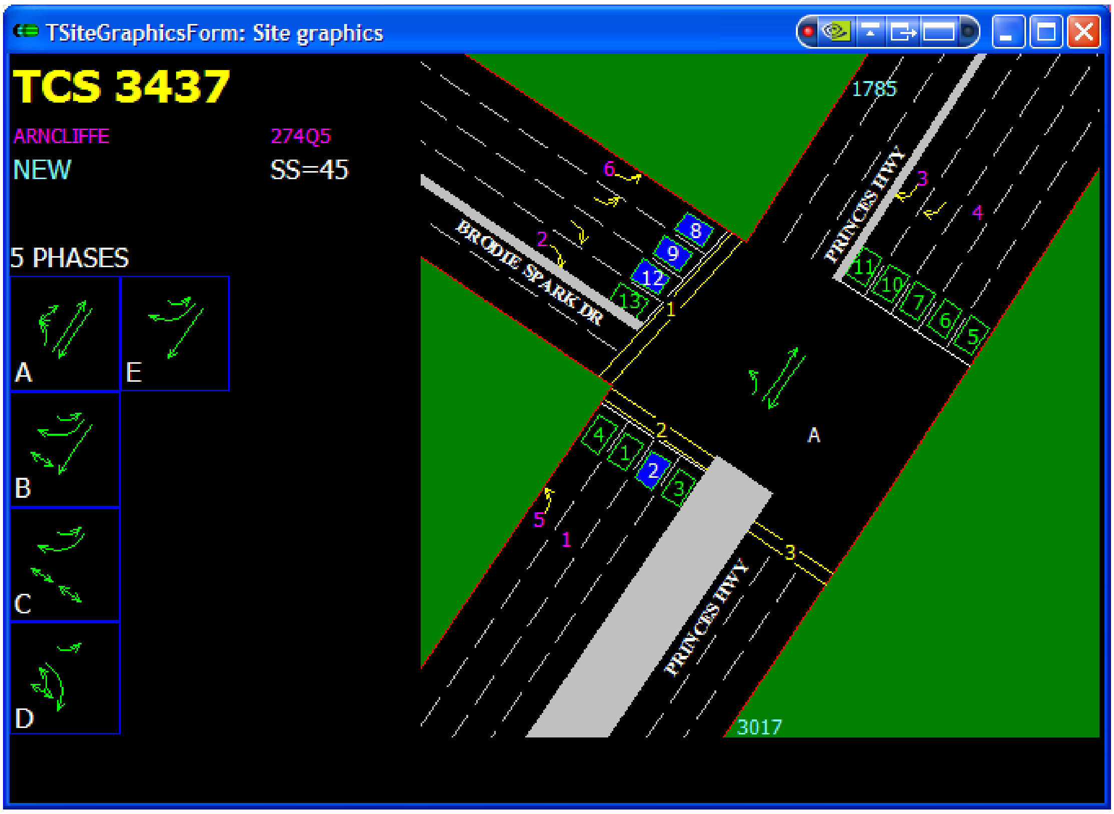
ROCKDALE COUNCIL AREA
TRAFFIC SIGNALS AT
PRINCES HIGHWAY (HW1) & BRODIE SPARK DRIVE
ARNCLIFFE

DESIGN LAYOUT
TCS No 3437

EXISTING ☒ PROPOSED ☐
CADD FILE: vv3437_1H.dgn
SCALE (1:200)
ISSUE H
FILE 386 TS 305
SUPERSEDES SHEET/ISSUE 1/F
REGN. 0001.386.VV.3437
SHEET 1

$DATE$ $TIME$ $FILEABBREV$

TCS 3437 Princes Hwy, Brodie Spark Dr, Arncliffe



Statistics

Statistics for I=3437 from THU 18-OCT-2012 06:02 to THU 18-OCT-2012 06:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	9	54	115	72	68	656	9	1	2		
B	9	12	28	17	16	154	9	7			
C	2	15	15	15	3	30	2	1			
D	7	16	22	17	13	123	7				
E											
F											
G											
Act. Cycle	9	86	143	107							
Nom. Cycle	9	98	117	104							

Plan	#SP	#LP
1		
2		
3		
4	9	9
5		
6		
7		
8		

Ped	Occ.
1	
2	2
3	2
4	2
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 06:15 to THU 18-OCT-2012 06:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	65	115	89	69	716	8		4		
B	8	13	28	16	13	135	8	1			
C	6	15	16	15	9	91	6				
D	6	15	18	16	10	99	6				
E											
F											
G											
Act. Cycle	8	115	152	130							
Nom. Cycle	8	113	137	123							

Plan	#SP	#LP
1		
2	2	
3	2	
4	4	8
5		
6		
7		
8		

Ped	Occ.
1	2
2	10
3	6
4	4
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 06:30 to THU 18-OCT-2012 06:46 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	80	109	90	67	725	8	1	2		
B	7	12	25	14	10	103	7	1			
C	6	15	16	15	9	94	6				
D	8	14	33	19	14	154	8				
E											
F											
G											
Act. Cycle	8	121	152	134							
Nom. Cycle	8	127	140	133							

Plan	#SP	#LP
1		
2		
3	1	
4	7	8
5		
6		
7		
8		

Ped	Occ.
1	2
2	7
3	6
4	2
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 06:46 to THU 18-OCT-2012 07:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	85	105	94	67	661	7	2	1		
B	6	12	13	12	8	77	6				
C	7	15	16	15	11	106	7				
D	7	18	24	20	14	143	7				
E											
F											
G											
Act. Cycle	7	126	152	141							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4	7	7
5		
6		
7		
8		

Ped	Occ.
1	1
2	9
3	7
4	1
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 07:00 to THU 18-OCT-2012 07:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	86	94	90	66	727	8	1			
B	7	13	27	17	11	125	7	3			
C	5	15	16	15	7	77	5				
D	8	15	33	22	16	177	8				
E											
F											
G											
Act. Cycle	8	126	143	138							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2		
3	1	
4	7	8
5		
6		
7		
8		

Ped	Occ.
1	2
2	7
3	5
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 07:16 to THU 18-OCT-2012 07:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	85	102	93	66	653	7	1			
B	6	13	28	22	14	135	6	5			
C	1	15	15	15	2	15	1				
D	7	19	37	25	18	181	7				
E											
F											
G											
Act. Cycle	7	126	150	140							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4	7	7
5		
6		
7		
8		

Ped	Occ.
1	1
2	2
3	1
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 07:30 to THU 18-OCT-2012 07:47 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	83	110	92	66	742	8	1			
B	7	13	26	16	10	115	7	2			
C	6	15	16	15	8	92	6				
D	8	15	25	21	15	168	8				
E											
F											
G											
Act. Cycle	8	131	154	139							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4	8	8
5		
6		
7		
8		

Ped	Occ.
1	1
2	10
3	6
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 07:47 to THU 18-OCT-2012 08:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	83	95	91	65	639	7				
B	7	12	25	16	12	114	7	2			
C	5	15	16	15	8	77	5				
D	7	19	25	21	16	153	7				
E											
F											
G											
Act. Cycle	7	137	143	140							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4	7	7
5		
6		
7		
8		

Ped	Occ.
1	3
2	8
3	5
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

Statistics

Statistics for I=3437 from THU 18-OCT-2012 08:01 to THU 18-OCT-2012 08:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	88	97	93	66	653	7	1			
B	7	12	23	14	10	98	7	1			
C	6	15	16	15	9	92	6				
D	7	16	26	20	14	140	7				
E											
F											
G											
Act. Cycle	7	138	143	140							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4	7	7
5		
6		
7		
8		

Ped	Occ.
1	2
2	7
3	6
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

Statistics

Statistics for I=3437 from THU 18-OCT-2012 08:15 to THU 18-OCT-2012 08:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	95	103	97	70	783	8				
B	8	12	25	14	10	118	8	2			
C	6	15	16	15	8	92	6				
D	8	14	24	16	12	131	8				
E											
F											
G											
Act. Cycle	8	139	143	140							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4	8	8
5		
6		
7		
8		

Ped	Occ.
1	4
2	7
3	6
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 08:31 to THU 18-OCT-2012 08:45 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	94	98	96	69	672	7				
B	7	13	24	15	11	106	7	2			
C	5	15	16	15	8	78	5				
D	7	14	27	17	12	122	7				
E											
F											
G											
Act. Cycle	7	139	140	139							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4	7	7
5		
6		
7		
8		

Ped	Occ.
1	3
2	7
3	5
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 08:45 to THU 18-OCT-2012 09:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	88	99	93	67	751	8	1	1		
B	8	13	25	16	12	135	8	4			
C	4	15	16	15	6	63	4				
D	8	16	28	20	15	166	8				
E											
F											
G											
Act. Cycle	8	136	142	139							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1		
2		
3		
4	8	8
5		
6		
7		
8		

Ped	Occ.
1	3
2	4
3	4
4	1
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 09:01 to THU 18-OCT-2012 09:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	88	101	95	69	671	7		1		
B	7	13	26	20	15	144	7	5			
C	2	15	16	15	3	31	2				
D	7	15	28	19	14	133	7				
E											
F											
G											
Act. Cycle	7	134	144	139							
Nom. Cycle	7	139	140	139							

Plan	#SP	#LP
1		
2		
3		
4	7	7
5		
6		
7		
8		

Ped	Occ.
1	1
2	4
3	2
4	1
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 09:15 to THU 18-OCT-2012 09:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	76	105	87	67	698	8		2		
B	8	13	25	17	14	141	8	5			
C	3	15	16	15	5	47	3				
D	8	14	25	18	14	150	8				
E											
F											
G											
Act. Cycle	8	121	138	129							
Nom. Cycle	8	126	139	131							

Plan	#SP	#LP
1		
2		
3		
4	8	8
5		
6		
7		
8		

Ped	Occ.
1	
2	5
3	3
4	2
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 09:30 to THU 18-OCT-2012 09:45 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	76	99	90	71	727	8	1	1		
B	7	14	24	19	13	136	7	6			
C	1	16	16	16	2	16	1				
D	8	14	22	18	14	149	8				
E											
F											
G											
Act. Cycle	8	119	136	128							
Nom. Cycle	8	122	133	128							

Plan	#SP	#LP
1		
2		
3		
4	8	8
5		
6		
7		
8		

Ped	Occ.
1	
2	2
3	1
4	1
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 09:45 to THU 18-OCT-2012 10:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	69	99	85	69	683	8		2		
B	7	13	25	16	12	118	7	3			
C	4	15	16	15	6	62	4				
D	7	14	22	17	13	125	7				
E											
F											
G											
Act. Cycle	8	113	131	123							
Nom. Cycle	8	122	128	124							

Plan	#SP	#LP
1		
2		
3	2	
4	6	8
5		
6		
7		
8		

Ped	Occ.
1	3
2	5
3	4
4	2
5	
6	
7	
8	

Av" = Total Time / Frequency

Av% = Total Phase Time / Total Cycle Time

OK

Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 15:02 to THU 18-OCT-2012 15:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	79	102	87	63	615	7		1		
B	7	16	28	20	15	146	7	2			
C	5	15	16	15	8	78	5				
D	7	14	26	18	14	132	7				
E											
F											
G											
Act. Cycle	7	130	155	138							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1		
2		7
3	7	
4		
5		
6		
7		
8		

Ped	Occ.
1	3
2	6
3	5
4	1
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 15:16 to THU 18-OCT-2012 15:30 inclusively.

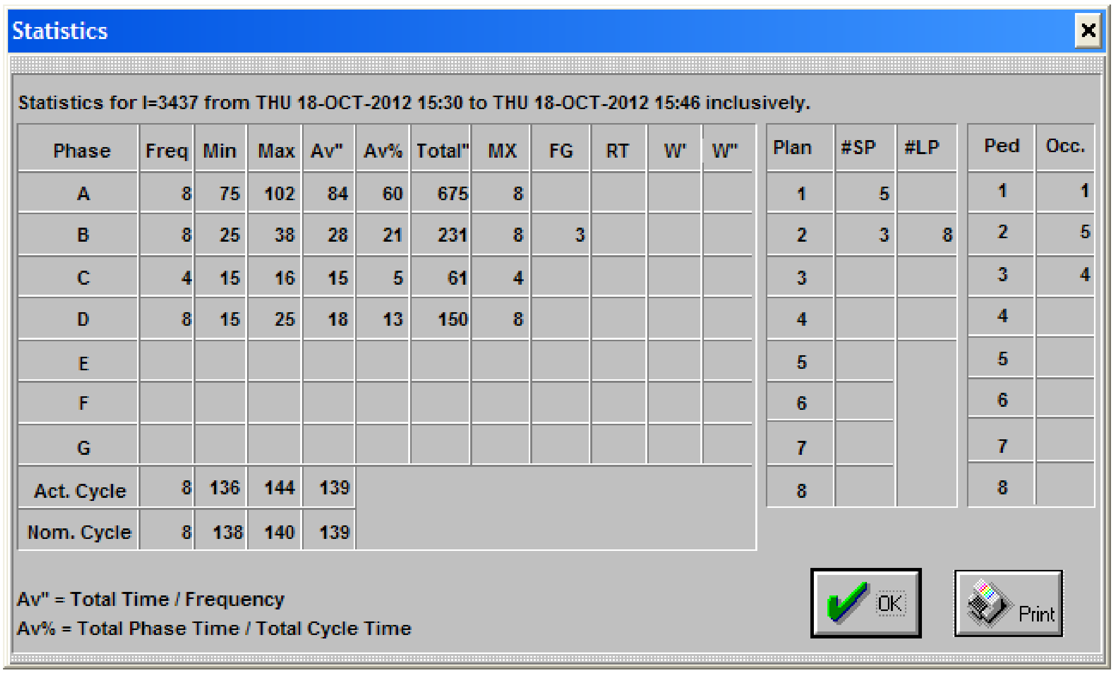
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	75	90	83	61	586	7				
B	7	17	37	27	20	190	7	3			
C	4	15	15	15	6	60	4				
D	7	16	22	18	13	128	7				
E											
F											
G											
Act. Cycle	7	134	142	137							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	1	
2	3	7
3	3	
4		
5		
6		
7		
8		

Ped	Occ.
1	4
2	6
3	4
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print



Statistics

Statistics for I=3437 from THU 18-OCT-2012 15:30 to THU 18-OCT-2012 15:46 inclusively.

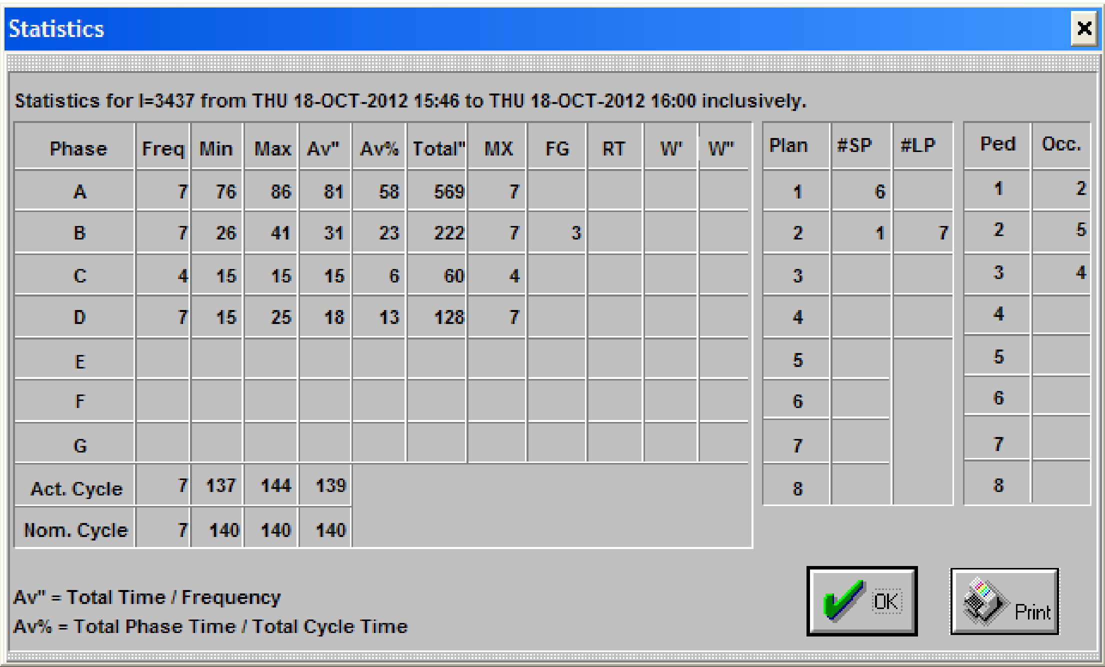
Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	75	102	84	60	675	8				
B	8	25	38	28	21	231	8	3			
C	4	15	16	15	5	61	4				
D	8	15	25	18	13	150	8				
E											
F											
G											
Act. Cycle	8	136	144	139							
Nom. Cycle	8	138	140	139							

Plan	#SP	#LP
1	5	
2	3	8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	5
3	4
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print



Statistics

Statistics for I=3437 from THU 18-OCT-2012 15:46 to THU 18-OCT-2012 16:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	76	86	81	58	569	7				
B	7	26	41	31	23	222	7	3			
C	4	15	15	15	6	60	4				
D	7	15	25	18	13	128	7				
E											
F											
G											
Act. Cycle	7	137	144	139							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	6	
2	1	7
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	2
2	5
3	4
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 16:00 to THU 18-OCT-2012 16:16 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	72	85	77	56	621	8		3		
B	8	26	40	33	24	265	8	2			
C	6	15	16	15	8	92	6				
D	8	15	22	17	12	139	8				
E											
F											
G											
Act. Cycle	8	136	144	139							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	8	
2		8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	4
2	9
3	6
4	3
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 16:16 to THU 18-OCT-2012 16:30 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	76	89	82	58	574	7		1		
B	7	24	40	32	23	227	7	3			
C	4	15	16	15	6	61	4				
D	7	15	24	18	13	128	7				
E											
F											
G											
Act. Cycle	7	140	144	141							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	6	
2	1	7
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	
2	6
3	4
4	1
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 16:30 to THU 18-OCT-2012 16:47 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	74	90	82	59	662	8				
B	8	19	43	30	22	243	8	4			
C	4	15	16	15	5	61	4				
D	8	16	24	19	14	156	8				
E											
F											
G											
Act. Cycle	8	136	144	140							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	3	
2	4	8
3	1	
4		
5		
6		
7		
8		

Ped	Occ.
1	5
2	7
3	4
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 16:47 to THU 18-OCT-2012 17:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	78	92	85	61	599	7		1		
B	7	20	38	25	18	181	7	1			
C	6	15	16	15	10	94	6				
D	7	16	17	16	11	113	7				
E											
F											
G											
Act. Cycle	7	136	144	141							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	1	
2	5	7
3	1	
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	7
3	6
4	1
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 17:01 to THU 18-OCT-2012 17:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	76	88	84	60	588	7				
B	7	20	39	27	19	189	7	2			
C	5	15	16	15	8	77	5				
D	7	16	19	17	12	119	7				
E											
F											
G											
Act. Cycle	7	136	141	139							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	1	
2	4	7
3	2	
4		
5		
6		
7		
8		

Ped	Occ.
1	2
2	5
3	5
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 17:15 to THU 18-OCT-2012 17:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	72	84	77	56	617	8				
B	8	26	48	35	25	282	8	3			
C	5	15	16	15	7	77	5				
D	8	15	20	16	12	134	8				
E											
F											
G											
Act. Cycle	8	135	144	138							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	8	
2		8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	6
3	5
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 17:31 to THU 18-OCT-2012 17:45 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	71	86	80	57	565	7				
B	7	24	41	31	22	219	7	2			
C	5	15	16	15	8	77	5				
D	7	16	22	17	13	123	7				
E											
F											
G											
Act. Cycle	7	134	144	140							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	6	
2	1	7
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	2
2	8
3	5
4	
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 17:45 to THU 18-OCT-2012 18:01 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	72	86	78	56	626	8		1		
B	8	24	42	30	22	247	8	2			
C	6	15	16	15	8	91	6				
D	8	15	30	19	14	153	8				
E											
F											
G											
Act. Cycle	8	136	144	139							
Nom. Cycle	8	140	140	140							

Plan	#SP	#LP
1	7	
2	1	8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	2
2	8
3	6
4	1
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 18:01 to THU 18-OCT-2012 18:15 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	7	71	93	81	58	567	7		1		
B	7	20	37	27	20	192	7	2			
C	5	15	16	15	8	76	5				
D	7	15	30	20	15	145	7				
E											
F											
G											
Act. Cycle	7	135	144	140							
Nom. Cycle	7	140	140	140							

Plan	#SP	#LP
1	4	
2	2	7
3	1	
4		
5		
6		
7		
8		

Ped	Occ.
1	4
2	8
3	5
4	1
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 18:15 to THU 18-OCT-2012 18:31 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	64	76	71	52	573	8		2		
B	8	24	37	30	22	244	8	1			
C	7	15	16	15	10	107	7				
D	8	17	30	21	16	175	8				
E											
F											
G											
Act. Cycle	8	131	144	137							
Nom. Cycle	8	129	140	137							

Plan	#SP	#LP
1	8	
2		8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	4
2	9
3	7
4	2
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 18:31 to THU 18-OCT-2012 18:45 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	8	60	72	66	56	535	8		3		
B	8	15	33	24	20	193	8	4			
C	4	15	16	15	6	61	4				
D	8	18	25	20	17	162	8				
E											
F											
G											
Act. Cycle	8	114	131	118							
Nom. Cycle	8	113	129	117							

Plan	#SP	#LP
1	4	
2	4	8
3		
4		
5		
6		
7		
8		

Ped	Occ.
1	1
2	9
3	4
4	3
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

Statistics

Statistics for I=3437 from THU 18-OCT-2012 18:45 to THU 18-OCT-2012 19:00 inclusively.

Phase	Freq	Min	Max	Av"	Av%	Total"	MX	FG	RT	W'	W"
A	9	43	88	65	57	588	9		2		
B	9	15	28	20	18	188	9	3			
C	6	15	16	15	9	91	6				
D	9	15	22	17	15	156	9				
E											
F											
G											
Act. Cycle	9	94	130	113							
Nom. Cycle	9	103	124	112							

Plan	#SP	#LP
1	4	
2	5	9
3		
4		
5		
6		
7		
8		

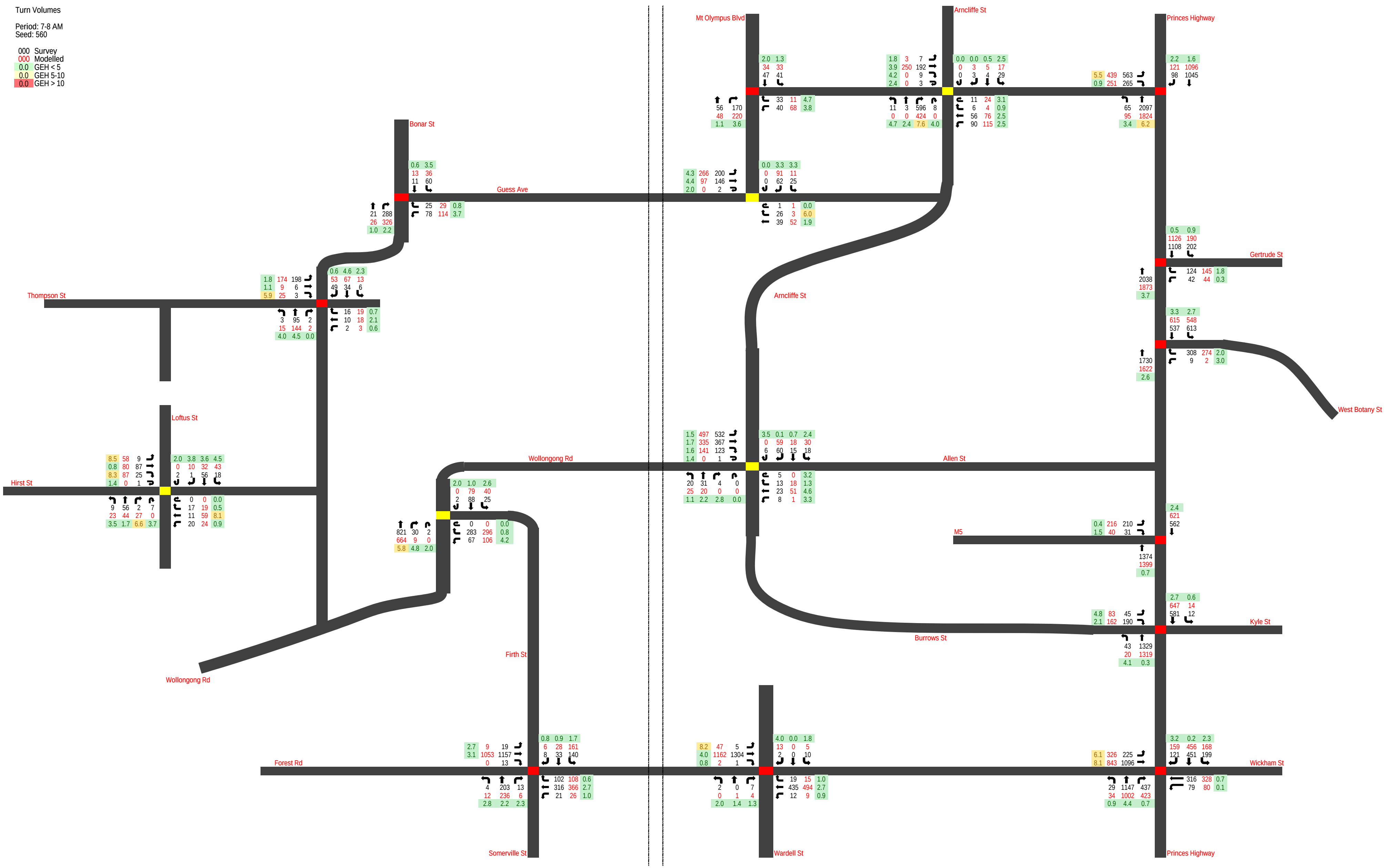
Ped	Occ.
1	2
2	9
3	6
4	2
5	
6	
7	
8	

Av" = Total Time / Frequency
Av% = Total Phase Time / Total Cycle Time

OK Print

APPENDIX D

CALIBRATION DIAGRAMS AND STATISTICS

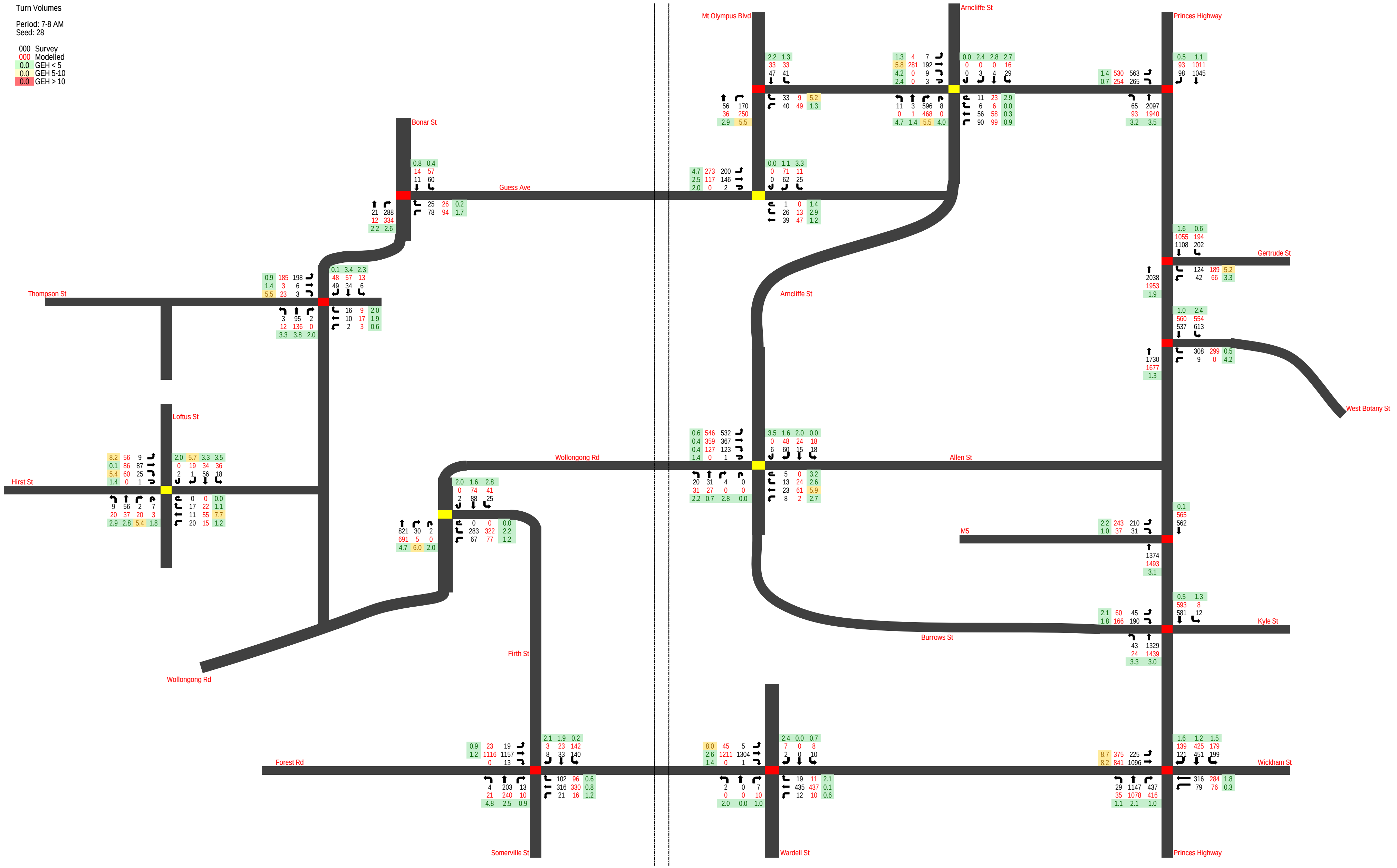


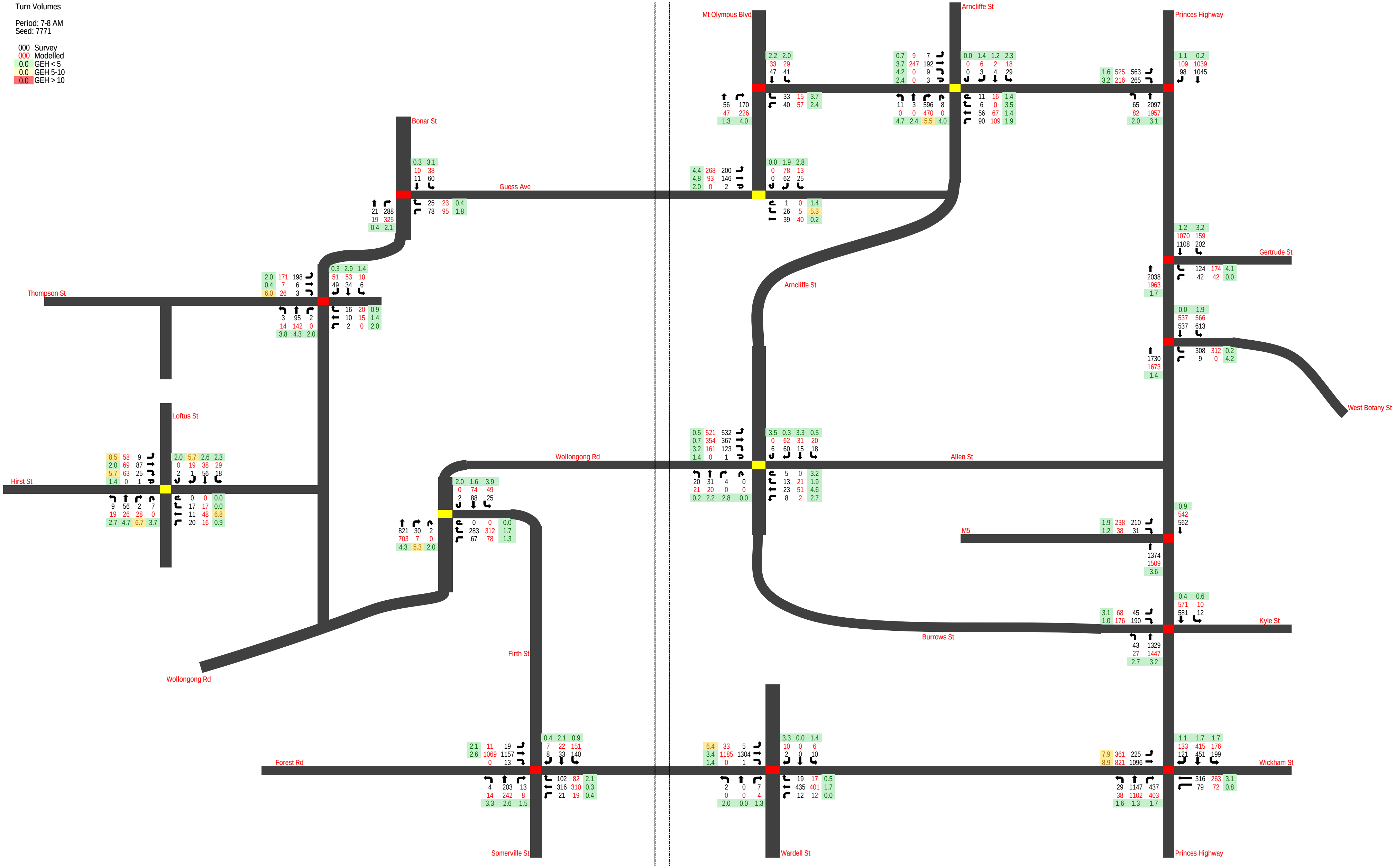
Turn Volumes
Period: 7-8 AM
Seed: 560
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Thompson St
Arncliffe St
Gertrude St
West Botany St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Wollongong Rd
Firth St
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

Turn Volumes

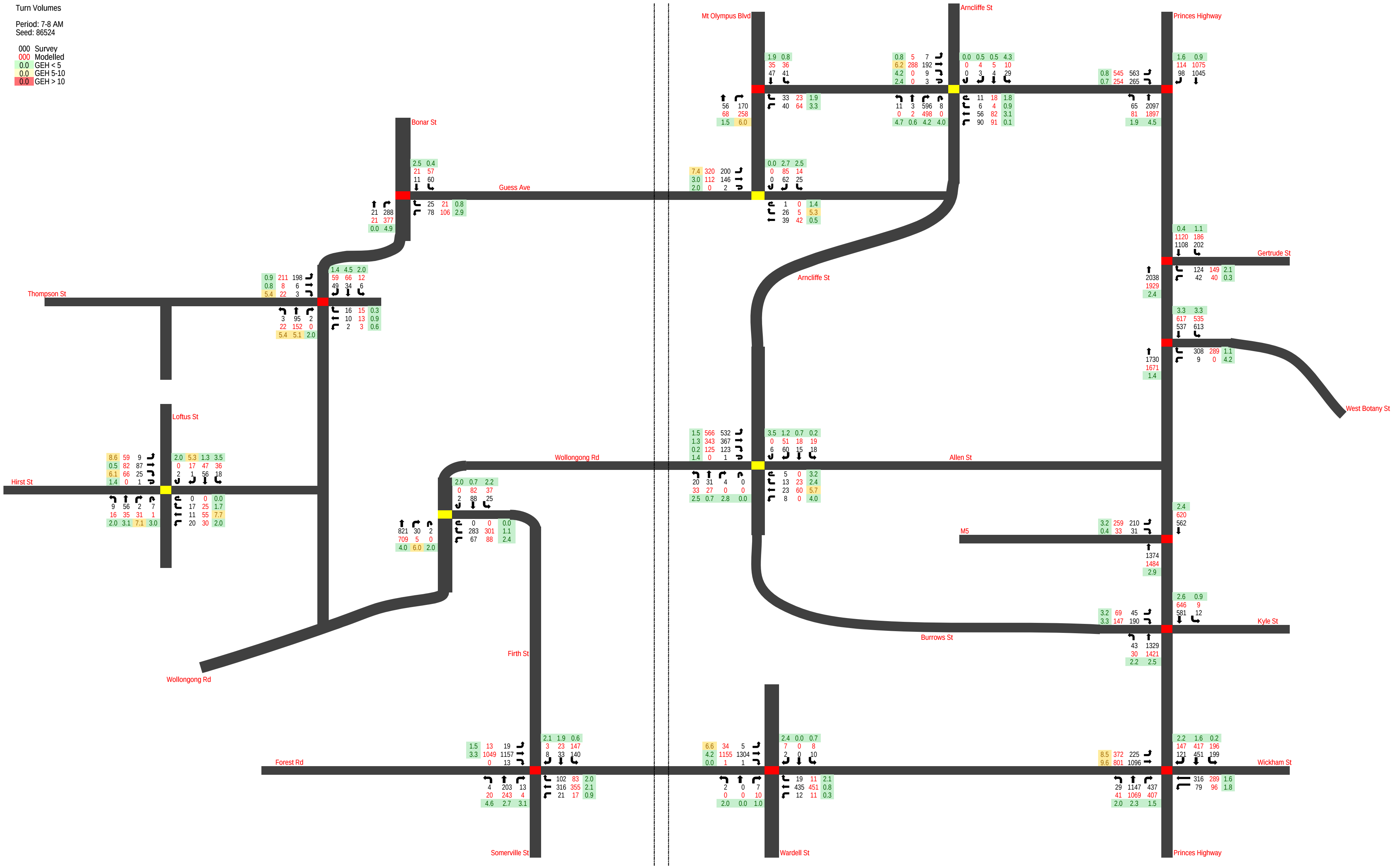
Period: 7-8 AM
Seed: 28

000	Survey
000	Modelled
0.0	GEH < 5
0.0	GEH 5-10
0.0	GEH > 10





Turn Volumes
Period: 7-8 AM
Seed: 7771
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Thompson St
Gertrude St
West Botany St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Firth St
Forest Rd
Wickham St
Somerville St
Wardell St

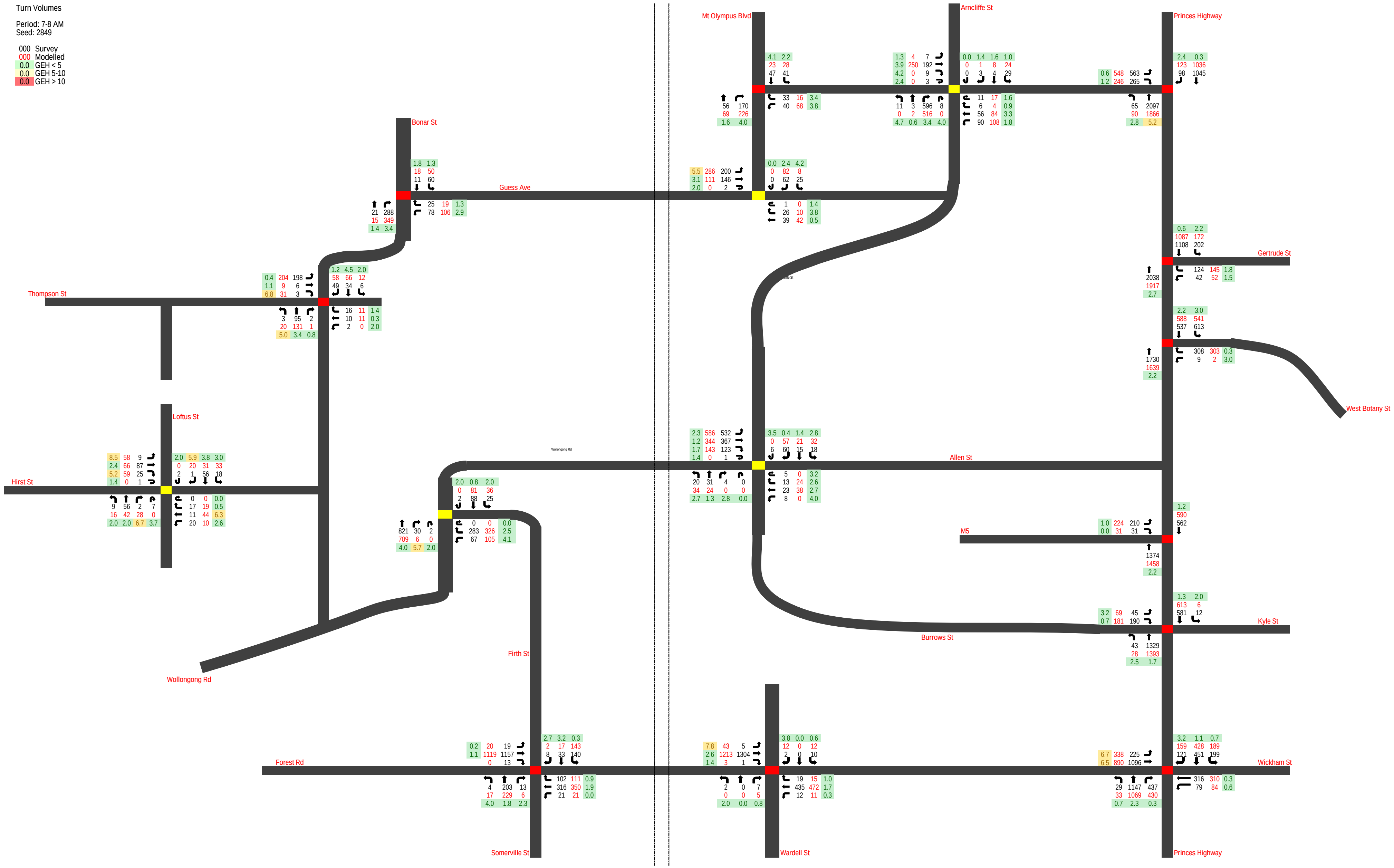


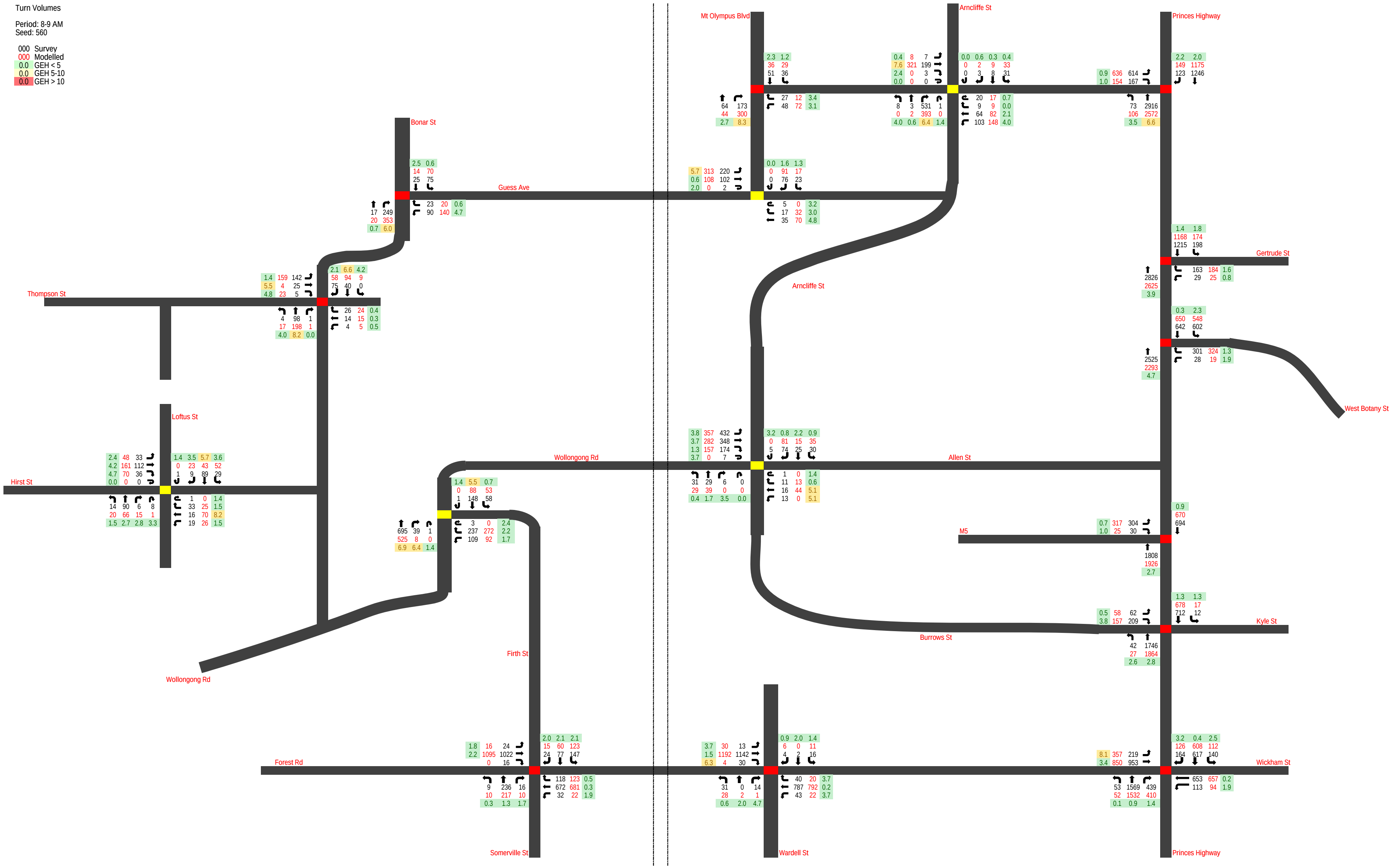
Turn Volumes
Period: 7-8 AM
Seed: 86524
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Thompson St
Gertrude St
Arncliffe St
West Botany St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

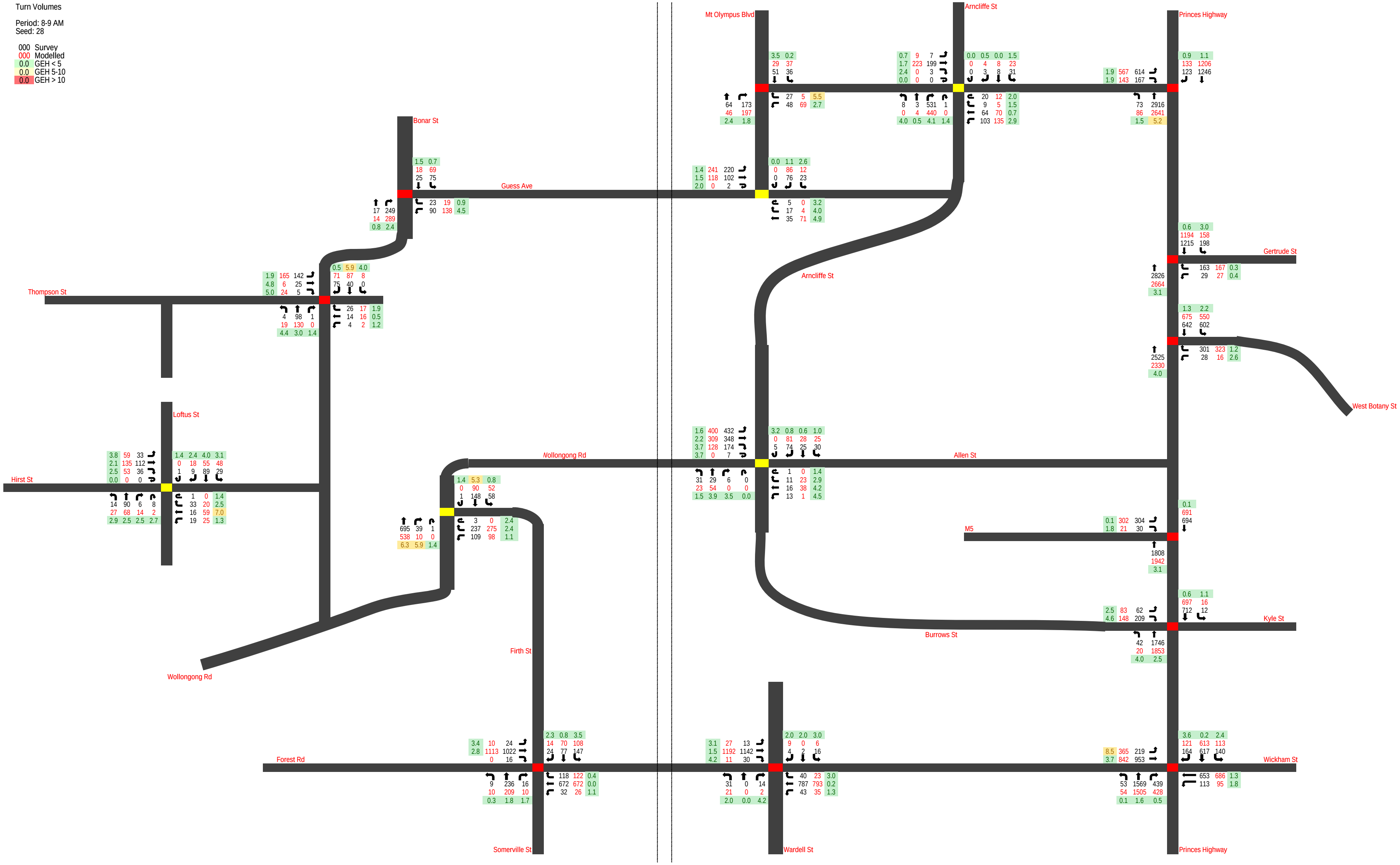
Turn Volumes

Period: 7-8 AM
Seed: 2849

000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10



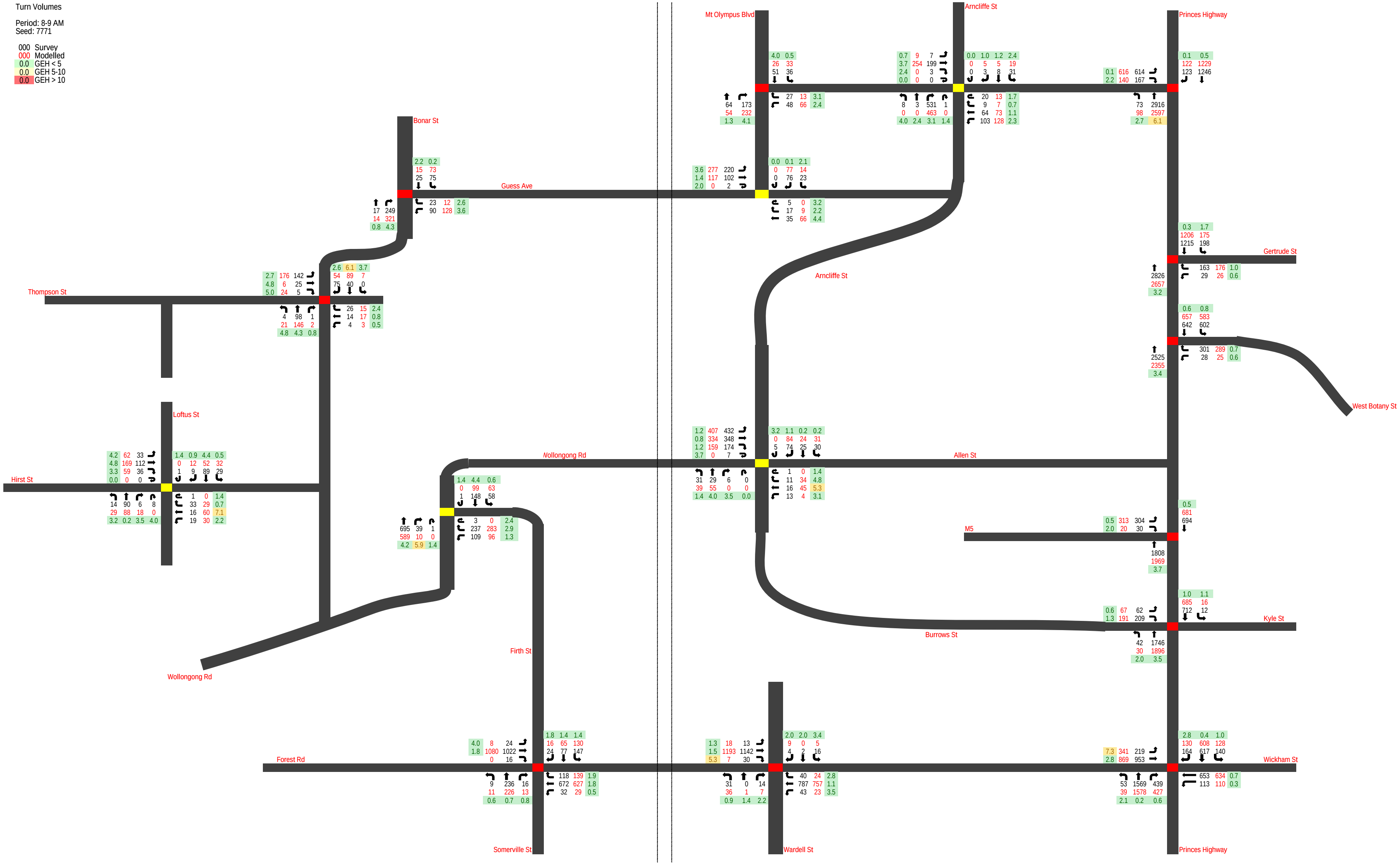

Turn Volumes
Period: 8-9 AM
Seed: 560
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Thompson St
Gertrude St
Arncliffe St
West Botany St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

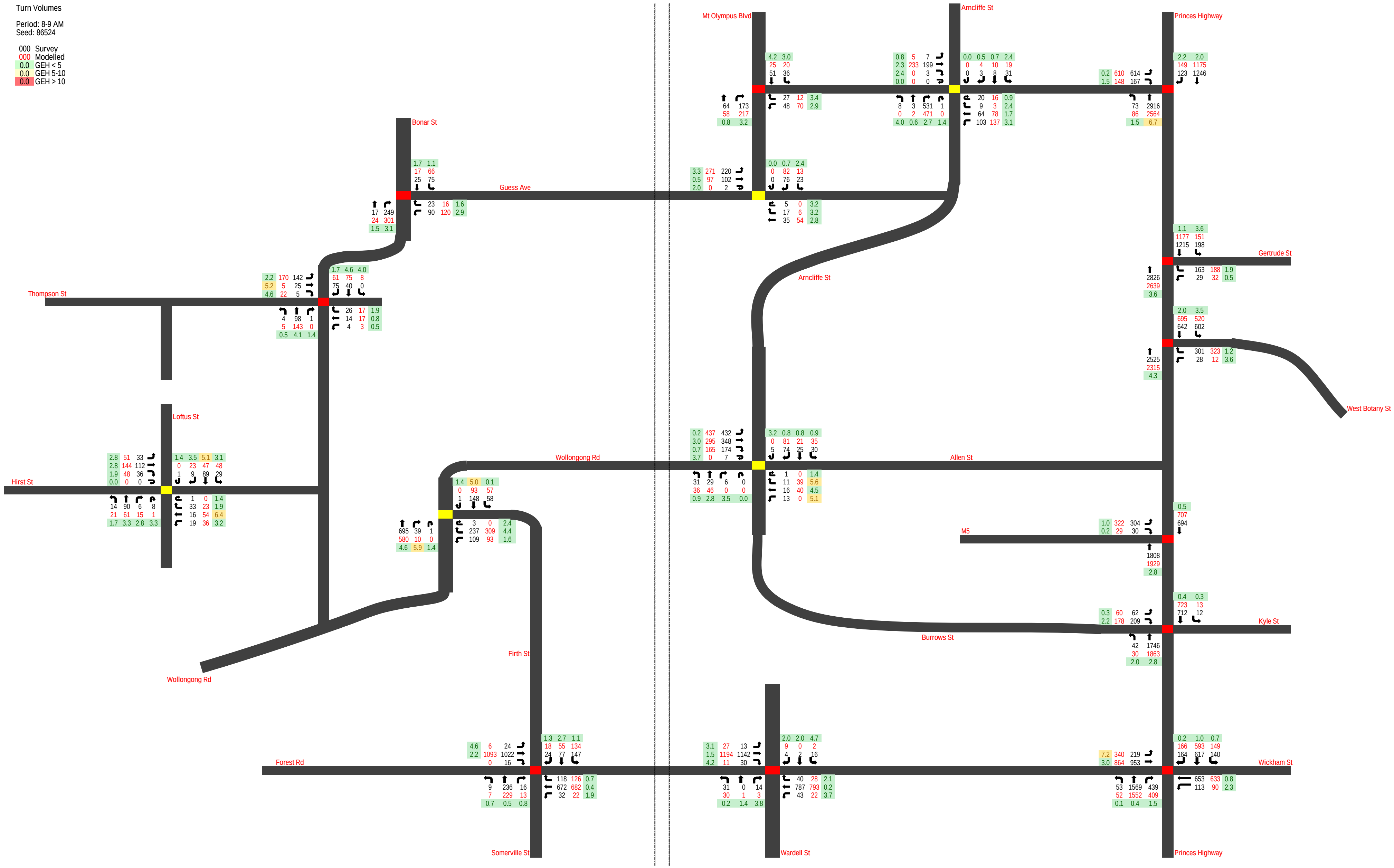

Turn Volumes
Period: 8-9 AM
Seed: 28
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Gertrude St
Thompson St
Arncliffe St
West Botany St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Wollongong Rd
Firth St
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

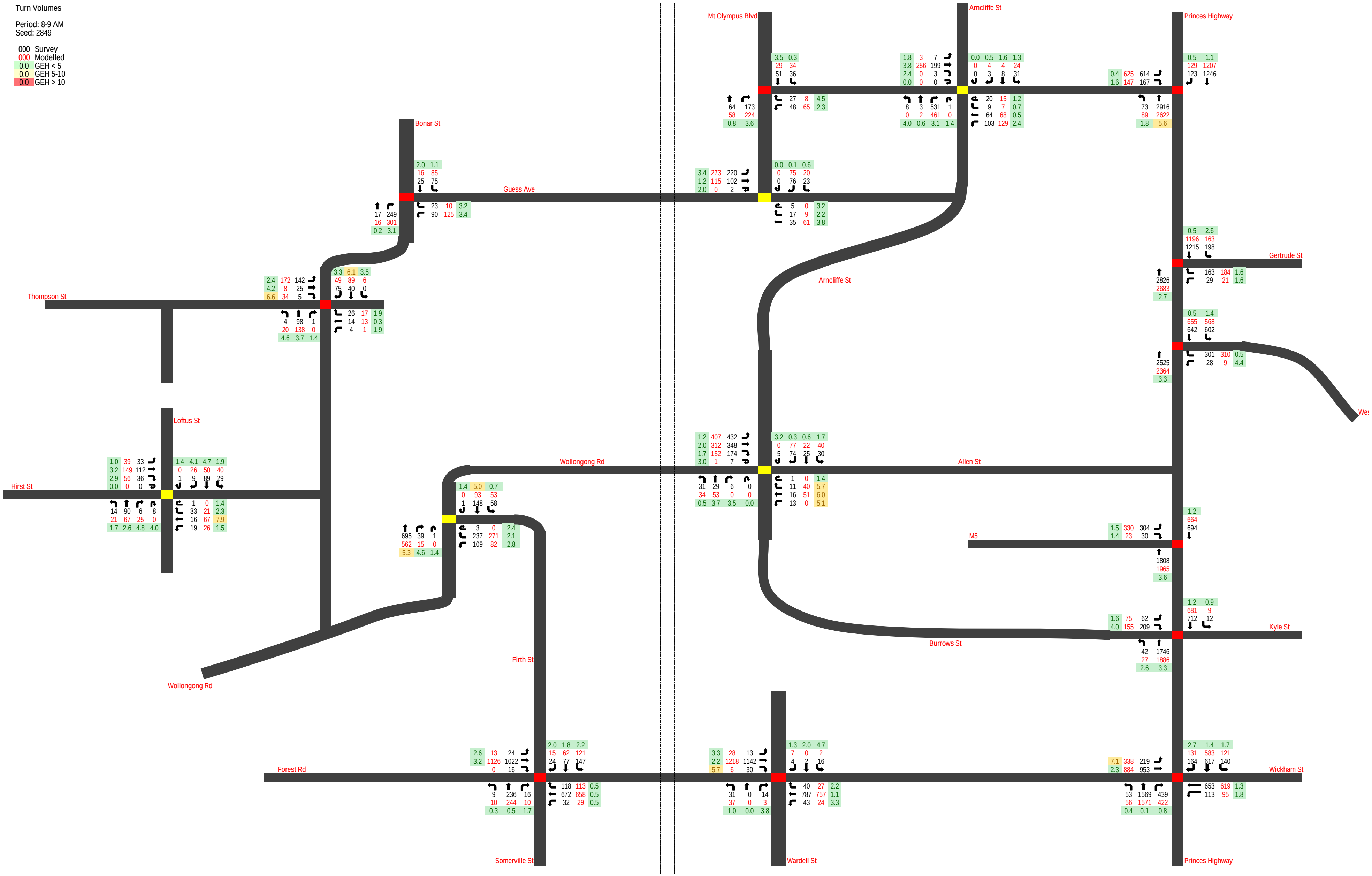
Turn Volumes

Period: 8-9 AM
Seed: 7771

000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10



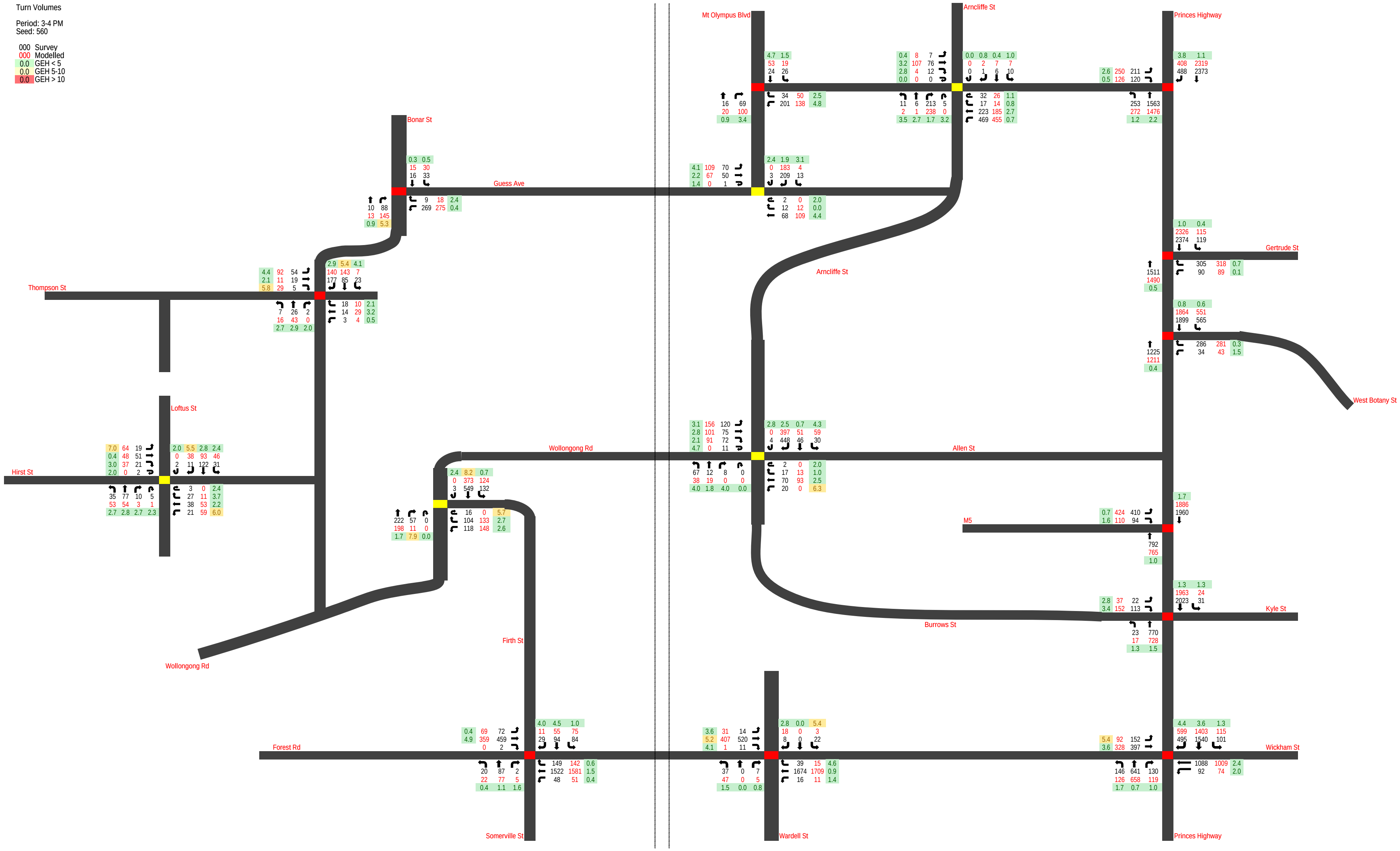

Turn Volumes
Period: 8-9 AM
Seed: 86524
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Thompson St
Gertrude St
Arncliffe St
West Botany St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway


Turn Volumes
Period: 8-9 AM
Seed: 2849
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Thompson St
Gertrude St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

Turn Volumes

Period: 3-4 PM
Seed: 560

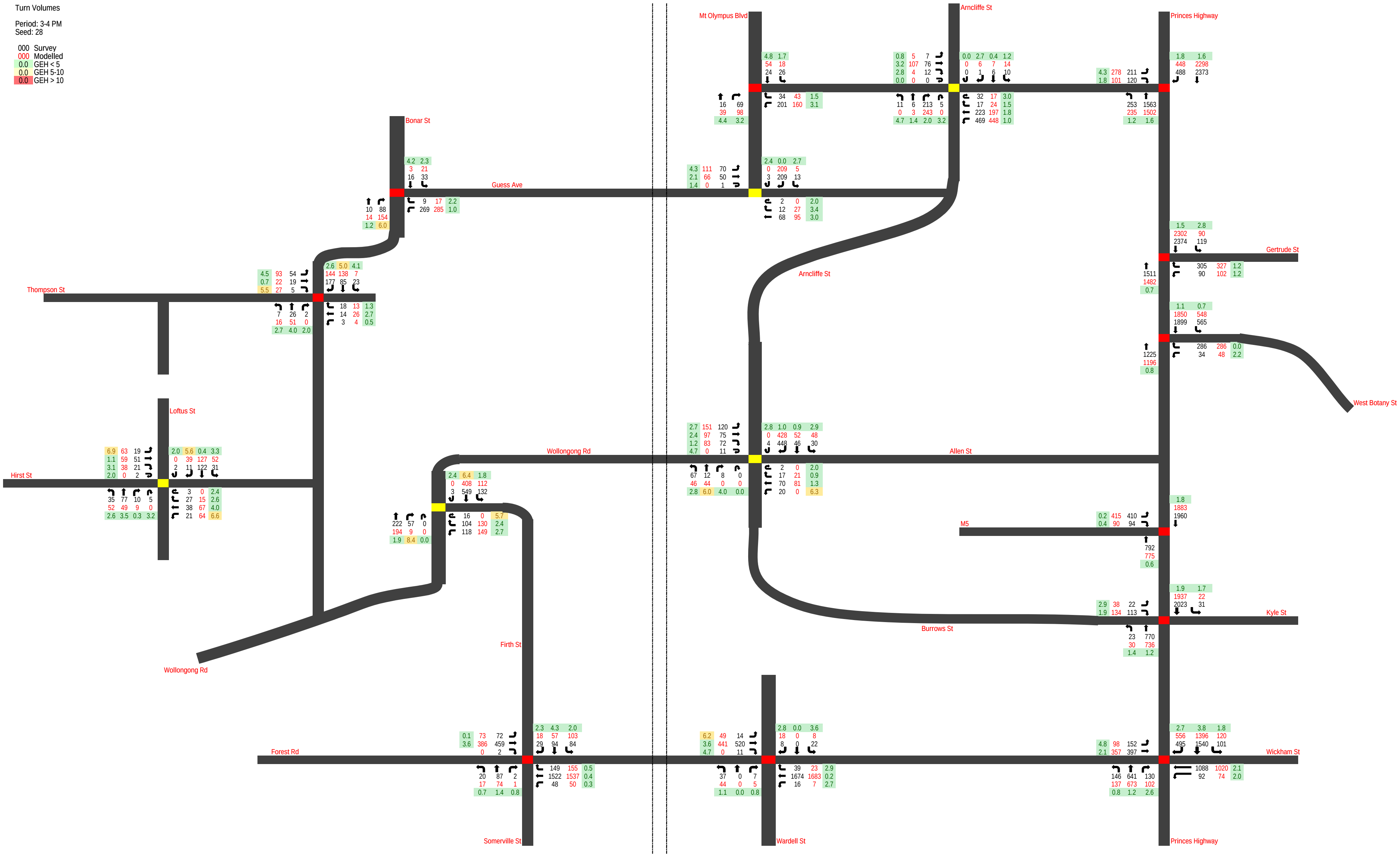
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10

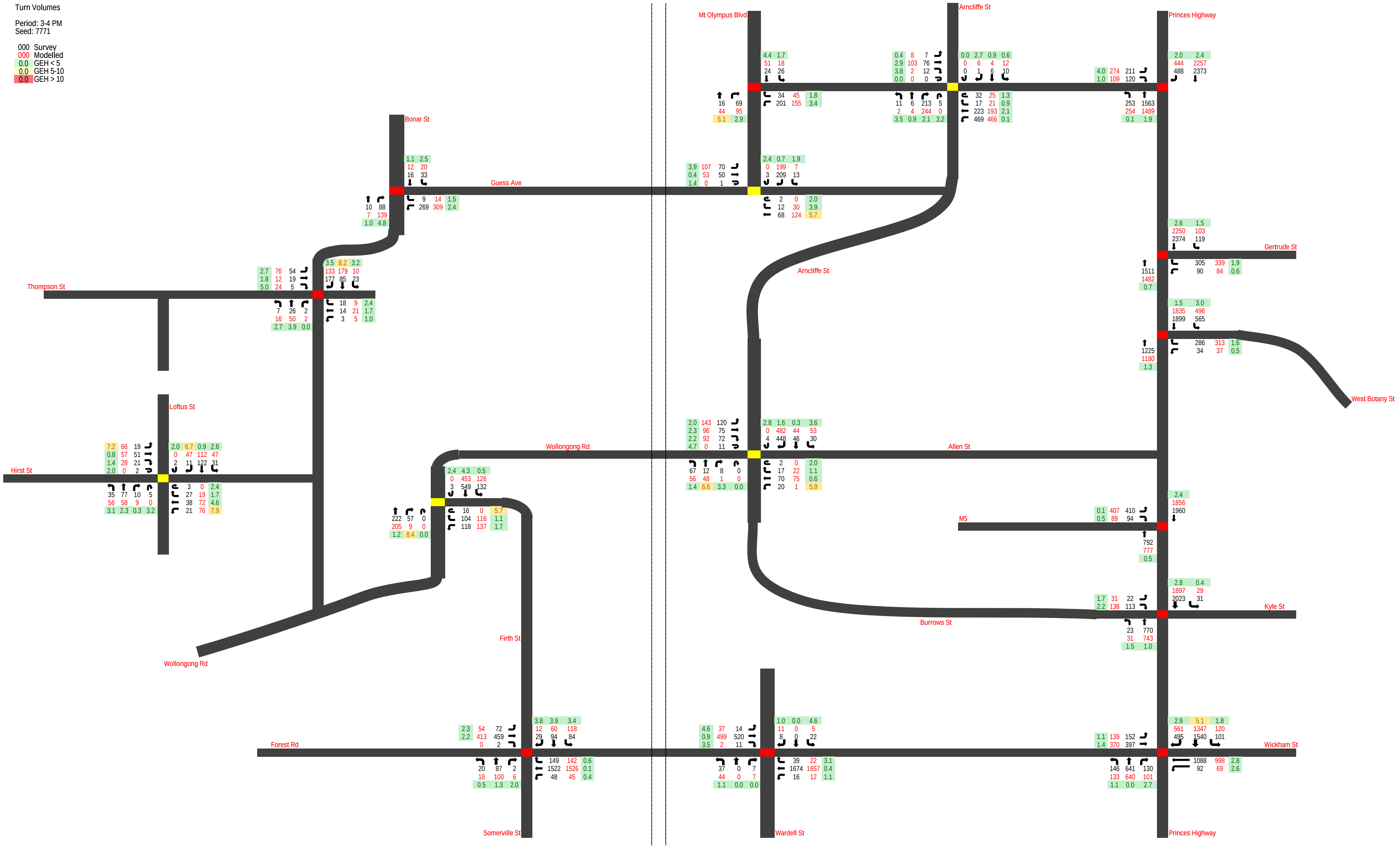


Turn Volumes

Period: 3-4 PM
Seed: 28

000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10

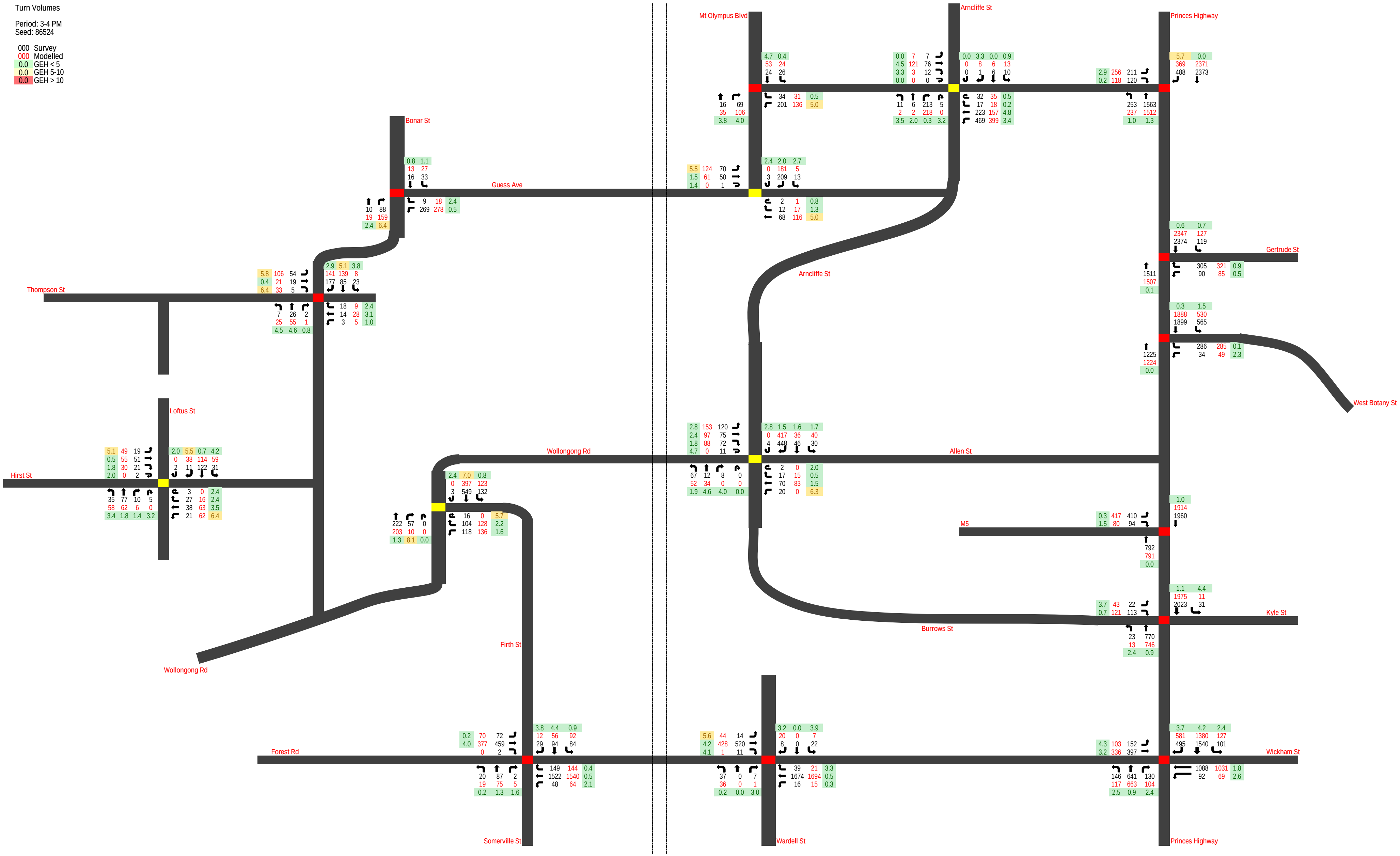


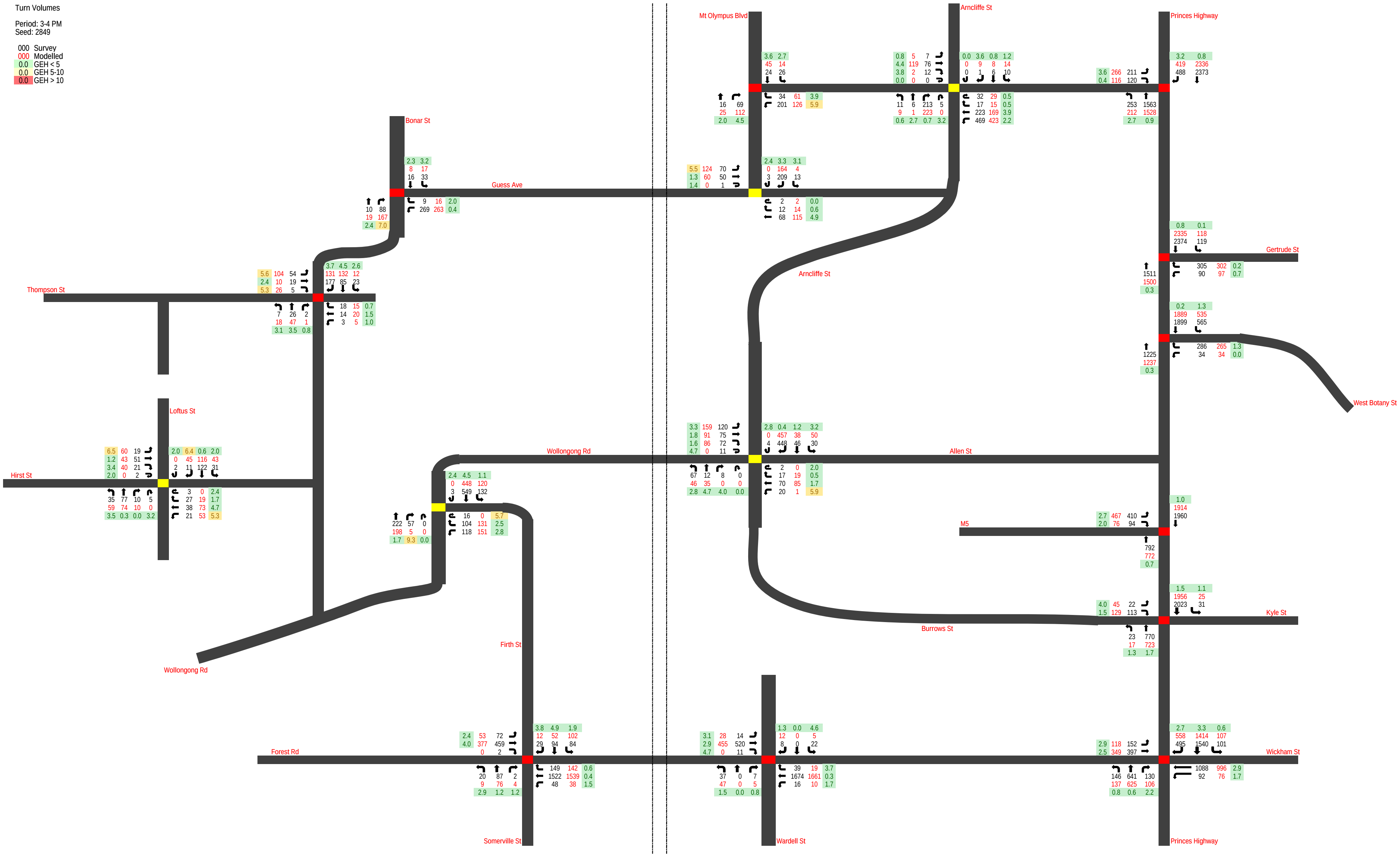

Turn Volumes
Period: 3-4 PM
Seed: 7771
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Thompson St
Gertrude St
West Botany St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Firth St
Forest Rd
Wickham St
Somerville St
Wardell St

Turn Volumes

Period: 3-4 PM
Seed: 86524

000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10

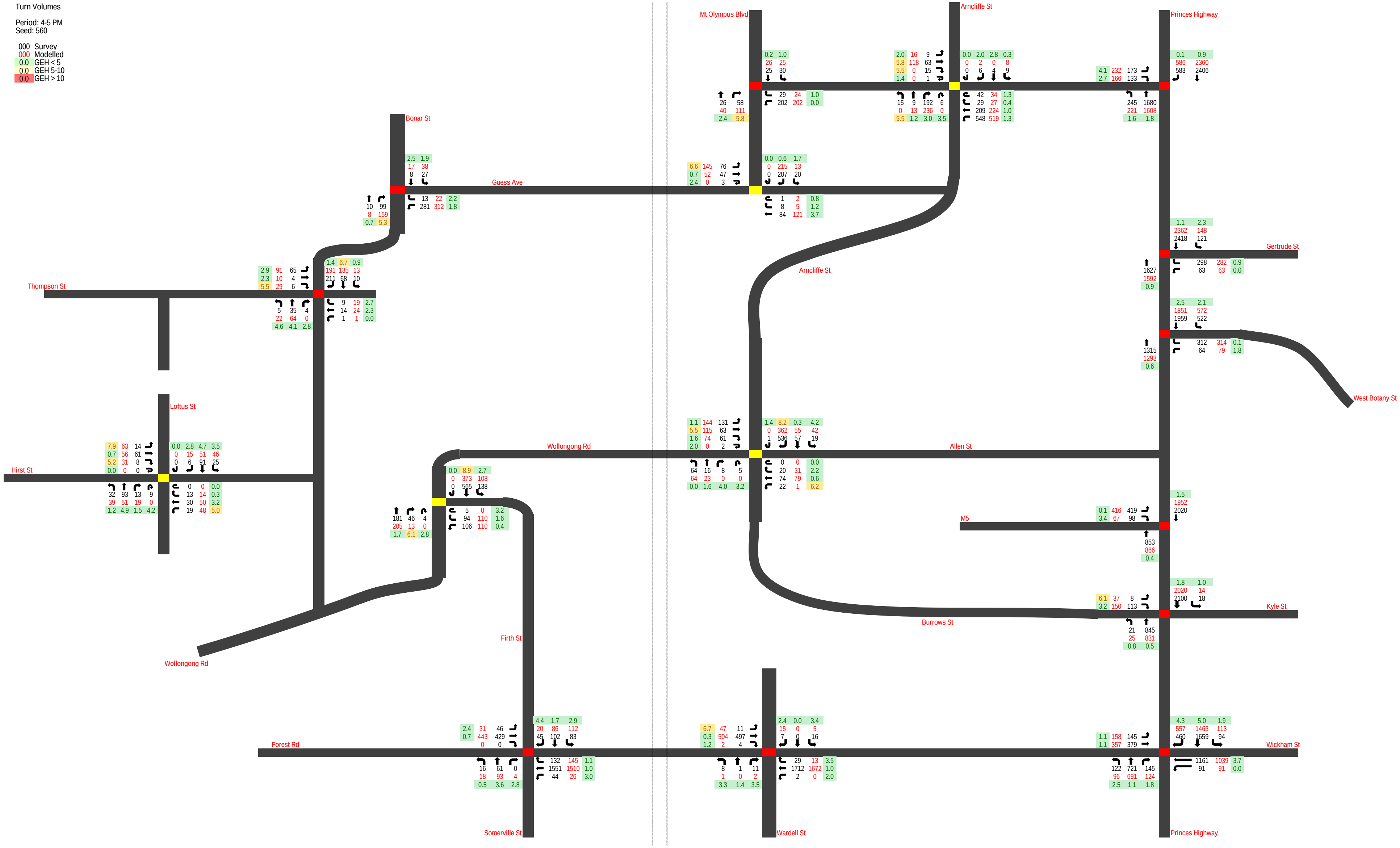


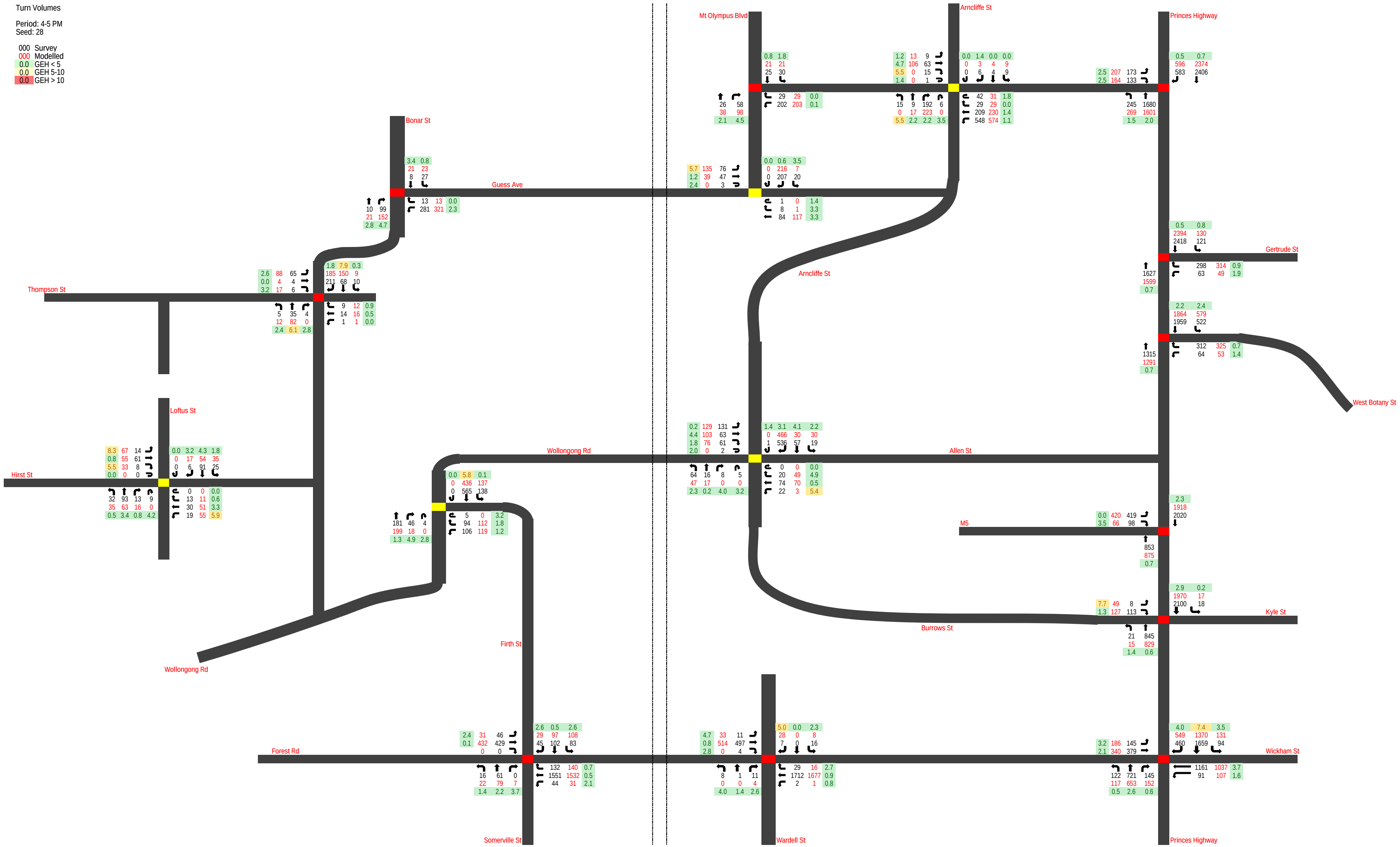

Turn Volumes
Period: 3-4 PM
Seed: 2849
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Thompson St
Gertrude St
Arncliffe St
West Botany St
Loftus St
Wollongong Rd
Allen St
Hirst St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

Turn Volumes

Period: 4-5 PM
Seed: 560

000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10

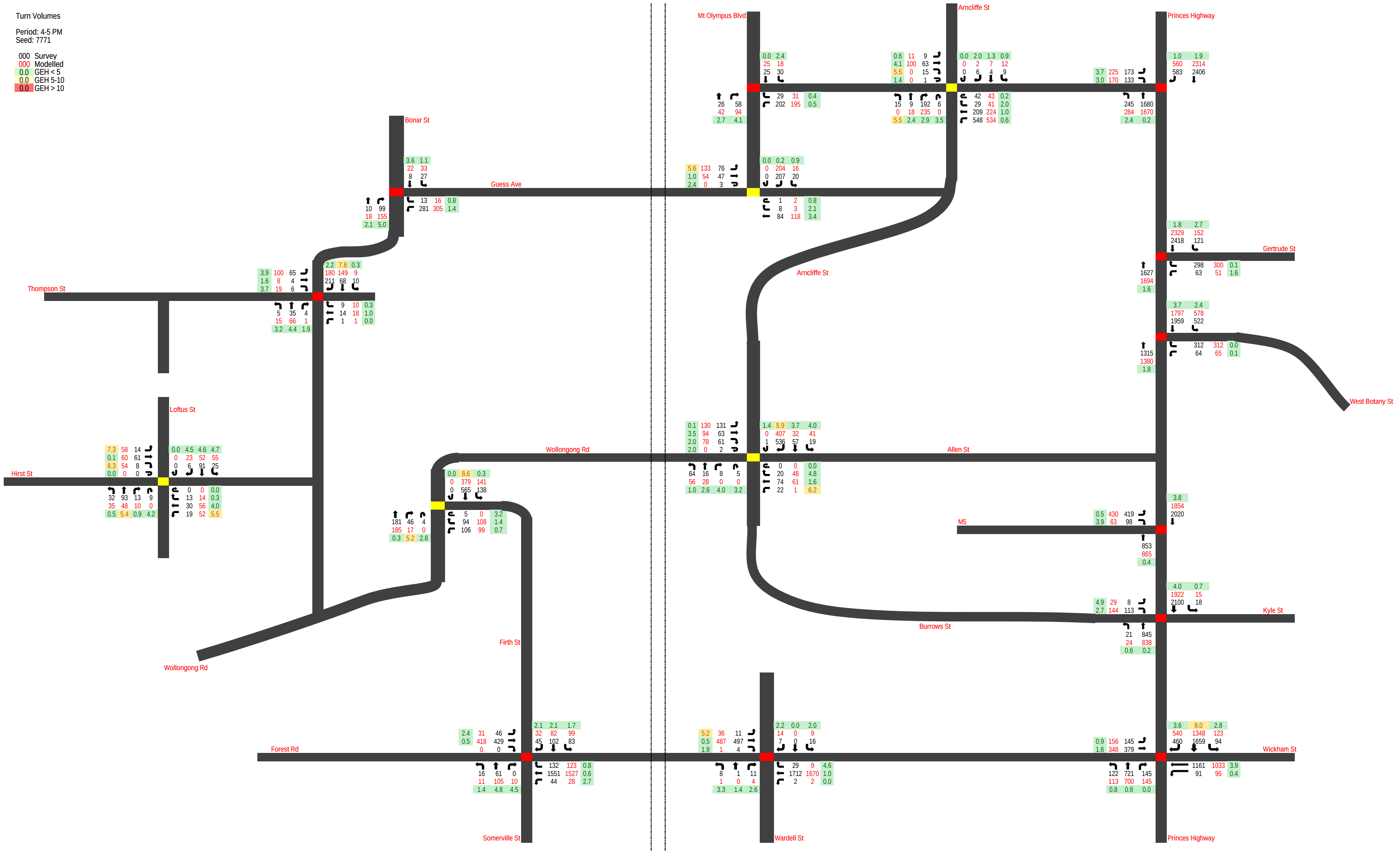


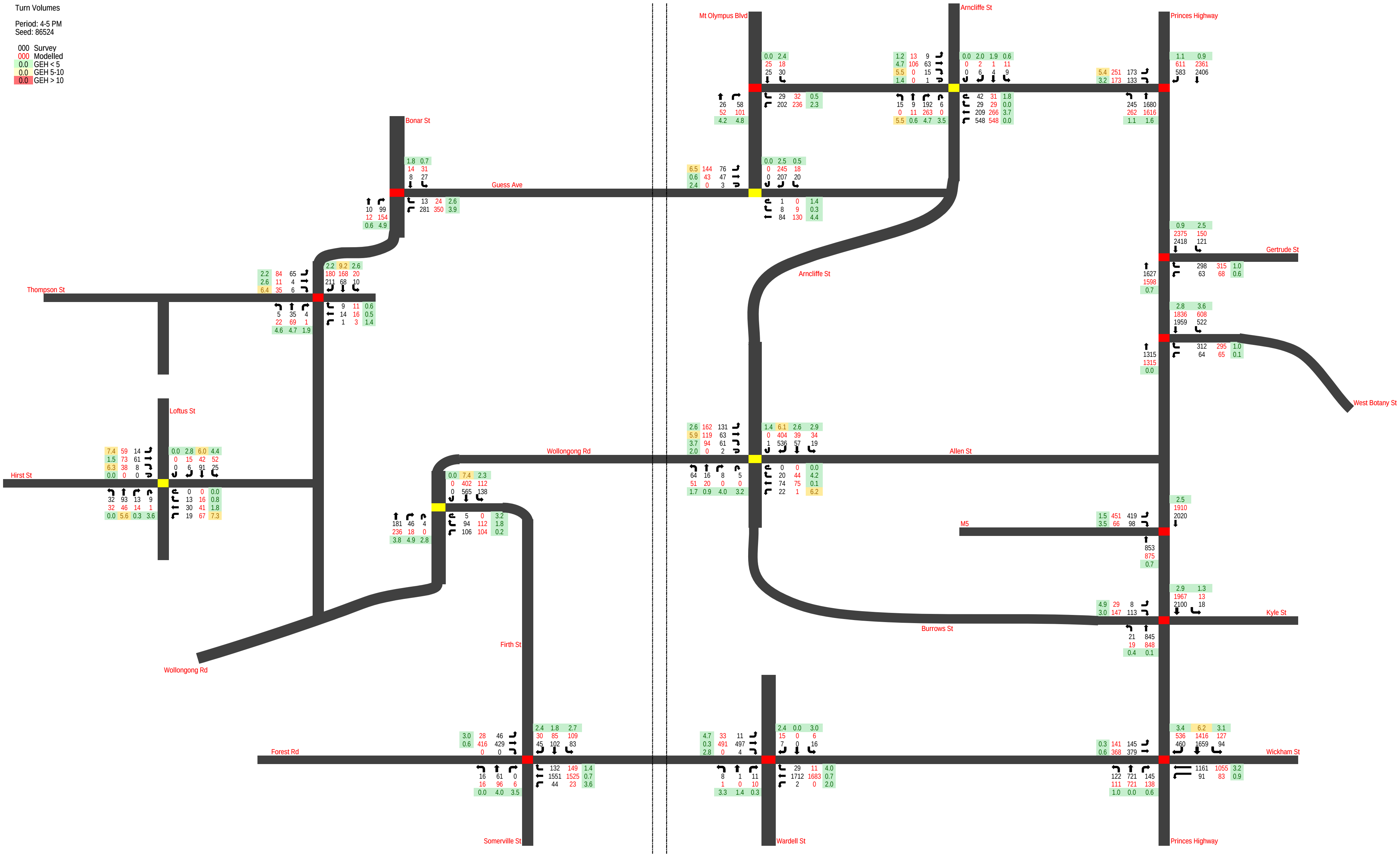

Turn Volumes
Period: 4-5 PM
Seed: 28
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Gertrude St
Thompson St
Arncliffe St
West Botany St
Loftus St
Wollongong Rd
Allen St
Hirst St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

Turn Volumes

Period: 4-5 PM
Seed: 7771

000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10

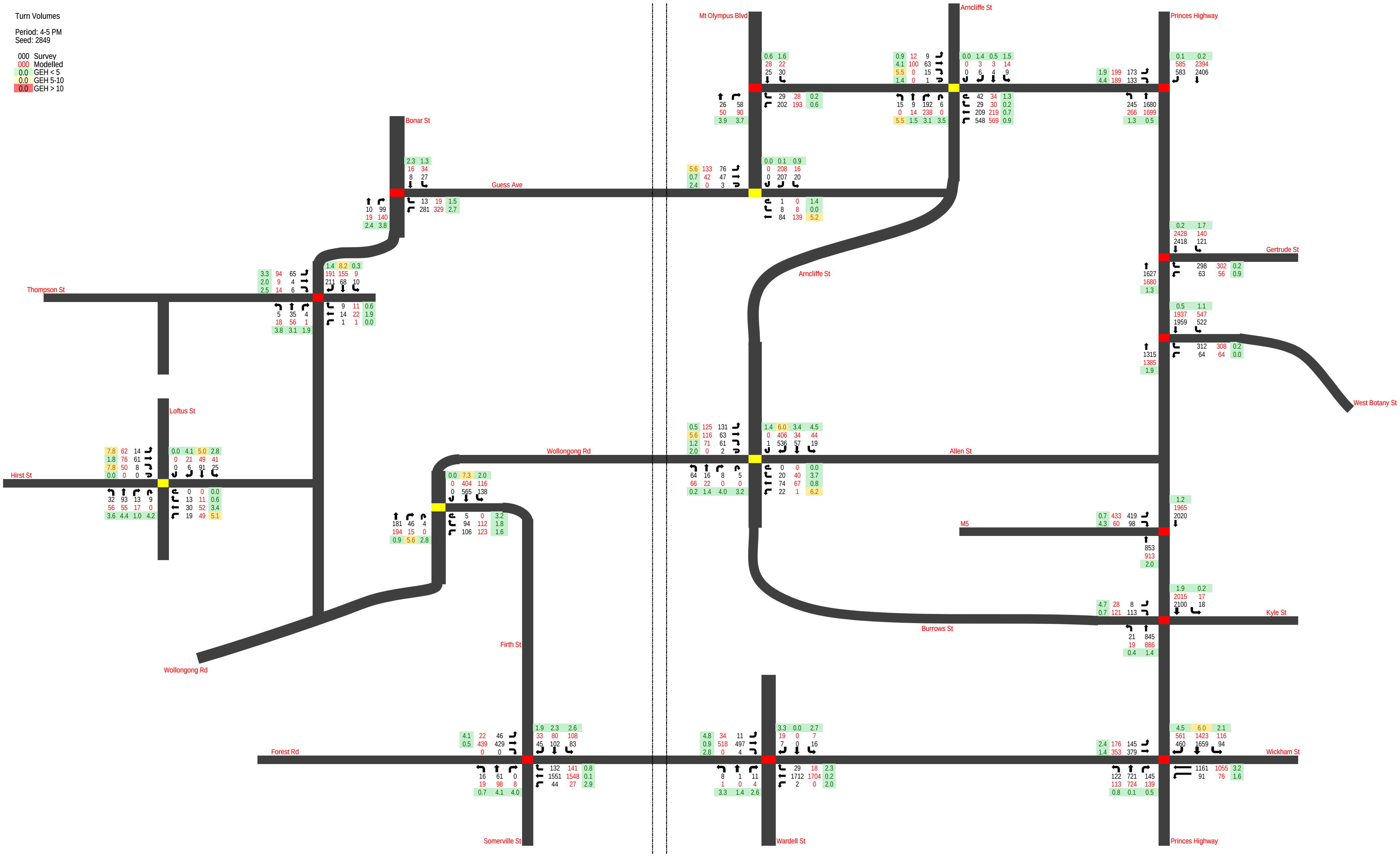



Turn Volumes
Period: 4-5 PM
Seed: 86524
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Gertrude St
Thompson St
Arncliffe St
West Botany St
Loftus St
Wollongong Rd
Allen St
Hirst St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

Turn Volumes

Period: 4-5 PM
Seed: 2849

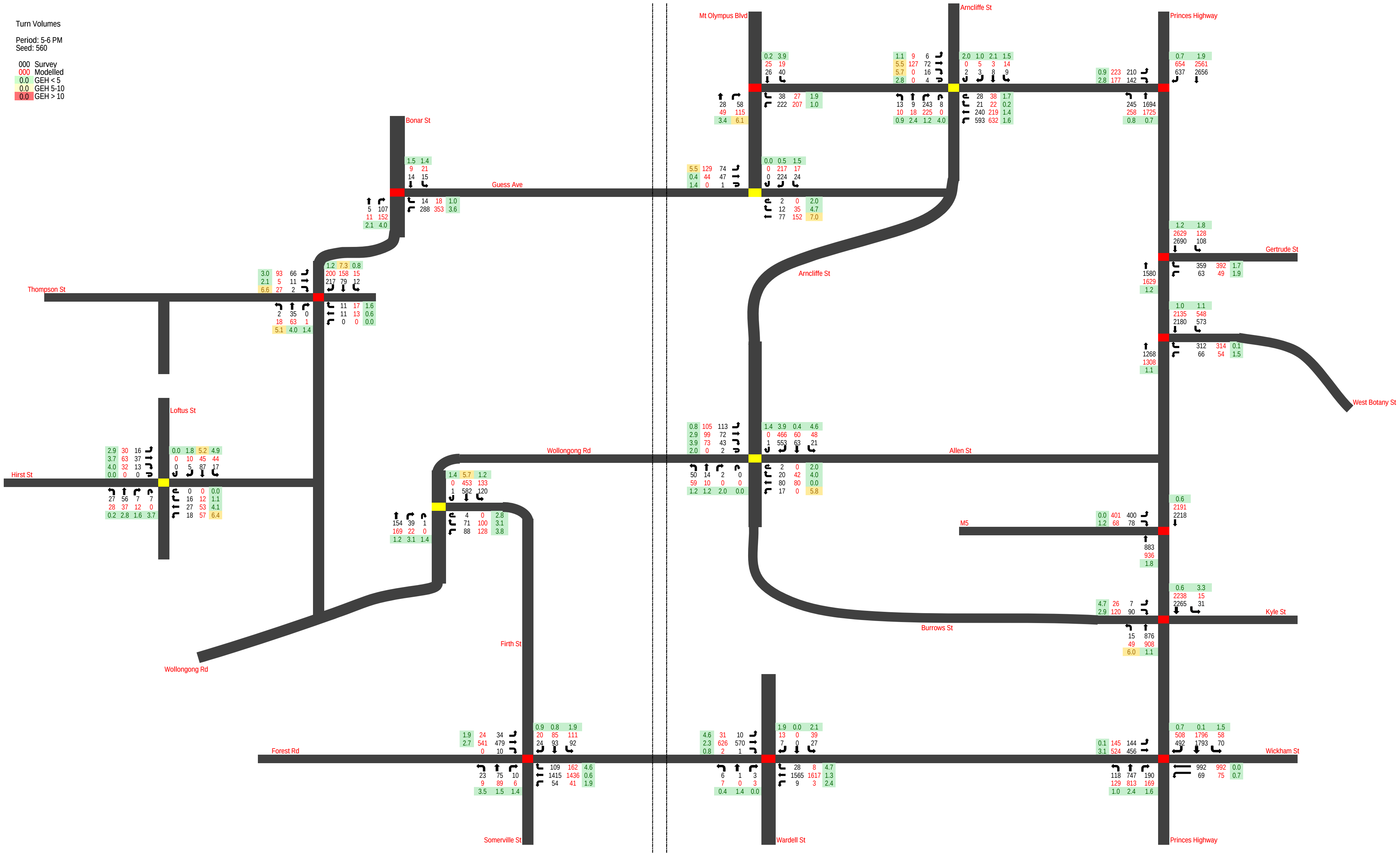
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10



Turn Volumes

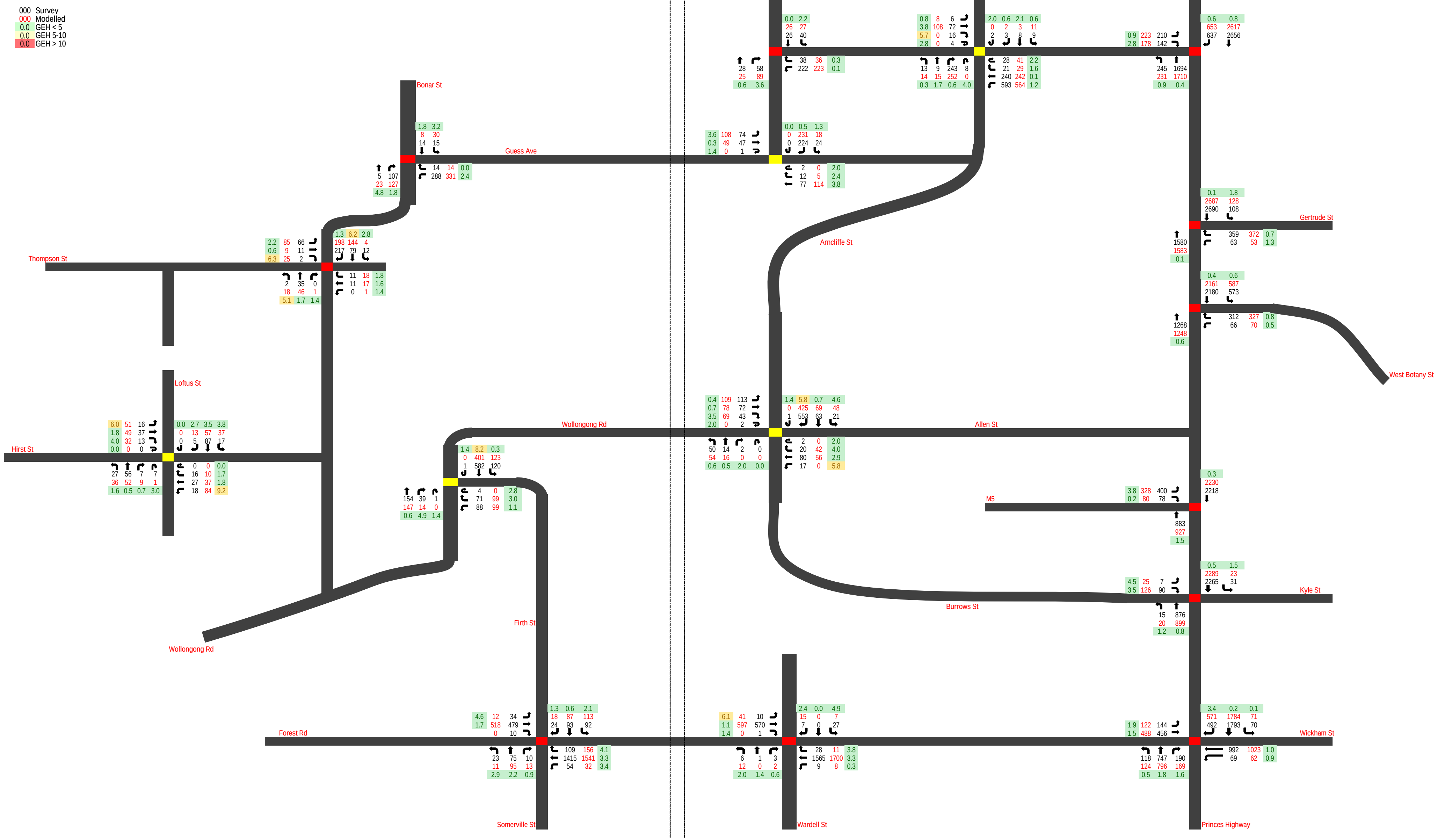
Period: 5-6 PM
Seed: 560

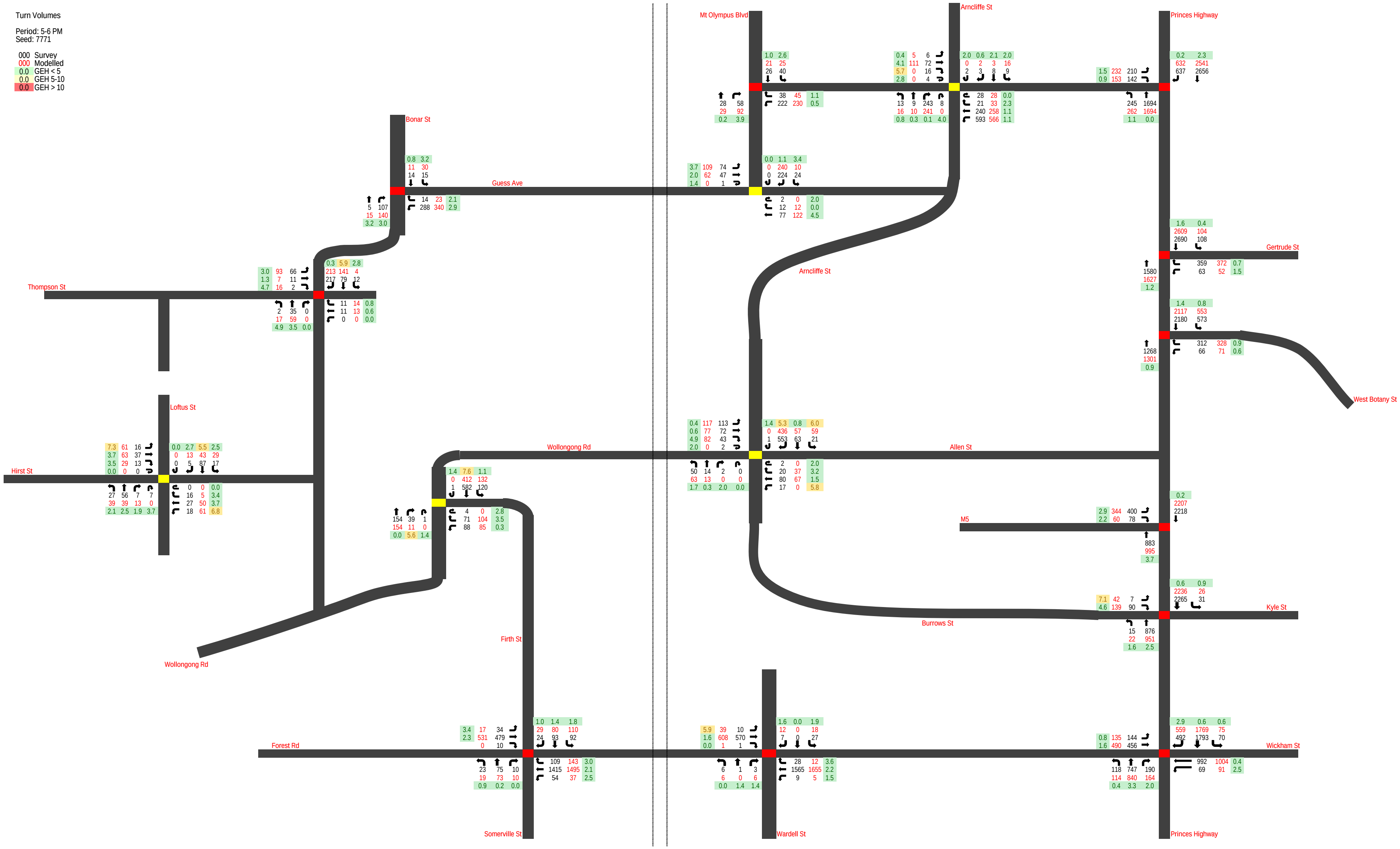
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10

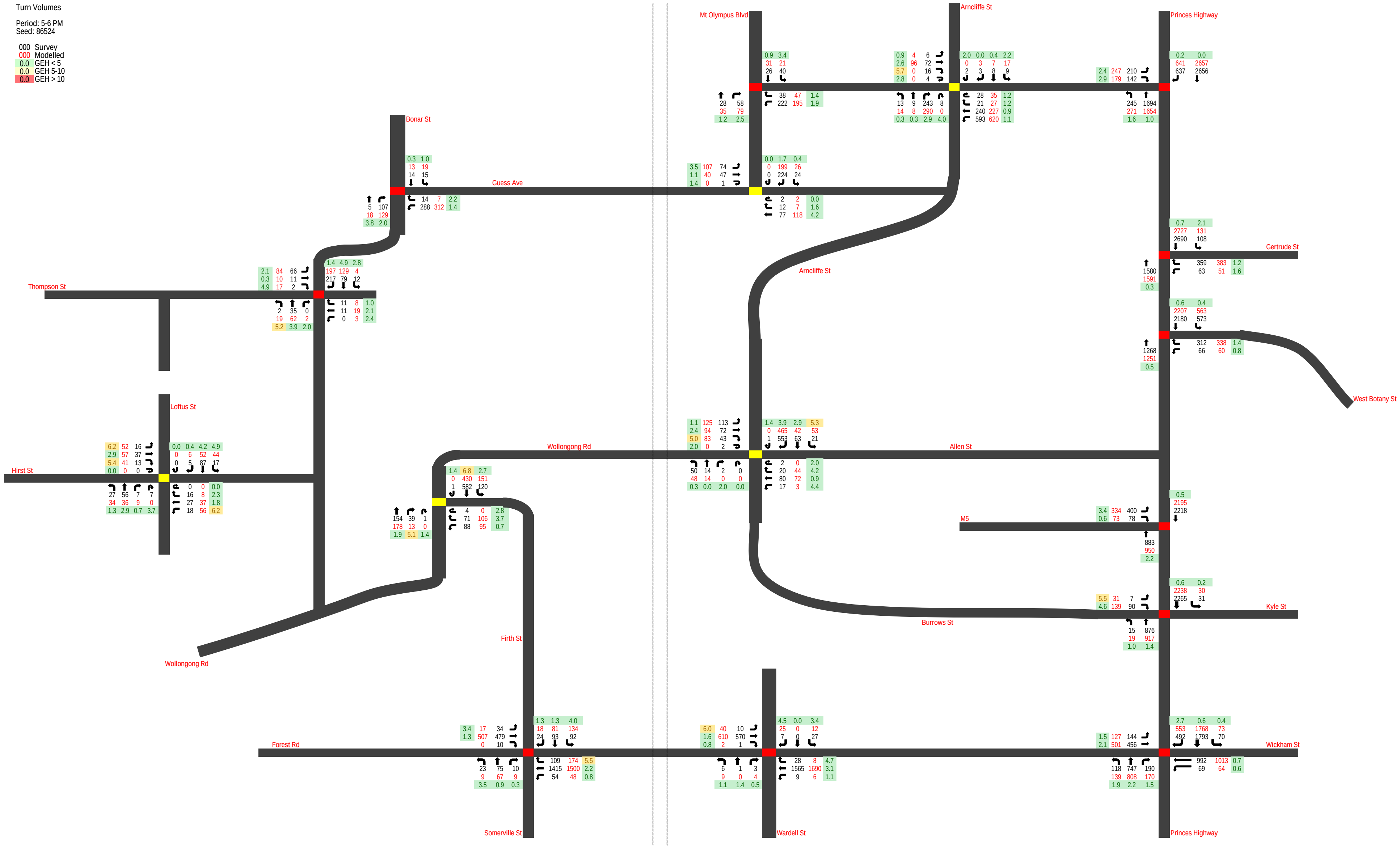


Turn Volumes

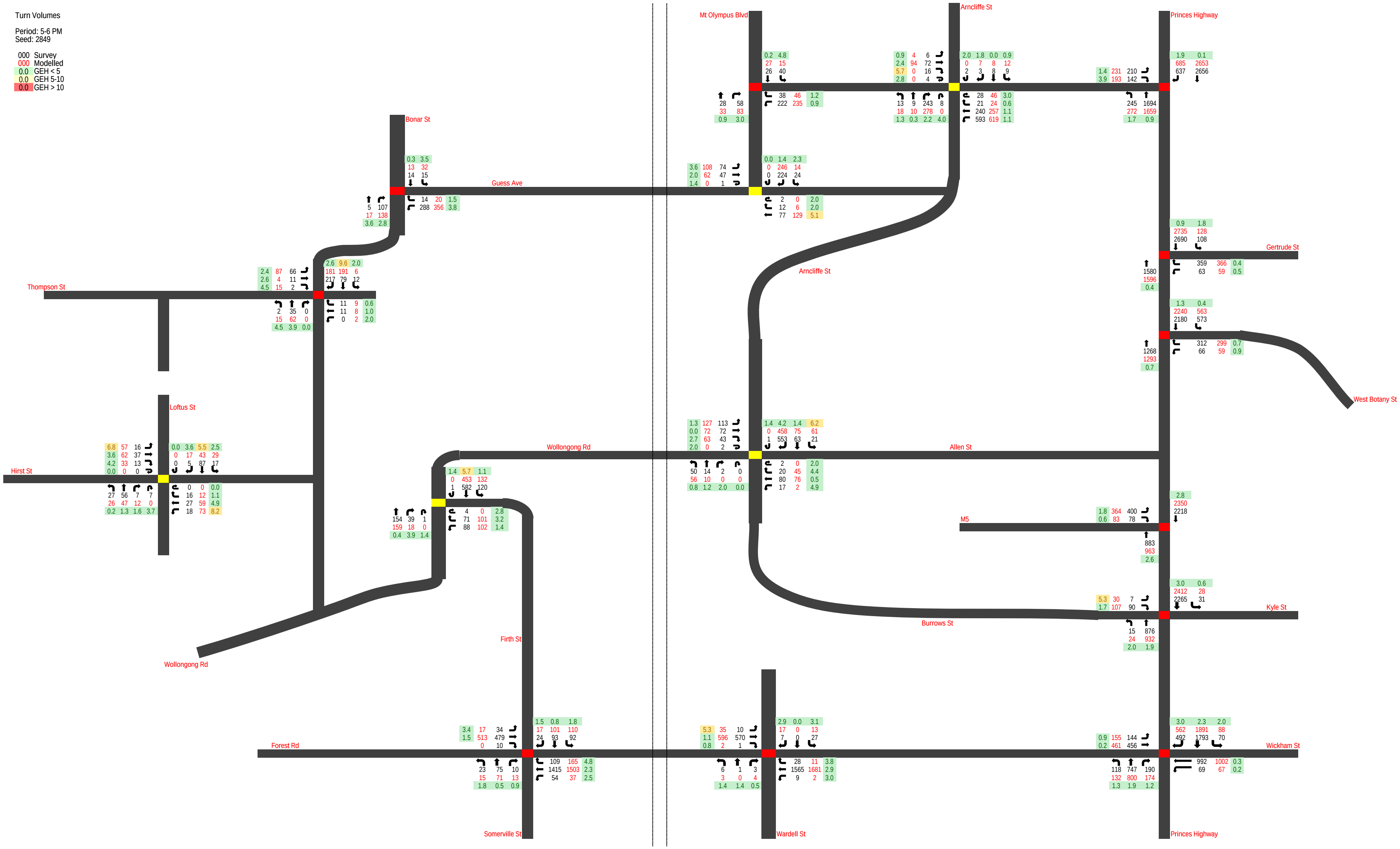
Period: 5-6 PM
Seed: 28




Turn Volumes
Period: 5-6 PM
Seed: 7771
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Gertrude St
Thompson St
Arncliffe St
West Botany St
Loftus St
Wollongong Rd
Allen St
Hirst St
M5
Kyle St
Firth St
Burrows St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway



Turn Volumes
Period: 5-6 PM
Seed: 86524
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Gertrude St
Thompson St
Arncliffe St
West Botany St
Loftus St
Hirst St
Wollongong Rd
Allen St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway


Turn Volumes
Period: 5-6 PM
Seed: 2849
000 Survey
000 Modelled
0.0 GEH < 5
0.0 GEH 5-10
0.0 GEH > 10
Mt Olympus Blvd
Arncliffe St
Princes Highway
Bonar St
Guess Ave
Gertrude St
Thompson St
Arncliffe St
West Botany St
Loftus St
Wollongong Rd
Allen St
Hirst St
M5
Kyle St
Burrows St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

APPENDIX E

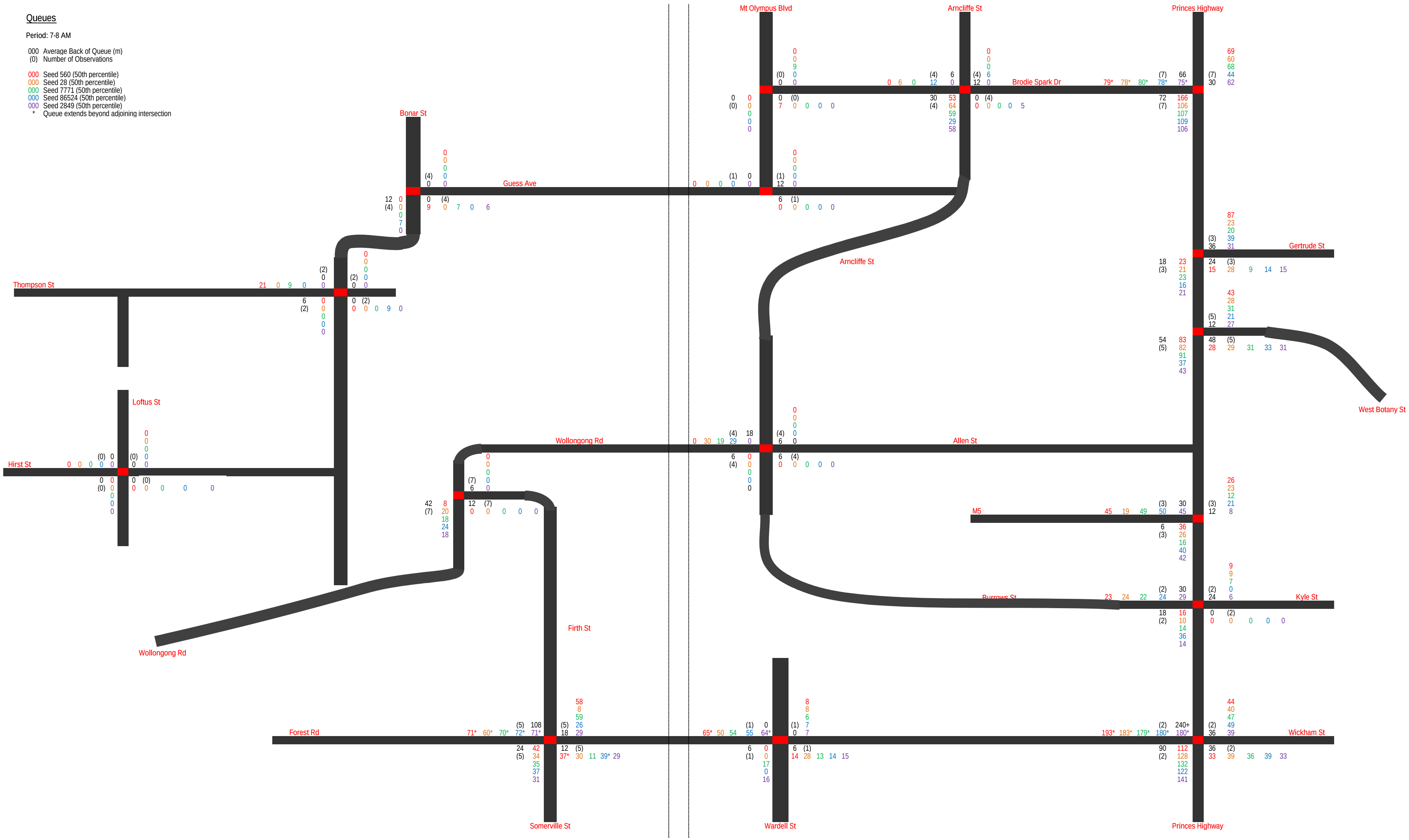
BACK OF QUEUE COMPARISON

Queues

Period: 7-8 AM

000 Average Back of Queue (m)
(0) Number of Observations

000 Seed 560 (50th percentile)
000 Seed 28 (50th percentile)
000 Seed 7771 (50th percentile)
000 Seed 86524 (50th percentile)
000 Seed 2849 (50th percentile)
* Queue extends beyond adjoining intersection

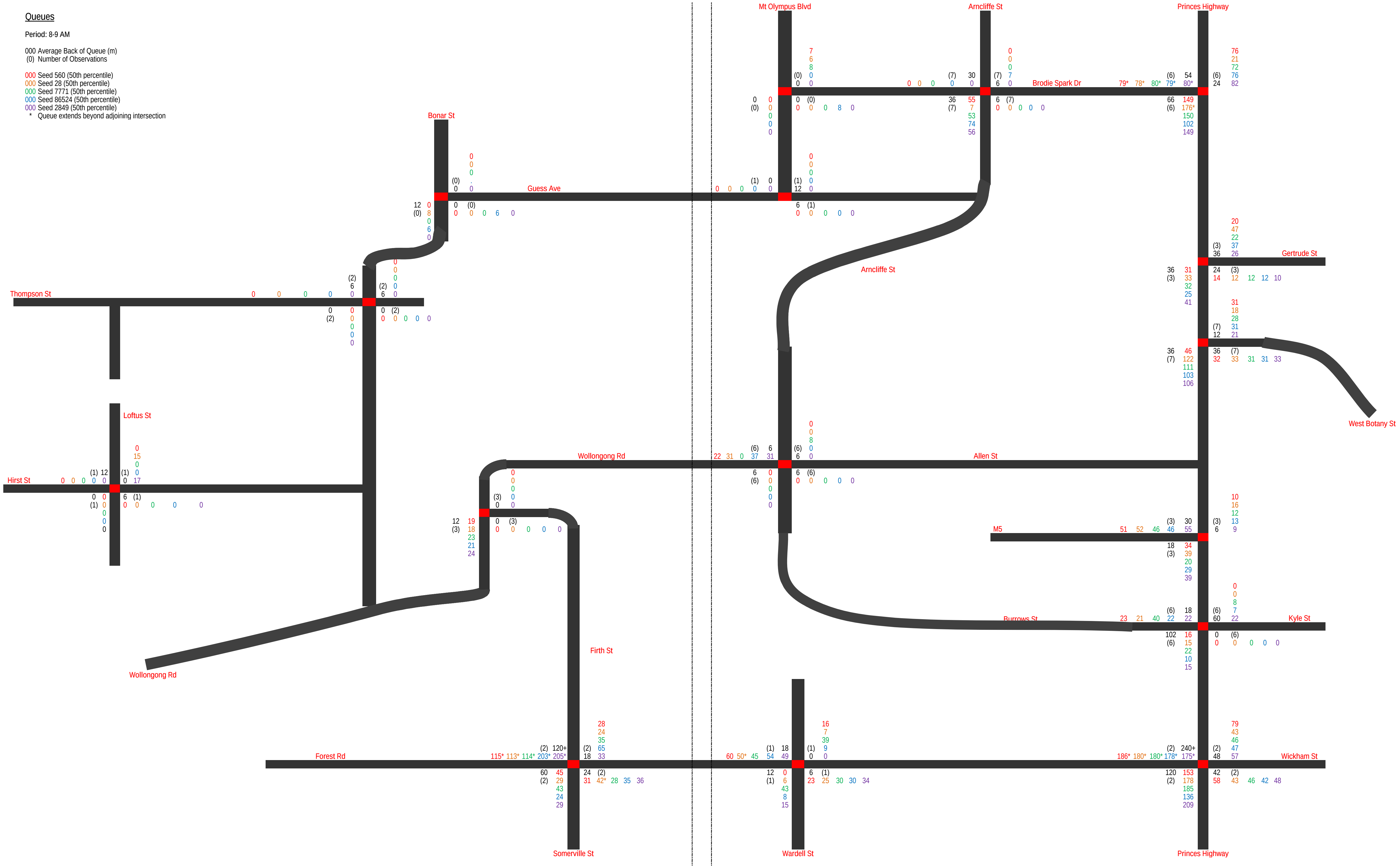


Queues

Period: 8-9 AM

000 Average Back of Queue (m)
(0) Number of Observations

000 Seed 560 (50th percentile)
000 Seed 28 (50th percentile)
000 Seed 7771 (50th percentile)
000 Seed 86524 (50th percentile)
000 Seed 2849 (50th percentile)
* Queue extends beyond adjoining intersection

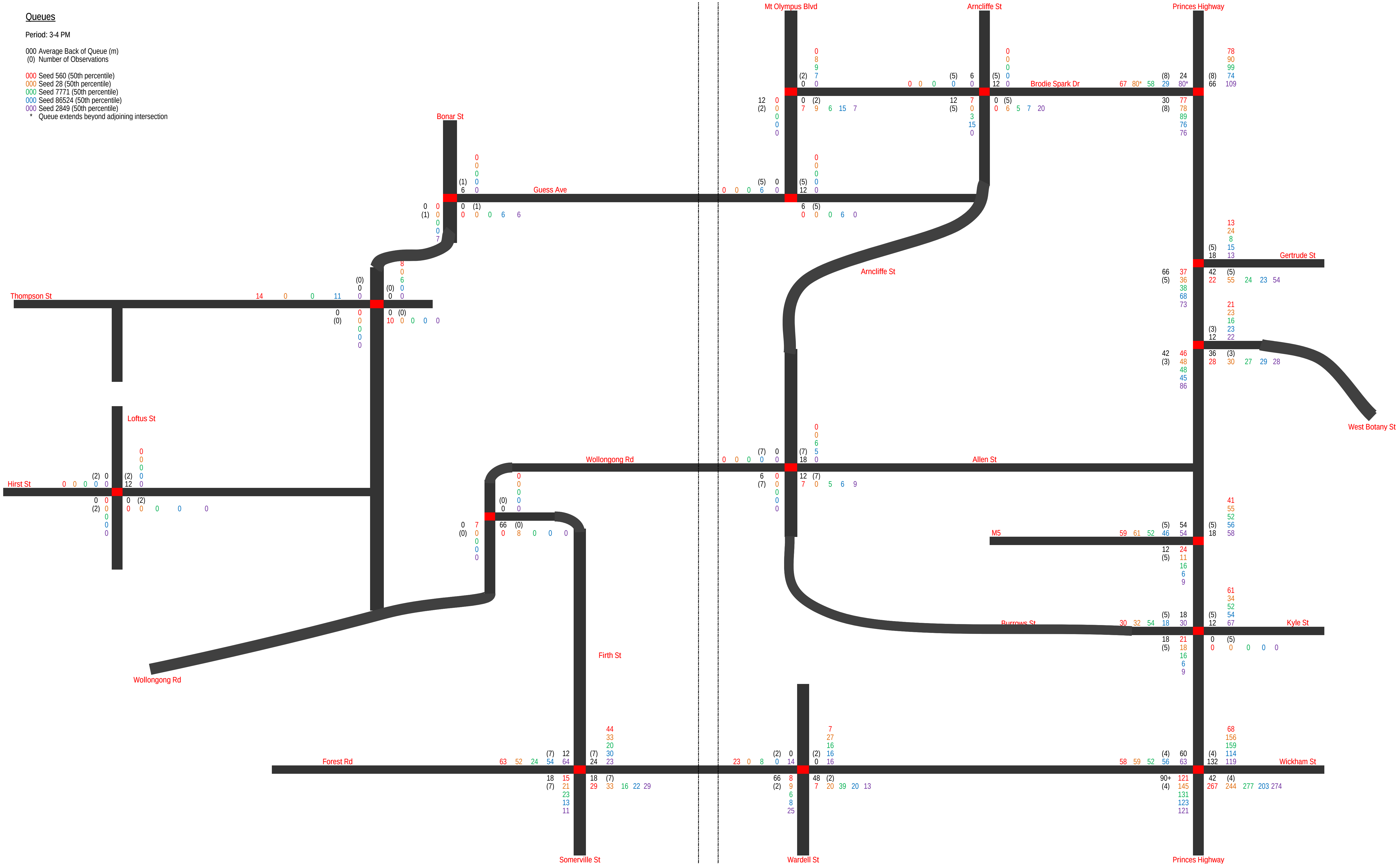


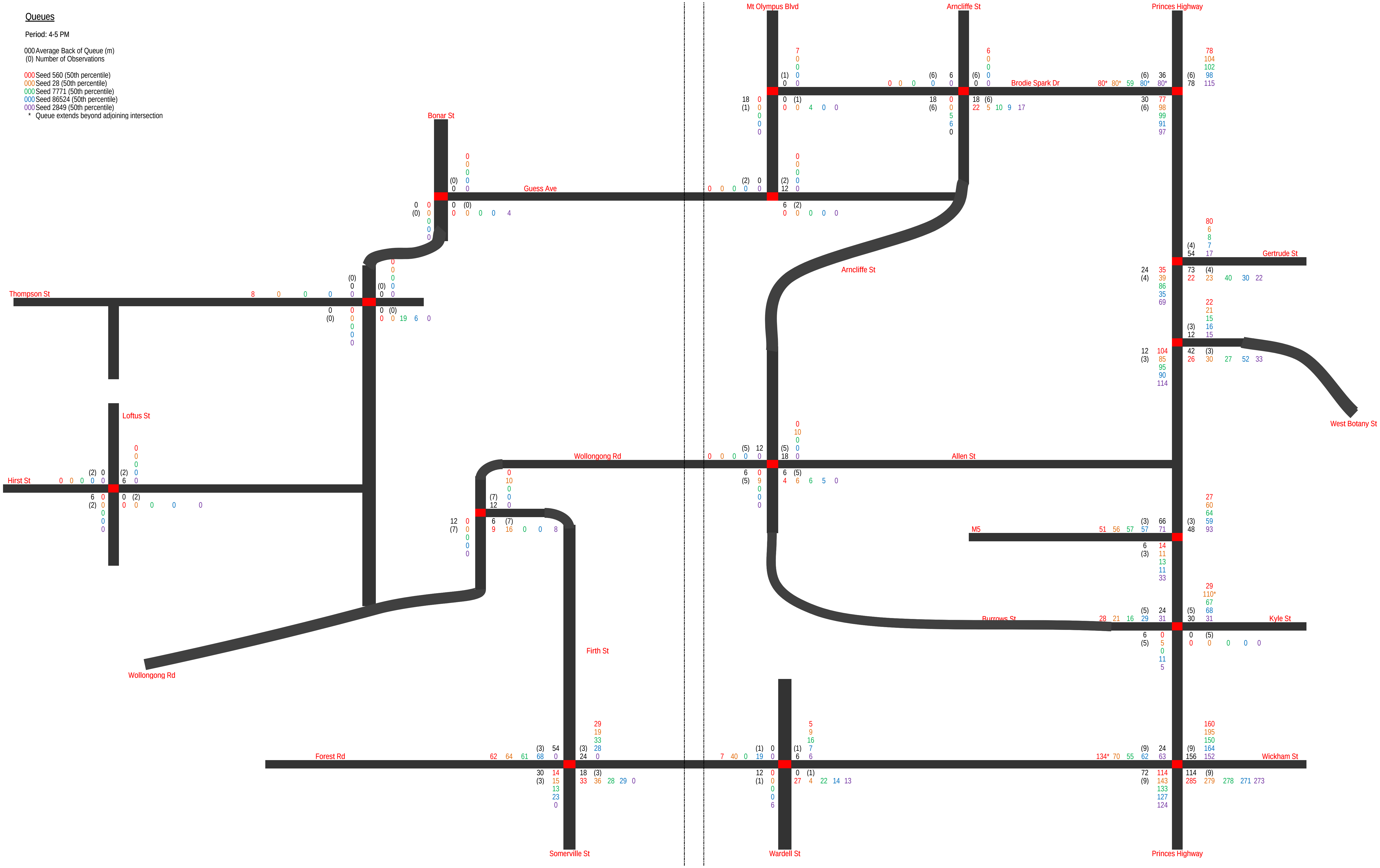
Queues

Period: 3-4 PM

000 Average Back of Queue (m)
(0) Number of Observations

000 Seed 560 (50th percentile)
000 Seed 28 (50th percentile)
000 Seed 7771 (50th percentile)
000 Seed 86524 (50th percentile)
000 Seed 2849 (50th percentile)
* Queue extends beyond adjoining intersection





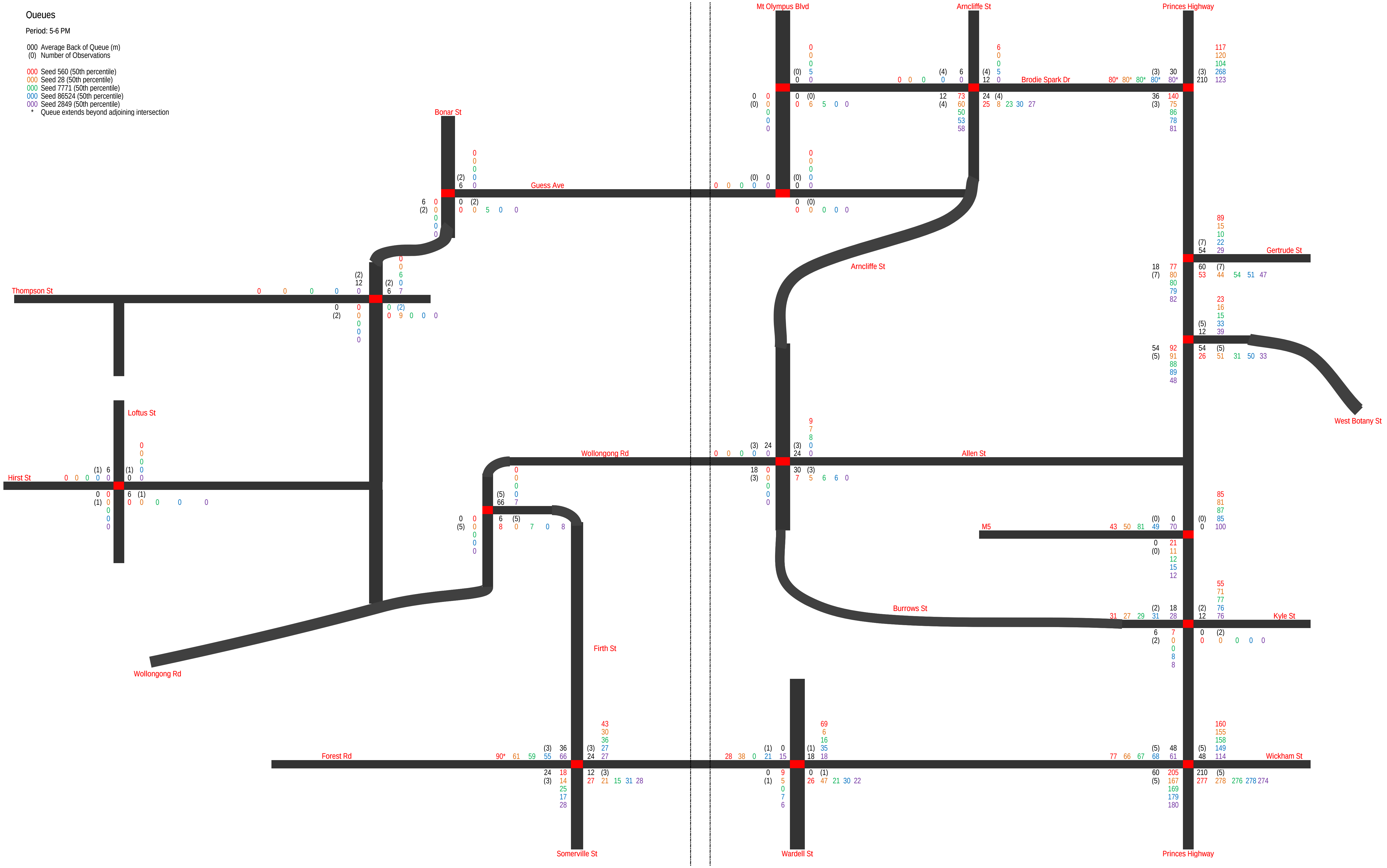
Queues
Period: 4-5 PM
000 Average Back of Queue (m)
(0) Number of Observations
000 Seed 560 (50th percentile)
000 Seed 28 (50th percentile)
000 Seed 7771 (50th percentile)
000 Seed 86524 (50th percentile)
000 Seed 2849 (50th percentile)
* Queue extends beyond adjoining intersection
Mt Olympus Blvd
Arncliffe St
Princes Highway
Brodie Spark Dr
Bonar St
Guess Ave
Gertrude St
Arncliffe St
Thompson St
West Botany St
Loftus St
Wollongong Rd
Allen St
Hirst St
M5
Burrows St
Kyle St
Firth St
Wollongong Rd
Forest Rd
Wickham St
Somerville St
Wardell St
Princes Highway

Queues

Period: 5-6 PM

000 Average Back of Queue (m)
(0) Number of Observations

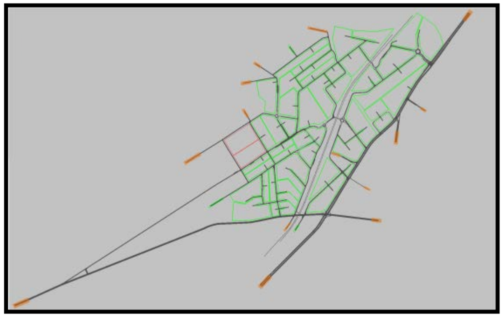
000 Seed 560 (50th percentile)
000 Seed 28 (50th percentile)
000 Seed 7771 (50th percentile)
000 Seed 86524 (50th percentile)
000 Seed 2849 (50th percentile)
* Queue extends beyond adjoining intersection

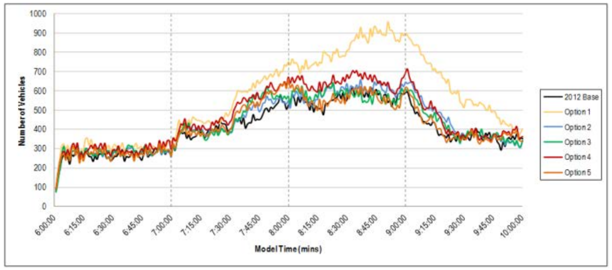


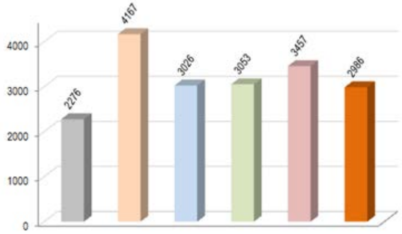
APPENDIX B

PREFERRED OPTION PERFORMANCE SUMMARY

Wolli Creek and Bonar Precinct
Future Year Options Outputs





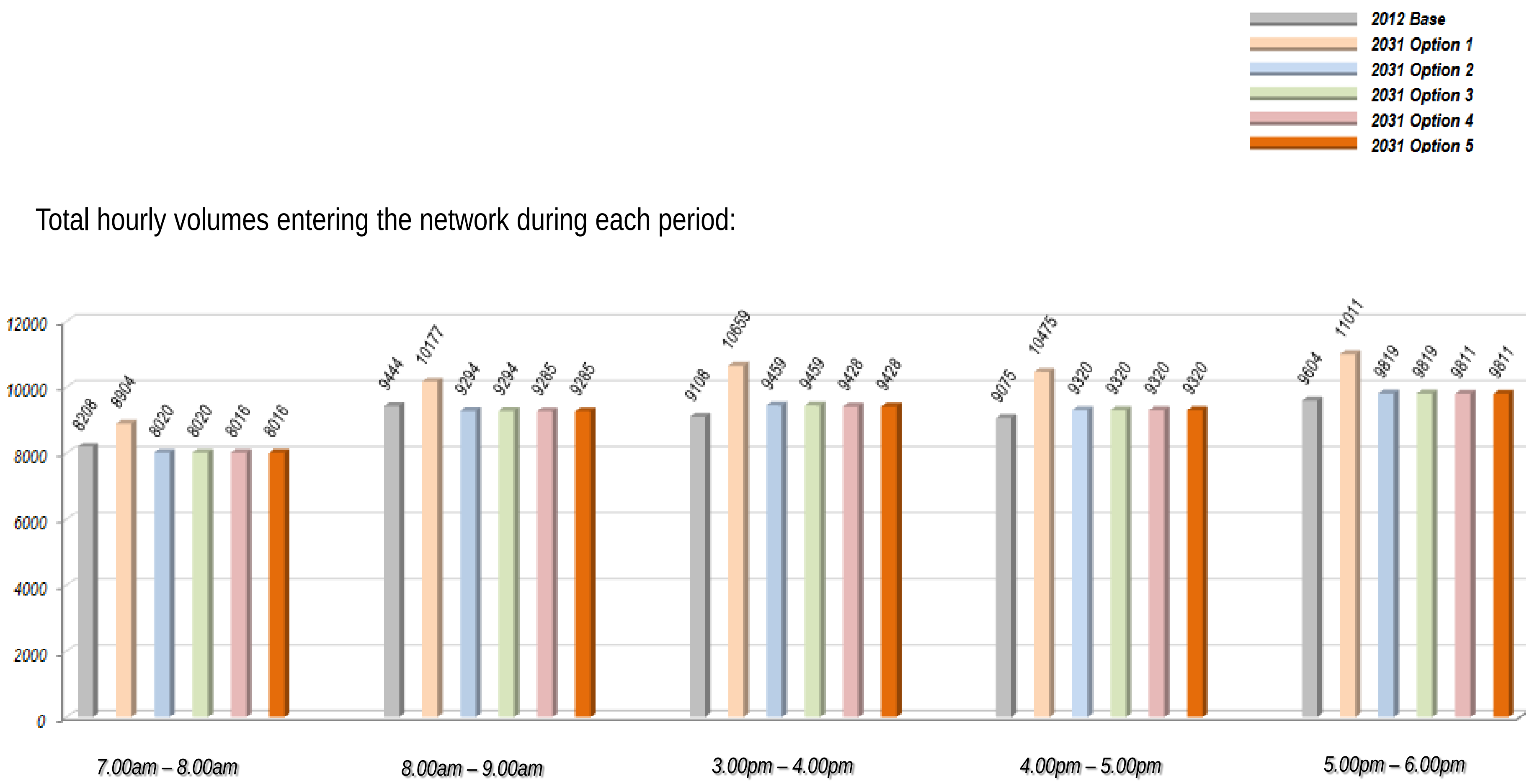


Adrian Bitzios

<table>
<tr><th></th><th>Option Description</th></tr>
<tr><td>2031 Option 1</td><td><u>Road network based on implementation of the DCP. Modifications to the model as follows:</u>
- "Discovery Point" site fully developed; internal network added to the model.
- Internal roads added within the Bonar Street precinct (roads 7 and 8) as per the PDP
- Wollongong Road / Firth Street roundabout converted to a signalised intersection (Road 7 is the northern leg of this intersection)
- Right turn from Allen Street onto Wollongong Road barred.
- Contra flow arrangements added to the model (Forest Road / Wickham Road / Princes Highway intersection).
- Signal phasing arrangements adjusted as necessary to match new conditions.
- Trip generation based on RMS rates (aligned with current mode share).</td></tr>
<tr><td>2031 Option 2</td><td><u>Same road network as Option 1. Trip generation amended to match following mode share targets:</u>
<table>
<tr><th></th><th>Train</th><th>Bus</th><th>Taxi</th><th>Car (Driver)</th><th>Car (Pass.)</th><th>Bicycle</th><th>Walk</th><th>Other</th></tr>
<tr><td>2011</td><td>51.0%</td><td>0.8%</td><td>0.3%</td><td>33.3%</td><td>2.8%</td><td>0.2%</td><td>1.7%</td><td>9.9%</td></tr>
<tr><td>2031</td><td>55.0%</td><td>0.5%</td><td>1.0%</td><td>27.6%</td><td>3.0%</td><td>1.0%</td><td>2.0%</td><td>9.9%</td></tr>
</table>
- Signal phasing arrangements adjusted as necessary to match new conditions.</td></tr>
<tr><td>2031 Option 3</td><td><u>Same demands as Option 2 (i.e. target mode share).</u>
- Princes Highway / Allen Street intersection converted to a signalised intersection with right turn permitted from Princes Highway onto Allen Street.
- Right turn out of Allen Street not permitted - southbound traffic unopposed and therefore does not have to stop at the signals (two lanes southbound / one lane for the right turn pocket)
- Signal phasing arrangements adjusted as necessary to match new conditions.</td></tr>
<tr><td>2031 Option 4</td><td><u>Same demands as Option 2 (i.e. target mode share).</u>
- Arncliffe Street converted to a cul de sac south of Guess Avenue
- Clockwise "one-way" circuit along Arncliffe Street, Guess Avenue, Mount Olympus Boulevard and Magdalene Terrace (only Magdalene Terrace maintains two-way traffic)
- Brodie Spark Drive / Arncliffe Street roundabout removed. Intersection converted to give-way. Access to/from Discovery Point operates as a "left-in/left-out".
- Right turn from Bonar Street onto Wollongong Road barred.
- Signal phasing arrangements adjusted as necessary to match new conditions.</td></tr>
<tr><td>2031 Option 5</td><td><u>Same demands as Option 2 (i.e. target mode share).</u>
- Same road network as Option 4 except for the following modifications:
  - cul de sac at Arncliffe Street removed. Two way circulation permitted south of Guess Avenue.
  - removal of the right turn from the Princes Highway onto Allen Street.</td></tr>
</table>

Total Demands

Total hourly volumes entering the network during each period:



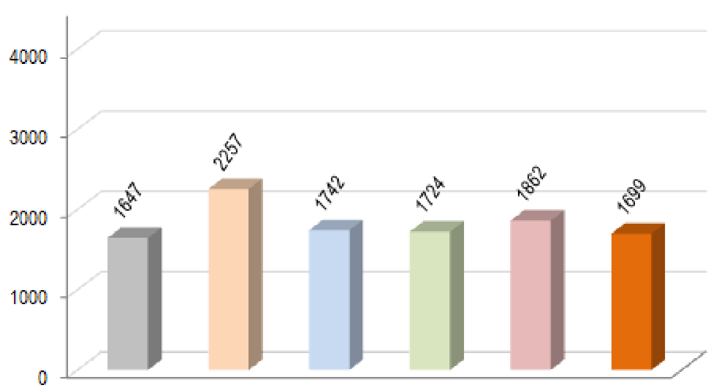
Vehicle Hours Travelled

Vehicle Hours Travelled

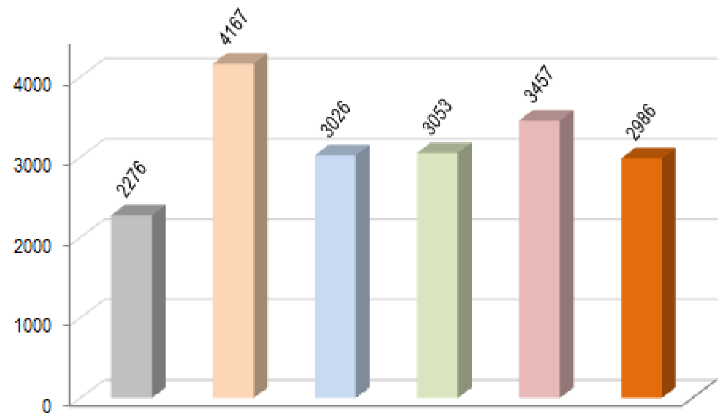
	2012 Base	2031				
		Option 1	Option 2	Option 3	Option 4	Option 5
AM	1647	2257	1742	1724	1862	1699
PM	2276	4167	3026	3053	3457	2986

note : includes warm up & cool down periods

2012 Base
2031 Option 1
2031 Option 2
2031 Option 3
2031 Option 4
2031 Option 5

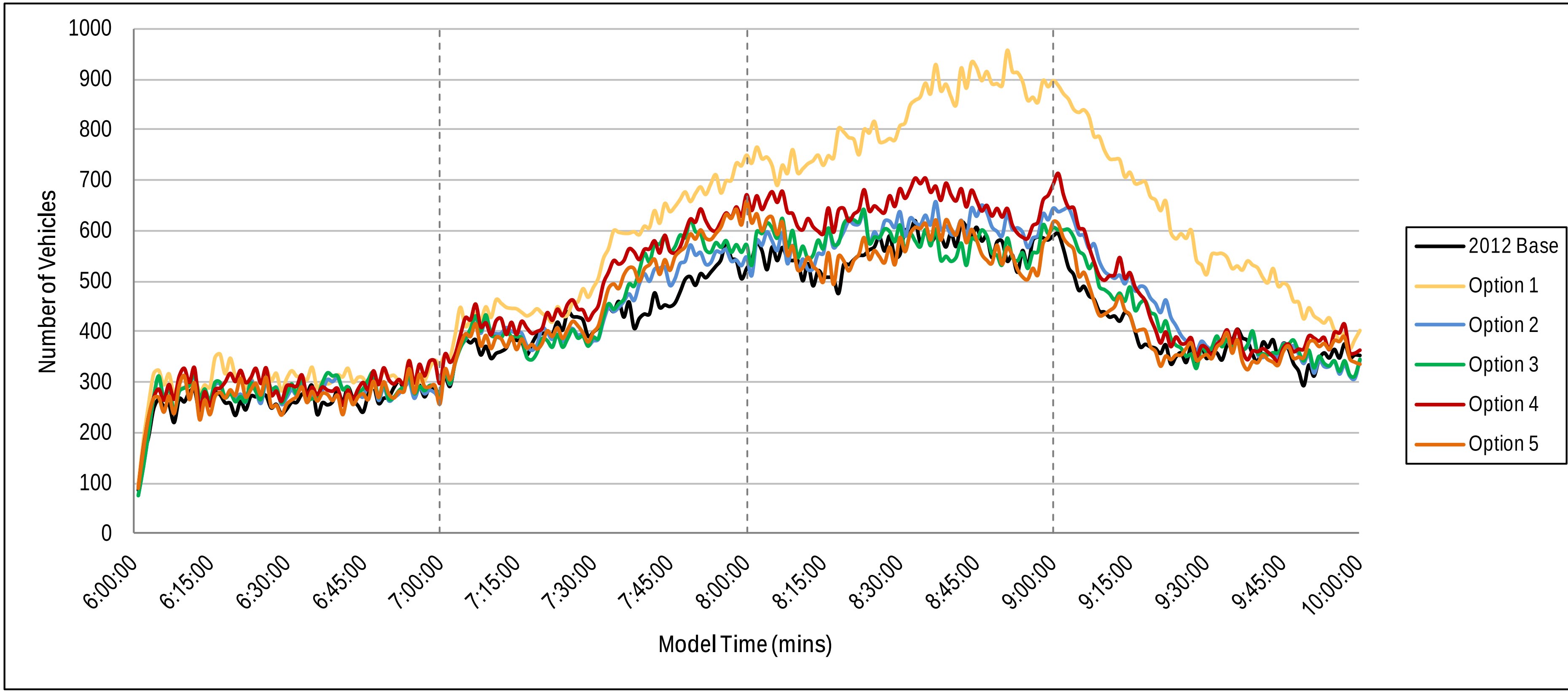


AM Peak

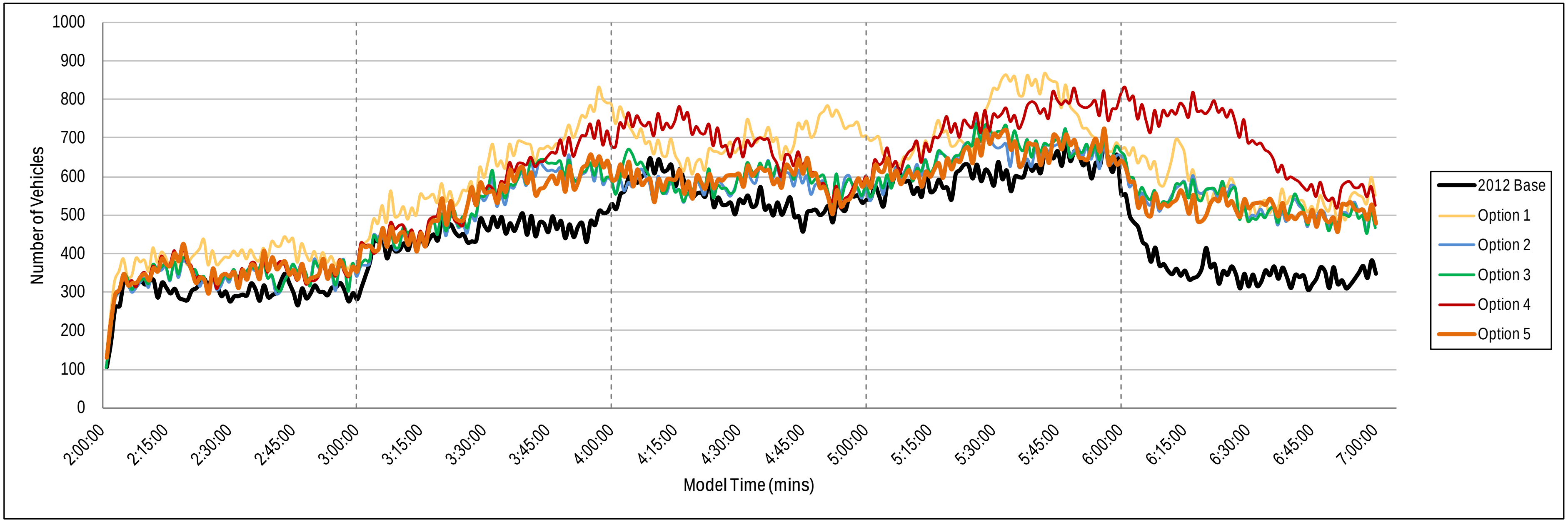


PM Peak

Number of Vehicles on the Network – AM Peak



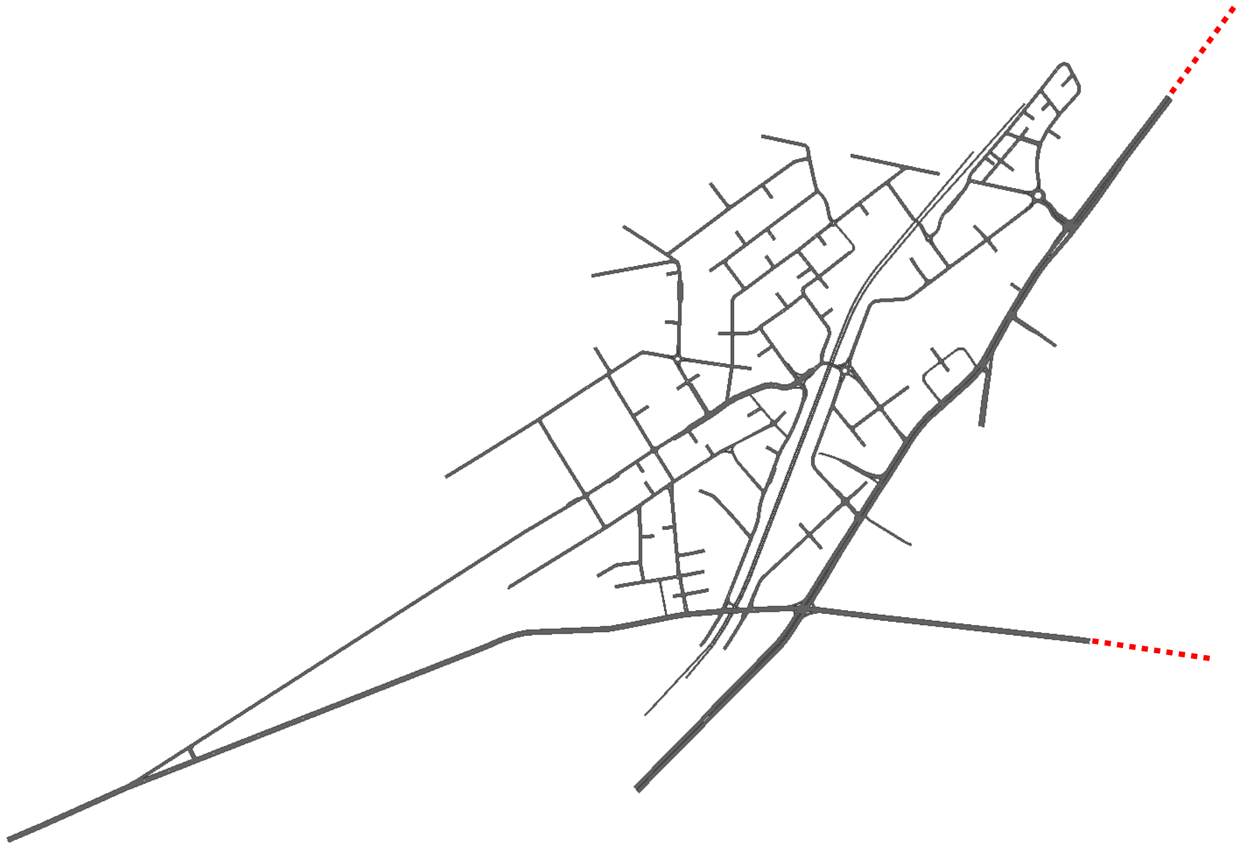
Number of Vehicles on the Network – PM Peak



Unreleased Vehicles

Note:

The AM models show no unreleased vehicles



Number of vehicles that could not enter the network due to congestion along the Princes Highway (SB) :

at 4.00pm				
Option 1	Option 2	Option 3	Option 4	Option 5
0	0	0	89	0

at 5.00pm				
Option 1	Option 2	Option 3	Option 4	Option 5
0	0	0	0	0

at 6.00pm				
Option 1	Option 2	Option 3	Option 4	Option 5
186	0	0	248	0

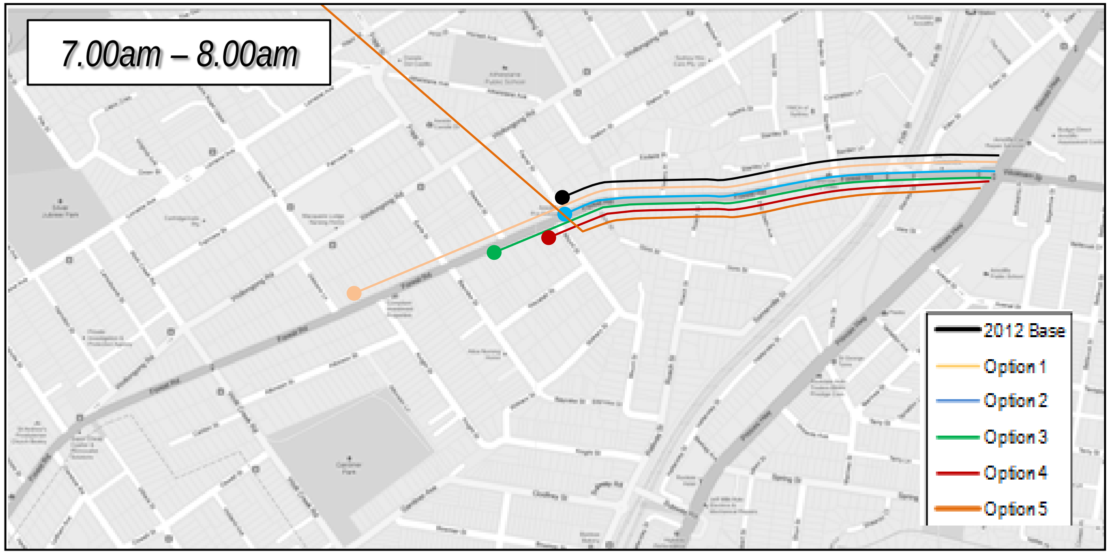
Number of vehicles that could not enter the network due to congestion along Wickham Street (WB) :

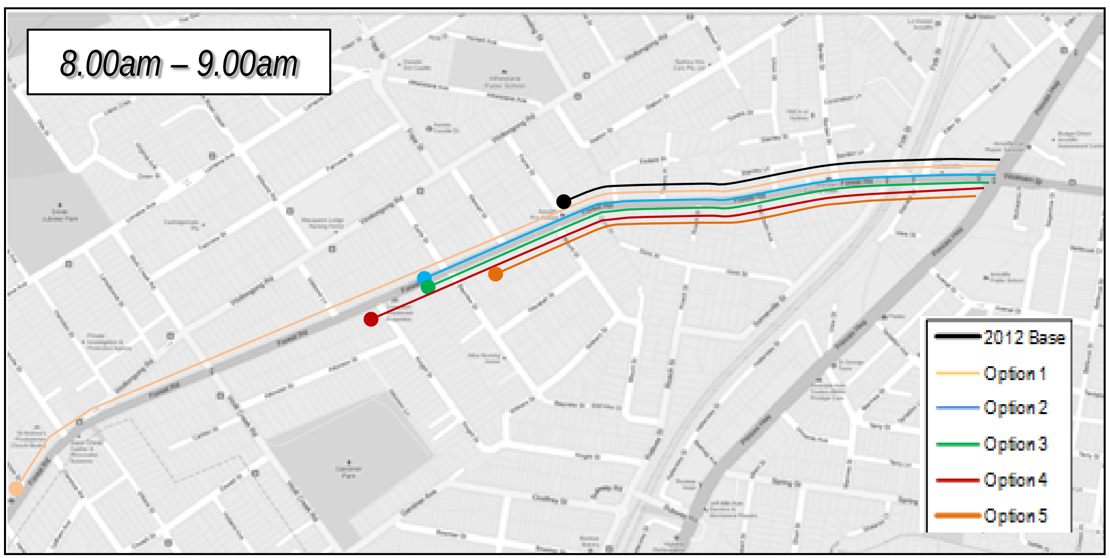
at 4.00pm				
Option 1	Option 2	Option 3	Option 4	Option 5
120	76	70	0	18

at 5.00pm				
Option 1	Option 2	Option 3	Option 4	Option 5
314	193	189	123	138

at 6.00pm				
Option 1	Option 2	Option 3	Option 4	Option 5
430	193	194	165	201

Eastbound Queues on Forest Road





Maximum Queue Length on Forest Rd (Eastbound)

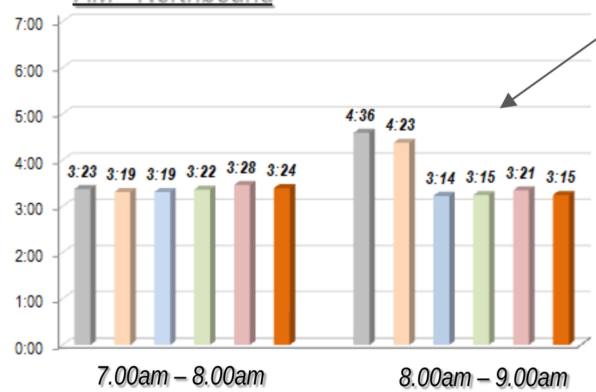
	2012 Base	2031				
		Option 1	Option 2	Option 3	Option 4	Option 5
7.00 am - 8.00 am	755m	1140m	770m	930m	870m	760m
8.00 am - 9.00 am	750m	1910m	1050m	1040m	1190m	960m

Travel Times (Princes Highway)

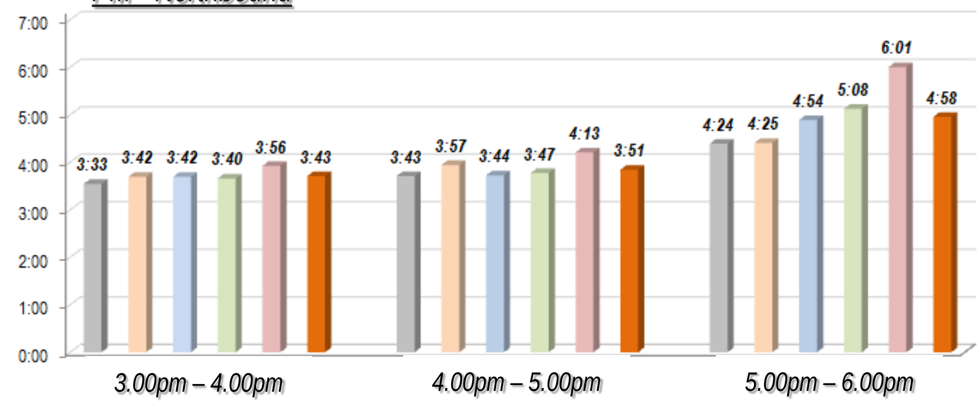
Average travel times between the southern and northern extremity of the model along the Princes Highway

Note: 2031 models include "contraflow" arrangements at the Princes Highway / Wickham St intersection with modified signal phasing favouring NB traffic

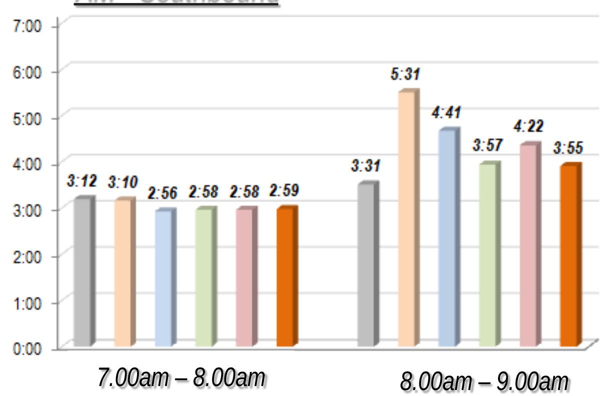
AM - Northbound



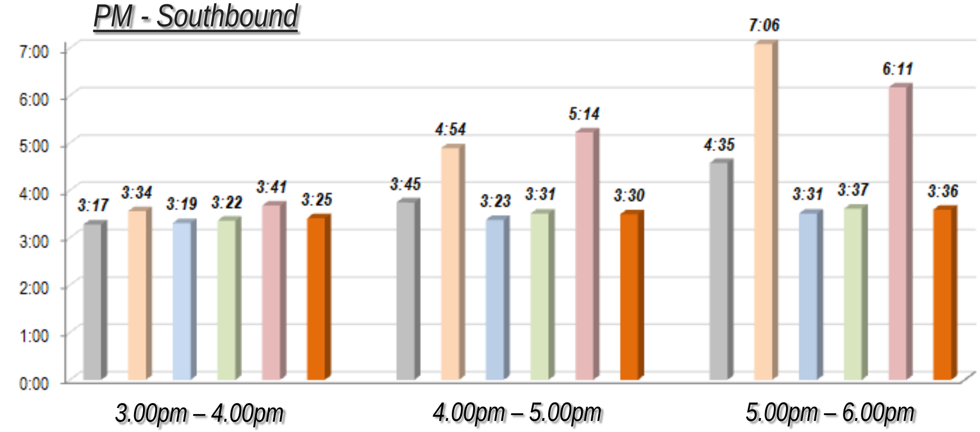
PM - Northbound



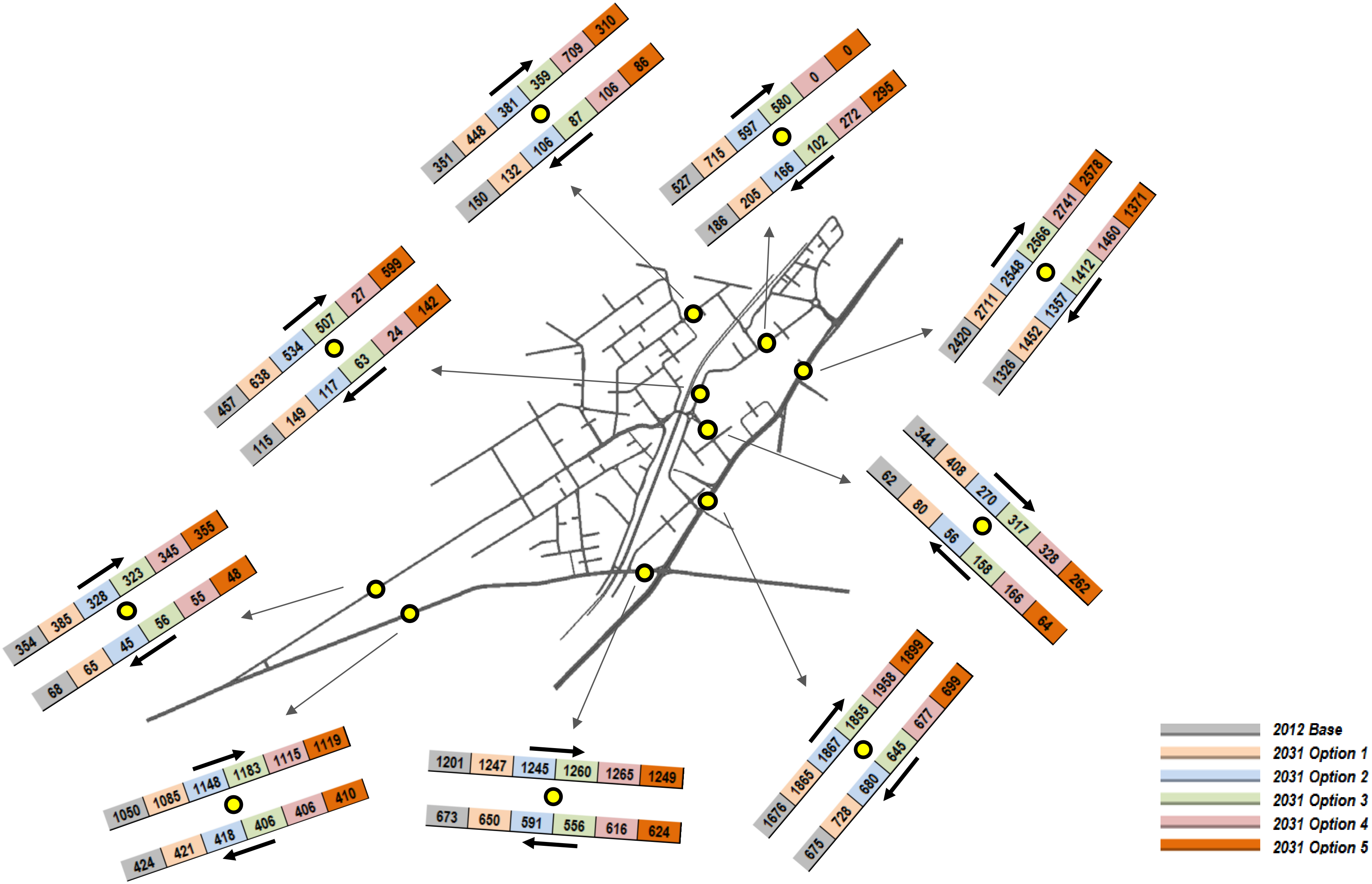
AM - Southbound



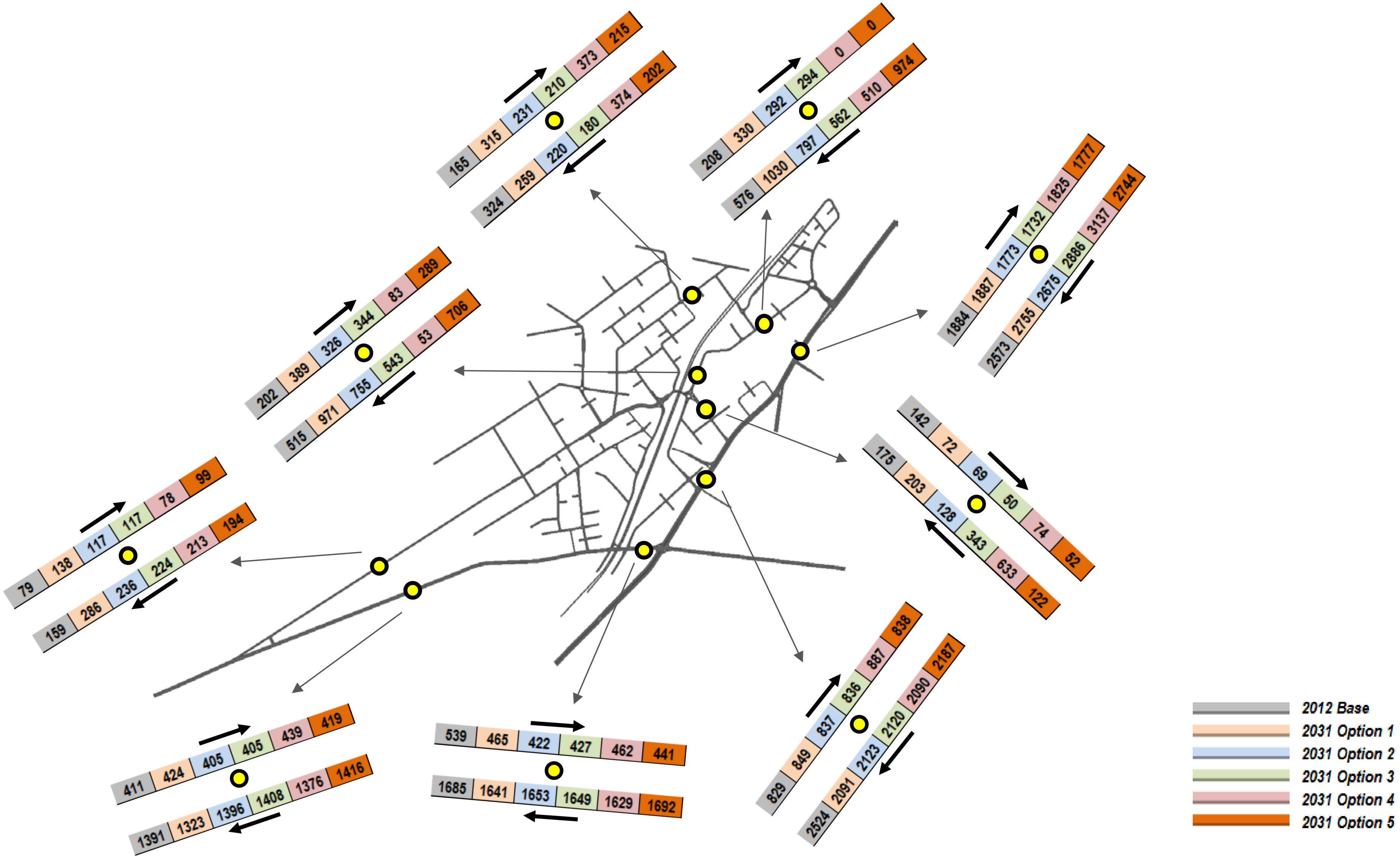
PM - Southbound



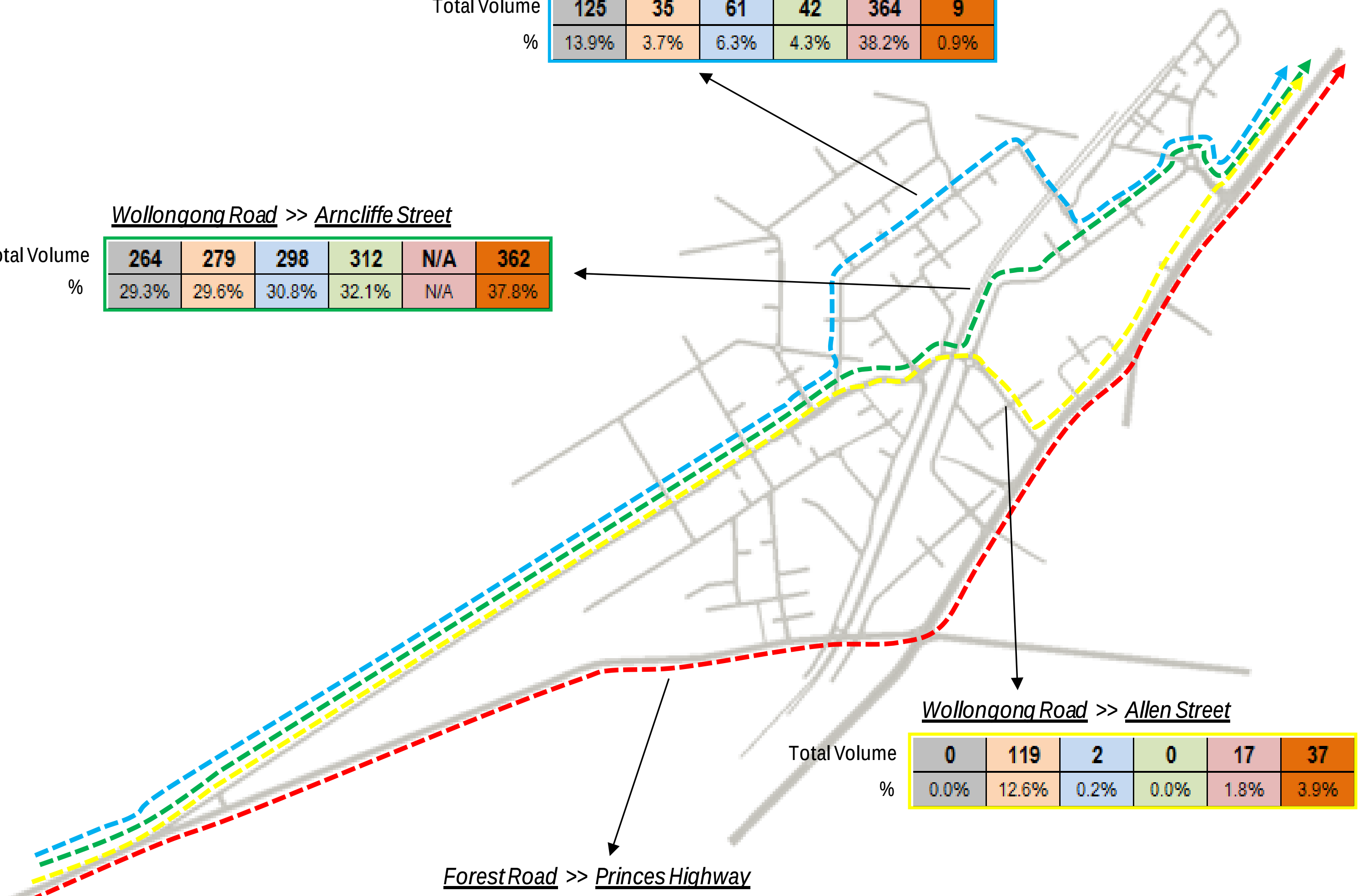
Key Hourly Volumes – AM Peak



Key Hourly Volumes – PM Peak



Route Choice Analysis – AM Peak



Wollongong Road >> Bonar Street

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4	2031 Option 5
Total Volume	125	35	61	42	364	9
%	13.9%	3.7%	6.3%	4.3%	38.2%	0.9%

Wollongong Road >> Arncliffe Street

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4	2031 Option 5
Total Volume	264	279	298	312	N/A	362
%	29.3%	29.6%	30.8%	32.1%	N/A	37.8%

Wollongong Road >> Allen Street

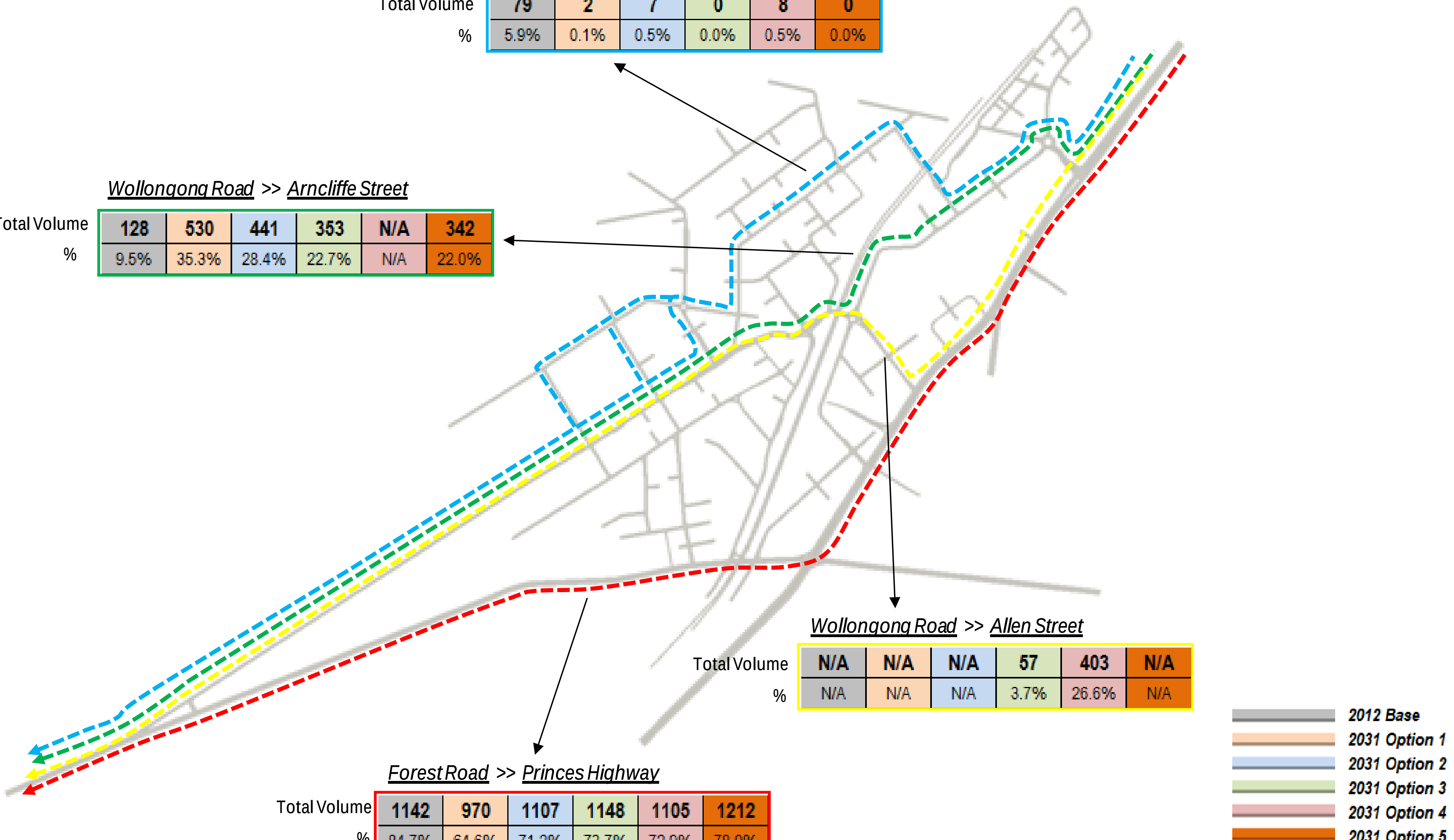
	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4	2031 Option 5
Total Volume	0	119	2	0	17	37
%	0.0%	12.6%	0.2%	0.0%	1.8%	3.9%

Forest Road >> Princes Highway

	2012 Base	2031 Option 1	2031 Option 2	2031 Option 3	2031 Option 4	2031 Option 5
Total Volume	511	509	606	619	571	549
%	56.8%	54.0%	62.7%	63.6%	60.0%	57.4%

2012 Base
2031 Option 1
2031 Option 2
2031 Option 3
2031 Option 4
2031 Option 5

Route Choice Analysis – PM Peak



Wollongong Road >> *Bonar Street*

Total Volume	79	2	7	0	8	0
%	5.9%	0.1%	0.5%	0.0%	0.5%	0.0%

Wollongong Road >> *Arncliffe Street*

Total Volume	128	530	441	353	N/A	342
%	9.5%	35.3%	28.4%	22.7%	N/A	22.0%

Wollongong Road >> *Allen Street*

Total Volume	N/A	N/A	N/A	57	403	N/A
%	N/A	N/A	N/A	3.7%	26.6%	N/A

Forest Road >> *Princes Highway*

Total Volume	1142	970	1107	1148	1105	1212
%	84.7%	64.6%	71.2%	73.7%	72.9%	78.0%