



# TWEED VALLEY HOSPITAL PROJECT STAGE 2 TRAFFIC IMPACT ASSESSMENT

FOR

**NSW HEALTH  
INFRASTRUCTURE**

**BITZIOS**  
consulting

**Gold Coast**  
Suite 26, 58 Riverwalk Avenue  
Robina QLD 4226  
P: (07) 5562 5377  
W: [www.bitziosconsulting.com.au](http://www.bitziosconsulting.com.au)

**Brisbane**  
Level 2, 428 Upper Edward Street  
Spring Hill QLD 4000  
P: (07) 3831 4442  
E: [admin@bitziosconsulting.com.au](mailto:admin@bitziosconsulting.com.au)

**Sydney**  
Studio 203, 3 Gladstone Street  
Newtown NSW 2042  
P: (02) 9557 6202

## DOCUMENT CONTROL SHEET

## Issue History

Report File Name	Prepared by	Reviewed by	Issued by	Date	Issued to
P3378.001R Tweed Valley Hospital Project Stage 2 Traffic Impact Assessment - DRAFT	J. Walden-Goodlet	A. Eke	J. Walden-Goodlet	18/06/19	TSA Management (via Aconex) GeoLINK (via Aconex)
P3378.002R Tweed Valley Hospital Project Stage 2 Traffic Impact Assessment - DRAFT	J. Walden-Goodlet	A. Eke	J. Walden-Goodlet	09/08/19	TSA Management (via Aconex) GeoLINK (via Aconex)
P3378.003R Tweed Valley Hospital Project Stage 2 Traffic Impact Assessment	J. Walden-Goodlet	A. Eke	J. Walden-Goodlet	16/08/19	TSA Management (via Aconex) GeoLINK (via Aconex) (via Aconex)
P3378.004R Tweed Valley Hospital Project Stage 2 Traffic Impact Assessment	J. Walden-Goodlet	A. Eke	J. Walden-Goodlet	22/08/19	TSA Management (via Aconex) GeoLINK (via Aconex)
P3378.005R Tweed Valley Hospital Project Stage 2 Traffic Impact Assessment	J. Walden-Goodlet	A. Eke	J. Walden-Goodlet	13/09/19	TSA Management (via Aconex) GeoLINK (via Aconex)
P3378.006R Tweed Valley Hospital Project Stage 2 Traffic Impact Assessment	J. Walden-Goodlet	A. Eke	J. Walden-Goodlet	23/09/19	TSA Management (via Aconex) GeoLINK (via Aconex)

*Copyright in the information and data in this document is the property of Bitzios Consulting. This document and its information and data is for the use of the authorised recipient and this document may not be used, copied or reproduced in whole or in part for any purpose other than for which it was supplied by Bitzios Consulting. Bitzios Consulting makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or its information and data.*

# CONTENTS

	Page
<b>1. OVERVIEW .....</b>	<b>1</b>
1.1 DESCRIPTION OF THE PROPOSAL	1
1.1.1 Overview	1
1.1.2 Stage 2 Hospital Main Works and Operation	1
1.1.3 Potential Future Expansions	2
1.2 APPLICATION AND STUDY PROCESS	3
1.2.1 Overview	3
<b>2. INTRODUCTION .....</b>	<b>6</b>
2.1 BACKGROUND	6
2.2 SCOPE OF REPORT	6
2.3 KEY ISSUES AND OBJECTIVES	6
2.4 OVERVIEW OF PREVIOUS TRAFFIC AND TRANSPORT ASSESSMENT	6
<b>3. GENERAL DATA COLLECTION AND EXISTING CONDITIONS .....</b>	<b>8</b>
3.1 PROJECT SITE DESCRIPTION AND PROPOSED ACTIVITY	8
3.2 PROJECT SITE LOCATION	8
3.2.1 Current Land Use and Zoning	9
3.3 EXISTING SITE ACCESS	9
3.4 EXISTING TRAFFIC AND ROAD CONDITIONS	11
3.4.1 Surrounding Road Network and Road Hierarchy	11
3.4.2 Parking Controls	13
3.4.3 Current and Proposed Roadworks – Short Term	13
3.5 FUTURE PLANNING AND TRANSPORT NETWORK CONSIDERATIONS	14
3.5.1 Overview	14
3.5.2 Kingscliff Locality Plan	14
3.5.3 Proposed Developments in the Vicinity	14
3.5.4 Tweed Shire Council's Transport Network Planning	16
3.5.5 Current and Proposed Bikeways	17
3.6 EXISTING TRAFFIC FLOWS (BACKGROUND TRAFFIC)	20
3.6.1 Traffic Surveys	20
3.6.2 AADT Volumes and 85 <sup>th</sup> Percentile Speed	21
3.6.3 Existing Traffic Generation	22
3.6.4 Background Heavy Vehicle Volumes	22
3.7 BACKGROUND TRAFFIC MODELLING	22
3.7.1 Modelling Process	22
3.7.2 Traffic Growth Rates	23
3.7.3 Pacific Highway / Tweed Coast Road Interchange	24
3.7.4 Tweed Coast Road / Cudgen Road signalised intersection	26
3.7.5 Cudgen Road / Kingscliff TAFE Access	28
3.7.6 Cudgen Road / Turnock Street roundabout	30
3.7.7 Turnock Street / Elrond Drive roundabout	32
3.7.8 Turnock Street / Pearl Street roundabout	33
3.8 TRAFFIC SAFETY	35
3.8.1 Crash History	35
3.9 EXISTING PARKING SUPPLY AND DEMAND	36
3.9.1 On-Street and Off-Street Parking	36
3.9.2 Existing Parking Demand	38
3.9.3 Pick-up and Set Down Areas	38
3.10 MODAL SPLIT	38
3.11 PUBLIC TRANSPORT	38
3.11.1 Rail Stations and Services	38
3.11.2 Bus Stops and Services	39
3.11.3 Commuter Parking	41
3.12 PEDESTRIAN NETWORK	41
3.12.1 Pedestrian Routes and Infrastructure	41
3.12.2 Pedestrian Conflict Points	42
<b>4. PROPOSED PROJECT .....</b>	<b>43</b>
4.1 THE PROJECT	43
4.2 TRAVEL TIME ASSESSMENT	43
4.3 ACCESS AND INTERNAL CIRCULATION ASSESSMENT	45
4.3.1 Access Locations	45

4.3.2	Access Sight Distance Assessment	46
4.3.3	Service and Emergency Vehicle Access and Circulation	47
4.3.4	Access Queuing Assessment	49
4.3.5	General Public Parking and Circulation	49
4.3.6	General Public Emergency Drop-off	50
4.3.7	Staff Access and Circulation	50
4.3.8	Public Transport Access	50
4.3.9	Internal Road Geometry	50
4.4	PARKING	50
4.4.1	Car Parking Requirements	50
4.4.2	Car Parking Provision	52
4.4.3	Management of Car Parking Facilities	53
4.4.4	Servicing and Refuse Requirements	54
4.4.5	Bicycle Parking Requirements and Provision	55
4.4.6	Car Parking Geometry Assessment	56
<b>5.</b>	<b>IMPACT OF PROPOSED PROJECT .....</b>	<b>57</b>
5.1	STAGE 1: TRANSPORT CONSULTATION UNDERTAKEN	57
5.2	STAGE 2: TRANSPORT CONSULTATION UNDERTAKEN	57
5.3	TWEED VALLEY HOSPITAL TRAFFIC	61
5.3.1	Tweed Valley Hospital Traffic Generation	61
5.3.2	Tweed Valley Hospital Traffic Splits	62
5.3.3	Seasonal Factors	62
5.3.4	Alternate Transport Generation and Movements	62
5.3.5	Traffic Distribution and Assignment	62
5.4	DESIGN TRAFFIC MODELLING	63
5.4.1	Design Traffic Modelling Process	63
5.4.2	Pacific Highway / Tweed Coast Road Interchange	63
5.4.3	Tweed Coast Road / Cudgen Road Signalised Intersection	66
5.4.4	Cudgen Road / Site Access	73
5.4.5	Cudgen Road / Kingscliff TAFE Access	77
5.4.6	Cudgen Road / Turnock Street Roundabout	79
5.4.7	Turnock Street / Elrond Drive roundabout	83
5.4.8	Turnock Street / Pearl Street Roundabout	85
5.5	IMPACT ON TRAFFIC SAFETY	89
5.6	PUBLIC AND ACTIVE TRANSPORT	89
5.6.1	Public Transport Demand	89
5.6.2	Active Transport	90
5.6.3	Green Travel Plan	90
5.7	AGRICULTURAL VEHICLES	90
5.8	RECOMMENDED WORKS	91
5.8.1	Improvements to Site Access and Circulation	91
5.8.2	Intersection Improvements	91
5.8.3	Pedestrian Facility Improvements	91
5.8.4	Public Transport Facility Improvements	92
5.8.5	Provision of LATM Measures	92
5.8.6	Funding of Proposed Improvement Measures	92
5.8.7	Way Finding Signage	93
5.8.8	Noise Attenuation Measures	93
<b>6.</b>	<b>CONSTRUCTION TRAFFIC MANAGEMENT PLAN - PRELIMINARY CONSIDERATIONS .....</b>	<b>94</b>
6.1	OVERVIEW	94
6.2	CONSTRUCTION TRAFFIC MANAGEMENT PLAN	94
6.3	CONSTRUCTION PARKING	94
6.4	CONSTRUCTION TRAFFIC VOLUMES	94
6.5	INTERSECTION OPERATIONS	95
6.6	ALTERNATE TRANSPORT ACCESS	95
6.7	PUBLIC TRANSPORT IMPACTS	95
6.8	ACTIVE TRANSPORT IMPACTS	95
6.9	HAULAGE ROUTES	96
6.10	CONSTRUCTION TRAFFIC SAFETY CONSIDERATIONS	96
<b>7.</b>	<b>SUMMARY AND CONCLUSIONS .....</b>	<b>97</b>

## Tables

Table 1.1:	SEARs – Transport and Accessibility (Stage 2)
Table 1.2:	SSD 9575: Part B Conditions To Be Satisfied in Future Development Application(s)
Table 3.1:	AADT and Speed Data
Table 3.2:	Existing Development Traffic Generation
Table 3.3:	AADT Volume Comparison
Table 3.4:	Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary (Year 2023 Background Traffic Volumes)
Table 3.5:	Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary (Year 2033 Background Traffic Volumes)
Table 3.6:	Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary (Year 2023 Background Traffic Volumes) - Existing
Table 3.7:	AADT Volume Comparison on Cudgen Road
Table 3.8:	Cudgen Road / Kingscliff TAFE Access SIDRA Results Summary (Year 2023 Background Traffic Volumes)
Table 3.9:	Cudgen Road / Kingscliff TAFE Access SIDRA Results Summary (Year 2033 Background Traffic Volumes)
Table 3.10:	Cudgen Road / Turnock Street SIDRA Results Summary (Year 2023 Background Traffic Volumes)
Table 3.11:	Turnock Street / Elrond Drive SIDRA Results Summary (Year 2023 Background Traffic Volumes)
Table 3.12:	Turnock Street / Elrond Drive SIDRA Results Summary (Year 2033 Background Traffic Volumes)
Table 3.13:	Turnock Street / Pearl Street Intersection SIDRA Results Summary (Year 2023)
Table 3.14:	Turnock Street / Pearl Street Intersection SIDRA Results Summary (Year 2033)
Table 3.15:	TfNSW Crash Data Summary for Surrounding Roads (2013-2017)
Table 4.1:	Council Car Parking Requirements
Table 4.2:	Car Parking Supply
Table 4.3:	Tweed Valley Hospital Bicycle Parking Requirements
Table 4.4:	On-Site Parking Geometric Layout Requirements
Table 5.1:	Stakeholder Engagement Register
Table 5.2:	Tweed Valley Hospital Traffic Generation (Peak Hour)
Table 5.3:	Tweed Valley Hospital Traffic Generation (Daily)
Table 5.4:	Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)
Table 5.5:	Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)
Table 5.6:	Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)
Table 5.7:	Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)
Table 5.8:	Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)
Table 5.9:	Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes) – With Upgrades
Table 5.10:	Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary (Year 2023 PVT Design Traffic Volumes) – With Upgrades
Table 5.11:	Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes) – Indicative Four Lane Upgrade
Table 5.12:	Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary (Year 2033 PVT Design Traffic Volumes) – Indicative Four Lane Upgrade
Table 5.13:	Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)
Table 5.14:	Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)
Table 5.15:	Cudgen Road / Site Access SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)
Table 5.16:	Cudgen Road / Site Access SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)
Table 5.17:	Cudgen Road / Site Access SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)
Table 5.18:	Cudgen Road / Site Access SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)
Table 5.19:	Cudgen Road / Site Access SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)
Table 5.20:	Cudgen Road / Kingscliff TAFE SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)
Table 5.21:	Cudgen Road / Kingscliff TAFE SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)

Table 5.22:	Cudgen Road / Kingscliff TAFE SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)
Table 5.23:	Cudgen Road / Kingscliff TAFE SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)
Table 5.24:	Cudgen Road / Kingscliff TAFE SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)
Table 5.25:	Cudgen Road / Turnock Street SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)
Table 5.26:	Cudgen Road / Turnock Street SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)
Table 5.27:	Cudgen Road / Turnock Street SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)
Table 5.28:	Cudgen Road / Turnock Street SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)
Table 5.29:	Cudgen Road / Turnock Street SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)
Table 5.30:	Turnock Street / Elrond Drive Intersection SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)
Table 5.31:	Turnock Street / Elrond Drive Intersection SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)
Table 5.32:	Turnock Street / Elrond Drive Intersection SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)
Table 5.33:	Turnock Street / Elrond Drive Intersection SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)
Table 5.34:	Turnock Street / Elrond Drive Intersection SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)
Table 5.35:	Turnock Street / Pearl Street Intersection SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)
Table 5.36:	Turnock Street / Pearl Street Intersection SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)
Table 5.37:	Turnock Street / Pearl Street Intersection SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)
Table 5.38:	Turnock Street / Pearl Street Intersection SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)
Table 5.39:	Turnock Street / Pearl Street Intersection SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)

## Figures

Figure 3.1:	Project Site Locality
Figure 3.2:	Project Site
Figure 3.3:	Land Zoning
Figure 3.4:	Existing Access Locations – Aerial
Figure 3.5:	Existing Site Access
Figure 3.6:	Surrounding Road Network
Figure 3.7:	Pacific Highway Typical Section South of Tweed Coast Road (northbound)
Figure 3.8:	Pacific Highway Typical Section North of Tweed Coast Road (northbound)
Figure 3.9:	Tweed Coast Road Typical Section North of Cudgen Road (southbound)
Figure 3.10:	Cudgen Road Typical Section East of Tweed Coast Road (westbound)
Figure 3.11:	Turnock Street Typical Section North of Cudgen Road (southbound)
Figure 3.12:	Locality of Proposed Surrounding Development (Indicative)
Figure 3.13:	Concept for Proposed Kings Forest Development
Figure 3.14:	Concept for Proposed Gales-Kingscliff Development
Figure 3.15:	Overview of Network Planning in the Locality
Figure 3.16:	Surrounding Bicycle Network
Figure 3.17:	Existing Off-road Shared Pedestrian Bicycle Path Fronting Project Site
Figure 3.18:	Existing Separated On-road Bicycle Path on Turnock Street
Figure 3.19:	Future Kingscliff Pedestrian and Cycle Network
Figure 3.20:	Traffic Survey Locations
Figure 3.21:	Project Delivery Timeline
Figure 3.22:	Pacific Highway / Tweed Coast Road SIDRA Intersection Layout
Figure 3.23:	Tweed Coast Road / Cudgen Road SIDRA Intersection Layout - Existing
Figure 3.24:	Cudgen Road / Kingscliff TAFE Access SIDRA Intersection Layout
Figure 3.25:	Cudgen Road / Turnock Street SIDRA Intersection Layout

Figure 3.26:	Turnock Street / Elrond Drive SIDRA Intersection Layout
Figure 3.27:	Turnock Street / Pearl SIDRA Intersection Layout
Figure 3.28:	TfNSW Crash Data Summary for Surrounding Roads (2013-2017)
Figure 3.29:	McPhail Avenue Cross Section and Observed On-street Parking
Figure 3.30:	Cudgen Road (north of McPhail Avenue) Cross Section and Observed On-street Parking
Figure 3.31:	Oxford Street Cross Section and Observed On-street Parking
Figure 3.32:	Method of Travel to Work – Tweed Shire 2016
Figure 3.33:	Existing Bus Stop Infrastructure
Figure 3.34:	Existing Eastbound Bus Stop and Pedestrian Refuge Crossing
Figure 3.35:	Existing Westbound Bus Stop
Figure 3.36:	Existing Bus Service Routes
Figure 3.37:	Surrounding Pathway Network
Figure 4.1:	Travel Time to Project Site by Area
Figure 4.2:	Travel Time to Project Site by Population Centre
Figure 4.3:	Site Access Locations
Figure 4.4:	Vehicle Access Routes
Figure 4.5:	Vehicle Egress Routes
Figure 5.1:	Traffic Routes and Distributions
Figure 5.2:	Tweed Coast Road / Cudgen Road – Upgrade Works
Figure 5.3:	Tweed Coast Road / Cudgen Road – Signal Phasing Changes
Figure 5.4:	Tweed Coast Road / Cudgen Road – Indicative Four Lane Layout
Figure 5.5:	Cudgen Road / Site Access SIDRA Intersection Layout
Figure 5.6:	Cudgen Road / Site Access Phase Sequence.
Figure 5.7:	Cudgen Road / Turnock Street SIDRA Intersection Layout (With Access)
Figure 6.1:	Construction Traffic Volumes

## Acronyms

AADT:	Annual Average Daily Traffic
ABS:	Australian Bureau of Statistics
AS:	Australian Standards
ASD:	Approach Sight Distance
AUL:	Auxiliary Left Turn
AV:	Articulated Vehicle
CTMP:	Construction Traffic Management Plan
DOS:	Degree of Saturation
EIS:	Environmental Impact Statement
EVP:	Emergency Vehicle Priority
EVT:	Evening Vehicle Trip Generation
HRV:	Heavy Rigid Vehicle
ITE:	Institute of Transportation Engineers
LATM:	Local Area Traffic Management
LOS:	Level of Service
MGSD:	Minimum Gap Sight Distance
MRV:	Medium Rigid Vehicle
MVT:	Morning Vehicle Trip Generation
PVT:	Peak Vehicle Trips
RCV:	Refuse Collection Vehicle
RMS:	Roads and Maritime Services
SEARs:	Secretary's Environmental Assessment Requirements
SISD:	Safe Intersection Sight Distance
SRV:	Small Rigid Vehicle
SSD:	State Significant Development
SVMP:	Service Vehicle Management Plan
TCS:	Traffic Control Site
TDC:	Traffic Data and Control
TfNSW:	Transport for New South Wales
TMR:	Department of Transport and Main Roads
TRAC:	Tweed Regional Aquatic Centre
TSTM:	Tweed Strategic Transport Model

## Appendices

Appendix A:	Traffic Surveys
Appendix B:	Network Diagrams
Appendix C:	SIDRA Movement Summaries
Appendix D:	Swept Path Assessment
Appendix E:	Access and Intersection Plans
Appendix F:	Green Travel Plan
Appendix G:	Pedestrian Access Plan
Appendix H:	Transport Access Guide
Appendix I:	Way Finding Signage Plan



## 1. OVERVIEW

### 1.1 DESCRIPTION OF THE PROPOSAL

#### 1.1.1 Overview

On the 11 June 2019 the Minister for Planning and Public Spaces granted approval for the Concept Proposal and Stage 1 Early and Enabling Works for the new Tweed Valley Hospital (SSD 9575) located at 771 Cudgen Road, Cudgen (Lot 11 DP1246853). All documents relating to this consent can be found on the major project website of DPIE at <https://www.planningportal.nsw.gov.au/major-projects/project/10756>.

The Environmental Impact Statement (EIS) has been prepared to assist in the State Significant Development (SSD) Stage 2 Application for the Tweed Valley Hospital which will be assessed under Part 4 Division 4.7 of the Environmental Planning and Assessment Act 1979 (EP&A Act). This, along with supporting documentation, provides a clear outline of the Stage 2 Application.

The Tweed Valley Hospital Project broadly consists of:

- Construction of a new Level 5 major regional referral hospital to provide the health services required to meet the needs of the growing population of the Tweed-Byron region (in conjunction with the other hospitals and community health facilities across the region);
- Delivery of the supporting infrastructure required for the Tweed Valley Hospital, including green space and other amenities, roads and car parking, external road upgrades and connections, utilities connections, and other supporting infrastructure.

#### 1.1.2 Stage 2 Hospital Main Works and Operation

Stage 2 Hospital Main Works and Operation is the subject of this assessment.

The Stage 2 SSD component seeks consent for the Main Works and Operation of the Tweed Valley Hospital, including:

- Construction of Main Hospital Building
  - Main entry and retail area
  - Administration
  - Community health
  - In-Patient units
  - Outpatient clinics and day only units
  - Child and Adolescent Services
  - Intensive Care Unit
  - Mental Health Unit
  - Maternity Unit and Birthing Suites
  - Renal Dialysis
  - Pathology
  - Pharmacy
  - Radiation Oncology as part of integrated Cancer Care
  - Emergency Department
  - Perioperative Services
  - Interventional Cardiology
  - Medical Imaging
  - Mortuary
  - Education, Training, Research
  - Back of House services
  - Rooftop Helipad
- Construction of Support Buildings, referred to as the 'Health Hub'
  - Oral Health
  - Community Health
  - Aboriginal Health
  - Administration

- Education, Training and Research
- Internal Roads and carparking, including multi-deck parking for staff, patients and visitors;
- Construction of a temporary building for the 'Tweed Valley Skills Centre'
- External road infrastructure upgrades and main site access
- Environmental and wetland rehabilitation, including rehabilitation of existing farm dam as outlined in the Biodiversity Development Assessment Report (BDAR) prepared for the Concept Proposal and Stage 1 works
- Site landscaping
- Signage
- Utility and service works

The works outlined above comprise five key components, which are subject to various funding allocations and may be delivered independently to each other. Stage 2 has therefore been defined in the following sub-stages:

- Stage 2A – Main Hospital Building complete with supporting roads, services infrastructure and landscaping
- Stage 2B – Main Hospital Building incremental expansion areas
- Stage 2C – Health Hub
- Stage 2D – Tweed Valley Skills Centre
- Stage 2E – Multi-deck car park.

Development consent is sought for the all 5 components of Stage 2 under this SSDA.

Plans for Stage 2 Main Works and Operation are attached in Appendix B of the EIS. Approval of Stage 2 will enable the new Tweed Valley Hospital to be built which will provide a much-needed contemporary health service facilities for the surrounding region.

### **1.1.3 Potential Future Expansions**

Any subsequent stages or modifications to the proposal would be subject to separate applications as required including the potential future expansion of the facility.

## 1.2 APPLICATION AND STUDY PROCESS

### 1.2.1 Overview

This report assesses traffic and transport requirements to accompany the EIS for the SSD application for the Tweed Valley Hospital. The assessment has been undertaken to address the Secretary's Environmental Assessment Requirements (SEARs). Section 7 of SEARS relates to Transport and Traffic and dictates that transport and traffic must be assessed for both construction and operational phases of the Project.

This assessment details the operational transport and traffic impacts and mitigation measures. the process required for construction traffic management has been detailed in the Construction Traffic and Pedestrian Management Plan prepared by Lend Lease Building. Key guidelines referenced for use during the assessment include:

- Guide to Traffic Generating Developments (Roads and Maritime Services)
- EIS Guidelines – Road and Related Facilities (DoPI)
- Cycling Aspects of Austroads Guides
- NSW Planning Guidelines for Walking and Cycling
- Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development
- Standards Australia AS2890.3 (Bicycle Parking Facilities).

Table 1.1 details the SEARs requirements for Stage 2 and references relevant sections within this report that address each requirement. Table 1.2 details the SSD 9575 conditions required to be satisfied as part of this application. These are intended to be quick references to key sections only. Each item should be considered with the context of this report in its entirety.

**Table 1.1: SEARs – Transport and Accessibility (Stage 2)**

Requirement	Relevant Report Section
Include a transport and accessibility impact assessment in accordance with the conditions imposed under SSD 9575, which must also address the following matters:	
impact of existing and proposed development on the road network with consideration for a 10-year horizon	3.7 & 5.4
site access arrangements, including site distance measurements	4.3
provide an assessment of the impact on the Tweed Coast Road / Cudgen Road intersection and the Chinderah Road interchange with Pacific Highway and the need/associated funding for, and details of, upgrades or road improvement works, if required (traffic modelling is to be undertaken using SIDRA network modelling, or similar where required, for current and future years)	5.4.2, 5.4.3 & 5.8.2
provide details of proposed intersection improvements to mitigate impacts on safety and capacity, including sight distance measurements, at the Tweed Coast Road / Cudgen Road intersection and the Chinderah Road interchange with Pacific Highway	5.4.3 <sup>1</sup> & 5.8.2
provide details of servicing and parking arrangements, including swept paths for largest vehicles accessing the site.	4.4
Provide a preliminary Construction Traffic and Pedestrian Management Plan to demonstrate the proposed management of the impact in relation to construction traffic addressing the following:	
assessment of cumulative impacts associated with other construction activities (if any)	6 <sup>2</sup>
an assessment of road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity	
details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process	
details of anticipated peak hour and daily construction vehicle movements to and from the site	
details of on-site car parking and access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle	
details of temporary cycling and pedestrian access during construction.	

Notes:

1. A detailed review of sight distances at the Tweed Coast Road / Cudgen Road was not undertaken as this is an existing intersection. The proposed works at the intersection do not fundamentally change the form, function or operations of the intersection. The works provide additional capacity and improved efficiency. Further a review of crash history was undertaken in Section 3.8.1 which did not indicate any significant crash occurrence or trends
2. Section 6 provides general commentary on the requirements for the Construction Traffic and Pedestrian Management Plan. The Construction Traffic and Pedestrian Management Plan has been prepared as part of the Lend Lease Building submission. For further details refer to the Construction Traffic and Pedestrian Management Plan included within the EIS submission.

**Table 1.2: SSD 9575: Part B Conditions To Be Satisfied in Future Development Application(s)**

Requirement	Relevant Report Section
B22. The Stage 2 application must be accompanied by a detailed assessment of the traffic and transport impacts of the development having regard to Roads and Maritime Services (RMS's) Guide to Traffic Generating Development, prepared in consultation with Transport for NSW (TfNSW), RMS and Council and include (but not be limited to) the following:	
(a) a Traffic and Transport Impact Assessment Report having regard to:	
(i) cumulative traffic impacts of the development on local roads and the State roads including Cudgen Road, Tweed Coast Road, Turnock Street and the Pacific Highway;	5.4
(ii) details, scope and timing of intersection upgrade works for Tweed Coast Road and Cudgen Road intersection and the signalised intersection on Cudgen Road (at the main entry to the site as identified in the approved plans in condition A2 in Schedule 2);	5.4.3, 5.4.4 & 5.8.2
(iii) a pedestrian access plan from the nearest bus stops and the proposed new bus stops on Cudgen Road and the Kingscliff village to the east;	5.6.2
(iv) detailed analysis of the car parking demand within the Site based on the proposed number of beds, staff members and all other relevant users as identified in the Stage 2 application;	4.4
(v) detailed analysis of impact of any parking fee structure system within the Site, through parking analysis of similar hospital sites;	4.4.3
(vi) analysis of impacts of any proposed paid parking system within the Site on available parking within the surrounding streets or public / private parking facilities (including but not limited to Kingscliff TAFE, Kingscliff Pool and Kingscliff Library);	4.4.3
(vii) potential traffic impacts of the slow-moving agricultural vehicles utilising Cudgen Road on the hospital traffic and the proposed mitigation measures;	5.7
(viii) impacts of the staff using proposed western service access (access A in approved plans in condition A2 of Schedule 2) on the pedestrian and cyclist safety, and proposed mitigation measures to minimise all adverse safety impacts associated with this access;	4.3.1
(ix) impacts of the proposed design of the slip lane (marked as access C in the approved plans in condition A2 of Schedule 2) on the safety of pedestrians and cyclists accessing the Site or other users of the shared path along the Cudgen Road frontage of the Site and any alternative design / additional safety measures proposed for this vehicular access to address the identified impacts (if any);	4.3.1
(x) impact of the proposed hospital on the un-restricted parking spaces on Oxford Street and Cambridge Court, Kingscliff and all local roads within 500m of the Site.	4.4
(b) provision of approximately 700 car spaces for the users and the staff members within the public and staff car parking areas and a minimum of 43 bicycle spaces, with adequate spaces (bicycle and cars) provided to meet the demand for all staff, users and visitors accessing the site in accordance with the parking demand study required by condition B22(a)(iv) of Schedule 2;	4.4
(c) plans / sections and all associated details of Tweed Coast Road / Cudgen Road intersection upgrade works, prepared in consultation with Council including (but not limited to) the following elements:	5.1, 5.2 & 5.8.2
(i) works identified in plans approved in conditions A2 in Schedule 2 (Intersection upgrade works prepared by Bonacci); and	5.4.3, 5.4.6 & 5.8.2

Requirement	Relevant Report Section
(ii) any additional works to Cudgen Road (south - east) and Tweed Coast Road (south of the intersection).	5.4.3 & 5.8.2
(d) details to demonstrate that the Tweed Coast Road / Cudgen Road upgrade works are consistent with Council's plans for the four-lane upgrade of Tweed Coast Road;	5.2
(e) details of design of the proposed new bus stops on Cudgen Road prepared in accordance with the relevant guidelines;	5.8.4
(f) details of pedestrian access between the hospital and the proposed bus stop within the indented bay on Cudgen Road in accordance with the relevant disability access standards and guidelines;	5.6.2
(g) details of the shared access ways, the existing shared pathway, pedestrian crossings over the vehicular access points, pedestrian access on the southern side of Cudgen Road near Kingscliff TAFE and all other pedestrian connections outside the site boundary to demonstrate pedestrian and cyclist safety in the local road network surrounding the site;	3.12, 4.3.1, 5.4.4, 5.6, 5.8
(h) details of consideration of distance and grade requirements complying with disability access standards / guidelines (prepared in consultation with TfNSW) and allocation of car parking spaces within the Site near the hospital building for the elderly and vulnerable community;	4.4
(i) a Green Travel Plan (GTP) including recommendations of the Transport Access and Parking Working Group, target mode shares for both staff and visitors to reduce the reliance on private vehicles aligning with the targets in TfNSW's 'Regional NSW Services and Infrastructure Plan';	5.6.3
(j) details of consideration of community transport such as shuttle buses between the Tweed Heads town centre and the Site, to supplement the public transport system;	5.6.1
(k) detailed design of the signalised traffic signal on Cudgen Road (at the main entry to the site) and pedestrian crossings demonstrating compliance with the requirements of RMS (formerly RTA) Traffic Signal Design Manual, and considering provisions for pedestrian on all legs of a signalised intersection; and	5.4.4
(l) a 'Way Finding Signage' strategy to direct traffic from the Pacific Highway to the Tweed Valley Hospital prepared in consultation with RMS and in accordance with the requirements of the Service Signposting guidelines.	5.2 & 5.8.7
B23. Notwithstanding the requirements of condition B22 of Schedule 2, should the future capacity of the hospital in Stage 2 exceed 430 beds and 1050 average number of staff per weekday day shift, adequate evidence must be provided to demonstrate that the traffic, transport and parking impacts of the additional capacity can be managed and mitigated.	1.1, 4.4 & 5
B24. The Stage 2 application must include evidence of consultation with TfNSW, RMS, Council and other identified stakeholders to determine the requirements regarding bus stop designs, signalised traffic intersections, intersection upgrade works and associated wayfinding signs, Council's civil specifications for roadworks on Cudgen road, preparation of the relevant traffic impact assessment reports for construction and operational stages, pedestrian management, bicycle network and parking impacts, and relevant design solutions.	5.1 & 5.2

## 2. INTRODUCTION

### 2.1 BACKGROUND

On the 11 June 2019 the Minister for Planning and Public Spaces granted approval for the Concept Plan and Stage 1 Early and Enabling Works for the new Tweed Valley Hospital (SSD 18\_9575) located at 771 Cudgen Road, Cudgen (Lot 11 DP1246853).

The Concept Proposal and Stage 1 Early and Enabling Works was granted approval on 11/06/2019. The Project is now in Stage 2: Hospital Delivery - Main Works and Operation.

The Tweed Valley Hospital Project broadly consists of:

- Delivery of the Tweed Valley Hospital; a new Level 5 major regional referral hospital to provide the health services required to meet the needs of the growing population of the Tweed-Byron region (in conjunction with the other hospitals and community health facilities across the region); and
- Delivery of the supporting infrastructure required for the Tweed Valley Hospital, including green space and other amenities, roads and car parking, external road upgrades and connections, utilities connections, and other supporting infrastructure.

### 2.2 SCOPE OF REPORT

The scope of this study included the following:

- a review of the Project Site, including existing operations and accesses;
- reviewing and summarising traffic survey data for the surrounding road network;
- a review of the proposed Project and land zoning requirements;
- a review and assessment of the existing road network and traffic conditions;
- an assessment of traffic safety in the vicinity of the Project Site;
- an assessment of public transport, pedestrian and cycling networks and connectivity surrounding the Project Site. This will include a summary of infrastructure to support the proposed Project (e.g. provision of footpaths, pedestrian crossings, bicycle paths);
- an assessment of the proposed Project's traffic generation and the distribution onto the external road network, and any impacts and mitigation measures that are required to support the Project (e.g. intersection / road upgrades);
- an assessment of access locations and requirements;
- an assessment of existing public transport provisions / services and upgrades required to support the Project (e.g. provision of additional bus stops and bus services); and
- liaison with relevant stakeholders regarding traffic and transport infrastructure upgrades and public transport service changes.

### 2.3 KEY ISSUES AND OBJECTIVES

The key issues and objectives of this assessment include:

- maintaining safety standards;
- maximising traffic and transport efficiencies;
- traffic impact mitigation;
- management of environmental impacts through facilitating green travel plans, active and alternate transport and minimising private vehicle dependencies; and
- catering for needs of the broader community through facilitating access by multiple transport modes, including private vehicles; public transport, community transport and active transport.

### 2.4 OVERVIEW OF PREVIOUS TRAFFIC AND TRANSPORT ASSESSMENT

A Traffic Impact Assessment was prepared as part of the Concept Proposal and Stage 1 Early and Enabling Works. This scope of the previous included:

- a review of the Project Site, including existing operations and accesses;
- recording and summarising traffic survey data for the surrounding road network;
- a review of the proposed Project and land zoning requirements;
- a review and assessment of the existing road network and traffic conditions;
- an assessment of traffic safety in the vicinity of the Project Site;
- an assessment of public transport, pedestrian and cycling networks and connectivity surrounding the Project Site. This will include a summary of infrastructure to support the proposed Project (e.g. provision of footpaths, pedestrian crossings, bicycle paths);
- an assessment of the proposed Project's traffic generation and the distribution onto the external road network, and any impacts and mitigation measures that are required to support the Project (e.g. intersection / road upgrades). This included a preliminary assessment of intersection upgrade requirements at the Tweed Coast Road / Cudgen Road;
- an assessment of access locations and design requirements;
- an assessment of existing public transport provisions / services and upgrades required to support the Project (e.g. provision of additional bus stops and bus services);
- preliminary liaison with relevant stakeholders regarding traffic and transport infrastructure upgrades and public transport service changes.

The Traffic Impact Assessment for Stage 2 provides an updated and refined assessment relative to the Concept Proposal and Stage 1 Early and Enabling Works and includes additional detail as required.



### 3. GENERAL DATA COLLECTION AND EXISTING CONDITIONS

#### 3.1 PROJECT SITE DESCRIPTION AND PROPOSED ACTIVITY

Stage 2 is informed by service planning to 2031/2032. The Tweed Valley Hospital will be a new Level 5 major regional referral hospital to provide the health services required to meet the needs of the growing population of the Tweed-Byron region (in conjunction with the other hospitals and community health facilities across the region). The hospital will include various associated components/ services as detailed in Section 1.1.2. For the purpose of the traffic and parking components of this assessment the following has been used:

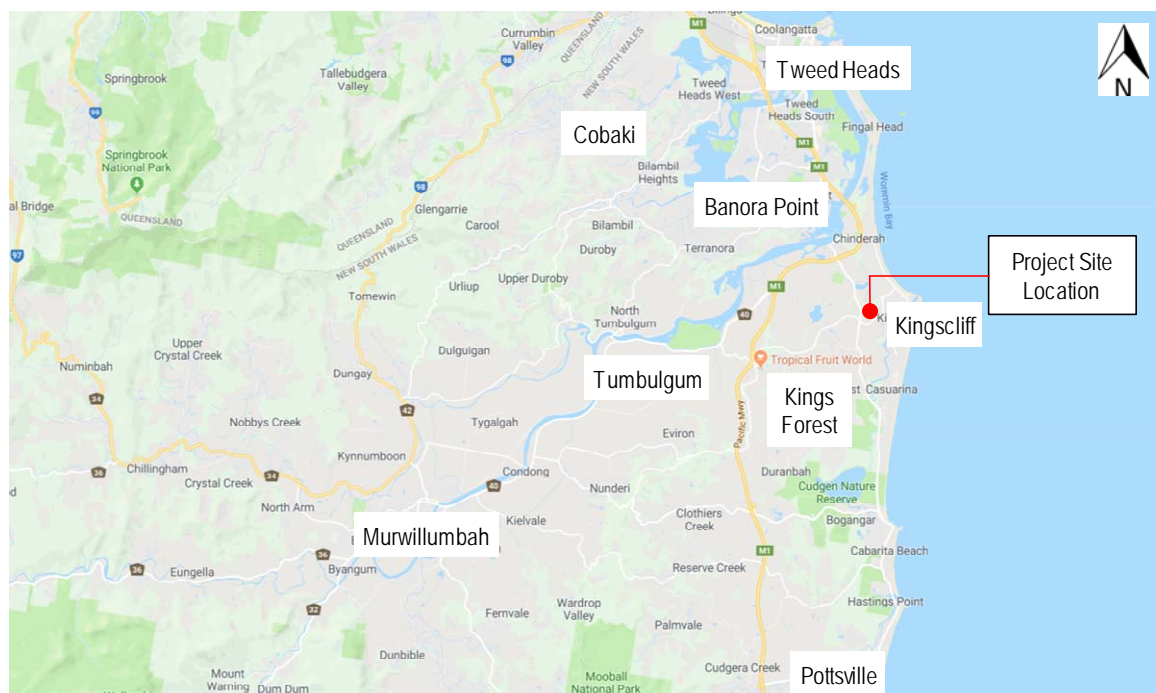
- 391 overnight and day only beds by Year 2023 (2018 Draft Service Statement)
- 443 overnight and day only beds by Year 2033 (2018 Draft Service Statement)
- Year 2023: approximately 1,120 staff on-site during the day shift (ASDS) as advised by NSW Health Infrastructure
- Year 2033: approximately 1,300 staff on-site during the day shift (ASDS) as advised by NSW Health Infrastructure.

Approval for an additional 56 inpatient unit beds is also being sought. These additional beds are subject to separate business cases and funding; however, approval is being sought as part of this application. Sensitivity testing has been undertaken for Year 2033 with the inclusion of the additional 56 beds (499 overnight and day only bed scenario by Year 2033). The sensitivity test includes approximately 1,330 staff on-site during the day shift (ASDS) in Year 2033 as advised by NSW Health Infrastructure.

It is noted that the total number of beds included in the EIS application is 545 beds, which in addition to the above includes 46 emergency beds. Emergency beds are typically a point of initial treatment with patients then transferred to overnight or day only beds. On this basis, and consistent with the Stage 1 assessment, emergency beds have not been included as part of the traffic assessment.

#### 3.2 PROJECT SITE LOCATION

The Project Site location is 771 Cudgen Road, Cudgen NSW. The Project Site is described as Lot 11 DP1246853. The Project Site locality is shown in Figure 3.1 and the Project Site is shown in Figure 3.2



Source: Google Maps

Figure 3.1: Project Site Locality

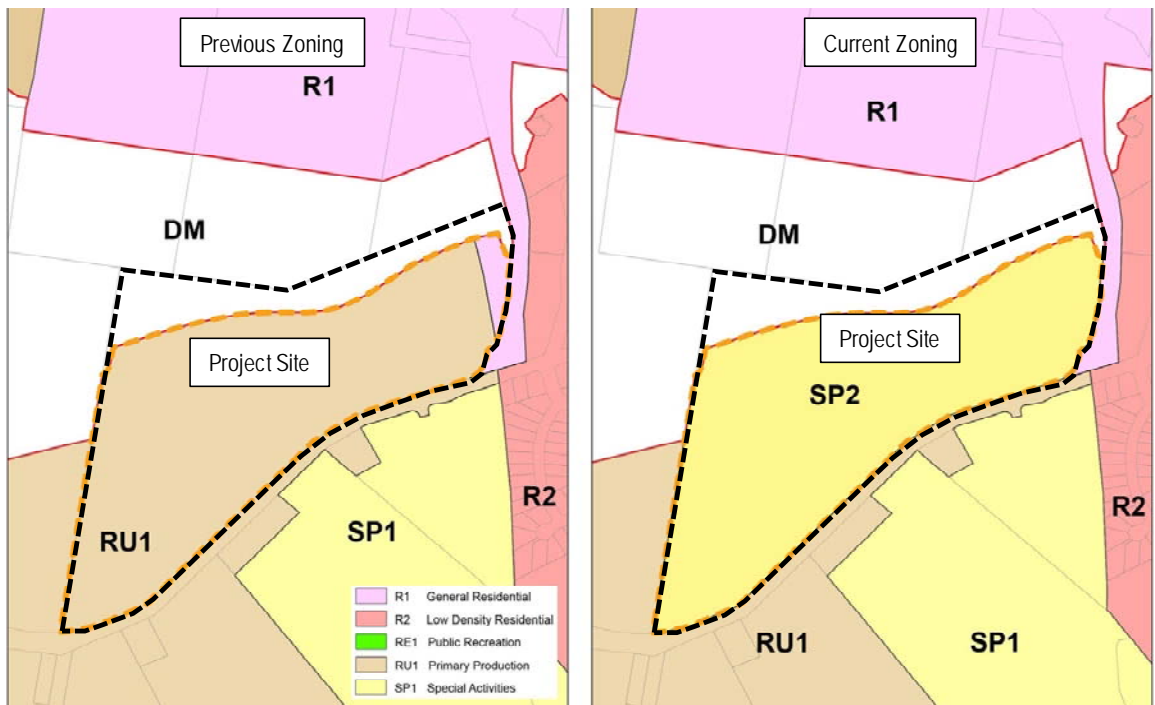




Figure 3.2: Project Site

### 3.2.1 Current Land Use and Zoning

The Project Site has recently been rezoned from RU1 Primary Production to SP2 Infrastructure. The surrounding land zoning is for R1 General Residential, SP1 Special Activities Educational Establishment and R2 Low Density Residential. Figure 3.3 shows the land zoning of the Project Site and surrounding area.



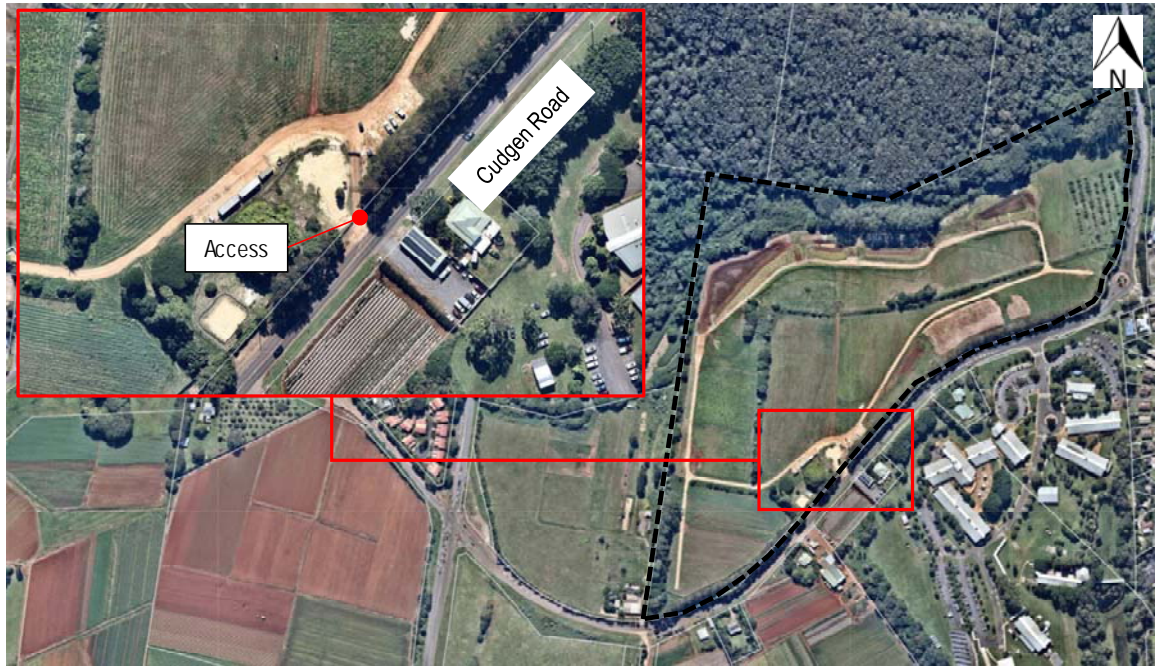
Source: NSW Planning and Environment

Figure 3.3: Land Zoning

### 3.3 EXISTING SITE ACCESS

The Project Site currently has one existing access location. The access location is shown in Figure 3.4. Figure 3.5 show the current access arrangement to the Project Site.





Source: Nearmap

**Figure 3.4: Existing Access Locations – Aerial**



**Figure 3.5: Existing Site Access**

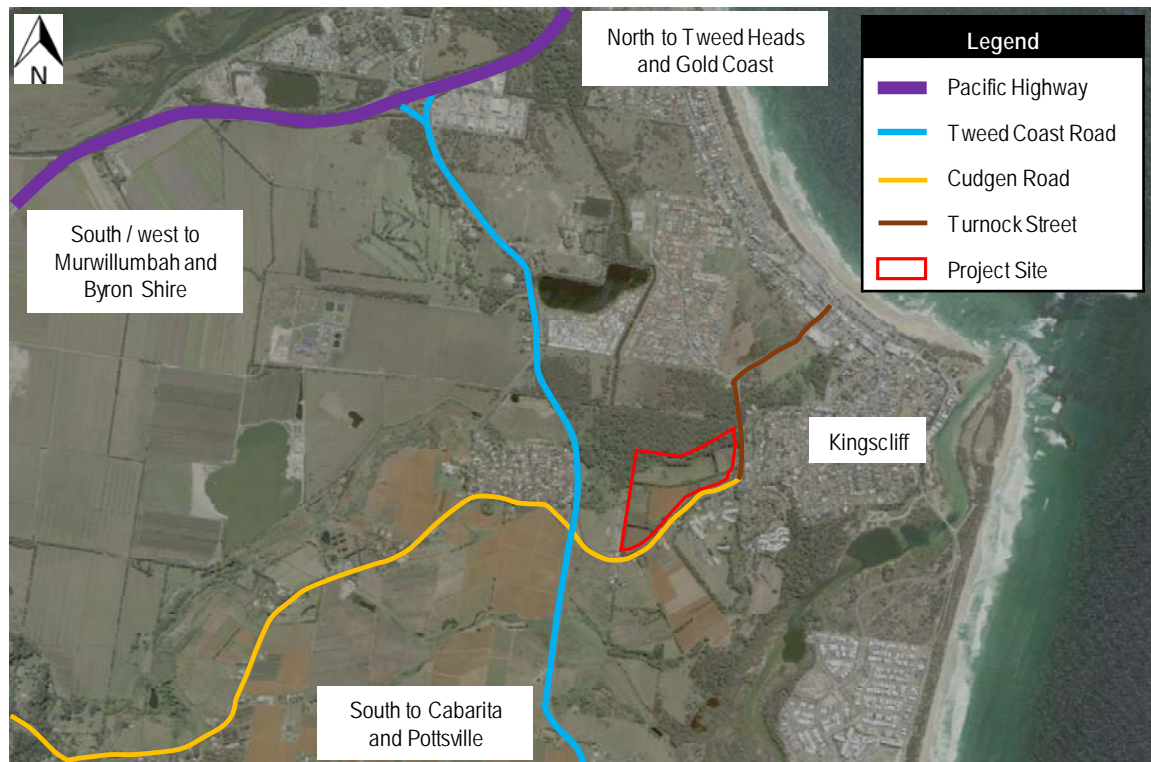
As part of Stage 1 Early Works three accesses will be constructed:

- Ingress only left slip lane (referred to as Access A in the approved Concept Plan). During construction this will be used for construction purposes. Following construction, it will form a permanent site access for Hospital operations;
- Temporary all-movements site access for construction activities; and
- Access via an additional leg to the existing Cudgen Road / Turnock Street roundabout (referred to as Access D in the approved Concept Plan). During construction it will be used as an egress only site access. Following construction, it will form a permanent all movements site access for Hospital operations.

### 3.4 EXISTING TRAFFIC AND ROAD CONDITIONS

#### 3.4.1 Surrounding Road Network and Road Hierarchy

The surrounding roadwork is shown in Figure 3.6.



Source: SIX Maps

**Figure 3.6: Surrounding Road Network**

##### *Pacific Highway*

The Pacific Highway is a RMS controlled highway connecting Sydney and Brisbane. In the vicinity of the Project Site, the Pacific Highway is a four-lane divided road with a posted speed limit of 110 km/h. Further north (approximately 2km from the Tweed Coast Road interchange) the posted speed is 100km/h and consists of a six-lane cross-section as north to South Tweed Heads, then four-lane divided to the Queensland border.

The Pacific Highway includes an interchange with Tweed Coast Road and incorporates a dual lane roundabout configuration. Typical sections of the Pacific Highway are shown in Figures 3.7 and 3.8.



**Figure 3.7: Pacific Highway Typical Section South of Tweed Coast Road (northbound)**





Figure 3.8: Pacific Highway Typical Section North of Tweed Coast Road (northbound)

#### *Tweed Coast Road*

Tweed Coast Road is a north-south rural arterial road connecting coastal towns including Pottsville, Hastings Point, Cabarita, Casuarina and Kingscliff. The posted speed limit is generally 80 km/h which is reduced to 60 km/h in the vicinity of Cudgen Road intersection and the Pacific Highway. The typical cross section of Tweed Coast Road is two-lane undivided. Tweed Coast Road is classified as a regional road under the jurisdiction of Tweed Shire Council. Tweed Coast Road carries predominantly commuter traffic, with a tidal flow pattern (northbound in the morning, southbound in the afternoon). It is understood some rural properties have approvals to operate tractors and machinery on Tweed Coast Road. A typical section of Tweed Coast Road is shown in Figures 3.9.



Figure 3.9: Tweed Coast Road Typical Section North of Cudgen Road (southbound)

#### *Cudgen Road*

Cudgen Road is an undivided two lane rural collector / distributor road connecting Kingscliff to the east with Cudgen and Tweed Valley Way to the west. In the vicinity of the Project Site, the posted speed limit is 60km/h. Cudgen Road fronts the Project Site on its southern side. Cudgen Road is under the jurisdiction of Tweed Shire Council. Dominant traffic flows on Cudgen Road are primarily related to commuter and school traffic movements. It is understood some rural properties have approvals (understood to be issued by NSW Police) to operate tractors and machinery on Cudgen Road and Tweed Coast Road. It is also understood that trucks service some non-residential properties and do so via restricted manoeuvring to/from Cudgen Road. A typical section of Cudgen Road is shown in Figures 3.10.



Figure 3.10: Cudgen Road Typical Section East of Tweed Coast Road (westbound)

#### *Turnock Street*

Turnock Street is an undivided two lane rural arterial road connecting Kingscliff to the east with Cudgen Road to the west. In the vicinity of the Project Site the posted speed limit is 60km/h. Turnock Street fronts the Project Site on its eastern side. Turnock Street is under the jurisdiction of Tweed Shire Council.

A typical section of Turnock Street is shown in Figures 3.11.



Figure 3.11: Turnock Street Typical Section North of Cudgen Road (southbound)

### **3.4.2 Parking Controls**

The road network immediately surrounding the Project Site consists predominantly of rural arterial or local access and collector streets. There are no formalised parking facilities on-street in the area.

### **3.4.3 Current and Proposed Roadworks – Short Term**

No significant roadworks were being undertaken during site inspections or at the time of traffic surveys. Further, no road upgrades are understood to be planned for the immediate future in the area other than maintenance works. This was confirmed against Tweed Shire Council's capital works schedule for maintenance and capacity upgrades.

Notwithstanding, future planned upgrades are identified with Council's Tweed Road Development Strategy (TRDS) which are outlined in Section 3.5 and Council has identified that planning and funding investigations of the Tweed Coast Road duplication are underway.

### **3.5 FUTURE PLANNING AND TRANSPORT NETWORK CONSIDERATIONS**

#### **3.5.1 Overview**

There are several future planning and transport network considerations for the subject area, specifically relating to future network capacity upgrades, new road connections and developments.

#### **3.5.2 Kingscliff Locality Plan**

The draft Kingscliff Locality Plan has recently been developed for the area surrounding the Project site. The purpose of the Kingscliff Locality Plan is to provide a 30-year vision and planning framework to guide the future growth and expansion of the Kingscliff locality. The framework revolves around managing population and employment growth, environmental protection and planning for relevant infrastructure (including roads and the active transport network) to cater for future growth in the area.

#### **3.5.3 Proposed Developments in the Vicinity**

The key developments proposed in the area include the Kings Forest and Gales-Kingscliff developments. The Kings Forest development site is located to the south of the Project Site. Kings Forest is considered to be a State Significant Site and is identified to be one of the largest contributors to new housing and employment in the Tweed Shire over the next 25 years. The site proposes a mixture of land uses including residential, commercial, neighbourhood and community facilities. The site is expected to comprise of:

- 4,500 detached dwellings as well as mix of other residential dwellings (townhouses, terraces etc.) with an estimated residential population in the order of 11,000 residents;
- a mixed-use Town Centre and two Neighbourhood Centres;
- community and education facilities over 12.7 hectares;
- employment land covering 3.4 hectares; and
- recreational and open space areas.

The proposed Kings Forest development will rely significantly on Tweed Coast Road as the main traffic route between Kings Forest and the Pacific Highway.

The Gales-Kingscliff Development site is located to the north of the Project Site. It is understood that the proposal is still in planning stages. The site proposes a mixture of land uses including residential, commercial, neighbourhood and community facilities.

The locality of the Kings Forest, Gales-Kingscliff developments and Kingscliff Locality Plan area with respect to the Project Site is shown in Figure 3.12. Concept plans for the Kings Forest and Gales-Kingscliff Developments are shown in Figures 3.13 and 3.14, respectively.



Source: Google Maps

**Figure 3.12: Locality of Proposed Surrounding Development (Indicative)**

**LEGEND**

- TOWN CENTRE / NEIGHBOURHOOD CENTRE
- RESIDENTIAL
- COMMUNITY FACILITIES / EDUCATION
- EMPLOYMENT LAND
- STRUCTURED OPEN SPACE (ACTIVE)  
(Passive open space to council standards, location subject to urban design)
- ENVIRONMENTAL PROTECTION AREA  
(Includes APZs & bush where approved)
- 50m ECOLOGICAL BUFFER
- STATE SCHOOL SITE
- PROPOSED ZONE SUBSTATION  
(Subject to County Energy Grid approval)
- POTENTIAL ROAD CONNECTION TO MELALEUCA ROAD
- PRIVATE OPEN SPACE
- GOLF COURSE AREA  
(Incorporating ecological buffers where indicated)
- PRIVATE OPEN SPACE INCLUDING LAKE

**NSW GOVERNMENT Planning**

Issued under the Environmental Planning and Assessment Act 1979

Approved Section 75W Modification Application

No. MOD 2 granted on the 11/8/13

In respect to MP CG-0318

Signed [Signature]

Sheet 24

**IMPORTANT NOTE**

This map is an integral part of the plan.

**LEDA**

Source: Tweed Shire Council – Major Developments: Kings Forest

**Figure 3.13: Concept for Proposed Kings Forest Development**



Source: [www.galeskingscliff.com.au](http://www.galeskingscliff.com.au)

**Figure 3.14: Concept for Proposed Gales-Kingscliff Development**

In addition to the proposed Kings Forest and Gales-Kingscliff developments there are expected to be other development applications, approvals and construction in the coming years for Kingscliff. In this regard, Tweed Shire Council recently published the draft Kingscliff Locality Plan which is currently out for public consultation.

### 3.5.4 Tweed Shire Council's Transport Network Planning

Tweed Shire Council's transport network planning for the area has been developed in the form of the draft Kingscliff Locality Plan, Development Control Plan and the TRDS. The purpose of the draft Kingscliff Locality Plan and the Development Control Plan is to provide a 30-year vision and planning framework to guide the future growth and expansion of the Kingscliff locality.

The TRDS recently underwent a review in 2017 and considered:

- the existing road network (in terms of capacity, efficiency and safety);
- existing and forecast network capacity constraints; and
- growth in the Tweed Shire for a 25-30-year planning horizon.

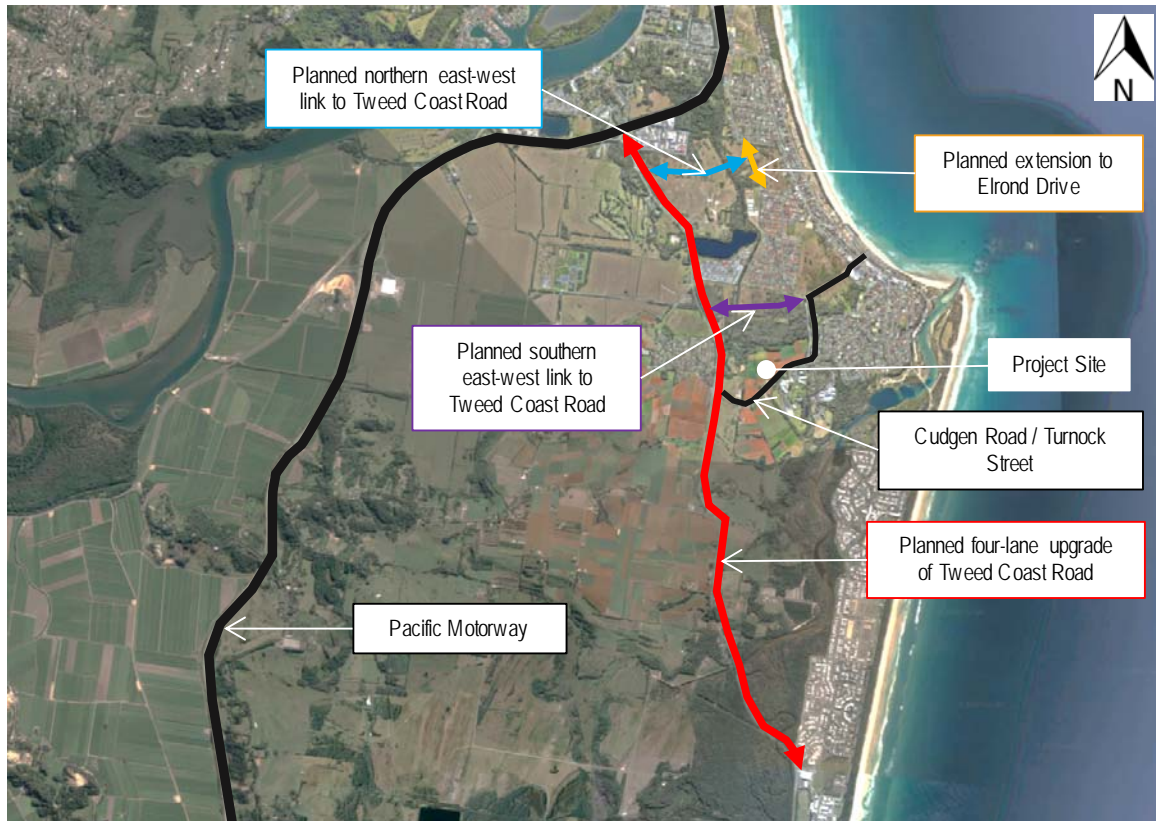
The TRDS identifies a number of road capacity upgrades for the immediate area surrounding the Project Site including:

- four-lane upgrade of Tweed Coast Road between the Pacific Highway and Casuarina;
- a new east-west connection associated with the northern component of the Gales Kingscliff development linking Tweed Coast Road to Kingscliff Street;
- the north-south extension of Elrond Drive associated with the northern component of Gales Kingscliff, allowing for a connection of Beach Street through to Ozone Street;
- a new east-west connection associated with the southern component of the Gales Kingscliff development extending Turnock Street to Tweed Coast Road linking Tweed Coast to Kingscliff Street;
- reconfiguration of the Morton Street intersection from Tweed Coast Road and improvements for access for Chinderah Industrial Estate; and
- improvements to the Pacific Highway / Tweed Coast interchange in consultation with RMS.



The various road network upgrades are based on the network capacity requirements and projected traffic growth within the area. While timing is not set for commencement of works, funding for road upgrades is provided by Section 94 developer contributions, and funding allocations from state and federal government sources. In this regard it is understood that Tweed Shire Council is in the process of planning the four-lane upgrade of Tweed Coast and is applying for funding grants to assist with the delivery of the works.

Figure 3.15 provides an overview of network planning and capacity upgrades in the locality as identified in the TRDS. It is noted that the specific alignments of road extensions are strategic in nature only and subject to further detailed planning and design.



Source: Google Maps

Figure 3.15: Overview of Network Planning in the Locality

### 3.5.5 Current and Proposed Bikeways

An existing off-road shared path runs along the Project Site frontage. The pathway connects to residential areas west of Tweed Coast Road and to Kingscliff in the east. Broader network connections are provided to the Banora Point / Tweed Heads area to the north and to Casuarina / Pottsville to the south. Following a review of Tweed Shire Council's capital works schedule, it is understood that there are no planned new cycleways in the immediate area in the short-term. It is noted that future planning for the surrounding area as part of the Kingscliff Locality Plan will include a combination of new on and off-road cycle facilities. Key facilities include on-road bicycle paths on Tweed Coast Road from Casuarina to Chinderah. The existing bicycle network in proximity to the Project Site is shown in Figure 3.16. The existing cycle path infrastructure in proximity to the site are shown in Figures 3.17 and 3.18. Long term planning for the cycle and pedestrian network surrounding the Project site is shown in Figure 3.19.



Source: Tweed Shire Council Cycleways and Footpaths 2017

Figure 3.16: Surrounding Bicycle Network

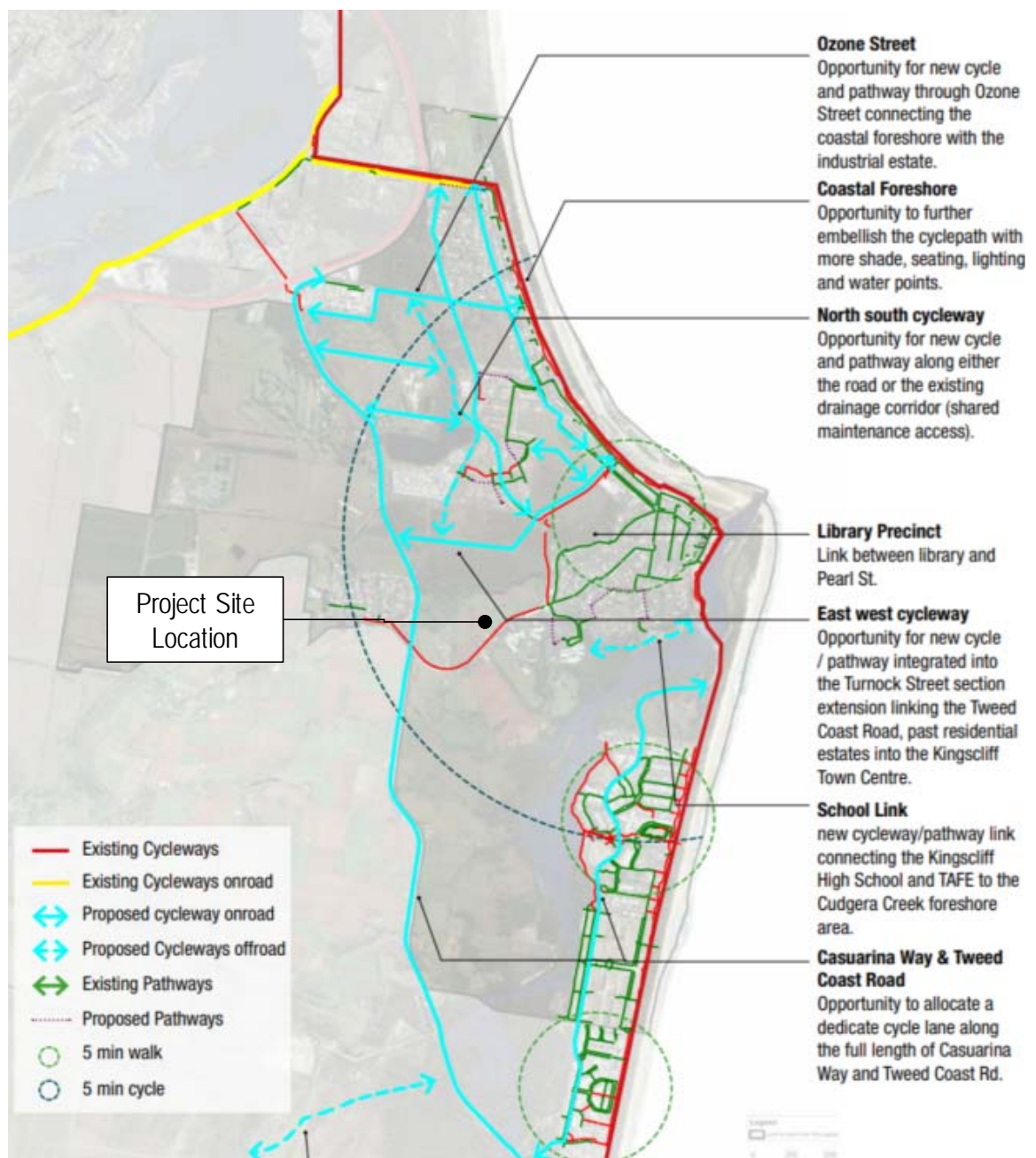


Figure 3.17: Existing Off-road Shared Pedestrian Bicycle Path Fronting Project Site





Figure 3.18: Existing Separated On-road Bicycle Path on Turnock Street



Source: Draft Kingscliff Locality Plan

Figure 3.19: Future Kingscliff Pedestrian and Cycle Network

### 3.6 EXISTING TRAFFIC FLOWS (BACKGROUND TRAFFIC)

#### 3.6.1 Traffic Surveys

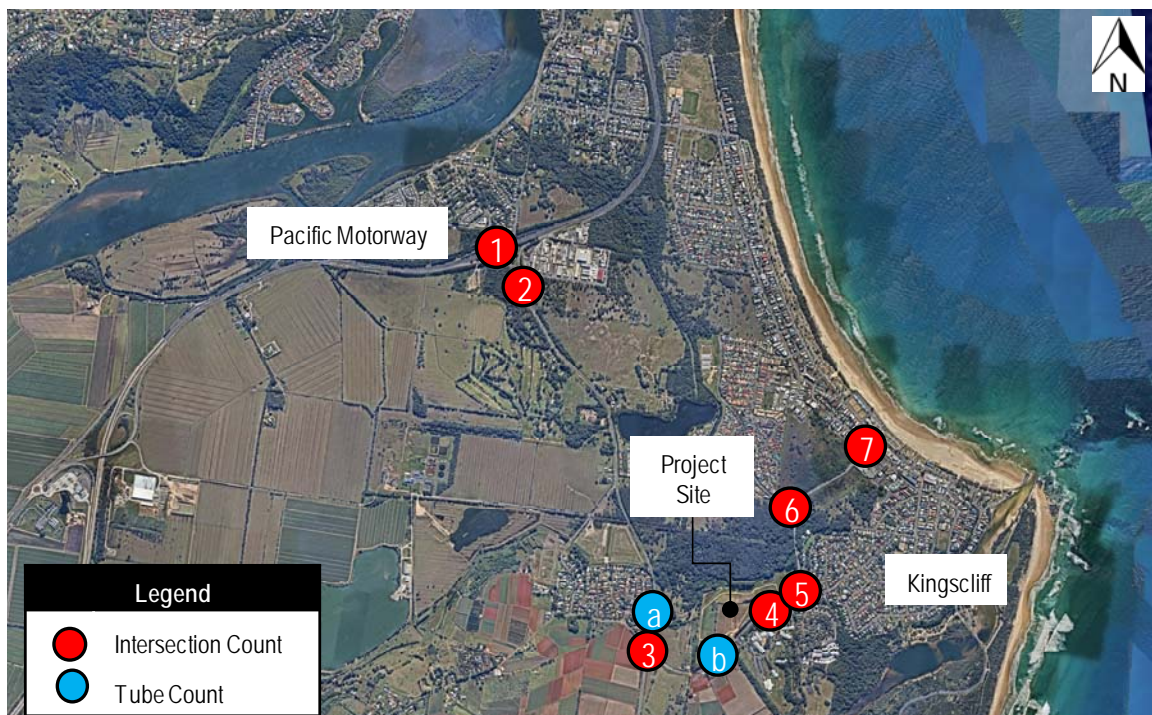
Turning movement surveys were undertaken by Traffic Data and Control (TDC) on Thursday 31 May 2018 for the following intersections:

1. Pacific Highway / Tweed Coast Road interchange;
2. Tweed Coast Road / Morton Street priority-controlled intersection;
3. Tweed Coast Road / Cudgen Road signalised intersection;
4. Cudgen Road / Kingscliff TAFE access;
5. Cudgen Road / Turnock Street roundabout;
6. Turnock Street / Elrond Drive roundabout; and
7. Turnock Street / Pearl Street roundabout.

The survey period was between 7:00AM and 10:00AM and between 2:00PM and 6:00PM. Tube count surveys were also undertaken at the following locations

- a. Tweed Coast Road to the north of Cudgen Road; and
- b. Cudgen Road to the east of Tweed Coast Road.

The tube counts were undertaken for a 7-day period, 24-hours a day starting on Thursday 31 May 2018. Figure 3.20 illustrates the traffic survey locations.



Source: Nearmap

**Figure 3.20: Traffic Survey Locations**

Peak hour periods for each intersection were identified as follows:

1. Pacific Highway / Tweed Coast Road interchange:
  - 8:00AM – 9:00AM; and
  - 3:15PM – 4:15PM.
2. Tweed Coast Road / Morton Street priority-controlled intersection;

- 8:00AM – 9:00AM; and
  - 3:15PM – 4:15PM.
3. Tweed Coast Road / Cudgen Road signalised intersection;
    - 8:00AM – 9:00AM; and
    - 3:15PM – 4:15PM.
  4. Cudgen Road / Kingscliff TAFE access;
    - 8:00AM – 9:00AM; and
    - 2:45PM – 3:45PM.
  5. Cudgen Road / Turnock Street roundabout;
    - 8:00AM – 9:00AM; and
    - 2:45PM – 3:45PM.
  6. Turnock Street / Elrond Drive roundabout; and
    - 8:15AM – 9:15AM; and
    - 3:00PM – 4:00PM.
  7. Turnock Street / Pearl Street roundabout.
    - 8:15AM – 9:15AM; and
    - 3:00PM – 4:00PM.

Peak hour periods on Cudgen Road at the Project Site frontage (based on the tube count data) were 8:00AM – 9:00AM and 2:45PM – 3:45PM.

The full set of traffic surveys are presented in Appendix A. Network diagrams demonstrating peak hour traffic volumes are presented in Appendix B.

### 3.6.2 AADT Volumes and 85<sup>th</sup> Percentile Speed

Average Annual Daily Traffic (AADT) was derived from the tube count surveys undertaken for Cudgen Road and Tweed Coast Road. The 85<sup>th</sup> percentile speed was taken from all recorded speed data during the seven-day period (the highest daily 85<sup>th</sup> percentile speed was recorded). Table 3.1 summarises the AADT and 85<sup>th</sup> percentile speed.

**Table 3.1: AADT and Speed Data**

	Location	Description	AADT	Recorded 85 <sup>th</sup> Percentile Speed	Post Speed Limit
a	Tweed Coast Road	to the north of Cudgen Road	17,757	82.3km/h	60km/h*
b	Cudgen Road	To the east of Tweed Coast Road and fronting the Project Site	11,774	67.5km/h	60km/h

*Note: the section of Tweed Coast Road from approximately 300m north of the Cudgen Road intersection to near Lot 130 Tweed Coast Road is 80km/h. The tube count was undertaken within the 60km/h zone.*

It is noted that the 85<sup>th</sup> percentile speeds are significantly higher than the posted speed on Tweed Coast Road (around 80km/h). This is expected to be due to the proximity to the 80km/h speed zone just to the north of count location. The vehicle speeds do however indicate that even with relatively high volumes for a two-lane road, there does not appear to be any significant flow breakdown which would be associated with reduced Level of Service. Even during the isolated peak periods, the 85<sup>th</sup> percentile speeds were still in the order of 70km/h. The full set of tube count data including 85<sup>th</sup> percentile speeds is presented in Appendix A.



### 3.6.3 Existing Traffic Generation

Traffic generation rates for the existing development (existing at the time traffic surveys were undertaken) were sourced from:

- RMS Guide to Traffic Generating Developments – Technical Direction 2013.

The existing development's peak hour and daily traffic generation is summarised in Table 3.2.

Table 3.2: Existing Development Traffic Generation

Development Component	Yield	Rate (daily)	Rate (peak)	Unit	Daily Trips	Trips in Peak Hour
Detached Dwelling	1	7.4	0.78	dwelling	7.4	0.78

It is noted that the Project Site also includes a farm component. However, given the scale of the farm component, site layout and access (i.e. unformal accesses and limited on-site parking) combined with site observations, this element of the existing development is expected to generate low traffic volumes. Conservatively assessing the farming component to generate similar traffic to that of the existing residential dwelling, the site's total traffic is calculated to be in the order of:

- 2 trips in the peak hour; and
- 15-daily trips

### 3.6.4 Background Heavy Vehicle Volumes

The traffic surveys undertaken recorded peak hour heavy vehicle volumes for turning movements at each intersection surveyed. Heavy vehicle volumes were also recorded (daily) as part of the tube count surveys. Heavy vehicle percentages relative to AADT are as follows:

- 8.8% of AADT on Tweed Coast Road; and
- 5.0% of AADT on Cudgen Road.

The heavy vehicle percentage includes light trucks and heavy trucks and is relative to total traffic. For the purpose of modelling the percentage of heavy vehicles was calculated for each turning movement in Year 2018. These percentages were maintained for all traffic modelling scenarios. The full set of traffic surveys with heavy vehicle counts are presented in Appendix A.

## 3.7 BACKGROUND TRAFFIC MODELLING

### 3.7.1 Modelling Process

The following process has been used to assess the background traffic:

- identifying key intersections for assessment;
- undertaking traffic surveys for the key intersections subject to this assessment in order to ascertain background traffic volumes for the AM and PM peak hours;
- forecasting future year background traffic volumes at the anticipated year of opening and 10-year design horizon; and
- undertaking intersection modelling for key intersections. SIDRA Intersection 7 was used for the intersection modelling. It is noted that the layouts produced by SIDRA are schematic only. Any infrastructure works are subject to detail design.

Key intersections were identified based on the Project Site location, surrounding road network and road hierarchies and a thorough understanding of traffic and network operations in the area. Intersections identified for assessment are as follows:

1. Pacific Highway / Tweed Coast Road interchange;
2. Tweed Coast Road / Cudgen Road signalised intersection;
3. Cudgen Road / Kingscliff TAFE access;

4. Cudgen Road / Turnock Street roundabout;
5. Turnock Street / Elrond Drive roundabout; and
6. Turnock Street / Pearl Street roundabout.

Based on the broad Project delivery timeframes the Project is expected to be completed in Year 2022. Based on these time frames, Year 2023 has therefore been assessed as the conservative year of opening with Year 2033 as the 10-year design horizon. The Project delivery time frames are presented in Figure 3.21.



Source: <http://www.tweedvalleyhospital.health.nsw.gov.au/>

Figure 3.21: Project Delivery Timeline

### 3.7.2 Traffic Growth Rates

The following factors were considered in determining the surrounding road network background growth:

- existing capacity and volumes;
- future capacity upgrades;
- future provision of alternate routes;
- population growth in the region; and
- future developments in the area.

Historical growth trends are not considered to be a realistic reflection of expected growth over the next 5-15 years. Historically the local road network and in particular Tweed Coast Road has experienced periods of significant growth driven by the Tweed Coast Release Areas including Salt and Casuarina. However, in recent years there have been no developments of significant scale. It is however noted that the aforementioned developments of Kings Forest Estate and Gales-Kingscliff will increase traffic volumes on Tweed Coast Road and the surrounds. Noting Kings Forest has approval to proceed, however has not yet done so and Gales-Kingscliff has not yet been approved, timing of these developments is not defined and any impacts to traffic growth is considered to occur in a staged manner over an extended period of time. In addition, these large scale developments will also coincide with the construction of new linkages which will likely impact route choice.

For the purpose of this assessment, background traffic growth has been differentiated between the north-south corridor of Tweed Coast Road and the east-west corridor of Cudgen Road. Tweed Coast Road serves as a north-south rural arterial road connecting a number of small coastal towns to the Pacific Highway. Cudgen Road provides access to Kingscliff from Tweed Coast Road. While both roads have a two-lane cross section and similar capacity, Cudgen Road currently carries in the order of 35% less traffic on a daily basis than Tweed Coast Road. In this regard, carrying capacity has an influence on growth (i.e. when capacity is reached, flow breakdown and reduced travel speeds occur. Drivers adjust to some degree by changing time of trips, reducing discretionary trips and choosing alternate routes.

With consideration to the above, traffic growth in the area was assessed by corridor, based on the traffic surveys (i.e. 2018 tube count volumes) and 2041 volumes from the Tweed Strategic Transport Model (2041 medium yield "base" scenario). This 2041 scenario does not include any infrastructure upgrades (e.g. such as the two east west connections from Tweed Coast Road to Kingscliff) that will change route choice or potentially reduce traffic past the Project Site frontage. The strategic model considers future planning and development (e.g. such as Kings Forest and the Gales-Kingscliff Developments). Table 3.3 shows the 2018

tube count volumes and 2041 Tweed Strategic Transport Model volumes used for the calculation of growth rates.

Table 3.3: AADT Volume Comparison

Location	Description	2018 Tube Count AADT	2041 Strategic Model AADT*
Tweed Coast Road	to the north of Cudgen Road	17,757	21,340
Cudgen Road	To the east of Tweed Coast Road and fronting the Project Site	11,774	17,480

\* Base scenario (i.e. no infrastructure upgrades)

Based on these volumes, the following traffic growth volumes were used for calculating future background volumes:

- 1.73% p.a. compounding for the Cudgen Road / Turnock Street corridor and turning movements at the Tweed Coast Road / Cudgen Road intersection; and
- 0.80% p.a. compounding for the Tweed Coast Road Corridor.

Year 2023 and 2033 Background Traffic Volumes are presented in Appendix B.

### 3.7.3 Pacific Highway / Tweed Coast Road Interchange

Analysis of the Pacific Highway / Tweed Coast Road interchange was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) and Year 2033 (10-year design horizon) background traffic volumes. The existing geometric layout for the intersection was used.

The layout of the intersection used in SIDRA is shown in Figure 3.22.

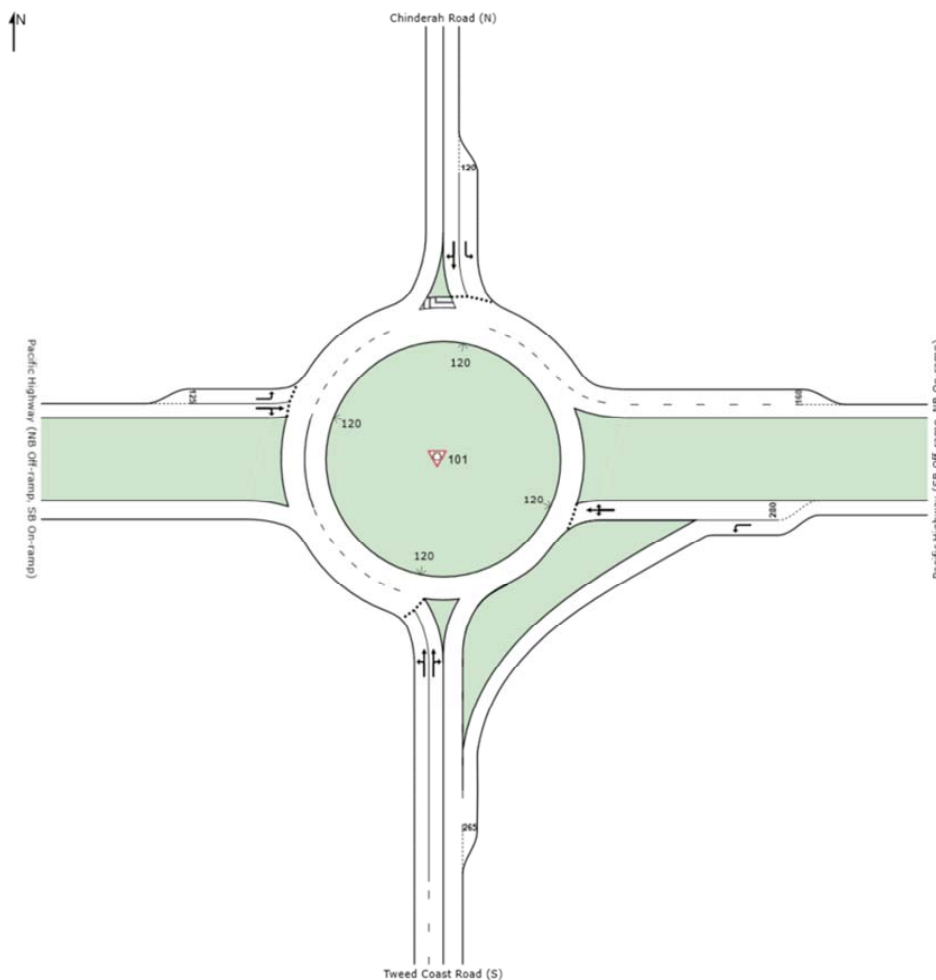


Figure 3.22: Pacific Highway / Tweed Coast Road SIDRA Intersection Layout



The results of the analysis for background traffic volumes are summarised in Tables 3.4 and 3.5. A copy of the SIDRA movement summaries is provided in Appendix C.

**Table 3.4: Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary (Year 2023 Background Traffic Volumes)**

Approach	Year 2023 AM Peak					Year 2023 PM Peak			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L2	0.088	3.1	LOS A	4.1	0.093	3.1	LOS A	4.4
	T1	0.088	3.3	LOS A	4.1	0.093	3.5	LOS A	4.4
	R2	0.535	10.5	LOS B	35.9	0.439	10.3	LOS B	27.2
	Approach	0.535	9.7	LOS A	35.9	0.439	9.3	LOS A	27.2
East: Pacific Highway (SB Off-ramp, NB On-ramp)	L2	0.301	2.1	LOS A	16.4	0.352	2.1	LOS A	18.9
	T1	0.301	3	LOS A	16.4	0.352	2.9	LOS A	18.9
	R2	0.301	9.9	LOS A	16.4	0.352	9.7	LOS A	18.9
	Approach	0.301	2.9	LOS A	16.4	0.352	2.9	LOS A	18.9
North: Chinderah Road (N)	L2	0.078	7	LOS A	5	0.057	4.5	LOS A	3.2
	T1	0.166	6.5	LOS A	13.5	0.112	4	LOS A	7.5
	R2	0.166	11.7	LOS B	13.5	0.112	8.7	LOS A	7.5
	Approach	0.166	8.5	LOS A	13.5	0.112	5.5	LOS A	7.5
West: Pacific Highway (NB Off-ramp, SB On-ramp)	L2	0.109	6.7	LOS A	4.7	0.087	5.4	LOS A	3.3
	T1	0.148	5.6	LOS A	7.4	0.106	4.6	LOS A	4.7
	R2	0.148	12.6	LOS B	7.4	0.106	11.6	LOS B	4.7
	Approach	0.148	10.5	LOS B	7.4	0.106	9.2	LOS A	4.7
All Vehicles		0.535	6.7	LOS A	35.9	0.439	5.7	LOS A	27.2

**Table 3.5: Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary (Year 2033 Background Traffic Volumes)**

Approach	Year 2033 AM Peak					Year 2033 PM Peak			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L2	0.097	3.2	LOS A	4.6	0.101	3.2	LOS A	4.9
	T1	0.097	3.4	LOS A	4.6	0.101	3.6	LOS A	4.9
	R2	0.59	10.8	LOS B	41.7	0.484	10.5	LOS B	31.4
	Approach	0.59	9.9	LOS A	41.7	0.484	9.5	LOS A	31.4
East: Pacific Highway (SB Off-ramp, NB On-ramp)	L2	0.328	2.2	LOS A	18.4	0.384	2.2	LOS A	21.5
	T1	0.328	3.1	LOS A	18.4	0.384	3	LOS A	21.5
	R2	0.328	10	LOS A	18.4	0.384	9.8	LOS A	21.5
	Approach	0.328	2.9	LOS A	18.4	0.384	2.9	LOS A	21.5
North: Chinderah Road (N)	L2	0.098	8.8	LOS A	6.5	0.068	5.3	LOS A	4
	T1	0.207	8.3	LOS A	17.9	0.133	4.8	LOS A	9.5
	R2	0.207	13.5	LOS B	17.9	0.133	9.5	LOS A	9.5
	Approach	0.207	10.3	LOS B	17.9	0.133	6.3	LOS A	9.5
West: Pacific Highway (NB Off-ramp, SB On-ramp)	L2	0.13	7.4	LOS A	5.8	0.103	5.8	LOS A	4.1
	T1	0.175	6.2	LOS A	9.2	0.122	4.9	LOS A	5.7
	R2	0.175	13.2	LOS B	9.2	0.122	11.9	LOS B	5.7
	Approach	0.175	11.2	LOS B	9.2	0.122	9.6	LOS A	5.7
All Vehicles		0.59	7	LOS A	41.7	0.484	5.9	LOS A	31.4

As demonstrated in Table 3.4 and 3.5, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a roundabout intersection in the Year 2023 and 2033 background traffic scenarios.

### 3.7.4 Tweed Coast Road / Cudgen Road signalised intersection

The existing geometric layout for the intersection was used. The intersection was modelled as an isolated intersection with a single diamond overlap and split side streets, based on the Traffic Control Site (TCS) plan. Given that assessment is being undertaken for a future scenario (i.e. Year 2023), it is unlikely that current time settings are relevant. As such the intersection has been modelled with an "Optimum Cycle Time".

The layout of the intersection used in SIDRA is shown in Figure 3.23.

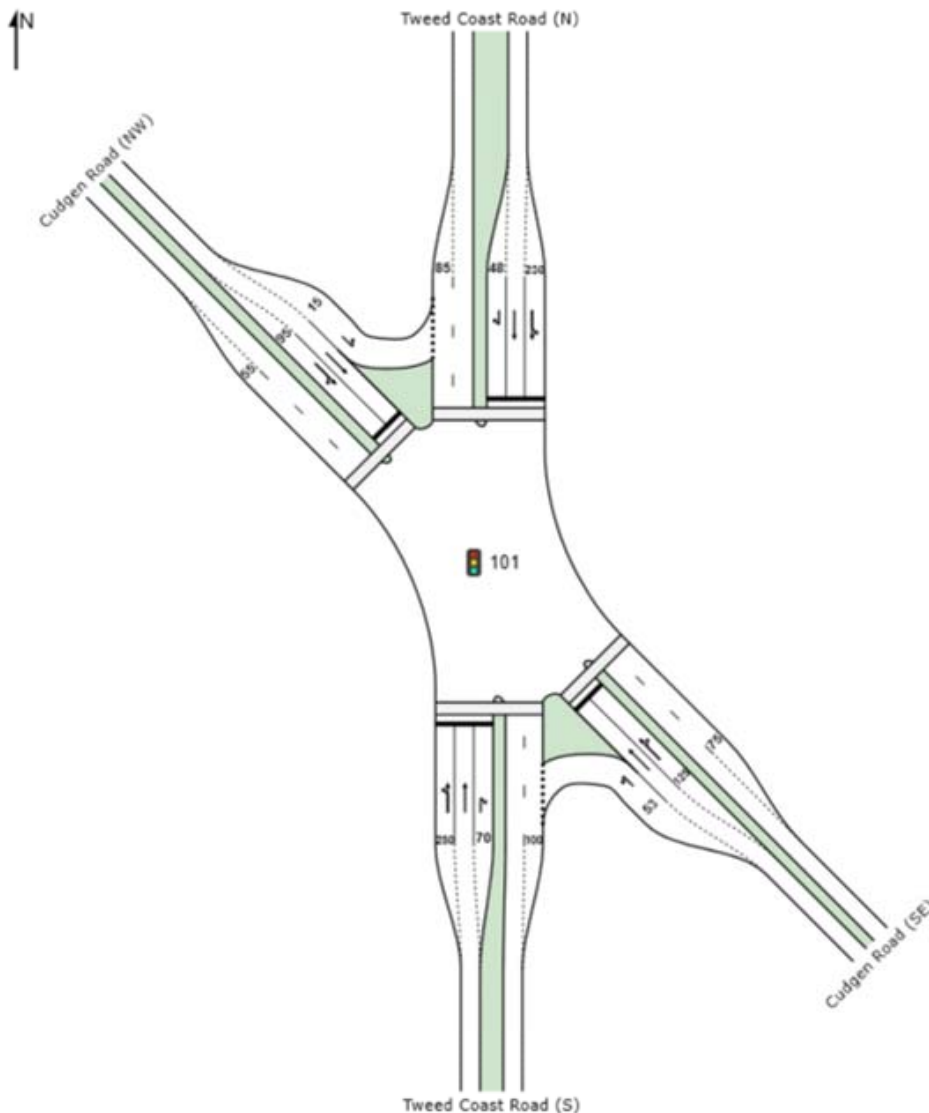


Figure 3.23: Tweed Coast Road / Cudgen Road SIDRA Intersection Layout - Existing

The results of the analysis for background traffic volumes are summarised in Table 3.6. A copy of the SIDRA movement summaries is provided in Appendix C.

**Table 3.6: Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary (Year 2023 Background Traffic Volumes) - Existing**

Approach	Year 2023 AM Peak					Year 2023 PM Peak			
	OD Movement	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)
South: Tweed Coast Road (S)	L1	0.462	45.9	LOS D	107.9	0.196	32.9	LOS C	38.1
	T1	0.969	71.2	LOS F	229.1	0.41	31.1	LOS C	88.1
	R3	0.724	42.2	LOS C	103.4	0.632	43.1	LOS D	37.5
	Approach	0.969	60.8	LOS E	229.1	0.632	34.3	LOS C	88.1
SouthEast: Cudgen Road (SE)	L3	0.093	9.1	LOS A	11.5	0.24	26.6	LOS B	55.9
	T1	0.285	52.2	LOS D	51.4	0.223	43.9	LOS D	41.8
	R1	0.964	98.4	LOS F	260.5	0.893	70.7	LOS F	229.7
	Approach	0.964	72.4	LOS F	260.5	0.893	54.9	LOS D	229.7
North: Tweed Coast Road (N)	L1	0.816	55.2	LOS D	255.2	0.558	38.4	LOS C	157.7
	T1	0.56	51.6	LOS D	115	0.952	70.6	LOS F	364.4
	R3	0.065	24.3	LOS B	6.9	0.127	25.1	LOS B	13.9
	Approach	0.816	52.9	LOS D	255.2	0.952	56	LOS D	364.4
NorthWest: Cudgen Road (NW)	L3	0.069	22.3	LOS B	12.8	0.056	18.3	LOS B	8.6
	T1	0.99	100.2	LOS F	84.9	0.856	76.3	LOS F	56.5
	R1	0.99	117	LOS F	84.9	0.856	84.4	LOS F	56.5
	Approach	0.99	83.4	LOS F	84.9	0.856	64.4	LOS E	56.5
All Vehicles		0.99	63.2	LOS E	260.5	0.952	52	LOS D	364.4

As demonstrated in Table 3.6, the intersection is shown to operate outside acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a signalised intersection in the Year 2023 background traffic scenario. Traffic volumes through the intersection are demonstrated to exceed the capacity of the intersection. North and southbound through volumes are relatively high, as are the southbound left-turn to Cudgen Road (i.e. vehicles travelling to Kingscliff) and north-westbound right turn onto Tweed Coast Road (i.e. vehicles travelling to the Pacific Highway from Kingscliff). The main capacity constraints relate to the key movements (i.e. insufficient stand-up lanes northbound and southbound and capacity for the major turning movements).

Further to the above the capacity limitations on Tweed Coast Road are well known, and a four-lane upgrade of Tweed Coast Road from the Pacific Highway to Casuarina is a priority within Council's future infrastructure planning. For further details on Council's planning, refer Section 3.5.

Through the Stage 1 Concept Proposal process, a series of improvements were identified to address existing deficiencies as well as to mitigate against the traffic impact associated with the Hospital. Further details of the proposed upgrades are detailed in Section 5.4.3.

There are a number of factors that require consideration for the 10-year design horizon (and beyond) on this section of Tweed Coast Road, including:

- the four-lane upgrade of Tweed Coast Road;
- future planned east-west connections from Tweed Coast Road to Kingscliff (which may or may not be completed by 2033);
- surrounding urban releases including Kings Forest and Gales Kingscliff; and
- existing capacity constraints at the intersection.

Based on the future road network planning as outlined in Council's TRDS and KLP and reiterated within discussions with Tweed Shire Council officers, it is not considered appropriate to provide significant additional turning capacity to and from Cudgen Road over and above that identified in Section 5.4.3. This is due to the future capacity that will be added on Tweed Coast Road, at the intersection and through alternate east-west links located to the north.

Turning movements (particularly right turning movements) are one of the critical factors that affect the performance of signalised intersections. Turning movements reduce green time for through movements and increase overall delays. As discussed above, it is not considered appropriate to provide significant

additional turning capacity (including but not limited to a southbound left-slip or northbound right-turns) at the intersection given the future capacity that will be added on Tweed Coast Road, at the intersection and through alternate east-west links to the north.

Cudgen Road currently carries relatively high through traffic, with the dominant turning movements at the Tweed Coast Road / Cudgen Road intersection being the north-westbound right-turn and the southbound left-turn. Without additional east-west links connecting between Tweed Coast Road and Kingscliff to the north, traffic volumes will continue to increase on this link. However, strategic modelling indicates that traffic volumes on Cudgen Road will be significantly reduced with the provision of additional east-west links which provide additional capacity and more direct route choice. For comparison 2041, AADT on Cudgen Road from the Tweed Strategic Transport Model for the Base Scenario (i.e. no infrastructure upgrade) and Scenario 2 (with the inclusion of the two east-west links and four lane upgrade of Tweed Coast Road) were compared to the 2018 AADT recorded as part of the traffic surveys. This comparison is presented in Table 3.7.

**Table 3.7: AADT Volume Comparison on Cudgen Road**

2041 AADT – Survey	2041 AADT – Base Scenario (without Tweed Coast Road Upgrade and east-west links to the north)	2041 AADT – Scenario 2 (with Tweed Coast Road Upgrade and east-west links to the north)
11,774vpd	17,480vpd	12,200vpd

As demonstrated, the 2041 volumes with the provision of the east-west links are significantly lower (30%) than without the future road links in place. The volumes are comparable to the 2018 surveys (3-4% higher). On this basis, turning volumes at the Cudgen Road / Tweed Coast Road intersection will be significantly reduced once the future planned links are provided and are expected to return to levels currently exhibited on Cudgen Road.

### 3.7.5 Cudgen Road / Kingscliff TAFE Access

Analysis of the Cudgen Road / Kingscliff TAFE access intersection was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) and Year 2033 (10-year design horizon) background traffic volumes. The existing geometric layout for the intersection was used. Given the form of the intersection being a “seagull intersection”, the intersection was modelled in SIDRA as two intersections in a network (i.e. each stage of the intersection is separated), following standard SIDRA methodology. While the southern approach (TAFE approach) is not delineated as having two approach lanes, the width of the approach lane accommodates two vehicles to prop side by side simultaneously (i.e. a right turning vehicle and a left turning vehicle). To reflect this, the intersection was modelled with a short-left lane.

The layout of the intersection network used in SIDRA is shown in Figure 3.24.

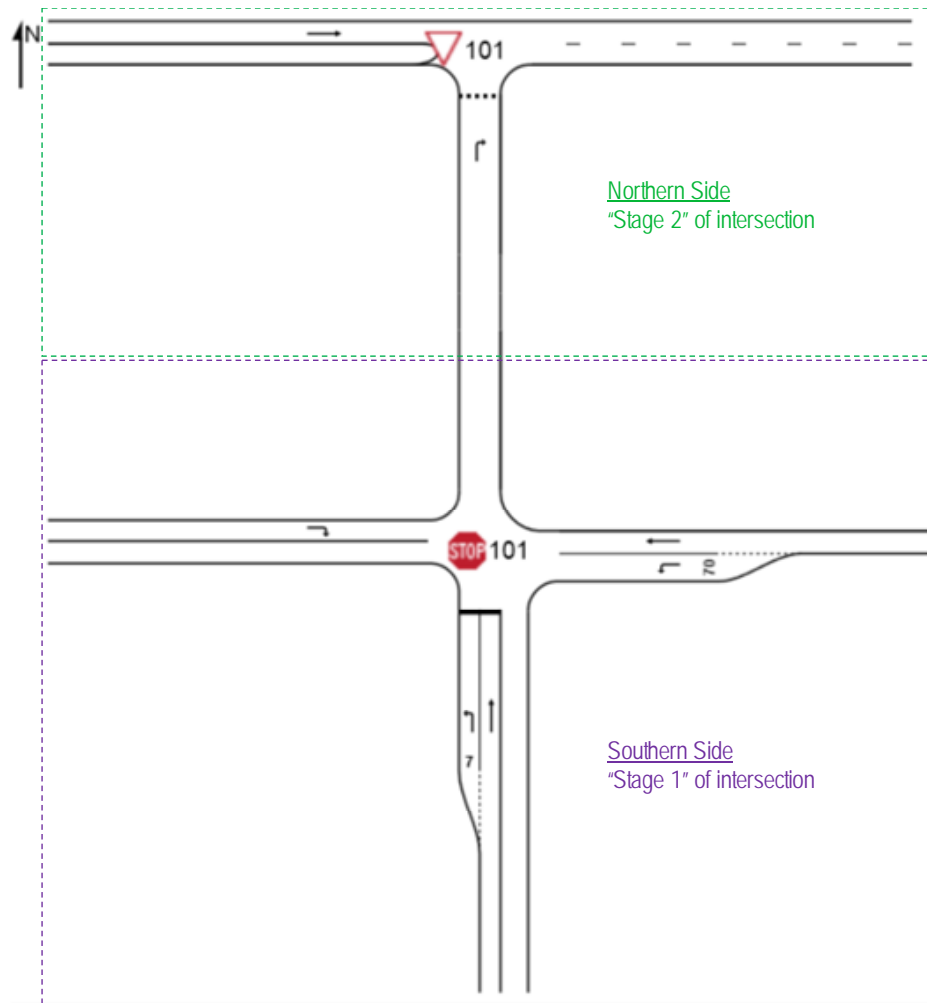


Figure 3.24: Cudgen Road / Kingscliff TAFE Access SIDRA Intersection Layout

The results of the analysis for background traffic volumes are summarised in Tables 3.8 and 3.9. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 3.8: Cudgen Road / Kingscliff TAFE Access SIDRA Results Summary (Year 2023 Background Traffic Volumes)

Approach	Year 2023 AM Peak					Year 2023 PM Peak			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: TAFE Access (S)	L2	0.052	9.2	LOS A	1.3	0.168	9.8	LOS A	4.4
	T1	0.02	18.2	LOS B	0.5	0.091	14.4	LOS A	2.4
	Approach	0.052	10.3	LOS A	1.3	0.168	10.9	LOS A	4.4
East: Cudgen Road €	L2	0.034	5.6	LOS A	0	0.006	5.6	LOS A	0
	T1	0.317	0	LOS A	0	0.331	0	LOS A	0
	Approach	0.317	0.5	NA	0	0.331	0.1	NA	0
West: Cudgen Road (W)	R2	0.35	11.3	LOS A	12	0.036	9.4	NA	0.9
	T1	0.401	0	LOS A	0	0.361	0	LOS A	0
	Approach	0.401	11.3	LOSA	12	0.361	9.4	LOS A	0.9
South: Median Storage Area	R2	0.008	5	LOS A	0.2	0.361	0	LOS A	0
	Approach	0.008	5	LOS A	0.2	0.361	0	NA	0
All Vehicles		0.401	3.5	N/A	12	0.361	2.3	NA	4.4

**Table 3.9: Cudgen Road / Kingscliff TAFE Access SIDRA Results Summary (Year 2033 Background Traffic Volumes)**

Approach	Year 2033 AM Peak					Year 2033 PM Peak			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: TAFE Access (S)	L2	0.073	10.5	LOS A	1.8	0.244	11.8	LOS A	6.6
	T1	0.034	24.7	LOS B	0.8	0.143	18.2	LOS B	3.7
	Approach	0.073	12.4	LOS A	1.8	0.244	13.3	LOS A	6.6
East: Cudgen Road €	L2	0.04	5.6	LOS A	0	0.007	5.6	LOS A	0
	T1	0.377	0	LOS A	0	0.393	0	LOS A	0
	Approach	0.377	0.5	NA	0	0.393	0.1	NA	0
West: Cudgen Road (W)	R2	0.511	15	LOS B	19.9	0.052	10.9	LOS A	1.3
	T1	0.476	0	LOS A	0	0.428	0	LOS A	0
	Approach	0.511	15	N/A	19.9	0.428	10.9	NA	1.3
South: Median Storage Area	R2	0.013	6.6	LOS A	0.3	0.066	5.5	LOS A	1.4
	Approach	0.013	6.6	LOS A	0.3	0.066	5.5	LOS A	1.4
All Vehicles		0.511	4.5	NA	19.9	0.428	2.8	NA	6.6

As demonstrated in Table 3.8 and 3.9, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a roundabout intersection in the Year 2023 and 2033 background traffic scenarios.

Through movements on Cudgen Road have no queuing associated with the subject intersection, as these movements have priority. Queuing therefore does not impact the Cudgen Road / Turnock Street roundabout, which is located approximately 120m away.

### 3.7.6 Cudgen Road / Turnock Street roundabout

Analysis of the Cudgen Road / Turnock Street / Elrond Drive intersection was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) background traffic volumes. The existing geometric layout for the intersection was used. Analysis beyond the year of opening for background traffic was not assessed as the Tweed Valley Hospital proposes to take access from the intersection, therefore modifying the intersection geometry. Further analysis of the intersection was undertaken with the proposed new intersection layout and design traffic volumes in Section 5.4.

The layout of the intersection used in SIDRA is shown in Figure 3.25.

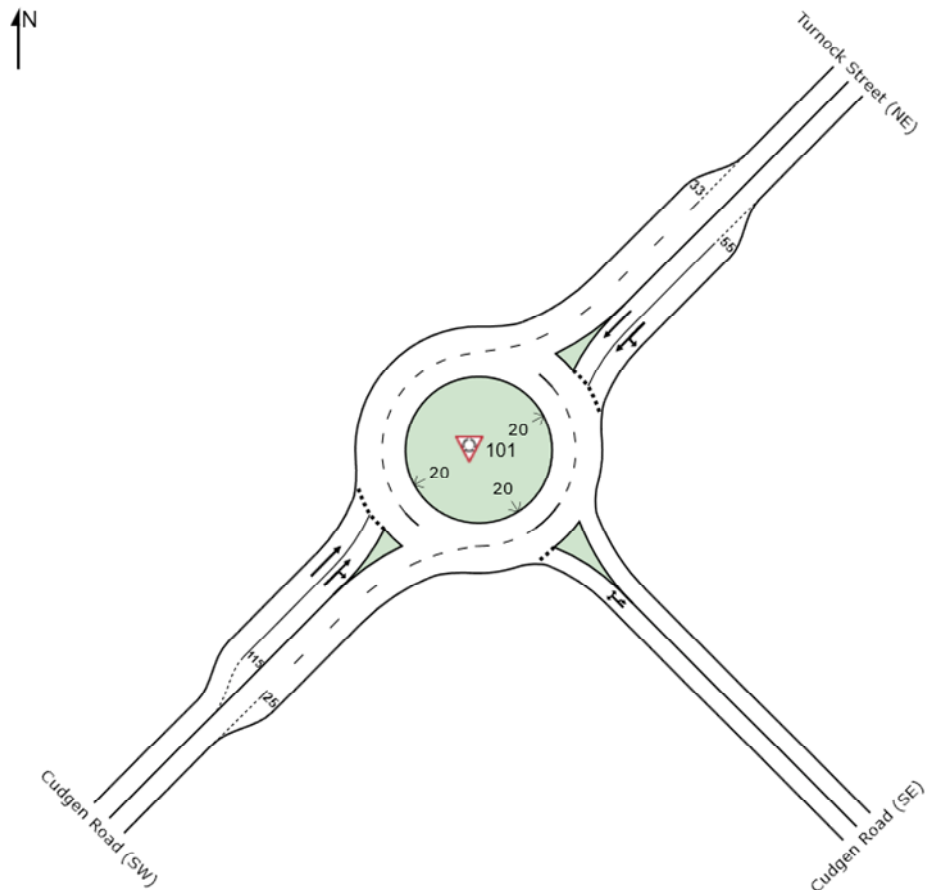


Figure 3.25: Cudgen Road / Turnock Street SIDRA Intersection Layout

The results of the analysis are summarised in Table 3.10. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 3.10: Cudgen Road / Turnock Street SIDRA Results Summary (Year 2023 Background Traffic Volumes)

Approach	Year 2023 AM Peak					Year 2023 PM Peak			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Cudgen Road (SE)	L2	0.59	4.6	LOS A	39.4	0.522	5	LOS A	30.6
	R2	0.59	9.1	LOS A	39.4	0.522	9.5	LOS A	30.6
	U	0.59	10.9	LOS A	39.4	0.522	11.2	LOS A	30.6
	Approach	0.59	5.4	LOS A	39.4	0.522	5.8	LOS A	30.6
NorthEast: Turnock Street (NE)	L2	0.138	7.5	LOS A	5.4	0.107	8	LOS A	3.8
	T1	0.193	7.1	LOS A	8.3	0.223	6.3	LOS A	9.2
	Approach	0.193	7.2	LOS A	8.3	0.223	6.7	LOS A	9.2
SouthWest: Cudgen Road (SW)	T1	0.49	5	LOS A	30.4	0.447	4.7	LOS A	26.6
	R2	0.49	9.4	LOS A	30.4	0.447	9.3	LOS A	26.6
	Approach	0.49	7.9	LOS A	30.4	0.447	7.3	LOS A	26.6
All Vehicles		0.59	6.8	LOS A	39.4	0.522	6.6	LOS A	30.6

As demonstrated in Table 3.10, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a roundabout intersection in the Year 2023 background traffic scenarios.

95<sup>th</sup> percentile queues on the Cudgen Road South East approach extend approximately 30m and therefore does not impact the operations of the Cudgen Road / TAFE access intersection, which is located approximately 120m away.

### 3.7.7 Turnock Street / Elrond Drive roundabout

Analysis of the Turnock Street / Elrond Drive intersection was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) and Year 2033 (10-year design horizon) background traffic volumes. The existing geometric layout for the intersection was used.

The layout of the intersection used in SIDRA is shown in Figure 3.26.

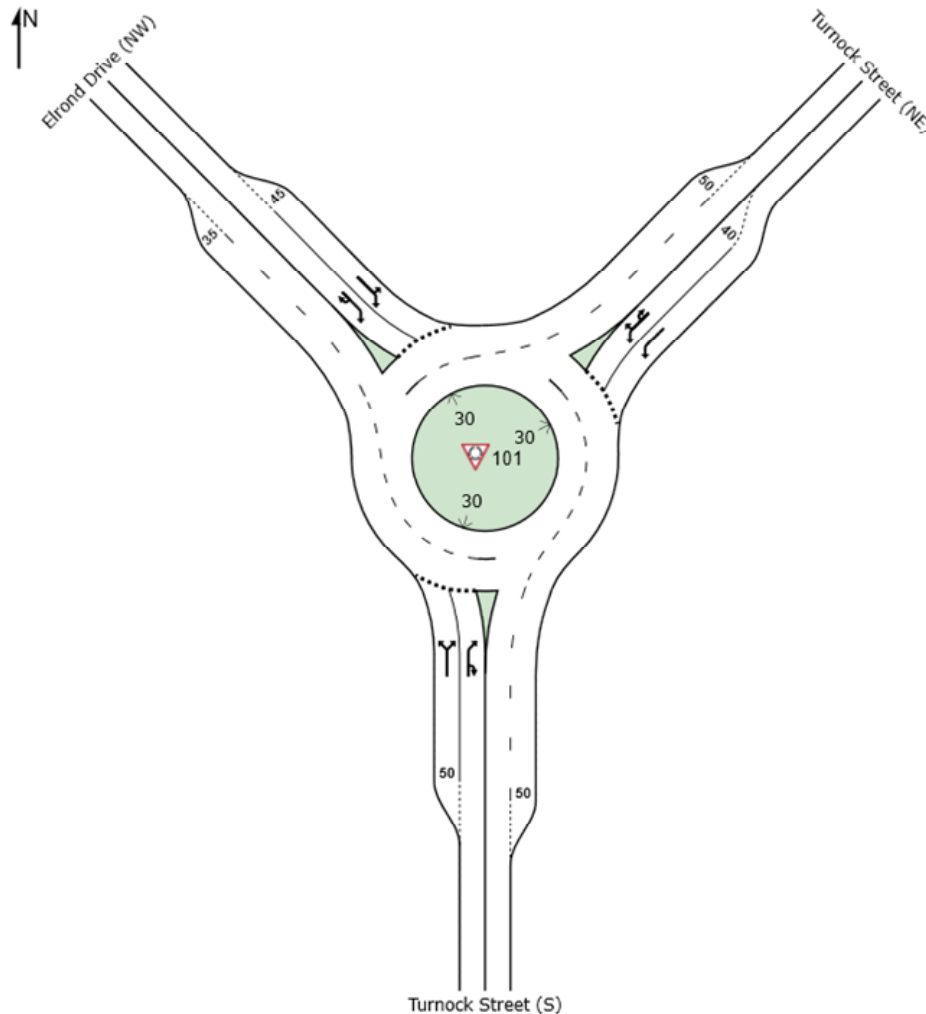


Figure 3.26: Turnock Street / Elrond Drive SIDRA Intersection Layout

The results of the analysis are summarised in Tables 3.11-3.12. A copy of the SIDRA movement summaries is provided in Appendix C.



Table 3.11: Turnock Street / Elrond Drive SIDRA Results Summary (Year 2023 Background Traffic Volumes)

Approach	Year 2023 AM Peak					Year 2023 PM Peak			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Turnock Street (S)	L1	0.092	3.4	LOS A	2.8	0.115	3.5	LOS A	3.4
	R1	0.18	8.2	LOS A	6	0.203	8.3	LOS A	6.7
	U	0.18	11.7	LOS A	6	0.203	11.8	LOS A	6.7
	Approach	0.18	7.2	LOS A	6	0.203	6.8	LOS A	6.7
NorthEast: Turnock Street (NE)	L1	0.13	3.5	LOS A	4.2	0.163	3.3	LOS A	5.6
	R2	0.13	9.5	LOS A	4.2	0.163	9.4	LOS A	5.6
	U	0.13	11.8	LOS A	4.2	0.163	11.7	LOS A	5.6
	Approach	0.13	4.8	LOS A	4.2	0.163	5.1	LOS A	5.6
NorthWest: Elrond Drive (NW)	L2	0.07	4.6	LOS A	2	0.045	4.7	LOS A	1.3
	R1	0.077	8.9	LOS A	2.3	0.046	8.9	LOS A	1.4
	U	0.077	12.4	LOS A	2.3	0.046	12.4	LOS A	1.4
	Approach	0.077	7	LOS A	2.3	0.046	7	LOS A	1.4
All Vehicles		0.18	6.4	LOS A	6	0.203	6.2	LOS A	6.7

Table 3.12: Turnock Street / Elrond Drive SIDRA Results Summary (Year 2033 Background Traffic Volumes)

Approach	Year 2033 AM Peak					Year 2033 PM Peak			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Turnock Street (S)	L1	0.111	3.4	LOS A	3.5	0.139	3.6	LOS A	4.2
	R1	0.216	8.2	LOS A	7.5	0.243	8.4	LOS A	8.5
	U	0.216	11.7	LOS A	7.5	0.243	11.9	LOS A	8.5
	Approach	0.216	7.2	LOS A	7.5	0.243	6.9	LOS A	8.5
NorthEast: Turnock Street (NE)	L1	0.157	3.6	LOS A	5.3	0.196	3.4	LOS A	7
	R2	0.157	9.5	LOS A	5.3	0.196	9.4	LOS A	7
	U	0.157	11.9	LOS A	5.3	0.196	11.7	LOS A	7
	Approach	0.157	4.9	LOS A	5.3	0.196	5.1	LOS A	7
NorthWest: Elrond Drive (NW)	L2	0.087	4.8	LOS A	2.5	0.055	4.9	LOS A	1.7
	R1	0.095	9.1	LOS A	2.9	0.057	9.1	LOS A	1.8
	U	0.095	12.5	LOS A	2.9	0.057	12.6	LOS A	1.8
	Approach	0.095	7.2	LOS A	2.9	0.057	7.2	LOS A	1.8
All Vehicles		0.216	6.5	LOS A	7.5	0.243	6.3	LOS A	8.5

As demonstrated in Table 3.11 and 3.12, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a roundabout intersection in the Year 2023 and 2033 background traffic scenarios.

### 3.7.8 Turnock Street / Pearl Street roundabout

Analysis of the Turnock Street / Pearl Street intersection was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) and Year 2033 (10-year design horizon) background traffic volumes. The existing geometric layout for the intersection was used.

The layout of the intersection used in SIDRA is shown in Figure 3.27.

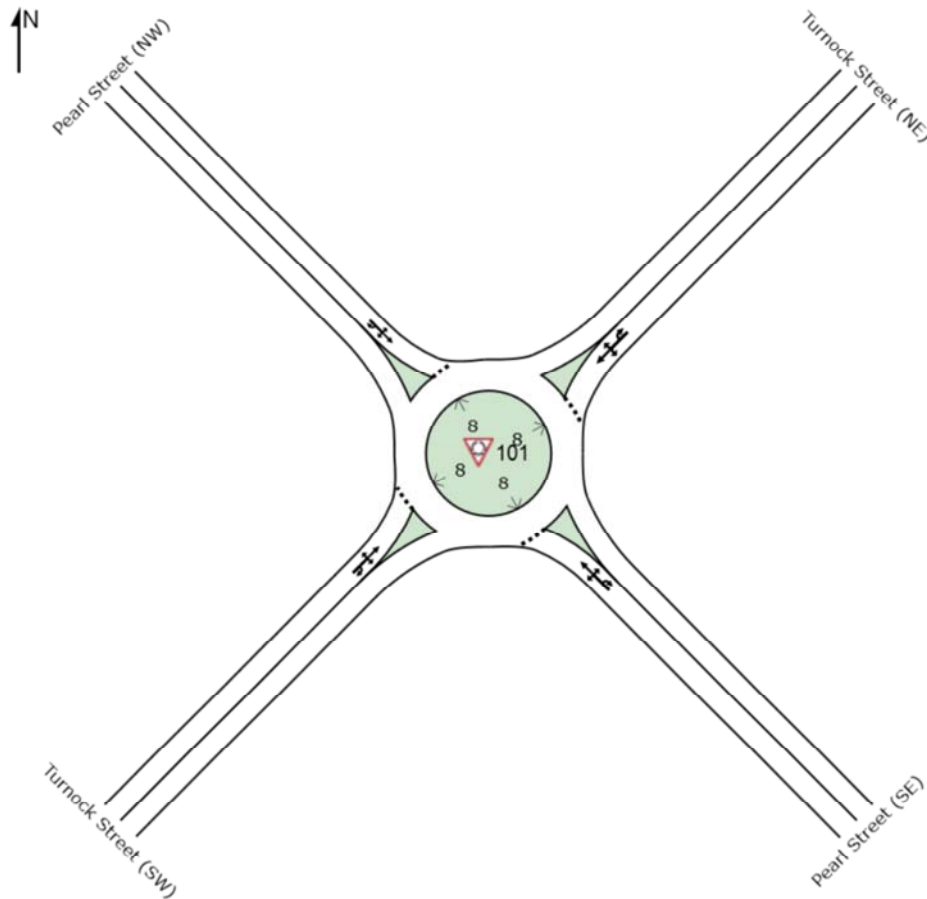


Figure 3.27: Turnock Street / Pearl SIDRA Intersection Layout

The results of the analysis are summarised in Tables 3.13 and 3.14. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 3.13: Turnock Street / Pearl Street Intersection SIDRA Results Summary (Year 2023)

Approach	Year 2023 AM Peak					Year 2023 PM Peak			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Pearl Street (SE)	L2	0.517	4.8	LOS A	32	0.58	5	LOS A	38
	T1	0.517	4.4	LOS A	32	0.58	4.7	LOS A	38
	R2	0.517	7.3	LOS A	32	0.58	7.7	LOS A	38
	U	0.517	8.4	LOS A	32	0.58	8.8	LOS A	38
	Approach	0.517	5.4	LOS A	32	0.58	5.6	LOS A	38
NorthEast: Turnock Street (NE)	L2	0.172	6.3	LOS A	7.2	0.159	5.8	LOS A	6.5
	T1	0.172	6	LOS A	7.2	0.159	5.7	LOS A	6.5
	R2	0.172	9	LOS A	7.2	0.159	8.7	LOS A	6.5
	U	0.172	10.4	LOS A	7.2	0.159	10.1	LOS A	6.5
	Approach	0.172	6.5	LOS A	7.2	0.159	6	LOS A	6.5
NorthWest: Pearl Street (NW)	L2	0.364	8	LOS A	18.4	0.334	7.5	LOS A	16.8
	T1	0.364	8	LOS A	18.4	0.334	7.6	LOS A	16.8
	R2	0.364	10.9	LOS A	18.4	0.334	10.4	LOS A	16.8
	U	0.364	12.3	LOS A	18.4	0.334	11.8	LOS A	16.8
	Approach	0.364	9	LOS A	18.4	0.334	8.7	LOS A	16.8
SouthWest: Turnock Street (SW)	L2	0.487	10	LOS A	28.4	0.477	9.3	LOS A	27.3
	T1	0.487	9.8	LOS A	28.4	0.477	9.2	LOS A	27.3
	R2	0.487	12.9	LOS A	28.4	0.477	12.5	LOS A	27.3
	U	0.487	14.1	LOS A	28.4	0.477	13.6	LOS A	27.3
	Approach	0.487	10.9	LOS A	28.4	0.477	9.9	LOS A	27.3
All Vehicles		0.517	7.7	LOS A	32	0.58	7.3	LOS A	38

Table 3.14: Turnock Street / Pearl Street Intersection SIDRA Results Summary (Year 2033)

Approach	Year 2033 AM Peak					Year 2033 PM Peak			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Pearl Street (SE)	L2	0.637	5.8	LOS A	46.6	0.718	7.5	LOS A	66.7
	T1	0.637	5.3	LOS A	46.6	0.718	7.1	LOS A	66.7
	R2	0.637	8.2	LOS A	46.6	0.718	10.1	LOS A	66.7
	U	0.637	9.3	LOS A	46.6	0.718	11.2	LOS A	66.7
	Approach	0.637	6.4	LOS A	46.6	0.718	8	LOS A	66.7
NorthEast: Turnock Street (NE)	L2	0.221	7	LOS A	9.7	0.203	6.4	LOS A	8.7
	T1	0.221	6.7	LOS A	9.7	0.203	6.2	LOS A	8.7
	R2	0.221	9.7	LOS A	9.7	0.203	9.2	LOS A	8.7
	U	0.221	11.1	LOS A	9.7	0.203	10.6	LOS A	8.7
	Approach	0.221	7.1	LOS A	9.7	0.203	6.6	LOS A	8.7
NorthWest: Pearl Street (NW)	L2	0.478	10.1	LOS A	27.8	0.435	8.6	LOS A	23.3
	T1	0.478	10.1	LOS A	27.8	0.435	8.7	LOS A	23.3
	R2	0.478	12.9	LOS A	27.8	0.435	11.4	LOS A	23.3
	U	0.478	14.4	LOS A	27.8	0.435	12.9	LOS A	23.3
	Approach	0.478	11.1	LOS A	27.8	0.435	9.8	LOS A	23.3
SouthWest: Turnock Street (SW)	L2	0.664	16.1	LOS B	52.7	0.65	14.7	LOS B	50.4
	T1	0.664	15.9	LOS B	52.7	0.65	14.6	LOS B	50.4
	R2	0.664	19.1	LOS B	52.7	0.65	18	LOS B	50.4
	U	0.664	20.2	LOS B	52.7	0.65	19	LOS B	50.4
	Approach	0.664	17	LOS B	52.7	0.65	15.3	LOS B	50.4
All Vehicles		0.664	10.2	LOS A	52.7	0.718	10	LOS A	66.7

As demonstrated in Table 3.13 and 3.14, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a roundabout intersection in the Year 2023 and 2033 background traffic scenarios.

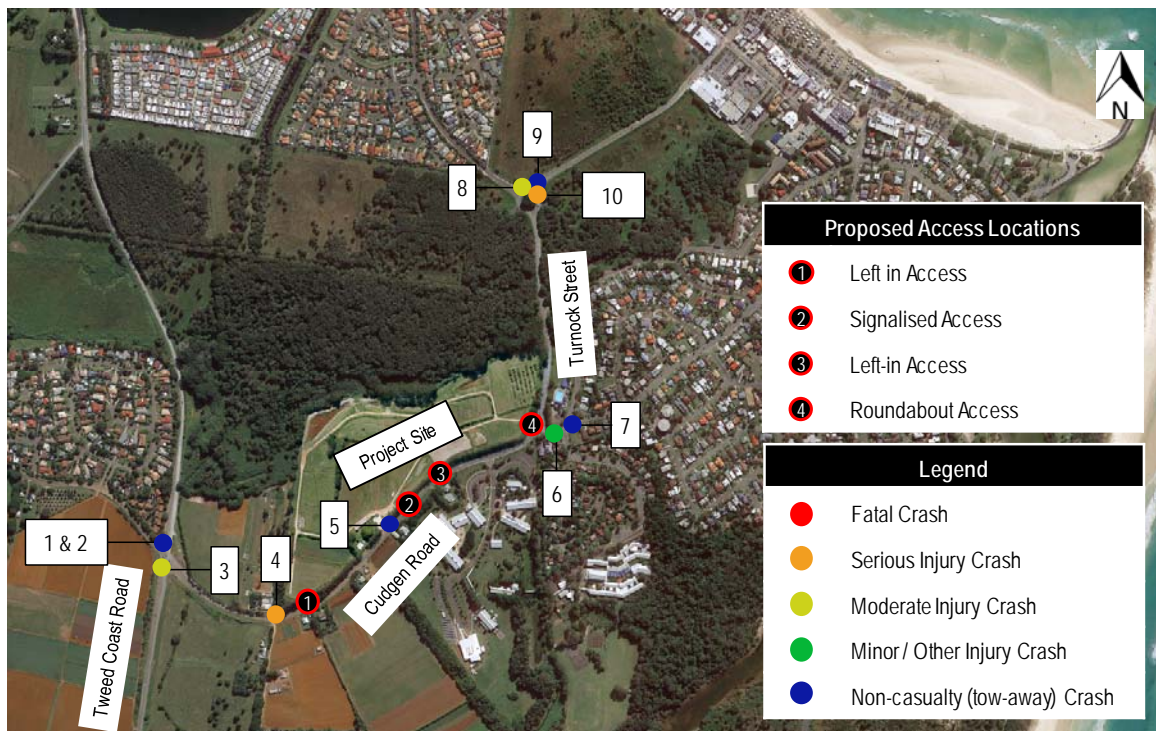
### 3.8 TRAFFIC SAFETY

#### 3.8.1 Crash History

As part of Stage 1, crash data was obtained from Transport for NSW (TfNSW) to assess crash occurrence and identify existing deficiencies within proximity to the proposed external access intersection locations and at existing nearby intersections. Crash data was obtained for the following road sections:

- Cudgen Road from Turnock Street to Tweed Coast Road (including the eastbound approach to the Tweed Coast Road / Cudgen Road intersection);
- Turnock Street from Cudgen Road to Elrond Drive; and
- Tweed Coast Road in proximity to the Tweed Coast Road / Cudgen Road intersection (approximately 250m on each approach).

Crash data was obtained for the five-year period between 2013 and 2017. Crash data for 2017 was noted by TfNSW as being 95% complete. Figure 3.28 illustrates the recorded crash locations and severity whilst Table 3.15 provides further details relating to each crash. As part of Stage 2, the TfNSW *Crash and casualty statistics - LGA view; Crashes Map – Tweed* was reviewed which confirmed additional data to that reviewed as part of Stage 1, was not available.



Source: TfNSW

Figure 3.28: TfNSW Crash Data Summary for Surrounding Roads (2013-2017)

Table 3.15: TfNSW Crash Data Summary for Surrounding Roads (2013-2017)

#	Year	Severity	RUM	Description	Lighting / Weather	Key Direction	Contributing Factors
1	2017	Non-casualty	81	Off bend into object	Dark / wet / raining	West	Speeding
2	2015	Moderate Injury	80	Off bend	Dark / dry / fine	North	Unknown
3	2014	Moderate Injury	30	Rear end	Daylight / dry / fine	South	Unknown
4	2013	Serious Injury	80	Off bend	Dark / dry / fine	West	Speeding
5	2014	Non-casualty	32	Right rear	Daylight / dry / fine	East	Unknown
6	2015	Minor / other injury	40	U-turn	Daylight / dry / fine	West	Unknown
7	2017	Non-casualty	87	Off bend	Daylight / dry / fine	South	Speeding
8	2014	Moderate Injury	10	Cross traffic	Daylight / dry / fine	South	Unknown
9	2014	Non-casualty	73	Off road into object	Darkness / dry / fine	West	Unknown
10	2015	Serious Injury	72	Off road to right	Daylight / dry / fine	West	Fatigue

The crash data does not demonstrate a significantly high crash rate for the section of Cudgen Road or Turnock Street between Tweed Coast Road and Elrond Drive. There are no crash clusters or identified crash trends at any of the proposed site access locations.

It is noted that RMS has previously raised concern with traffic safety at the Pacific Highway / Tweed Coast Road interchange, particularly around the westbound left-turn from the off-ramp to Tweed Coast Road. In this regard, in 2018 Tweed Shire Council obtained Blackspot funding for this location and undertook works in August 2018 (including provision of a new median, line marking and provision of a skid resistant pavement).

### 3.9 EXISTING PARKING SUPPLY AND DEMAND

#### 3.9.1 On-Street and Off-Street Parking

No on-street parking is provided along the Project Site frontage on either Cudgen Road or Turnock Street. The cross-sections of both roads are predominantly rural in nature and include one travel lane in each



direction, with no on-street parking and limited shoulder provisions. Nearby residential streets including McPhail Avenue, Cudgen Road (north of McPhail Avenue) and Oxford Street include on-street parking provision. Surrounding land uses including Kingscliff TAFE, Kingscliff High School, Tweed Regional Aquatic Centre, Kingscliff Library and residential dwellings include off-street parking. On-street parking is primarily utilised during school periods by students and pick-up / drop-off along Oxford Street and Cambridge Court. The on-street parking in these areas is unrestricted. Figures 3.29-3.31 shows the on-street parking and typical utilisation during the day on a weekday.



Figure 3.29: McPhail Avenue Cross Section and Observed On-street Parking



Figure 3.30: Cudgen Road (north of McPhail Avenue) Cross Section and Observed On-street Parking



Figure 3.31: Oxford Street Cross Section and Observed On-street Parking

### 3.9.2 Existing Parking Demand

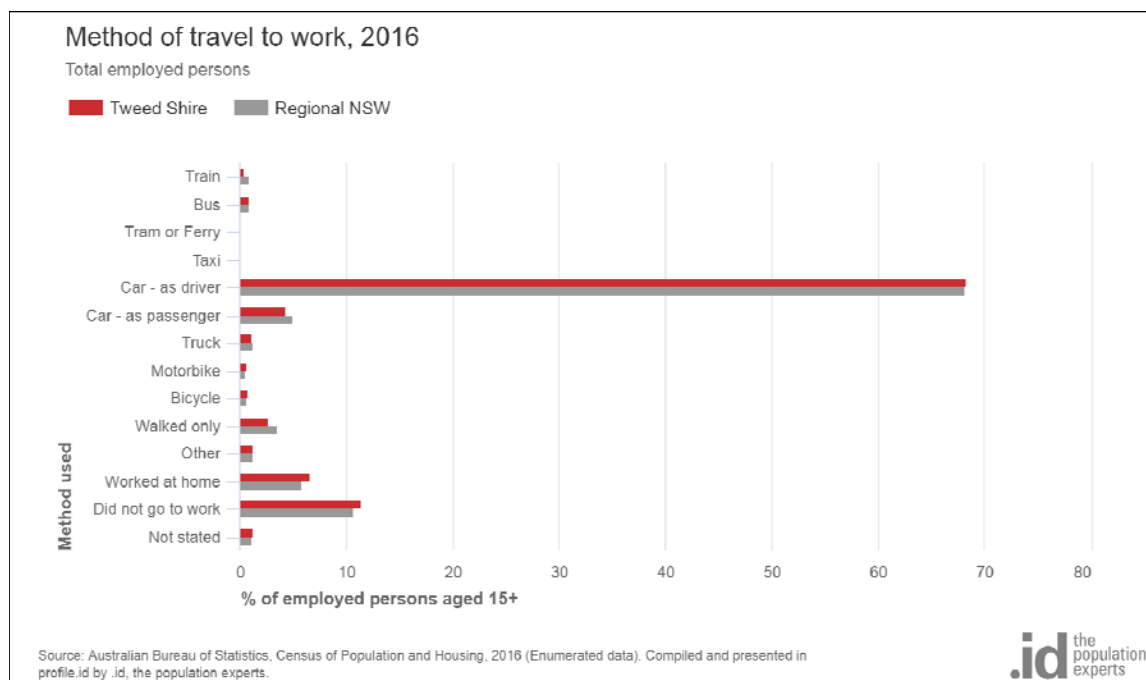
A review of the existing operations and land uses on the Project Site combined with site observations indicates that there is little existing parking demand for the current site operations. All current operations on the Project Site are expected to cease as a result of the Tweed Valley Hospital.

### 3.9.3 Pick-up and Set Down Areas

There are no existing pick-up or set down areas for the Project Site.

## 3.10 MODAL SPLIT

Australian Bureau of Statistics (ABS) data prepared and compiled by profile.id was reviewed to compare typical travel modes used in the Tweed Shire (refer Figure 3.32).



Source: ABS and profile.id

**Figure 3.32: Method of Travel to Work – Tweed Shire 2016**

For those that travelled to work, travelling by private vehicle as the driver was the most common method (68.3%), followed by private vehicle as a passenger (4.4%). Active transport (walking and cycling) and public transport (bus) were the other main transport methods although utilisation was low (0.9-2.7%).

The Roads and Maritime Services (RMS) Guide to Traffic Generating Developments 2002 surveyed travel modes for trips to hospitals and identified the that “the mean proportion of people who travelled to the site by vehicle was 87.4%, with a range of 67.3% - 98.2%. Average vehicle occupancy was found to be 1.3 persons per car.”

## 3.11 PUBLIC TRANSPORT

### 3.11.1 Rail Stations and Services

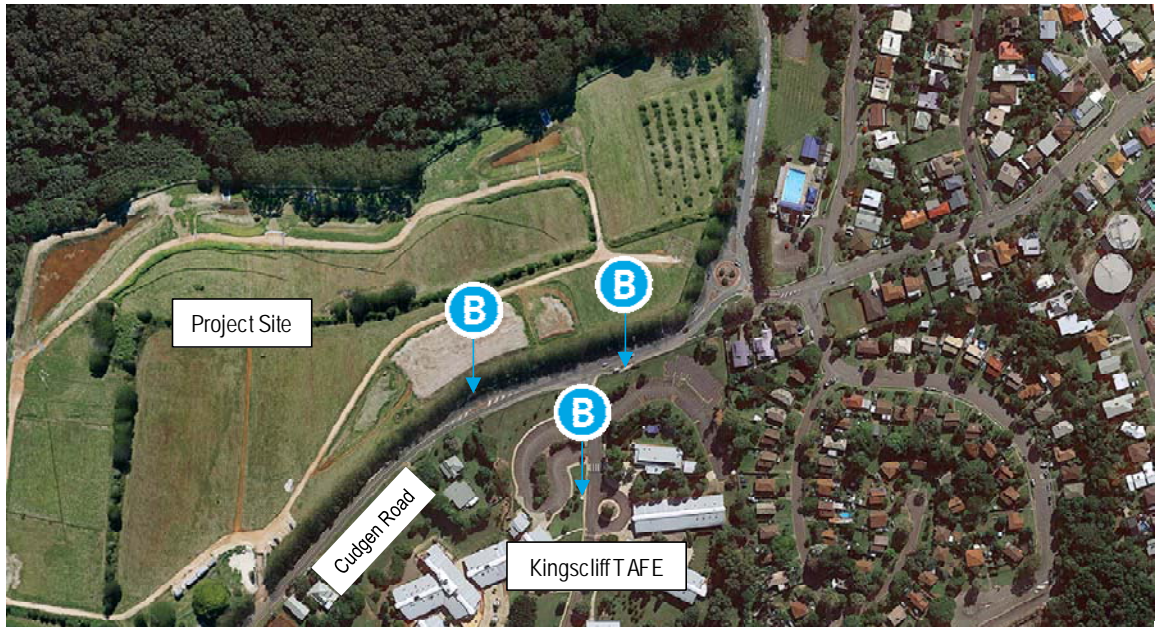
The Tweed Shire has no operational rail stations or services. The nearest rail services are located to the north in the City of Gold Coast with the closest heavy rail station located at Varsity Lakes. The most southern Gold Coast Light Rail stage is currently located in Broadbeach. The NSW regional services terminates in Casino and continues north of Casino via bus.

There is no planning in the short-medium future for rail services to extend into the Tweed Shire.



### 3.11.2 Bus Stops and Services

Two existing bus stops are located on Cudgen Road fronting the Project Site (eastbound and westbound). These stops service the adjacent Kingscliff TAFE Campus, TRAC Kingscliff, Kingscliff Library and immediate residential catchment. Both stops have shelters and seating. Footpaths connections are provided to each bus stop and a pedestrian refuge crossing is provided on Cudgen Road. The eastbound stop is located directly adjacent a pedestrian refuge crossing (i.e. pedestrians cross into the bus stop) and the westbound stop is located in the left turn lane to the TAFE. Figures 3.33 and 3.34 shows the existing bus stop infrastructure. It is noted that Route 601 also terminates within the TAFE site during teaching terms.



Source: Google Maps & TINSW

Figure 3.33: Existing Bus Stop Infrastructure



Figure 3.34: Existing Eastbound Bus Stop and Pedestrian Refuge Crossing





**Figure 3.35: Existing Westbound Bus Stop**

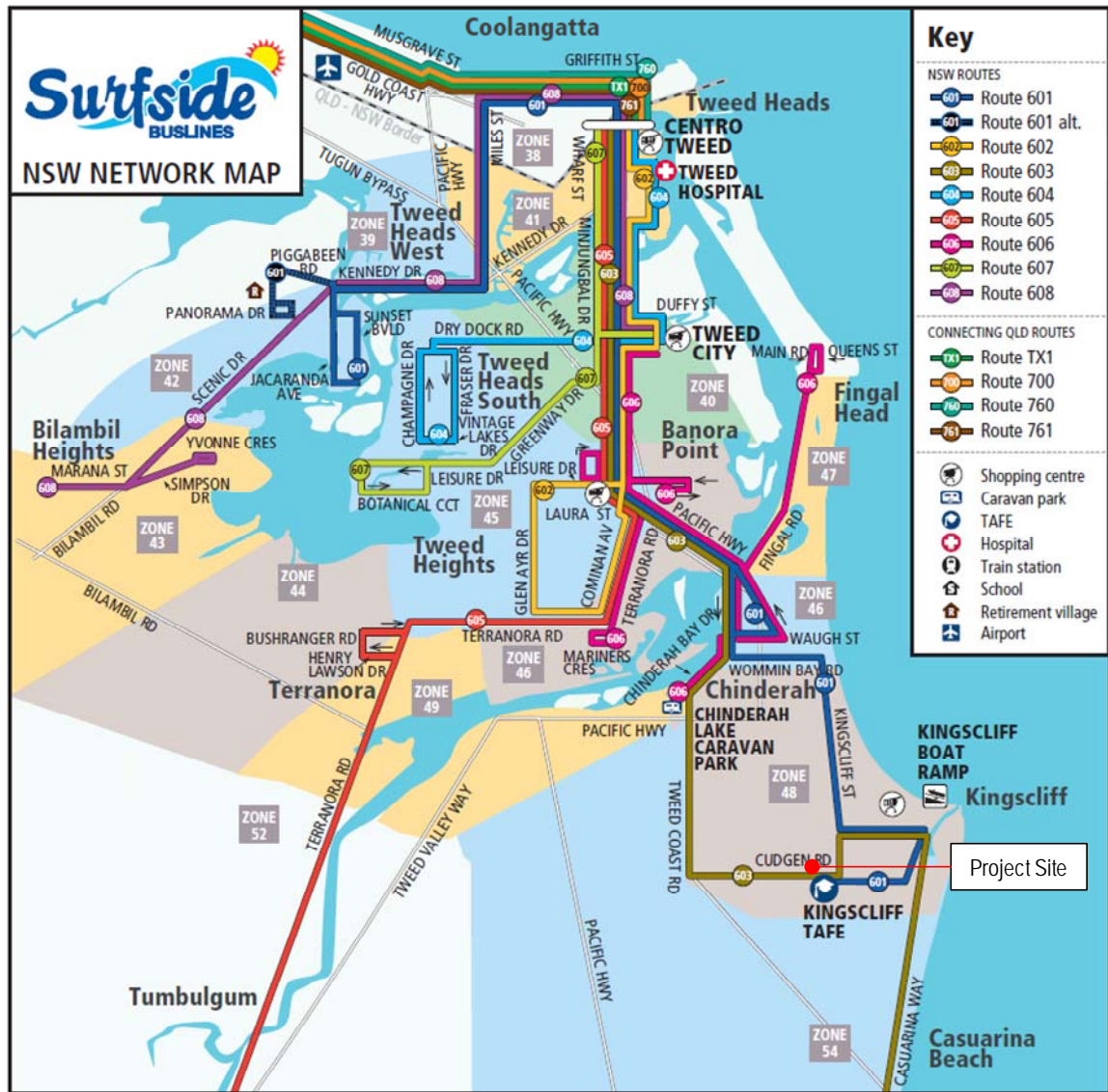
The existing bus stops are serviced by the Route 603 on an hourly basis. Route 603 provides connection between the following locations:

- Tweed Heads
- Tweed City;
- Chinderah;
- Cudgen;
- Kingscliff;
- Salt;
- Casuarina;
- Bogangar;
- Cabarita;
- Hastings Point; and
- Pottsville.

Kingscliff TAFE is also serviced by Route 601. Route 601 provides connection between the following locations

- Kingscliff;
- Chinderah;
- Tweed City;
- Tweed Heads;
- Coolangatta; and
- West Tweed.

Surfside have noted that Route 601 terminates within Kingscliff TAFE and does not continue past the Project Site. Surfside also noted issues with the service when the TAFE is closed, and the access is gated, restricting the bus from turning around on the site. The existing bus service routes are presented in Figure 3.36.



Source: Surfside Buslines

Figure 3.36: Existing Bus Service Routes

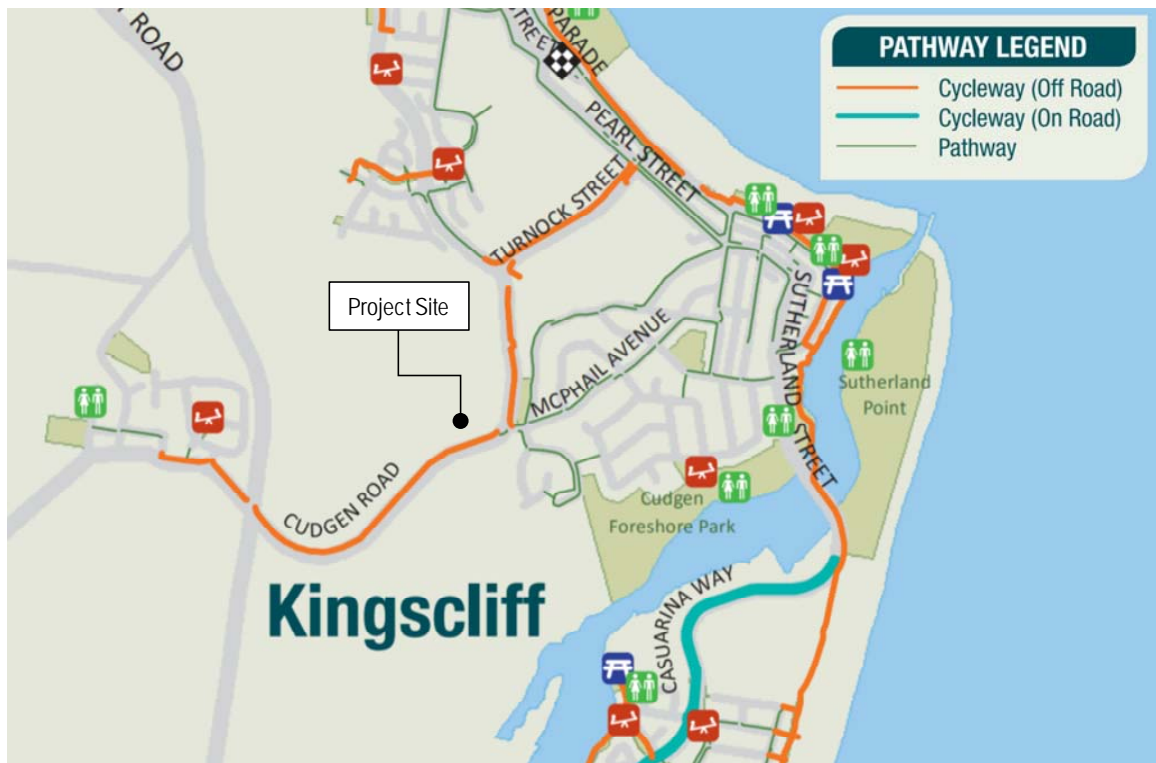
### 3.11.3 Commuter Parking

There is no existing commuter parking supply or demands in the area.

## 3.12 PEDESTRIAN NETWORK

### 3.12.1 Pedestrian Routes and Infrastructure

An existing off-road shared path is provided along the Project Site frontage. The pathway connects to residential areas west of Tweed Coast Road and to Kingscliff in the east. The existing network in proximity to the Project Site is shown in Figure 3.37. Note that the off-road cycle ways shown in the figure are shared pathways suitable for pedestrians.



Source: Tweed Shire Council Cycleways and Footpaths 2017

**Figure 3.37: Surrounding Pathway Network**

### 3.12.2 Pedestrian Conflict Points

Pedestrian crossings across Cudgen Road and Turnock Street are all unsignalised crossings. The location of the refuge crossing on Cudgen Road to the west of the Kingscliff TAFE access conflicts with the location of the eastbound stop and is considered to be a safety issue.

## 4. PROPOSED PROJECT

### 4.1 THE PROJECT

The Project is for a new hospital for the Tweed Shire. The Project Site for the Tweed Valley Hospital is to the west of Kingscliff on 771 Cudgen Road, Cudgen NSW. The Project is expected to include a range of services and services (as detailed in Section 1.1). For the purpose of this assessment the following is expected:

- 391 overnight and day only beds by Year 2023
- 443 overnight and day only beds by Year 2033
- Year 2023: approximately 1,120 staff on-site during the day shift,
- Year 2033: approximately 1,300 staff on-site during the day shift

As approval for an additional 56 inpatient unit beds is also being sought (although subject to separate business cases and funding), a sensitivity scenario was also tested. It is understood that the outcomes of the Strategic Workforce Plan do not change under this scenario. The Sensitivity test includes:

- 499 overnight and day only beds by Year 2033; and
- Year 2033: approximately 1,330 staff on-site during the day shift.

The Project is considered SSD and critical social infrastructure. The Project Development Plan is presented in Appendix B of the EIS.

### 4.2 TRAVEL TIME ASSESSMENT

Travel times were calculated for the various population sectors across the Tweed Local Government Area. For the purpose of access to health services, the QLD suburbs were excluded from the travel time calculations. The model used for the travel time assessment was the Tweed Strategic Transport Model (TSTM) which is approved for use by Tweed Shire Council. Travel times were based on the morning peak period using a 2041 design year. The model used to extract travel times includes forecast population growth and traffic demand growth as well as planned future road network upgrades. Figure 4.1 summarises travel time by proportion of the Tweed Shire population. Travel times and associated travel routes to key population centres is also presented in Figure 4.2.



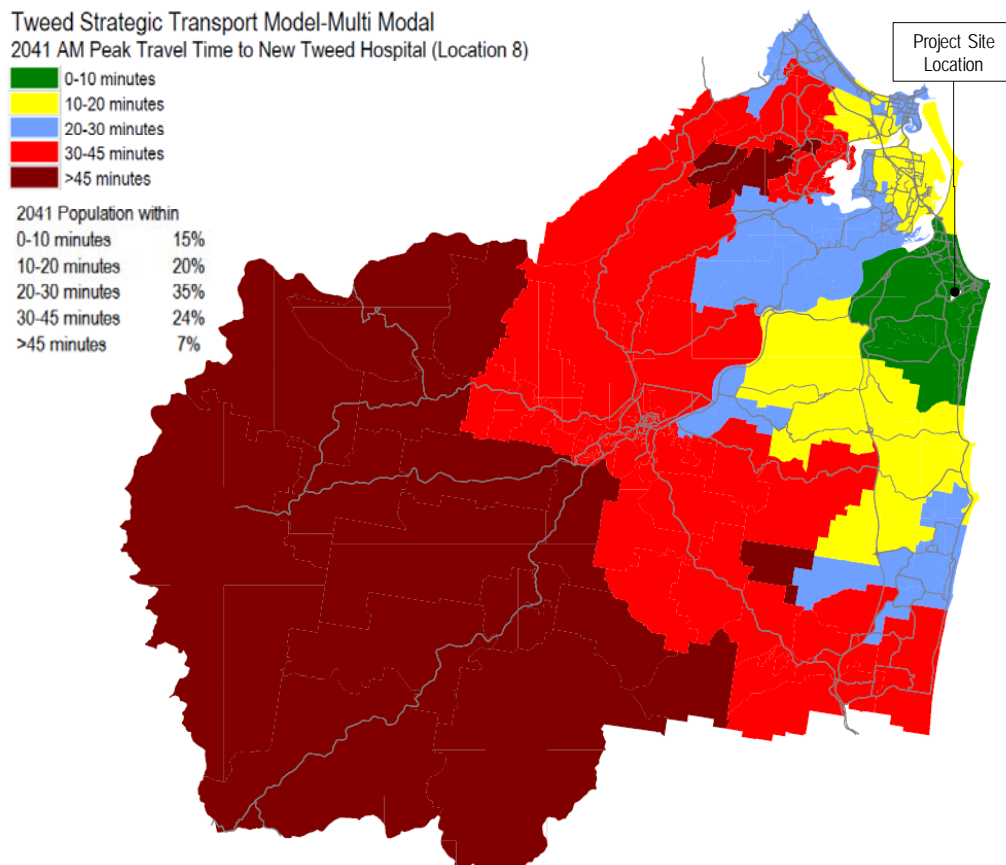


Figure 4.1: Travel Time to Project Site by Area

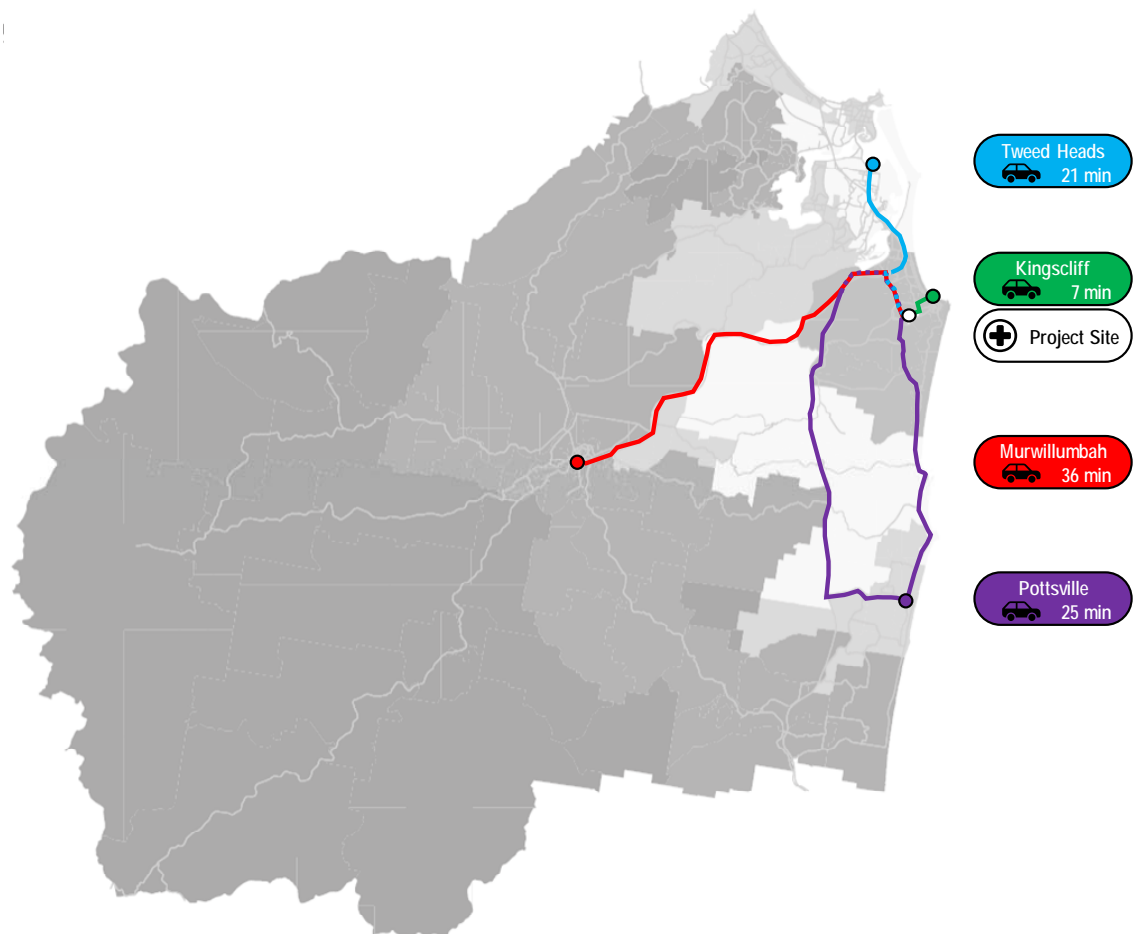


Figure 4.2: Travel Time to Project Site by Population Centre

The proposed Tweed Valley Hospital is well located with respect to current and forecast population centres, with a travel time of less than 30 minutes for nearly 70% of the Tweed Shire population.

## 4.3 ACCESS AND INTERNAL CIRCULATION ASSESSMENT

### 4.3.1 Access Locations

The Tweed Valley Hospital includes a total of four access locations as follows:

- **Access A:** Left-in only from Cudgen Road at the eastern boundary. The access is provided with an Auxiliary Left turn (AUL) treatment. This is a limited access only and provides access to the staff car park and dedicated access for ambulances and service vehicles. Access A does not facilitate public access. This will be clearly signed as part of the way finding strategy. The proposed Site Access A configuration has been developed through the masterplan process in consultation with a range of stakeholders including clinicians, emergency services, transport authorities and Council officers. The proposed configuration incorporates a higher order facility compared to a standard driveway crossover as typically stipulated under Council's Driveway Access to Property Specifications. The reasonings for this are as follows:
  - The proposed access location connects to the service ring road and provides dedicated access to emergency services and authorised vehicles only to the precinct
  - Council's driveway specification does not specify turn treatments. The installation of turn treatments for property access is also not explicitly stipulated within Austroads, but may be used as a guide only. The design service vehicle using this access coupled with the through traffic volumes were reviewed through the design process. Given these volumes combined with the signalised intersection located to the west, the installation of a turn treatment was considered necessary to allow design vehicles entering the site to do so without the risk of rear end collisions associated with through traffic. A turn treatment is appropriate at this access location to improve safety when compared to a standard driveway crossover
  - a typical driveway crossover requires a 90-degree angled turn into the site and traverse of the kerb and channel crossover. Whilst this operation is acceptable for typical crossovers that allows two-way movements turning right and left into a site, the proposed access is for left-in movements only and by Ambulances and service vehicles. As such, the driveway alignment and splays are only required for left-in movements and by the nominated largest vehicle, which in this case is an Articulated Vehicle. In order for an Articulated Vehicle to enter the site from the kerbside turn lane, a driveway splay across the shared pathway would be significantly wider than the proposed configuration. The driveway crossover configuration would increase the pedestrian / cycle 'crossing distance' from 3.5m up to an estimated 13m and would require eastbound pedestrians / cyclist to check for entering vehicles a full 180 degrees (i.e. back in the opposite direction of travel) for inbound vehicles seeking to entry the driveway. Under the proposed configuration, pedestrian / cyclists would be required to rotate 90 degrees to check for approaching vehicles
  - The installation of vertical thresholds or sharper turns to enter the site via a driveway crossover was expressed through the stakeholder consultation process as an issue for Ambulance operations. Specifically, a driveway crossover configuration impacts the delivery of emergency patients to the hospital who may be in distress, fragile or undergoing emergency procedures while in transit. The proposed access configuration allowed for level, smooth and direct access to the site, whilst still maintaining adequate pedestrian crossing facilities past the access
  - Australian Standards AS2890 requirements for selection of access facilities specifies that access to arterial roads should be provided in the form of an intersection not an access driveway for accesses servicing more than 600 parking spaces. Cudgen Road is considered to be a sub-arterial road and would not fall within the local road hierarchy which would require a driveway crossover.

Access A will be constructed as part of the Stage 1 approval and subsequent Section 138 applications to Council. As part of this process and as part of the Stage 1 conditions of approval a road safety audit was required to be undertaken including for alternate design options. This process identified that the proposed access with an AUL treatment was preferable. The road safety audit process identified a number of issues where improvements could be made. The final design considered the road safety audit and incorporated improvements to address issues. Improvements included RMS standard pedestrian fencing to restrict pedestrians from moving from the path onto the



travel lane, widening of the pathway, separation of the path from the back-of kerb, provision of signs and line marking to demonstrate priority for vehicles and re-alignment of the pathway on the southern side of the AUL such that it approaches the AUL at 90 degrees

- **Access B:** Signalised all movements access to Cudgen Road. This is the site's primary access and provides access for staff, ambulances and visitors. The signalised nature and design of the intersection provides a high level of pedestrian amenity, providing pedestrian connectivity to the westbound bus stop, Kingscliff TAFE and surrounding residential areas. The signalised access has been designed as an intersection and to cater for design traffic volumes in the 10-year design horizon (i.e. Year 2033). Detailed assessment of the intersection has been undertaken in Section 5.4.4. The specific location of access intersection is dictated by a number of factors including the requirement to provide sufficient vegetation buffer from overspray on adjacent farmland and to align with the TAFE frontage to Cudgen Road to allow for a potential future upgrade to a four-leg intersection as part of future expansion or development on the TAFE site. This future upgrade would allow for conversion of the existing TAFE access from a "seagull" to a left-in / left-out configuration;
- **Access C:** Left-in only from Cudgen Road west of the Kingscliff TAFE access. The access is provided with a short Auxiliary Left turn (AUL(s)) treatment. This access provides access to staff and visitor car parking as well as for more direct access to the transit set-down and eastern parking module. The access is important in reducing traffic demands passing the main entry and internal roadway, improving pedestrian-vehicle conflicts within high pedestrian activity areas of the site.; and
- **Access D:** This access provides access for staff, emergency and service vehicles to connect to the service ring road. Access D does not facilitate public access. All movements are provided to Cudgen Road / Turnock Street in the form of a fourth leg to the existing Turnock Street / Cudgen Road intersection.. The access has been designed as an expansion to the existing roundabout and to cater for design traffic volumes in the 10-year design horizon (i.e. Year 2033). Detailed assessment of the intersection has been undertaken in Section 5.4.6. The roundabout is located approximately 110m from the TAFE access. In this regard it is noted that this separation is an existing arrangement. Volumes turning left-into the site at this location are expected to be relatively low given the three other accesses to the west. The addition of a fourth leg is also not expected to result in any significant weaving or issues with vehicles turning right from the TAFE and then left into the site (no public access is provided via Access D).

The site access locations are illustrated in Figure 4.3. For further details refer to the Masterplan presented in Appendix B of the EIS.

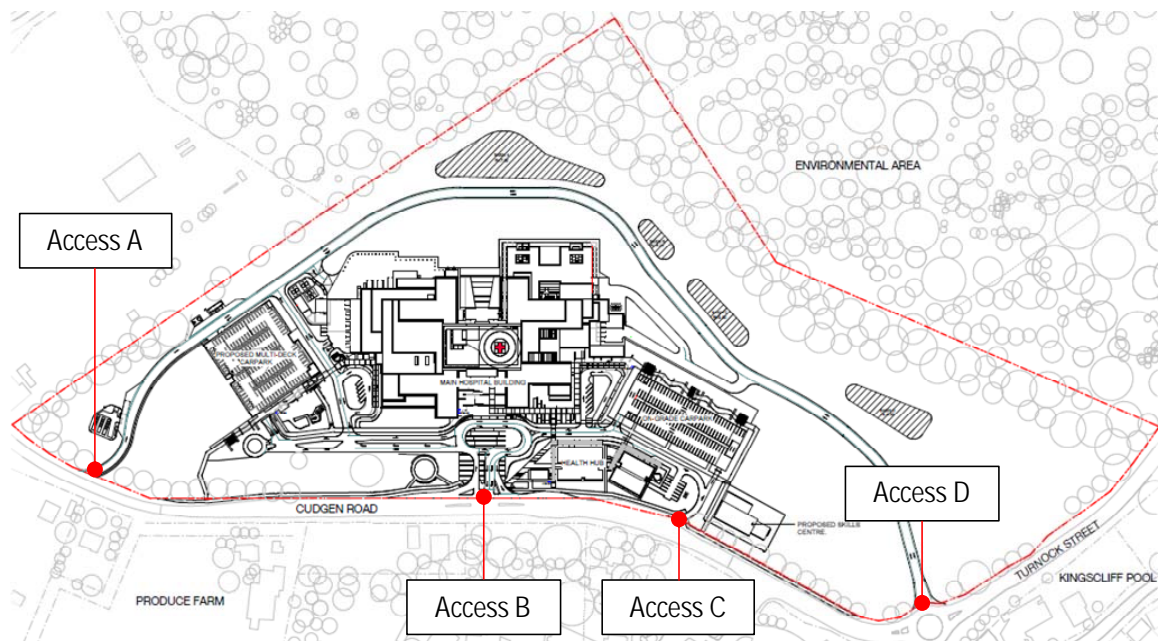


Figure 4.3: Site Access Locations

#### 4.3.2 Access Sight Distance Assessment

Sight distance requirements and compliance for each access are summarised below. Each access is unique in terms of sight distance requirements due to the various intersection forms as stipulated in

Austrroads Guide to Road Design. A reaction time of 1.5-2.0 seconds has been adopted and varying design speeds have been adopted with 70km/h adopted for Cudgen Road based on the 60km/h posted speed and recorded 85th percentile speeds which was as 67.5km/h). For the internal approach to intersection a design speed of 40km/h was used noting the low speed internal road environment. A right-turn circulating speed of 30km/h was used for the roundabout consistent with typical speeds identified by Austrroads.

#### ***Access A***

Access A is left-in only and has no conflict points. Access A will be clearly signed and will primarily be used by drivers familiar with the site and access (staff, delivery drivers, ambulances etc). The access includes a auxiliary left turning lane to cater for diverging and decelerating traffic. A stopping sight distance of approximately 80m is available to the start of the taper which is consistent with the stopping sight distance requirement of 81m-83m (absolute minimum requirement with 2.0 second reaction time to desirable minimum with a 1.5 second reaction time). Considering there are no conflict points and an auxiliary lane is provided to cater for diverging and decelerating traffic, the available sight distance is sufficient.

#### ***Access B***

Access B is the primary signalised intersection. An approach sight distance requirement (ASD) of approximately 40m is available which complies with the minimum requirement of 34m for a design speed of 40km and reaction time of 1.5 seconds.

While the intersection is signalised, the desirable Safe Intersection Sight Distance (SISD) requirement of 151m is achieved in both directions on Cudgen Road. This allows sufficient sight distance in the instance that a vehicle stalls in the middle of the intersection, fails to stop at a red light leaving the site and for vehicles turning left onto Cudgen Road.

The minimum gap sight distance (MGSD) of 97m is achieved for the unsignalised left-turn onto Cudgen Road.

#### ***Access C***

Access C is left-in only and has no conflict points. A minimum stopping sight distance of 81-83m is achieved to the start of the taper.

#### ***Access D***

Access D utilises the existing Turnock Street / Cudgen Road roundabout intersection. The existing approaches to the roundabout are well delineated with line-marking, medians and advanced warning signage. Minor vegetation trimming is recommended on the Project Site frontage to improve sight lines (when approaching from the west). Approach sight distances to the roundabout in the order of the required 83-92m are available on the Cudgen Road (west) and Turnock Street (north) and it is clearly evident prior to these points that the roundabout is ahead with the provision of large directional and advanced warning signage. Approach sight distances for the Cudgen Road (eastern) approach exceed the desirable 73m.

Sight distances for vehicles circulating on the roundabout and approaching are achieved on each existing approach. Sight distances for the new (i.e. access) to vehicles entering from the right require confirmation during detail design and will be subject to vegetation trimming / removal.

### **4.3.3 Service and Emergency Vehicle Access and Circulation**

The primary emergency vehicle access to the Project Site from the west is via Access A and the internal circulation road. For access from the east the main access point is via Access B and D. The northern ring-road provides a direct route via Access D. The Tweed Valley Hospital layout and access provisions do however allow for emergency vehicle access via all four access locations. Emergency vehicle egress is via Access B and D. The emergency vehicle drop-off / pick-up area and primary, internal roads and access intersections has the potential to cater for an Emergency Vehicle Priority (EVP) system if required, which could allow for emergency vehicle priority on egress and ingress by:

- metering the internal elongated roundabout and priority-controlled intersection to give priority to emergency vehicles; and
- allowing for phase "green flushes" on the signalised access to clear queued vehicles and to give the emergency vehicle priority movement.

For egress, the priority could be called by a number of mechanisms including a physical push button, loop detectors or by a signal transmitted from the vehicle. For ingress the system would rely on a signal from the vehicle. It is noted however that the ingress ambulances are the main consideration as ambulances are typically deployed from the ambulance station to a call-out, rather than from the hospital.

It is noted that, Queensland's Department of Transport and Main Roads (TMR) has an EVP system that has already been implemented on many intersections and emergency vehicles across Queensland. In addition, it is understood that RMS currently operate a similar system at the Minjungbal Drive / Dry Dock Road signalised intersection in proximity to the Tweed Heads Fire Station. It is expected that similar technology will be available for the RMS intelligent traffic management system "SCATS" by the Project's year of opening. It is recommended that this be implemented at the Tweed Coast Road / Cudgen Road Intersection to further improve emergency vehicle access to the Project Site from the external network.

A service loading yard is provided at the western side of the main Tweed Valley Hospital building and caters for servicing and refuse collection. Service vehicle ingress is provided via Access A for vehicles from the west and via Access D for vehicles from the east. All service vehicle egress is via Access D. Service vehicles will utilise the northern internal ring road to minimise service vehicle movements on the internal road fronting the main entrance.

Project Site access, internal circulation and egress movement paths are shown in Figures 4.4 and 4.5. For further details on the emergency and servicing facilities refer to the Masterplan provided as Appendix B of the EIS.

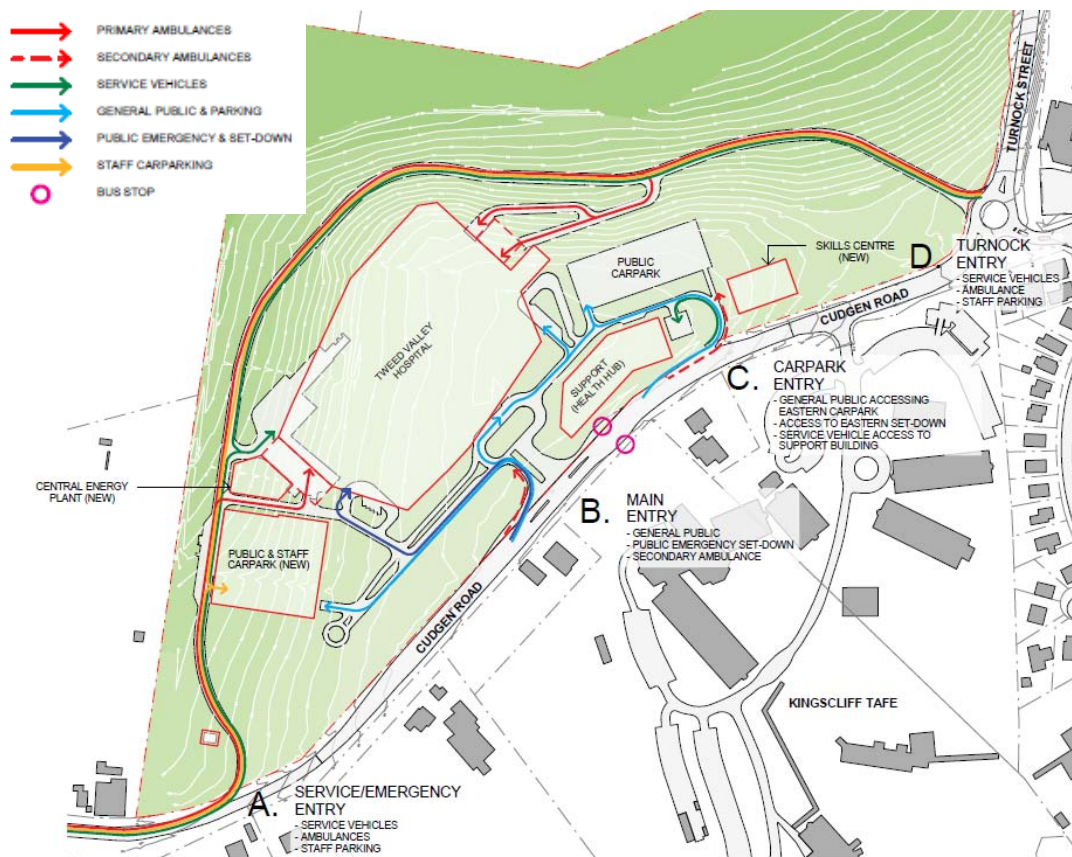


Figure 4.4: Vehicle Access Routes



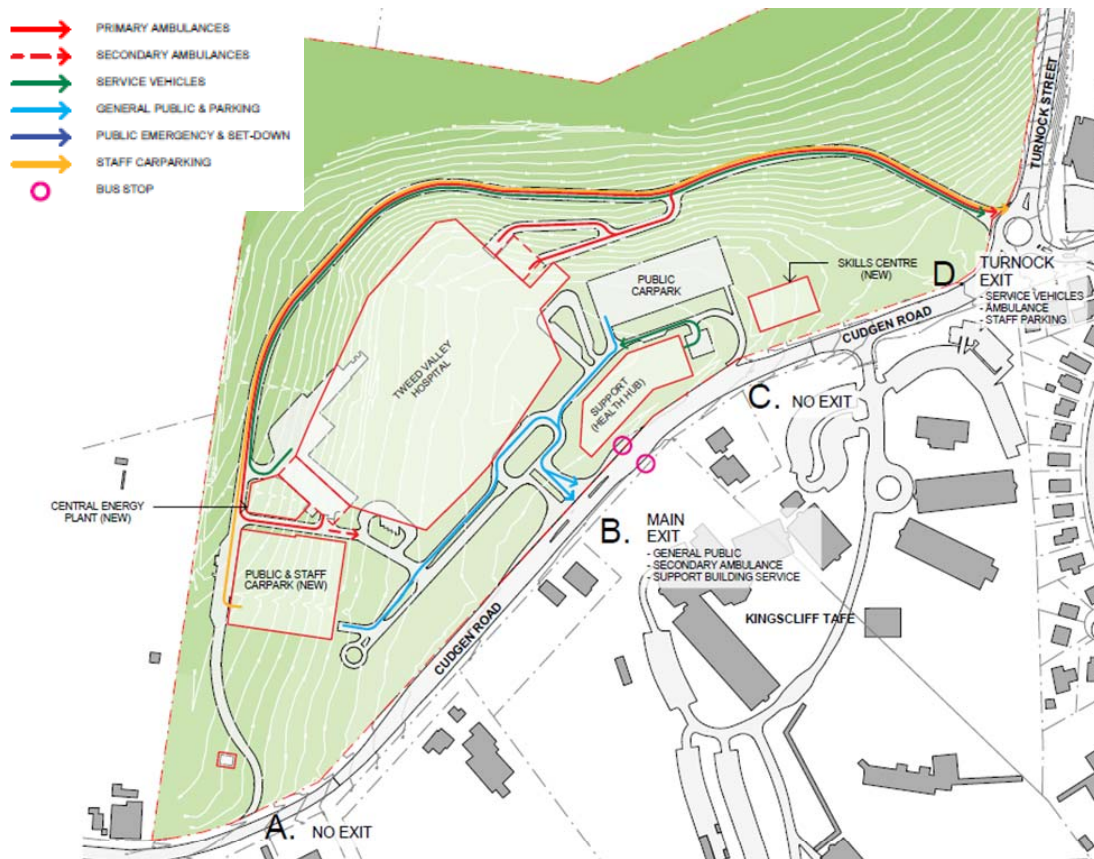


Figure 4.5: Vehicle Egress Routes

#### 4.3.4 Access Queuing Assessment

This section considers vehicles entering the site with the potential to queue onto the external road network. Access B has one internal departure lane from the access intersection. Internal queuing was modelled as part of the access intersection modelling. For design traffic in Year 2033, the site egress 95<sup>th</sup> percentile queues approach 30m, which is contained within the available queuing distance (approximately 60m of dual lane and a further 50m single lane available queuing distance) Queuing on ingress will be lower than on egress on the basis that opposing volumes on the internal road will be significantly lower than on Cudgen Road and ingress is distributed via four accesses while egress is via two. The separation and configuration of the internal intersection is suitable to cater for ingress queues. On this basis queues will not impact Cudgen Road at this access. It is noted that the modelled internal queuing and the additional available queuing area beyond this allows flexibility in managing the intersection by managing cycle and phase times.

Access D has significant queuing distance (more than 200m) and no external queuing issues are expected at this access.

Access A and C are left in only and ingressing vehicles have priority into the Project Site. A minimum of 50m of queuing distance is available. No external queuing issues are expected at these access locations.

#### 4.3.5 General Public Parking and Circulation

General public car parking has been provided on the eastern and western sides of the Tweed Valley Hospital and are the closest car parking facilities to the main hospital building. Access and egress for the general public car parks is via Access B and C. General public parking access and circulation paths are shown in Figures 4.4 and 4.5.

For further details on the general public parking facilities refer to the Masterplan provided as Appendix B of the EIS.



#### 4.3.6 General Public Emergency Drop-off

General public emergency drop-off is provided at the western side fronting the primary access to the Project Site. A dedicated indented drop-off bay is provided as is a small supply of angled parking. Access to the drop-off is primarily via Access B, although access C also provides a secondary access.

General public emergency drop-off and circulation paths are shown in Figures 4.4 and 4.5.

For further details on the general public drop-off facilities refer to the SSD Stage 2 Plan Set which is attached as Appendix B of the EIS.

#### 4.3.7 Staff Access and Circulation

Dedicated staff car parking is provided on the western side of the hospital, in the western half of the multi-deck car park. Staff access is provided via Access A and Access D. Staff access and circulation paths are shown in Figures 4.4 and 4.5.

For further details on the staff parking facilities refer to the Masterplan provided as Appendix B of the EIS.

#### 4.3.8 Public Transport Access

Public transport to the Project Site will be via bus, with all bus infrastructure located on the Project Site frontage on Cudgen Road. For further details on Public Transport refer Section 5.6.

The Project will also cater for access for Community Transport and aged care transport in terms of standard cars / vans (i.e. B85 and B99 vehicles) as well as mini-buses (e.g. SRV) via the main accesses.

#### 4.3.9 Internal Road Geometry

The internal road geometry has been designed to comply with Australian Standards AS2890.1 (Off-street parking) and AS2890.2 (Off-street commercial vehicle facilities). Specific details are as follows:

- Two-way circulation roads are a minimum of 6.5m to cater for service vehicles. Additional width is provided at some locations to cater for curves and swept paths;
- One-way circulation roads are a minimum of 3m wide;
- The service vehicle ring-road (connecting from Access A to Access D) has been provided with additional width to cater for cyclists;
- Maximum grades for internal circulation roadways do not exceed 15.4% and the maximum rates of change do not exceed 6.25%. The length over which the rate of change occurs varies depending on the design vehicle requirements at specific locations on the site.

A detailed internal road and car parking geometry assessment is provided in Section 4.4.6

### 4.4 PARKING

#### 4.4.1 Car Parking Requirements

An important consideration when planning for the car parking provision is to achieve a balance between parking demand and providing an oversupply. It is widely acknowledged that provision of parking relates directly to car parking utilisation and traffic generation. Providing additional parking beyond the requirement will unnecessarily increase parking demand and private vehicle utilisation on the surrounding road network. Managing parking demands also is an important measure in promoting active transport modes including walking and cycling. In determining the parking requirements for the Hospital, the following was considered:

- Council's minimum parking requirements for a hospital;
- Peak parking accumulation based on the RMS Guide to Traffic Generating Developments; and
- The project car parking demand based on a detailed Project-specific Car Parking Demand Study undertaken for the project.

Table 4.1 details Council's car parking requirements stipulated within Section A2 – Site Access and Parking Code.

Table 4.1: Council Car Parking Requirements

Land Use	Year	Yield	Required Parking Rate	Parking Requirement
Hospital (visitor)	2023	391 beds	0.8 spaces / bed	313
Hospital (staff)			0.8 spaces / bed	313
Hospital (visitor)	2033	443 beds	0.8 spaces / bed	355
Hospital (staff)			0.8 spaces / bed	355
Hospital (visitor)	2033	499 beds (sensitivity test)	0.8 spaces / bed	400
Hospital (staff)			0.8 spaces / bed	400

Council's car parking requirements range from 626 spaces (Year 2023) to 710 spaces (Year 2033). Under the sensitivity test scenario (499 beds) Council's parking requirements are 800 spaces.

For comparison, the peak parking accumulation (PPA) was calculated based on the rate stipulated within the RMS Guide to Traffic Generating Developments. The rate is based on historical surveys undertaken at hospital developments and provides an indication of peak parking demands. The PPA rate is shown below:

$$PPA = -19.56 + 0.85 B + 0.27 ASDS$$

Based on this rate, the PPA ranges between 616 car parking spaces (Year 2023) and 708 car parking spaces (Year 2033). Under the sensitivity test the PPA is 764 car parking spaces (Year 2033).

A detailed Project-specific Car Parking Demand Study was undertaken by PTC for the Tweed Valley Hospital. The demand study considered the existing The Tweed Hospital as well as projected staff numbers, bed numbers and service events. The methodology of the parking demand study is summarised below:

- Online staff surveys were undertaken for the existing The Tweed Hospital to identify the existing travel mode share of staff
- Car park occupancy surveys were undertaken for the existing The Tweed Hospital to identify the existing on-site car parking demands
- Car park and occupancy counts were undertaken with the surrounding areas of the existing The Tweed Hospital and the Project site to identify existing parking demands
- Previously undertaken surveys for patients and visitors to in-patients were utilised to identify proportion of patients and visitors driving, people per car and parking space turnover
- Operational information was obtained for the existing The Tweed Hospital (and future growth considered) for, but not limited to the following:
  - Staff numbers (FTE)
  - Allocated parking for Fleet vehicles
  - Inpatient bed numbers and occupancy
  - Outpatient service events
  - Emergency department Student numbers
- The raw demand data was converted into detailed demand estimates, subdivided by the appropriate user and time categories, expected turnover per space etc.

A summary of key weekday parking demands as identified in the detailed Project-specific Car Parking Demand Study is provided below:

- Staff demand: 718 parking spaces in Year 2023/2024, 838 parking spaces in Year 2026/2027 and 934 parking spaces in Year 2031/2032
- Public demand: 367 parking spaces in Year 2023/2024, 408 parking spaces in Year 2026/2027 and 448 parking spaces in Year 2031/2032
- Fleet vehicle parking demand: 71 vehicles in Year 2023/2024, 83 vehicles in Year 2026/2027 and 92 vehicles in Year 2031/2032
- Other parking demands: 45 parking spaces in Year 2023/2024, 49 parking spaces in Year 2026/2027 and 54 parking spaces in Year 2031/2032

- A total parking demand in the order of 1,201 parking spaces in Year 2023/2024, 1,378 car parking spaces in Year 2026/2027 and up to 1,528 parking spaces in Year 2031/2032.

The car parking demand study assumes no change in behaviour (i.e. proportion driving, people per car, space turnover) from the existing The Tweed Hospital demands. In determining the parking requirement, consideration has been given to the minimum requirements, the forecast demands and sustainable transport initiatives for the Project overtime. As such, the above estimates are considered to be a conservative estimation of parking demand.

#### 4.4.2 Car Parking Provision

The minimum car parking requirements are specified by Council's Tweed Development Control Plan 2008, specifically Section A2 – Site Access and Parking Code. It is however noted, that this does not necessarily consider the site-specific demands. Additional parking to the minimum requirements has therefore been catered for on the site, predominantly through provision of a multi-deck car park. This additional parking primarily considers the parking demand study undertaken. The overall car parking supply considers the minimum parking requirements and forecast car parking demands and aims to find a balance between the minimum requirements, car parking demands and not encouraging the use of private vehicles through an oversupply of car parking. Car parking supply is also dictated by infrastructure costs and funding.

The ultimate car parking provision consists of a combination of multi-deck car parking and at grade car parking. The provision caters for the minimum parking requirement, considers forecast demands and is considered the most suitable and efficient solution to cater for the hospital's car parking needs.

The Tweed Valley Hospital car parking provision is summarised in Table 4.2.

**Table 4.2: Car Parking Supply**

Parking Type	Parking Location / Type	Parking Supply
Staff	Multi-deck Car Park	1,007
Staff (fleet)	Multi-deck Car Park	68
Public	Multi-deck Car Park	313
Public	Eastern at Grade	128
Public	Short term at Grade	22
Total		1,538

As demonstrated in Table 4.2, ultimately 1,538 car parking spaces are provided for the Tweed Valley Hospital. As part of this a total 40 Person With Disability (PWD) parking spaces are provided, for both staff and the public. Approximately 23 drop-off/pick-up bays are also provided in proximity to the various entrances. A further four dedicated bays are provided for patient transport vehicles adjacent to the transit lounge. This provision significantly exceeds the minimum requirements specified by Council as well as the PPA. The provision is consistent the parking demands identified as part of the detailed Project-specific Car Parking Demand Study for Year 2031/2032 and is considered an appropriate parking provision for the site which achieves a balance between typical parking requirements, meeting the projected demand and also not providing an oversupply. At year of opening, a minimum of 1,201 car parking spaces will provided, catering for the 2023/2024 parking demand. The parking supply will be supplemented with a range of supporting measures, including:

- Bicycle parking;
- Active travel infrastructure;
- End of trip facilities for active transport;
- Public transport infrastructure and service changes; and
- The Green Travel Plan that will include periodic monitoring and refinements to initiatives.

These supporting measures aim to reduce the reliance on private vehicle and parking demands. More details on these supporting measures are presented in Section 5.6.

While not proposed as part of this application, the site layout and future planning caters for additional parking provision in the form of overflow parking on the site to the north-east of the main building (prior to the provision of allied health and other ancillary land uses being provided). The design of the multideck car park facilitates flexible allocation of staff and public car parking through the provision of non-structural mesh fences which separate the two parking types. This allows for 'tweaking' of the staff and public provisions to cater for actual demands once operational and changing demands into the future. This maximises efficiency of the car parking provision, by reducing any significant underutilised parking areas as needed.

Considering the above, the proposed parking supply is sufficient to cater for the parking demands of the Hospital at year of opening. Once the Hospital is operational, parking operations onsite will be monitored to identify if any issues occur and mitigation measures will be investigated, if required.

#### 4.4.3 Management of Car Parking Facilities

The ability to provide over 1,500 parking spaces on the site will be through the construction of a multi-deck car park located directly adjacent to the Hospital. A car parking management plan will be developed as part of further planning and development of operational requirements. It is expected management of car parking facilities will include:

- Various time limits and restrictions at different locations and for different user groups (e.g. short-term parking adjacent to emergency drop-off);
- Boom gate access for the multi-storey car park; and
- Operation 24 hours a day, seven days a week.

Physical restrictions (i.e. boom gates) will only be placed on parking areas. Internal roads and patient drop-off areas will not be restricted.

A range of car parking funding options are being considered and there has been no NSW Government decision made at this time. Scenarios have been tested ranging from free parking to paid parking arrangements in line with Lismore Base Hospital. As an example, the fee structure used at the Lismore Base Hospital Uralba Street car park is as follows and is expected to increase annually by CPI:

- 0-15 minutes: FREE;
- 15 minutes – 1 hour: \$3.50;
- 1-2 hours: \$5.50;
- 2-3 hours: \$6.50;
- 3-4 hours: \$7.50; and
- 4+ hours (daily maximum): \$8.60.

Management of car parking facilities is important to ensure use of on-site parking is by bona fide patients, staff and visitors. It also reduces non-essential parking demands and trips. Where parking is not managed or restricted there is a greater utilisation of parking as there is no consequence associated with parking. For example, if no parking restrictions or costs are imposed, a patient requiring a long-term stay (e.g. for a number of days, weeks or months) is more likely to park onsite than if a restriction or cost is imposed, in which case they would be more likely to arrange alternate transport that doesn't require parking (e.g. being dropped-off and picked-up by a friend or relative). This reduces the demand on parking and increases the availability of parking for other uses (e.g. patients who require frequent short duration trips or where alternatives are not available).

While parking restrictions and cost alone reduce the desirability of parking and therefore may result in staff, patients and visitors seeking alternatives, the desirability of on-site parking for those who intend to park (whether on-site or on-street) has been maximised by providing high quality and highly convenient on-site parking. Specifically, all parking is located as close to the main Hospital building as possible (reducing walking distances), parking is managed, secure and well lit, and the majority of parking is covered. In conjunction with a supply that is aimed at meeting demand, the provision of high quality and convenient parking is expected to minimise external parking impacts.



Comparison of parking management and impacts relative to other hospital sites is not appropriate due to this being a greenfield site with no existing parking operations that can be used as a benchmark. The existing hospital (The Tweed Hospital) generates on-street demand, however has a limited supply of on-site parking (302 total on-site car parks) and a high proportion of available on-street and external off-street car parking (estimate of 1,404 relevant external parking spaces) as identified in the detailed Project-specific PTC Car Parking Demand Study. Further, each hospital's parking and transport operations are unique and relate to a number of factors including parking provision, mode share, availability of alternate parking, desirability of parking etc.

As this is a greenfield site, all Hospital and corresponding transport operations are bespoke (as are the transport operations in the region) and that the site aims to cater for parking demand, review of parking management

On-street parking utilisation is limited to the availability of on-street parking. The detailed Project-specific Car Parking Demand Study undertaken by PTC estimated approximately 260 available on-street parking within 500m of the site. The proposed parking provision also caters for estimated car parking demands for the site. Application of mitigation measures for on-street parking such as parking restrictions or precinct parking schemes are not appropriate at this preliminary stage.

There are a number of off-street carparks in the area serving various other community / civic facilities including Kingscliff TAFE, Tweed Regional Aquatic Centre and Kingscliff Library. The desirability of these car parks relative to on-site parking is similar to surrounding on-street parking and is subject to availability, distance from the Hospital, and convenience / desirability of the on-site parking at the Hospital. It is difficult to quantify impacts at this preliminary stage.

Similar to on-street parking impacts, in conjunction with a supply that is aimed at meeting demand, the provision of high quality and convenient parking is expected to minimise external parking impacts (including at external off-street carparks). Once the Hospital is operational, a tiered approach should be used at these car parks starting with monitoring of car parks to identify if non bona fide parking is occurring, escalating to parking restrictions (e.g. signage at entry, provision of permits) through to enforcement (if required).

Management of car parking facilities will be paired with a site's overall Green Travel Plan and Transport Access Guide which aims to minimise dependencies on private vehicle and on-street parking impacts. Further details are provided in Section 5.6.

#### 4.4.4 Servicing and Refuse Requirements

Based on information provided by HI, it is understood that the largest vehicle required for the Tweed Valley Hospital is a 19m AV for oxygen and gas deliveries and smaller service vehicles for a range of other deliveries and servicing requirements (e.g. linen, medical supplies, food, equipment). The servicing yard is located on the north-western side of the main hospital buildings with access via Access A or D. The servicing yard will cater for a range of standard service vehicles including:

- 19m AV;
- 12.5m HRV;
- 8.8m MRV; and
- 6.4m SRV.

Refuse will also be collected from the loading area. The following refuse bins and waste types will be serviced on:

- Roll-on / roll-off "ro-ro" general waste and recycling bins; and
- Medical waste wheelie bins.

The following Refuse Collection Vehicles (RCV) are required on-site for servicing:

- 9.8m Hook Lift RCV for serving ro-ro bins; and
- 12.5m HRV for servicing medical and other waste. This will deliver empty wheelie bins and remove full bins via the dock. No overhead lifting is required.

The Tweed Valley Hospital also requires servicing by ambulance. A 6.4m SRV has been assumed as the representative standard design vehicle for an ambulance. An ambulance service area has been provided on the sites south-western side. The ambulance service area includes nine dedicated ambulance parking spaces. The ambulance service area has been developed in consultation with HI and the Clinician's Reference Group.

Council's Section A2 – Site Access and Parking Code does not specify a minimum class of service vehicle for hospitals, although stipulates a service vehicle parking requirement of one space per 30 beds. On this basis Council's service vehicle parking requirement equates to 15 spaces. The Project is considered to provide sufficient service vehicle parking with:

- nine ambulance bays at the emergency department;
- three patient transfer vehicle bays (which also cater for ambulances) and one ambulance bay at the transit set-down area; and
- provision for a range of service vehicles in the dedicated servicing yard, with five dedicated HRV bays.

Servicing (other than by ambulances / emergency vehicles) and refuse collection is expected to occur at various times across a typical day or typical week. The loading area has been developed by STH-Bate Smart and Lendlease based on experience with similar projects and input from HI and various working groups to cater for the loading and servicing demands of the Hospital.

A swept path assessment of key vehicle movements is presented in Appendix D. This includes service vehicle access to the site, manoeuvring in the loading area and ambulance service area.

It is recommended that the Tweed Valley Hospital operate a Service Vehicle Management Plan (SVMP) that dictates standard servicing and refuse collection procedures and may incorporate timetables and schedules for that specify when certain deliveries can occur. At this stage service vehicle frequencies are not defined.

#### 4.4.5 Bicycle Parking Requirements and Provision

Table 4.3 details Council's bicycle parking requirements stipulated within Section A2 – Site Access and Parking Code.

**Table 4.3: Tweed Valley Hospital Bicycle Parking Requirements**

Land Use	Yield	Required Parking Rate	Parking Requirement
Hospital (visitor)	443 beds	1 bicycle space / 30 beds	15
Hospital (staff)		1 bicycle space / 15 beds	30
Hospital (visitor)	499 beds (Sensitivity Test)	1 bicycle space / 30 beds	17
Hospital (staff)		1 bicycle space / 15 beds	34

Further consideration for the bicycle parking requirement include:

- The conditions of approval for Stage 1 which require a minimum of 43 bicycle parking spaces; and
- Bicycle mode share targets specified in the Green Travel Plan (refer Section 5.6.3) which is reflective of targets specified in the TfNSW Regional NSW Services and Infrastructure Plan. The target is for a 2-5% cycle mode share. Noting the current region mode share (including at the existing The Tweed Hospital) is in the order of 2%, cycle racks should cater for a minimum of 4% to encourage and facilitate the mode share shift. For the 1,300 ASDS this is equivalent to 52 bicycle racks.

Considering the above, the Project provides:

- 52 Class 2 Bicycle Parking Spaces (for staff). Bicycle racks have been provided on the ground floor of the multi-deck car parking facility. The racks are undercover and in a secure location consistent with the requirements of AS2890.3. The bicycle parking facility is accessible via pathways that connect to the main entrance of the Hospital and to the external pathway network

A total of 20 Class 3 Visitor Bicycle Parking Spaces (for Visitors) have been provided (10 racks). These consist of simple bicycle racks on the ground level near entrances.

The above bicycle parking provision exceeds the requirement specified in the conditions of approval, Council's requirements and is suitable in facilitating targets specified in the Green Travel Plan. End-of trip facilities have been provided for staff (showers, changing facilities and lockers). These are located adjacent to the staff bicycle parking facilities.

#### 4.4.6 Car Parking Geometry Assessment

The internal car parking geometry has been designed to comply with Australian Standards AS2890.1 (Off-street parking) and AS2890.2 (Off-street commercial vehicle facilities). The car parking and internal geometry assessment is documented in Table 4.4.

**Table 4.4: On-Site Parking Geometric Layout Requirements**

Design Element	Requirement	Compliance
<b>General Car Parking Facilities</b>		
Car Parking Bays (User Class 3)	2.6m x 5.4m	YES
Parallel Car Parking Bays	2.1m x 6.1m	YES
PWD Parking Bays (User Class 4)	2.4m x 5.4m with adjacent shared area of same dimensions	NO See Note 1
Parking Aisle (90-Degree Parking)	5.8m minimum (6.2m preferred)	YES
Parking Aisle (Parallel Parking)	Min. 3.6m	Yes
Clearance Adjacent to Vertical Obstructions	0.3m	YES
Car Parking Aisle Width Clearance	Additional 0.3m aisle width for single sided parking aisles	YES
Internal Roadways (One-Way)	Min. 3.6m (light vehicles) and 4.1m (heavy vehicles)	YES
Internal Roadways (Two-Way)	Min. 6.5m (heavy vehicles)	YES
Grades (Entry)	Max 1:20 for first 6m into site (for passenger vehicle accesses and service vehicles up to an MRV) and max 1:20 for first 9.5m into site (for 19m AV accesses)	SHALL COMPLY
Grades (Circulation and Parking Areas)	Max 1:20	SHALL COMPLY
Car Parking Ramps	Max 1:5 with transitions	SHALL COMPLY
Height Clearance	Min. 2.2m	SHALL COMPLY
Height Clearance Over PWD Bay	Min. 2.5m	SHALL COMPLY
<b>Service Vehicle Facilities</b>		
SRV parking	3.5m x 6.4m	YES
MRV parking	3.5m x 8.8m	YES
HRV parking	3.5m x 12.5m	YES
AV parking	3.5m x 19m	YES
Height Clearance (travelling path for all service vehicles)	4.5m to overhead structure / services	YES
Servicing Height (ro-ro refuse vehicles)	Typically 4.8m (4.7m servicing height plus 100mm clearance) to overhead structure / services	YES
Grades Parking Areas	Max 1:25	SHALL COMPLY
Circulation roads	Max 1:6.5 (15.4%) grade and max rate of change should not exceed 1:16 (6.25%) in 10m travel (for AV circulation or smaller) or in 4m of travel (to cater for SRV vehicle movements)	SHALL COMPLY
<b>Bicycle Facilities</b>		
Bicycle Parking (Horizontal)	0.5m x 1.8m x 1.5m aisle	YES
Bicycle Parking (Vertical)	0.5m x 1.2m x 1.5m aisle	YES

Notes:

1. A number of shared spaces adjacent to PWD bays in the multi-deck car park have columns within them. It is recommended that PWD spaces are amended to comply with AS2890.6

## 5. IMPACT OF PROPOSED PROJECT

### 5.1 STAGE 1: TRANSPORT CONSULTATION UNDERTAKEN

In conjunction with assessing the traffic impact of the proposed Tweed Valley Hospital as part of the Stage 1 application, consultation was undertaken with a number of stakeholders, including:

- Tweed Shire Council - discussions with Manager Engineering Services in regard to:
  - site access intersection upgrades and integration with the adjacent road network;
  - external traffic operations and likely impacts associated with the inclusion of the hospital;
  - future road network infrastructure planning in proximity to the Project Site and changes to travel patterns;
  - pedestrian and active transport connections;
  - public transport facilities and integration with existing services;
  - parking facilities on-site in line with standard requirements and consideration to other recent Health Infrastructure developments in regional NSW.
- RMS in regard to:
  - existing operations of state-controlled roads in proximity to the Project Site;
  - expected intersection operations with the inclusion of the hospital;
  - notification of the expected signalised intersection form on Cudgen Road;
- TfNSW:
  - location of the Project Site with respect to existing bus services and stops located at the neighbouring Kingscliff TAFE;
  - review of bus stop location options both within and external to the site and what impacts this has on site operations, bus movements, traffic conflicts and route planning; and
  - potential for updates to bus services and incorporation into current route planning being undertaken for the Tweed Shire by TfNSW and Surfside.

### 5.2 STAGE 2: TRANSPORT CONSULTATION UNDERTAKEN

As part of this application, additional consultation has been undertaken with the relevant stakeholders. Consultation is summarised in Table 5.1.



**Table 5.1: Stakeholder Engagement Register**

Date	Organisation Name	Key Attendees	Key Outcomes / Request for Amendments	Amendments
05-06-2019	Community Reference Group	Community Reference Group Members Bitzios Consulting (Andrew Eke, Julius Walden-Goodlett, Felipe Irony) TSA (Susan Folliott, Leigh Gilshenan, HI (Jackie Hawkins, Emma Holborow, Sarah McEwan)	Community Input Workshop for Green Travel Plan. Seeking community input on transport barriers and opportunities to reduce private vehicle reliance and increase alternate transport modes.	Feedback and outcomes used in the development of the Draft Green Travel Plan, which forms part of the Stage 2 – Traffic Impact Assessment Report
05/06/2019	Transport for NSW	TfNSW (Arnab Roy, Steve Finnan) Bitzios Consulting (Andrew Eke) TSA (Susan Folliott)	TVH Design Team provided project status update RE Planning, Design and Timing TfNSW Discussion on Planned Tweed Bus Service Updates – status and timing. Significant improvements planned for bus route fronting site (30min frequency and increased hours of operation) PT Facilities updates fronting site – planning, design and responsibilities. TfNSW generally agreed with rational in design inclusion Feedback on route planning - Route Planner highlighted potential needs yet to be considered with operator include bus route turn-arounds, layovers, etc. Requested consideration of this and opportunities in design / site.	Turn-around of bus to be considered in the design.
20-06-2019	Tweed Shire Council	Tweed Shire Council (Ray Clark, David Oxenham, Brendan) TSA (Stuart Clark) Lendlease (Luis Biaggini, Jenny Third) Bitzios Consulting (Andrew Eke, Julius Walden-Goodlett)	Meeting regarding Section 138 Application for Access A and D and temp. construction access and associated CTMP. Council questioned provision of lighting at all accesses (both temporary and permanent). No lighting provision in design at time of meeting. Council also questioned suitability of RMS standard pipe and rail style fencing at Access D. Recommended RMS standard pedestrian fencing	Road Safety Audit undertaken. This identified a range of deficiencies in the design including path width, orientation, signage and delineation, pedestrian fencing, lighting. The design was updated with consideration to the deficiencies identified in the Road Safety Audit.
17-07-2019	RMS	Andy Gaudiosi (RMS) Julius Walden-Goodlett, Felipe Irony (Bitzios Consulting) (teleconference)	Way Finding Signage requires minor amendment to comply with RMS Signposting Guidelines. Signs on the Pacific Motorway are considered appropriate. Signs on the local network (Tweed Coast Road, Cudgen Road etc) should be updated consistent with the sign posting guideline (i.e. hospital signage to be standalone rather than symbology on intersection directional signage). Noted that the proposal is for a strategic concept. Detailed design to be undertaken by RMS. RMS have a preference for Emergency access to be signed irrespective of RMS signposting Guidelines.	Way Signage Plan updated to include comments and re-issued to RMS for further comment.

Date	Organisation Name	Key Attendees	Key Outcomes / Request for Amendments	Amendments
			Way Finding Signage to be updated and re-issued to RMS for comment.	
18-07-2019	RMS	John Perkins (RMS) Andrew Eke, Julius Walden-Goodlet, Felipe Irony (Bitzios Consulting) (teleconference)	Brief discussion of previous liaison with the RMS Guidance and Delineation Officer. Agreed that Way Finding Plan package to be updated and re-issued to RMS for further comments.  RMS to be involved in discussions regarding Tweed Coast Road / Cudgen Road intersection upgrades. Meeting with Council, RMS and Project team to be arranged.	Way Signage Plan to be updated to include comments and re-issued to RMS for further comment.  Meeting to be arranged to discuss ultimate Tweed Coast Road / Cudgen Road intersection form.
23-07-2019	Tweed Byron and Ballina Community Transport	Andrew Eke, Bitzios Sue Folliott, TSA Management Phil Barron, Tweed Byron Community Transport (TBCT) Faizer Hassan, Tweed Byron Community Transport (TBCT) Janet Whiting, Tweed Byron Community Transport (TBCT)	TBCT provided an outline of their existing operations including: The TBCT contract is managed by TfNSW Operate within Tweed and Byron, with a separate service operating out of Ballina. TBCT also broker services to aged care providers Operate 40 vehicles which are predominately standard vehicle sizes. The largest vehicle is a long wheelbase Hiace. Typically run single person journeys, however, try to arrange multiple where possible. This is difficult due to passenger requirements, appointment times, etc. Provide a service for elderly, frail, disabled, etc and where they have insufficient access to alternate transport services to get to health appointments. Work with other providers such as Lismore / Clarence LGAs cross boarder and Interhospital transport Tweed's existing pick-up/drop-off area is substandard. GCUH provides a transit lounge which works well for patient management, particularly when arriving at a large facility and not knowing where to go GHUH provides drivers with access to boom-gate area for driver waiting when required. Daylight savings is a key issue for patient bookings currently Potential considerations at TVH for TBCT: Require a flat and covered area to pick-up/ drop-off passengers The new TVH is expected to remove the need for TBCT services to travel to GCUH as often given the expected increase in services at TVH. This will improve the service and allow shorter and more trips to be provided locally. The implementation of paid parking will have an impact on the demand for the TBCT service as more people potentially will be less willing to pay. Communications between transit lounge and wards / units (i.e. Direct lines	Comments taken on board in design and planning proposal.

Date	Organisation Name	Key Attendees	Key Outcomes / Request for Amendments	Amendments
			<p>to IPUs/cancer care) to check patients are ready</p> <p>Pick-up/drop-off areas to be undercover and allow sufficient time for patients to load and unload.</p> <p>Ability for driver access to parking or storage areas to wait for patients. Preferable in covered / shaded areas.</p> <p>Improved bus services (as per TfNSW planning) will help to reduce the need for TBCT services across the Tweed Shire</p> <p>Opportunity for shuttle buses between health precincts (i.e. Byron, Tweed, Robina, Tweed Health for Everyone) will further reduce the demands for the service.</p>	
31-07-2019	RMS and Tweed Shire Council	John Perkins (RMS), Danny Rose, Ray Clark (Tweed Shire Council), Sue Folliott, Stuart Clark (TSA), Andrew Eke, Julius Walden-Goodlet, (Bitzios Consulting)	<p>Brief discussion on overall site design and layout development.</p> <p>Review of Way Finding Signage Plan. Council requested signage to be included at the Tweed Coast Road / Grand Parade signalised intersection. Following the meeting, further comments from Council on Way Finding Signage plan sent through on 01/08/2019. These included the request to remove some Way Finding signage in Kingscliff and Cudgen as well as other minor changes to some signs (spelling etc.).</p> <p>Council confirmed that planning for the Tweed Coast Road four-lane upgrade included tying in on either side of the intersection (north and south approaches) to the existing four-lane panel through the intersection. The proposed upgrades as part of the hospital are therefore commensurate with the ultimate planning for the intersection.</p> <p>Council flagged the need to investigate pedestrian fencing near the new signalised site access to encourage use of the signalised crossing and restrict j-walking</p>	<p>Way Finding Signage plan updated to reflect Council's comments.</p> <p>Noted that upgrades proposed at the Tweed Coast Road / Cudgen Road intersection are commensurate with Council's ultimate planning of the corridor.</p> <p>Pedestrian fencing to be considered as part of detailed design of the new signalised access.</p>
18-07-2019	RMS	Leisa Sedger (RMS) (email correspondence)	RMS confirmed that the resubmitted Strategic Concept wayfinding signposting plan for Tweed Hospital aligns with the RMS Service Signposting Guidelines.	NA

### 5.3 TWEED VALLEY HOSPITAL TRAFFIC

#### 5.3.1 Tweed Valley Hospital Traffic Generation

The Roads and Maritime Service (RMS) *Guide to Traffic Generating Developments* was used to calculate the Project's peak hour traffic generation. The RMS guide specifies three peak period traffic generation rates for hospitals as follows:

- Vehicle Trip Generation in the Morning Commuter Peak Hour (MVT) – this provides an indication of development traffic generation during the typical morning peak hour which typically occurs around 8am – 9am;
- Vehicle Trip Generation in the Evening Commuter Peak Hour (EVT) – this provides an indication of development traffic generation during the typical evening peak hour which typically occurs around 5pm – 6pm; and
- Peak Vehicle Trips (PVT) – this provides an indication of peak development traffic generation. While the time was found to vary, the most common time for the PVT to occur was 3pm-4pm. The PVT incorporates a staff shift change.

The MVT, EVT and PVT traffic volumes for the Project are presented in Table 5.2.

Table 5.2: Tweed Valley Hospital Traffic Generation (Peak Hour)

Land Use	Year	Yield	Peak	Peak Hour Trip Rate	Peak Hour Trips
Hospital	2023	391 beds and 1,120 staff (ASDS)	MVT	MVT=- $10.21+0.47B+0.06ASDS$	241
			EVT	EVT=- $2.84+0.25B+0.4ASDS$	543
			PVT	PVT=- $14.69+0.69B+0.31ASDS$	602
	2033	443 beds and 1,300 staff (ASDS)	MVT	MVT=- $10.21+0.47B+0.06ASDS$	276
			EVT	EVT=- $2.84+0.25B+0.4ASDS$	628
			PVT	PVT=- $14.69+0.69B+0.31ASDS$	694
	2033	499 beds and 1,330 staff (ASDS) (Sensitivity Test)	MVT	MVT=- $10.21+0.47B+0.06ASDS$	304
			EVT	EVT=- $2.84+0.25B+0.4ASDS$	654
			PVT	PVT=- $14.69+0.69B+0.31ASDS$	742

Due to the location of the Project Site with respect to Kingscliff TAFE and Kingscliff High School, the afternoon commuter peak period occurs around 3pm-4pm (refer Section 3.6) which is earlier than typical commuter peak periods. As such both the development's EVT and PVT generation were assessed against the same period (i.e. commuter peak). This allowed for a conservative assessment and allowed for a sensitivity comparison by assessing different traffic splits.

The RMS *Guide to Traffic Generating Developments* does not provide daily traffic generation rates. In lieu of this the Institute of Transportation Engineers (ITE) daily rate of 11.81 trips/bed/day was used to estimate daily traffic generation. The daily traffic volumes are presented in Table 5.3.



**Table 5.3: Tweed Valley Hospital Traffic Generation (Daily)**

Land Use	Year	Yield	Daily Trip Rate	Daily Trips
Hospital	2023	391 beds	11.81 trips/bed/day	4,618
	2033	443 beds		5,232
	2033	499 beds (Sensitivity Test)		5,894

The daily traffic generation aligns with typical traffic profiles where peak hour traffic is approximately 10% of daily volumes.

### 5.3.2 Tweed Valley Hospital Traffic Splits

An "IN:OUT" directionality split of "70%:30%" was adopted for the EVT peak and vice versa in the EVT peak. As a sensitivity test an "IN:OUT" split of "50%:50%" was used for the PVT which considers a staff changeover.

### 5.3.3 Seasonal Factors

The Tweed Shire is recognised as having a strong tourism market and Kingscliff is a coastal tourism destination. The surveyed volumes are considered to be representative of typical peak conditions on the basis:

- of the Project Site location and surrounding developments (i.e. Kingscliff TAFE, Kingscliff High School and Cudgen Public School); and
- that the peak periods identified are commuter and school peaks (i.e. distinct morning and afternoon peaks). Holiday traffic associated with seasonal factors is typically spread through the day and is influenced by many factors (e.g. accommodation check-in and check-out times).

### 5.3.4 Alternate Transport Generation and Movements

Based on the mode splits identified in Section 3.10 and the estimated daily traffic generation the Tweed Valley Hospital is estimated to generate in the order of 150-300 daily pedestrian trips and in the order of 50 cyclist trips. Pedestrians and cyclists are expected to predominantly originate to the east (Kingscliff) and use the existing pedestrian pathway network. A small proportion may originate from the suburban area west of Tweed Coast Road.

Considering the journey to work mode share and potential visitor / patient trips the Tweed Valley Hospital is expected to generate in the order of 150 public transport trips (bus), with potential for additional trip generation with future service enhancements.

### 5.3.5 Traffic Distribution and Assignment

Traffic distribution on the surrounding network was based on distributions from the Tweed Strategic Transport Model (with the Tweed Valley Hospital on the Project Site) and using a first principals assessment which considered population centres and densities across the Tweed Shire. Distribution via the various site accesses was based on proportion of car parking accessed via a particular access, expected route choice based on arrival or departure direction and access type (e.g. left-in ingress only accesses can only be used for access in certain scenarios). Figure 5.1 shows the major traffic routes and distributions.

The Project traffic assignment and MVT, EVT and PVT traffic volumes for Year 2023 and 2033 is presented in Appendix B.



Source: Nearmap

Figure 5.1: Traffic Routes and Distributions

## 5.4 DESIGN TRAFFIC MODELLING

### 5.4.1 Design Traffic Modelling Process

The design traffic assessment was undertaken for the same intersections assessed under the background traffic scenarios. A new intersection is proposed for the primary access to Cudgen Road which is only modelled in the design scenarios. Another point of access is proposed via an additional leg to the existing Cudgen Road / Turnock Street roundabout.

Design traffic consists of forecast background traffic and Tweed Valley Hospital traffic for Year 2023 (year of opening) and Year 2033 (10-year design horizon) for the MVT, EVT and PVT peak scenarios.

### 5.4.2 Pacific Highway / Tweed Coast Road Interchange

Analysis of the Pacific Highway / Tweed Coast Road interchange was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) and Year 2033 (10-year design horizon) design traffic volumes. The existing geometric layout for the intersection was used consistent with the background traffic modelling.

The results of the analysis for design traffic volumes are summarised in Tables 5.4-5.6. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 5.4: Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)

Approach	Year 2023 AM Peak - MVT					Year 2023 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L2	0.102	3.1	LOS A	4.8	0.166	3.2	LOS A	8.3
	T1	0.102	3.3	LOS A	4.8	0.166	3.6	LOS A	8.3
	R2	0.558	10.6	LOS B	38.4	0.551	10.5	LOS B	37.8
	Approach	0.558	9.6	LOS A	38.4	0.551	9.1	LOS A	37.8
East: Pacific Highway (SB Off-ramp, NB On-ramp)	L2	0.327	2.2	LOS A	18.1	0.378	2.2	LOS A	20.9
	T1	0.327	3.2	LOS A	18.1	0.378	3	LOS A	20.9
	R2	0.327	10	LOS B	18.1	0.378	9.9	LOS A	20.9
	Approach	0.327	2.9	LOS A	18.1	0.378	2.9	LOS A	20.9
North: Chinderah Road (N)	L2	0.087	8.6	LOS A	5.7	0.077	7.9	LOS A	4.9
	T1	0.186	8.1	LOS A	15.7	0.152	7.3	LOS A	11.8
	R2	0.186	13.3	LOS B	15.7	0.152	12	LOS B	11.8
	Approach	0.186	10.1	LOS B	15.7	0.152	8.8	LOS A	11.8
West: Pacific Highway (NB Off-ramp, SB On-ramp)	L2	0.111	6.9	LOS A	4.9	0.103	6.7	LOS A	4.3
	T1	0.205	6	LOS A	10.6	0.176	5.8	LOS A	8.9
	R2	0.205	13	LOS B	10.6	0.176	12.9	LOS B	8.9
	Approach	0.205	11.2	LOS B	10.6	0.176	11	LOS B	8.9
All Vehicles		0.558	6.9	LOS A	38.4	0.551	6.3	LOS A	37.8

Table 5.5: Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)

Approach	Year 2023 AM Peak - MVT					Year 2023 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L2	0.113	3.3	LOS A	5.5	0.187	3.3	LOS A	9.6
	T1	0.113	3.4	LOS A	5.5	0.187	3.7	LOS A	9.6
	R2	0.617	10.9	LOS B	45.1	0.617	10.8	LOS B	45.1
	Approach	0.617	9.9	LOS A	45.1	0.617	9.3	LOS A	45.1
East: Pacific Highway (SB Off-ramp, NB On-ramp)	L2	0.359	2.3	LOS A	20.7	0.414	2.2	LOS A	23.9
	T1	0.359	3.4	LOS A	20.7	0.414	3.2	LOS A	23.9
	R2	0.359	10.2	LOS B	20.7	0.414	10	LOS A	23.9
	Approach	0.359	3	LOS A	20.7	0.414	3	LOS A	23.9
North: Chinderah Road (N)	L2	0.112	11.4	LOS B	7.9	0.101	10.7	LOS B	6.9
	T1	0.243	10.9	LOS B	22	0.203	10.2	LOS B	17
	R2	0.243	16.2	LOS B	22	0.203	14.9	LOS B	17
	Approach	0.243	12.9	LOS B	22	0.203	11.7	LOS B	17
West: Pacific Highway (NB Off-ramp, SB On-ramp)	L2	0.132	7.6	LOS A	6.1	0.127	7.6	LOS A	5.6
	T1	0.25	6.7	LOS A	13.7	0.218	6.6	LOS A	11.7
	R2	0.25	13.7	LOS B	13.7	0.218	13.7	LOS B	11.7
	Approach	0.25	12	LOS B	13.7	0.218	11.8	LOS B	11.7
All Vehicles		0.617	7.3	LOS A	45.1	0.617	6.7	LOS A	45.1

Table 5.6: Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)

Approach	Year 2023 PM Peak - PVT					Year 2023 PM Peak - PVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L2	0.151	3.1	LOS A	7.5	0.17	3.3	LOS A	8.8
	T1	0.151	3.5	LOS A	7.5	0.17	3.7	LOS A	8.8
	R2	0.531	10.5	LOS B	36.1	0.591	10.7	LOS B	42.8
	Approach	0.531	9.1	LOS A	36.1	0.591	9.3	LOS A	42.8
East: Pacific Highway (SB Off-ramp, NB On-ramp)	L2	0.401	2.3	LOS A	23	0.442	2.3	LOS A	26.7
	T1	0.401	3.2	LOS A	23	0.442	3.4	LOS A	26.7
	R2	0.401	10	LOS B	23	0.442	10.2	LOS B	26.7
	Approach	0.401	3	LOS A	23	0.442	3	LOS A	26.7
North: Chinderah Road (N)	L2	0.074	7.7	LOS A	4.7	0.097	10.4	LOS B	6.6
	T1	0.152	7.2	LOS A	11.8	0.2	9.9	LOS A	16.7
	R2	0.152	11.9	LOS B	11.8	0.2	14.7	LOS B	16.7
	Approach	0.152	8.7	LOS A	11.8	0.2	11.4	LOS B	16.7
West: Pacific Highway (NB Off-ramp, SB On-ramp)	L2	0.097	6.2	LOS A	4.1	0.117	6.9	LOS A	5.1
	T1	0.209	5.6	LOS A	10.6	0.258	6.3	LOS A	13.8
	R2	0.209	12.7	LOS B	10.6	0.258	13.4	LOS B	13.8
	Approach	0.209	11	LOS B	10.6	0.258	11.7	LOS B	13.8
All Vehicles		0.531	6.3	LOS A	36.1	0.591	6.6	LOS A	42.8

The results of the analysis for design traffic volumes under the sensitivity scenario are summarised in Tables 5.7-5.8. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 5.7: Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)

Approach	Year 2033 Sensitivity AM Peak - MVT					Year 2033 Sensitivity PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L2	0.115	3.3	LOS A	5.6	0.1919	3.3	LOS A	9.9
	T1	0.115	3.4	LOS A	5.6	0.191	3.7	LOS A	9.9
	R2	0.62	10.9	LOS B	45.4	0.622	10.8	LOS B	45.8
	Approach	0.62	9.9	LOS A	45.4	0.622	9.3	LOS A	45.8
East: Pacific Highway (SB Off-ramp, NB On-ramp)	L2	0.363	2.3	LOS A	21.1	0.416	2.2	LOS A	24.1
	T1	0.363	3.4	LOS A	21.1	0.416	3.2	LOS A	24.1
	R2	0.363	10.2	LOS B	21.1	0.416	10	LOS A	24.1
	Approach	0.363	3	LOS A	21.1	0.416	3	LOS A	24.1
North: Chinderah Road (N)	L2	0.113	11.7	LOS B	8	0.103	11	LOS B	7.1
	T1	0.247	11.2	LOS B	22.4	0.207	10.5	LOS B	17.5
	R2	0.247	16.4	LOS B	22.4	0.207	15.3	LOS B	17.5
	Approach	0.247	13.2	LOS B	22.4	0.207	12.1	LOS B	17.5
West: Pacific Highway (NB Off-ramp, SB On-ramp)	L2	0.132	7.7	LOS A	6.1	0.128	7.7	LOS A	5.7
	T1	0.257	6.7	LOS A	14.1	0.223	6.7	LOS A	12.1
	R2	0.257	13.8	LOS B	14.1	0.223	13.8	LOS B	12.1
	Approach	0.257	12.1	LOS B	14.1	0.223	11.9	LOS B	12.1
All Vehicles		0.62	7.3	LOS A	45.4	0.622	6.7	LOS A	45.8



Table 5.8: Pacific Highway / Tweed Coast Road Interchange SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)

Approach	Year 2033 Sensitivity AM Peak - PVT				
	OD Movement	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)
South: Tweed Coast Road (S)	L2	0.175	3.3	LOS A	9
	T1	0.175	3.7	LOS A	9
	R2	0.599	10.7	LOS B	43.7
	Approach	0.599	9.3	LOS A	43.7
East: Pacific Highway (SB Off-ramp, NB On-ramp)	L2	0.446	2.3	LOS A	27.2
	T1	0.446	3.4	LOS A	27.2
	R2	0.446	10.2	LOS B	27.2
	Approach	0.466	3	LOS A	27.2
North: Chinderah Road (N)	L2	0.1	10.9	LOS B	6.8
	T1	0.209	10.6	LOS B	17.6
	R2	0.209	15.3	LOS B	17.6
	Approach	0.209	12	LOS B	17.6
West: Pacific Highway (NB Off-ramp, SB On-ramp)	L2	0.118	7	LOS A	5.2
	T1	0.269	6.5	LOS A	14.6
	R2	0.269	13.5	LOS B	14.6
	Approach	0.269	11.9	LOS B	14.6
All Vehicles		0.599	6.7	LOS A	43.7

As demonstrated in Tables 5.4-5.8, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a roundabout intersection in the Year 2023 and 2033 design traffic scenarios.

#### 5.4.3 Tweed Coast Road / Cudgen Road Signalised Intersection

As part of the traffic assessment undertaken for Stage 1 of the project, a number of capacity upgrades and operational improvements were identified at the Tweed Coast Road / Cudgen Road intersection to cater for both future background traffic volumes and design traffic volumes (background plus Hospital). These upgrade works were reflected in Schedule 2 Conditions of Consent Part A2 (Drawings C331 and C332 prepared by Bonacci) and Part B Conditions to be Satisfied in Future Development Application(s) Part B22 (c). The upgrades works are detailed as follows:

- addition of a 100m southbound left-turn lane on Tweed Coast Road;
- phase sequence change to allow the southbound left-turn to overlap with the westbound right-turn (i.e. possible with the provision of a dedicated southbound left-turn lane);
- lane discipline change for the two approach lanes on the south-eastern approach:
  - Change of the left through lane to a through and right lane;
  - Change of the right through and right lane to a right only lane;
- extension of the northbound departure lane from approximately 85m to approximately 200m; and
- conversion of the north-western leg departure to a single lane (no physical changes. i.e. through provision of chevron line marking). With the lane discipline changes on the south-eastern approach, there is only one lane travelling through to the north-western departure lane.

The following additional upgrade works has been identified as part of this assessment. This includes:

- extension of the northbound right-turn on Tweed Coast Road (i.e. on the southern leg) by approximately 50m (increasing the total length from approximately 95m to approximately 145m).

The intersection upgrade works should be complete at the time the Hospital opens. Figure 5.2 shows the SIDRA intersection layout with a summary of the proposed changes, relative to the existing layout. With regards to SIDRA layouts, it is noted that these are schematic only. The lane lengths and storage lengths show the available lane width in which a vehicle can still occupy the lane and do not necessarily

representative of the full length of turn lanes or merge lanes inclusive of tapers etc. The ultimate layout is subject to detail design. Figure 5.3 shows the signal phasing changes.

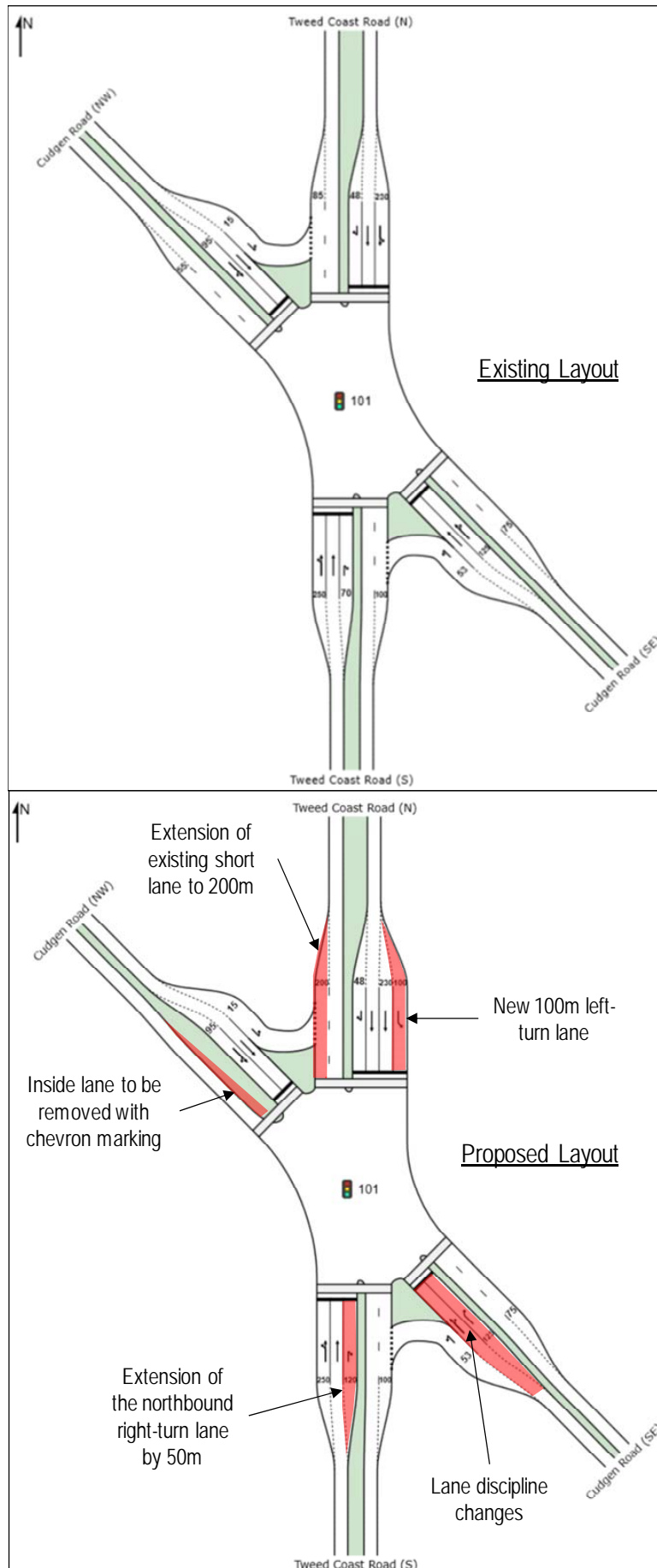


Figure 5.2: Tweed Coast Road / Cudgen Road – Upgrade Works



Figure 5.3: Tweed Coast Road / Cudgen Road – Signal Phasing Changes

The results of the analysis for design traffic volumes with the above upgrade works are summarised in Tables 5.9 and 5.10. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 5.9: Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes) – With Upgrades

Approach	Year 2023 AM Peak - MVT					Year 2023 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L1	0.401	24.7	LOS B	69.2	0.37	33.8	LOS C	34.8
	T1	0.401	20.1	LOS B	69.3	0.37	29.3	LOS C	68.3
	R3	0.905	58.9	LOS E	130.5	0.83	56.2	LOS D	56.3
	Approach	0.905	33.7	LOS C	130.5	0.83	37.4	LOS C	68.3
SouthEast: Cudgen Road (SE)	L3	0.103	8.1	LOS A	7	0.228	11.3	LOS A	23.5
	T1	0.861	47.7	LOS D	101.2	0.882	44.6	LOS D	76
	R1	0.861	51.8	LOS D	101.2	0.882	48.8	LOS D	170.8
	Approach	0.861	42.7	LOS D	101.2	0.882	39.6	LOS C	170.8
North: Tweed Coast Road (N)	L1	0.824	22.6	LOS B	135.7	0.542	11.9	LOS A	62.8
	T1	0.354	30.2	LOS C	43.5	0.839	36.3	LOS C	103.2
	R3	0.298	53.3	LOS D	10.3	0.3	47.3	LOS D	16.8
	Approach	0.824	25.6	LOS B	135.7	0.839	25.9	LOS B	103.2
NorthWest: Cudgen Road (NW)	L3	0.068	12.2	LOS A	5.8	0.053	14.1	LOS A	6.2
	T1	0.851	50.1	LOS D	45	0.826	50	LOS D	34.5
	R1	0.851	57	LOS E	45	0.826	56.8	LOS E	34.5
	Approach	0.851	41.9	LOS C	45	0.826	42.9	LOS D	34.5
All Vehicles		0.905	34	LOS C	135.7	0.882	33.9	LOS C	170.8

Table 5.10: Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary (Year 2023 PVT Design Traffic Volumes) – With Upgrades

Approach	Year 2023 PM Peak - PVT				
	OD Movement	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)
South: Tweed Coast Road (S)	L1	0.37	33.8	LOS C	48.6
	T1	0.37	29.3	LOS C	48.6
	R3	0.863	58.1	LOS E	67.2
	Approach	0.863	38.7	LOS C	67.2
SouthEast: Cudgen Road (SE)	L3	0.218	11.2	LOS A	25.6
	T1	0.829	39.2	LOS C	119.1
	R1	0.829	43.6	LOS D	136.5
	Approach	0.829	35.4	LOS C	136.5
North: Tweed Coast Road (N)	L1	0.663	13	LOS A	88.2
	T1	0.839	36.3	LOS C	130.8
	R3	0.275	46	LOS D	17.3
	Approach	0.839	25.3	LOS B	130.8
NorthWest: Cudgen Road (NW)	L3	0.051	13.3	LOS A	5.1
	T1	0.837	50.3	LOS D	37.9
	R1	0.837	57.3	LOS E	37.9
	Approach	0.837	43.1	LOS D	37.9
All Vehicles		0.863	32.1	LOS C	136.5

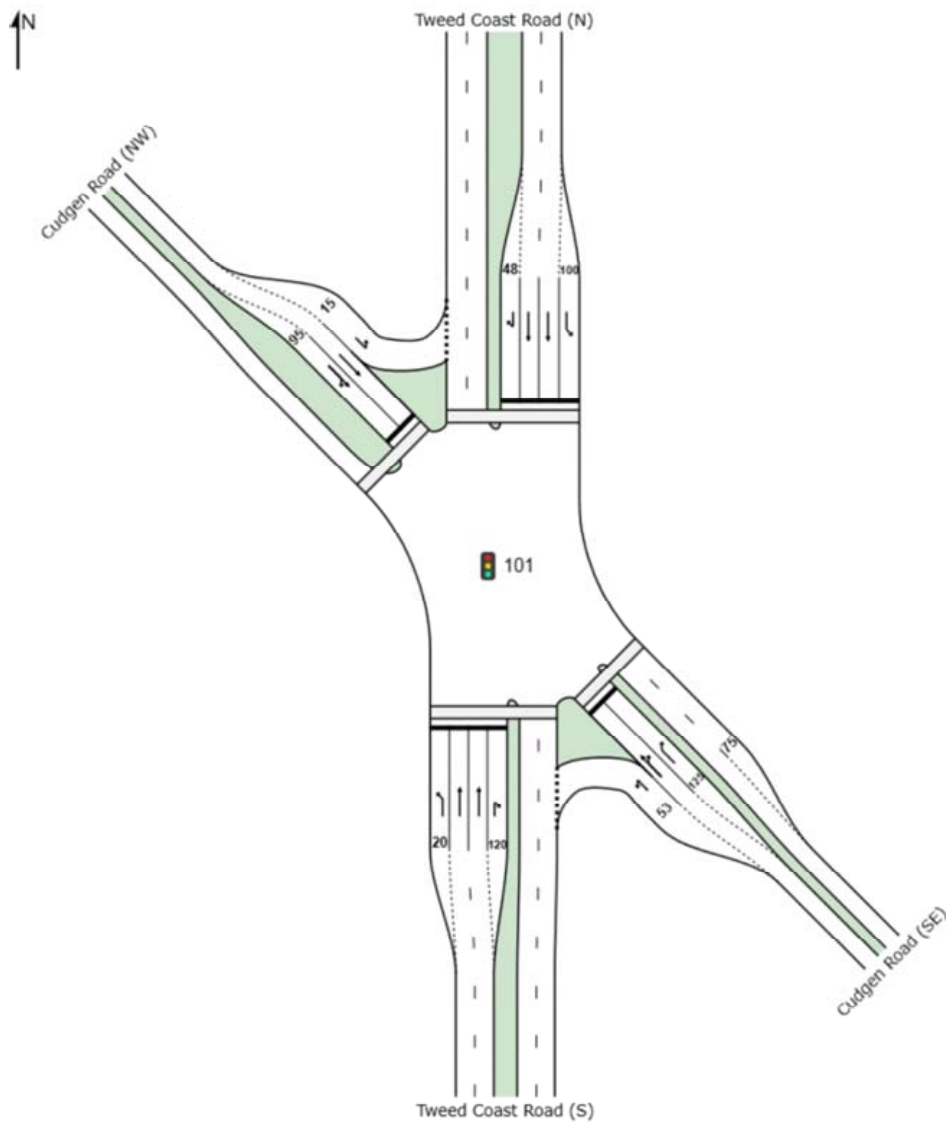
As demonstrated in Tables and 5.9-5.10, with the proposed upgrades, the intersection is shown to operate generally within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a signalised intersection in the Year 2023 design traffic scenarios. Some lanes are noted to operate at LOS D and E based on delay, however overall the intersection is considered to operate within acceptable limits.

The proposed upgrades mitigate against not only the development traffic impacts, they also significantly improve background traffic operations. The background traffic assessment in Section 3.7.4 identified that the intersection was operating outside of acceptable performance limits in Year 2023 with no development traffic (overall LOS D and DOS 0.94 for both the AM and PM scenarios). Discussions with Council as part of the Stage 1 assessment identified that there were no plans to upgrade the intersection to cater for background traffic operations, given Council's ultimate planning to four-lane Tweed Coast Road.

The proposed upgrades significantly improve overall intersection operations, including with the addition of development traffic. The upgrades are also commensurate with Council's overall planning for the four-lane upgrade of Tweed Coast Road.

There are a number of factors that require consideration for the 10-year design horizon (and beyond) on this section of Tweed Coast Road (including upgrade of Tweed Coast Road to a four-lane cross section and future provision of new east-west links from Tweed Coast Road to Kingscliff. Due to these considerations, it is not appropriate to provide significant additional turning capacity at the intersection. The intersection has therefore been assessed with an indicative four-lane cross-section as well as the upgrades works proposed as part of the Hospital (as detailed above). The layout is shown in Figure 5.4.





**Figure 5.4: Tweed Coast Road / Cudgen Road – Indicative Four Lane Layout**

The results of the analysis for design traffic volumes with the indicative four lane layout are summarised in Tables 5.11 and 5.12.

Table 5.11: Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes) – Indicative Four Lane Upgrade

Approach	Year 2033 AM Peak - MVT					Year 2033 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L1	0.031	18.2	LOS B	7.3	0.021	27.5	LOS B	3.4
	T1	0.378	27.1	LOS B	111.3	0.463	39.9	LOS C	67.2
	R3	0.892	76.7	LOS F	231.2	0.879	69.3	LOS E	85.2
	Approach	0.892	45.1	LOS D	231.2	0.879	48.8	LOS D	85.2
SouthEast: Cudgen Road (SE)	L3	0.114	7.8	LOS A	10.3	0.247	11.4	LOS A	37.2
	T1	0.868	67.6	LOS E	160.2	0.876	45.3	LOS D	159.5
	R1	0.868	72.4	LOS F	208.3	0.876	49.6	LOS D	239.2
	Approach	0.868	59.2	LOS E	208.3	0.876	40.3	LOS C	239.2
North: Tweed Coast Road (N)	L1	0.873	31.5	LOS C	271.5	0.599	12.8	LOS A	96.8
	T1	0.294	49.1	LOS D	59.1	0.823	48.9	LOS D	142.8
	R3	0.399	84	LOS F	20.4	0.324	54.4	LOS D	25.3
	Approach	0.873	37.7	LOS C	271.5	0.823	32.4	LOS C	142.8
NorthWest: Cudgen Road (NW)	L3	0.088	16.3	LOS B	12.1	0.067	17.2	LOS B	8.7
	T1	0.871	79.1	LOS F	88.9	0.715	55	LOS D	49.6
	R1	0.871	87.2	LOS F	88.9	0.715	61	LOS E	49.6
	Approach	0.871	65	LOS E	88.9	0.715	47.3	LOS D	49.6
All Vehicles		0.892	47.9	LOS D	271.5	0.879	39	LOS C	239.2

Table 5.12: Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary (Year 2033 PVT Design Traffic Volumes) – Indicative Four Lane Upgrade

Approach	Year 2033 PM Peak - PVT				
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L1	0.021	35.6	LOS C	4.6
	T1	0.429	50.9	LOS D	88.5
	R3	0.884	87.3	LOS F	127.5
	Approach	0.884	63	LOS E	127.5
SouthEast: Cudgen Road (SE)	L3	0.235	12.4	LOS A	45.7
	T1	0.869	53.7	LOS D	184.6
	R1	0.869	57.8	LOS E	272.2
	Approach	0.869	46.5	LOS D	272.2
North: Tweed Coast Road (N)	L1	0.677	15.3	LOS B	164.3
	T1	0.788	58.5	LOS E	178.4
	R3	0.288	68	LOS E	33.2
	Approach	0.788	37	LOS C	178.4
NorthWest: Cudgen Road (NW)	L3	0.067	18	LOS B	10.6
	T1	0.76	75	LOS F	68.4
	R1	0.76	81.7	LOS F	68.4
	Approach	0.76	63.1	LOS E	68.4
All Vehicles		0.884	46.3	LOS D	272.2

As demonstrated in Tables 5.11 and 5.12, with the indicative four lane upgrade for Tweed Coast Road the intersection is shown to operate at or just outside the accepted performance thresholds for a signalised intersection. A number of lanes are shown to operate at LOS D, E or F. However, overall delay and level of service is within acceptable performance limits. As discussed as part of the background traffic modelling for this intersection (refer Section 3.7.4) the above results do not consider the inclusion of the additional future

planned east-west links between Tweed Coast Road and Kingscliff which will significantly reduce turning volumes on Cudgen Road and improve intersection operations.

Overall, the proposed works are commensurate with Council's ultimate planning for Tweed Coast Road and the Tweed Coast Road / Cudgen Road intersection. A summary of consultation with Council regarding the intersection upgrades and future planning of the Tweed Coast Road corridor is summarised in Section 5.2.

The results of the analysis for design traffic volumes under the sensitivity scenario are summarised in Tables 5.13-5.14. A copy of the SIDRA movement summaries is provided in Appendix C.

**Table 5.13: Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)**

Approach	Year 2033 AM Sensitivity Peak - MVT					Year 2033 PM Sensitivity Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L1	0.031	18.2	LOS B	7.3	0.021	27.5	LOS B	3.4
	T1	0.378	27.1	LOS B	111.3	0.463	39.9	LOS C	67.2
	R3	0.897	77.8	LOS F	234.5	0.884	69.9	LOS E	86.2
	Approach	0.897	45.5	LOS D	234.5	0.884	49	LOS D	86.2
SouthEast: Cudgen Road (SE)	L3	0.115	7.8	LOS A	10.4	0.25	11.4	LOS A	37.7
	T1	0.879	69.4	LOS E	164.1	0.89	47.9	LOS D	167.2
	R1	0.879	74	LOS F	214.1	0.89	52	LOS D	250
	Approach	0.879	60.5	LOS E	214.1	0.89	42.2	LOS C	250
North: Tweed Coast Road (N)	L1	0.89	34.9	LOS C	288.3	0.605	12.9	LOS A	98.3
	T1	0.294	49.1	LOS D	59.1	0.823	48.9	LOS D	142.8
	R3	0.399	84	LOS F	20.4	0.324	54.4	LOS D	25.3
	Approach	0.89	40.1	LOS C	288.3	0.823	32.4	LOS C	142.8
NorthWest: Cudgen Road (NW)	L3	0.088	16.3	LOS B	12.1	0.067	17.2	LOS B	8.7
	T1	0.871	79.1	LOS F	88.9	0.715	55	LOS D	49.6
	R1	0.871	87.2	LOS F	88.9	0.715	61	LOS E	49.6
	Approach	0.871	65	LOS E	88.9	0.715	47.3	LOS D	49.6
All Vehicles		0.897	49.2	LOS D	288.3	0.89	39.7	LOS C	250

Table 5.14: Tweed Coast Road / Cudgen Road Intersection SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)

Approach	Year 2033 PM Sensitivity Peak - PVT				
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Tweed Coast Road (S)	L1	0.021	35.6	LOS C	4.6
	T1	0.429	50.9	LOS D	88.5
	R3	0.897	89.6	LOS F	131.6
	Approach	0.897	63.9	LOS E	131.6
SouthEast: Cudgen Road (SE)	L3	0.238	12.4	LOS A	46.5
	T1	0.894	59.2	LOS E	201.5
	R1	0.894	62.8	LOS E	289
	Approach	0.894	50.4	LOS D	289
North: Tweed Coast Road (N)	L1	0.694	15.5	LOS B	171.2
	T1	0.789	58.5	LOS E	178.3
	R3	0.288	68	LOS E	33.2
	Approach	0.789	36.8	LOS C	178.3
NorthWest: Cudgen Road (NW)	L3	0.067	18.4	LOS B	10.8
	T1	0.76	75	LOS F	68.4
	R1	0.76	81.7	LOS F	68.4
	Approach	0.76	63.2	LOS E	68.4
All Vehicles		0.897	47.7	LOS D	289

As demonstrated in Tables 5.13-5.14, overall delay and level of service is within acceptable performance limits. The impacts of the sensitivity scenario in comparison to the design traffic scenario are shown to be negligible. Therefore, no additional works are considered to be required under the additional yield scenario.

#### 5.4.4 Cudgen Road / Site Access

The primary site access has been designed as a signalised intersection to cater for the design traffic volumes (i.e. background volumes and Tweed Valley Hospital volumes) and to provide suitable pedestrian amenity (i.e. signalised pedestrian crossings across the access and across Cudgen Road). In designing the access, intersection performance limits were considered (in terms of degree of saturation, LOS, delays and queues). A key consideration was ensuring queues do not impact adjacent intersections or other site accesses. The access intersection comprises of:

- a T-intersection with the site access and Cudgen Road;
- two through lanes in each direction on Cudgen Road (with the inclusion of short kerbside approach and departure lanes);
- a 130m north-eastbound stand-up approach lane on Cudgen Road;
- a 100m north-eastbound stand-up departure lane on Cudgen Road;
- a 150m south-westbound stand-up departure lane on Cudgen Road;
- a short-left slip on the south-western approach (i.e. for the left turn into the site);
- dual right-turns and a left slip lane on the north-western approach (i.e. site access approach);
- a single north-westbound departure lane (i.e. into the site); and
- pedestrian crossings on the north-western and north-eastern legs. This arrangement allows for efficient signal phasing by allowing the south-eastbound right-turns to run complimentary with the pedestrian crossing on the north-eastern approach. Inclusion of an additional pedestrian crossing on the south-western leg would result in a significant reduction intersection performance as the south-eastbound-turns and pedestrian crossing could not run complimentary and would require an additional phase. Further, the existing pedestrian demands are on the existing shared pathway on the northern side of Cudgen Road and the new demands associated with the hospital will be crossing on the north-eastern leg given the location of the main pedestrian entry, pathways and external catchment.

The access intersection will be constructed and operational at the time the Hospital opens.

In addition to the access intersection capacity requirements, the RMS Traffic Signal Design: Section 2 – Warrants was considered when assessing the suitability of a signalised access intersection, noting that the warrants are emphasised as being a guide only. The signalised access is further deemed appropriate on the basis of:

- Traffic Demand – major road flows exceeding 600 vehicles / hour in each direction during the peak hours and the minor road flows exceeding 200 vehicles in an hour (year of opening). Based on growth projections, through volumes on Cudgen Road are also continued to grow beyond year of opening; and
- Pedestrian Safety – major road flows exceeding 600 vehicles / hour in each direction during the peak hours. While specific pedestrian volumes associated with the hospital are not known, the proposed hospital will generate a significant increase in pedestrian demand including the demand for crossing Cudgen Road. The demand for crossing is generated by the westbound bus stop (noting the proposed new bus stop will be located in close proximity to the intersection, the eastbound bus stop (for pedestrians crossing from the opposite residential developments and Kingscliff TAFE) and by the residential areas to the east of the Project Site. Consideration has also been given to the expected increase in "slow walkers" associated with a hospital including the elderly and people with disabilities who require larger gaps in traffic to safely cross.

The layout of the intersection used in SIDRA is shown in Figure 5.5.

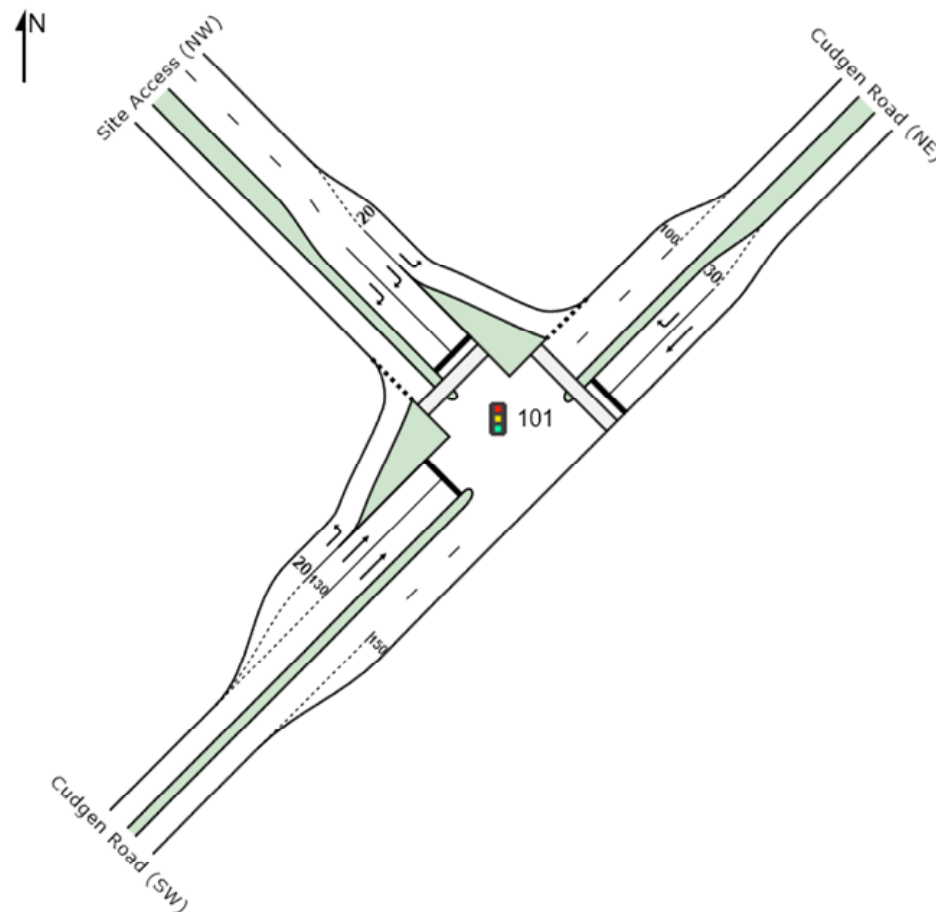


Figure 5.5: Cudgen Road / Site Access SIDRA Intersection Layout

The intersection was modelled with a lagging south-westbound right-turn phase sequence. The south-westbound right-turn filters in A Phase. The intersection was modelled with an 80 second cycle time and an actuated pedestrian call for the Cudgen Road pedestrian crossing (50% call). The phase sequence is presented in Figure 5.6. The ultimate intersection timing and operations will be subject to detailed design and operational refinements, in consultation with RMS.



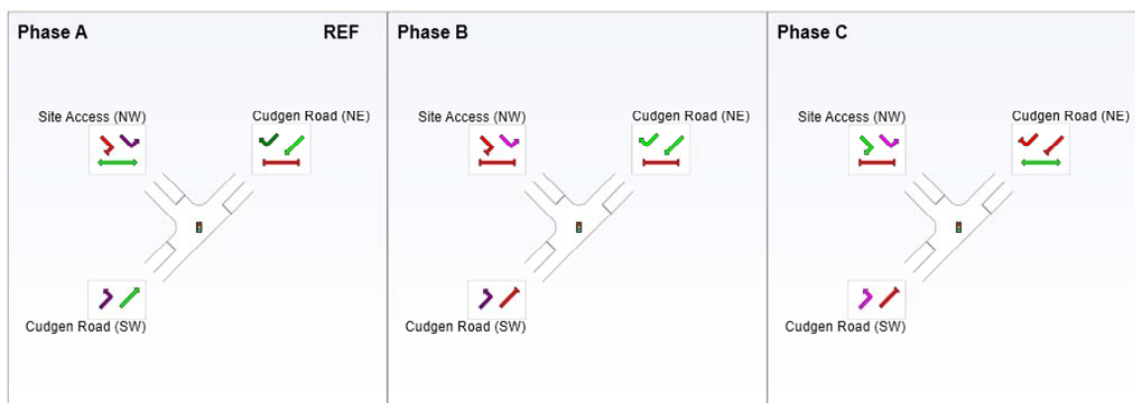


Figure 5.6: Cudgen Road / Site Access Phase Sequence.

The results of the analysis for design traffic volumes for the Cudgen Road / Site Access Intersection are summarised in Tables 5.15 - 5.17. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 5.15: Cudgen Road / Site Access SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)

Approach	Year 2023 AM Peak - MVT					Year 2023 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
NorthEast: Cudgen Road (NE)	T1	0.473	3.4	LOS A	67.3	0.649	4.3	LOS A	117.4
	R2	0.019	13.8	LOS A	0.9	0.014	11.2	LOS A	0.7
	Approach	0.473	3.5	LOS A	67.3	0.649	4.3	LOS A	117.4
NorthWest: Site Access (NW)	L2	0.005	3.2	LOS A	0.2	0.019	1.8	LOS A	0.8
	R2	0.11	39.3	LOS C	4.2	0.579	41.7	LOS C	23.3
	Approach	0.11	35.6	LOS C	4.2	0.579	37.8	LOS C	23.3
SouthWest: Cudgen Road (SW)	L2	0.034	7	LOS A	1.1	0.033	7	LOS A	1
	T1	0.556	8.6	LOS A	107.1	0.375	7.5	LOS A	61.4
	Approach	0.556	8.5	LOS A	107.1	0.375	7.5	LOS A	61.4
All Vehicles		0.556	7	LOS A	107.1	0.649	8.5	LOS A	117.4

Table 5.16: Cudgen Road / Site Access SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)

Approach	Year 2033 AM Peak - MVT					Year 2033 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
NorthEast: Cudgen Road (NE)	T1	0.569	3.8	LOS A	89	0.77	5.2	LOS A	168.8
	R2	0.026	17.1	LOS B	1.2	0.018	12	LOS A	0.9
	Approach	0.569	3.9	LOS A	89	0.77	5.3	LOS A	168.8
NorthWest: Site Access (NW)	L2	0.006	5.2	LOS A	0.3	0.025	2.2	LOS A	1.1
	R2	0.127	39.4	LOS C	4.8	0.668	42.4	LOS C	27.4
	Approach	0.127	36.3	LOS C	4.8	0.668	38.3	LOS C	27.4
SouthWest: Cudgen Road (SW)	L2	0.038	7	LOS A	1.2	0.038	7	LOS A	1.2
	T1	0.664	9.4	LOS A	142.7	0.446	7.9	LOS A	77.7
	Approach	0.664	9.3	LOS A	142.7	0.446	7.8	LOS A	77.7
All Vehicles		0.664	7.6	LOS A	142.7	0.77	9.1	LOS A	168.8

Table 5.17: Cudgen Road / Site Access SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)

Approach	Year 2023 PM Peak - PVT					Year 2033 PM Peak - PVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)
NorthEast: Cudgen Road (NE)	T1	0.626	4.1	LOS A	107	0.745	4.9	LOS A	150.8
	R2	0.024	11.2	LOS A	1.2	0.032	12.1	LOS A	1.6
	Approach	0.626	4.2	LOS A	107	0.745	5	LOS A	150.8
NorthWest: Site Access (NW)	L2	0.016	1.8	LOS A	0.7	0.02	2.2	LOS A	0.9
	R2	0.457	41.1	LOS C	18	0.529	41.4	LOS C	21.1
	Approach	0.457	37.1	LOS C	18	0.529	37.4	LOS C	21.1
SouthWest: Cudgen Road (SW)	L2	0.061	7.1	LOS A	1.9	0.071	7.1	LOS A	2.2
	T1	0.382	7.5	LOS A	62.9	0.456	7.9	LOS A	80.2
	Approach	0.382	7.5	LOS A	62.9	0.456	7.9	LOS A	80.2
All Vehicles		0.626	7.9	LOS A	107	0.745	8.4	LOS A	150.8

As demonstrated in Tables 5.15-5.17, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a signalised intersection in the Year 2023 and 2033 design traffic scenarios.

The results of the analysis for design traffic volumes under the sensitivity scenario are summarised in Tables 5.18-5.19. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 5.18: Cudgen Road / Site Access SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)

Approach	Year 2033 AM Sensitivity Peak - MVT					Year 2033 PM Sensitivity Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)
NorthEast: Cudgen Road (NE)	T1	0.6	3.9	LOS A	97.5	0.773	5.2	LOS A	170.3
	R2	0.029	16.6	LOS B	1.3	0.018	12	LOS A	0.9
	Approach	0.6	4.1	LOS A	97.5	0.773	5.3	LOS A	170.3
NorthWest: Site Access (NW)	L2	0.007	4.8	LOS A	0.4	0.026	2.2	LOS A	1.1
	R2	0.14	39.5	LOS C	5.3	0.698	42.7	LOS D	28.9
	Approach	0.14	35.8	LOS C	5.3	0.698	38.8	LOS C	28.9
SouthWest: Cudgen Road (SW)	L2	0.042	7	LOS A	1.3	0.04	7	LOS A	1.2
	T1	0.644	9.2	LOS A	135.5	0.451	7.9	LOS A	78.7
	Approach	0.644	9.1	LOS A	135.5	0.451	7.9	LOS A	78.7
All Vehicles		0.644	7.6	LOS A	135.5	0.773	9.2	LOS A	170.3

Table 5.19: Cudgen Road / Site Access SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)

Approach	Year 2033 PM Sensitivity Peak - PVT				
	OD Movement	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)
NorthEast: Cudgen Road (NE)	T1	0.752	4.9	LOS A	153.5
	R2	0.035	12.5	LOS A	1.7
	Approach	0.752	5	LOS A	153.5
NorthWest: Site Access (NW)	L2	0.022	2.5	LOS A	1
	R2	0.567	41.6	LOS C	22.8
	Approach	0.567	37.7	LOS C	22.8
SouthWest: Cudgen Road (SW)	L2	0.075	7.1	LOS A	2.4
	T1	0.463	8	LOS A	81.7
	Approach	0.463	7.9	LOS A	81.7
All Vehicles		0.752	8.6	LOS A	153.5

As demonstrated in Tables 5.18-5.19, overall delay and level of service is within acceptable performance limits. The impacts of the sensitivity scenario in comparison to the design traffic scenario are shown to be negligible.

As previously noted in the background traffic analysis, once the future planned east-west links between Kingscliff and Tweed Coast Road are provided, background through traffic volumes on Cudgen Road are expected to reduce to levels currently represented in 2018 count data, which will improve the access intersection performance.

#### 5.4.5 Cudgen Road / Kingscliff TAFE Access

Analysis of the Cudgen Road / Kingscliff TAFE access intersection was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) and Year 2033 (10-year design horizon) design traffic volumes. The existing geometric layout for the intersection was used consistent with the background traffic modelling.

The results of the analysis for design traffic volumes are summarised in Table 5.20-5.22. A copy of the SIDRA movement summaries is provided in Appendix C.

**Table 5.20: Cudgen Road / Kingscliff TAFE SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)**

Approach	Year 2023 AM Peak - MVT					Year 2023 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: TAFE Access (S)	L2	0.056	9.7	LOS A	1.4	0.254	13.9	LOS A	6.7
	T1	0.022	20	LOS B	0.6	0.155	22.4	LOS B	3.9
	Approach	0.056	11	LOS A	1.4	0.254	15.9	LOS A	6.7
East: Cudgen Road €	L2	0.034	5.6	LOS A	0	0.006	5.6	LOS A	0
	T1	0.343	0	LOS A	0	0.447	0	LOS A	0
	Approach	0.343	0.5	NA	0	0.447	0.1	NA	0
West: Cudgen Road (W)	R2	0.378	12.3	LOS A	13.2	0.054	12.6	LOS A	1.3
	T1	0.403	0	LOS A	0	0.369	0	LOS A	0
	Approach	0.403	12.3	NA	13.2	0.369	12.6	NA	1.3
South: Median Storage Area	R2	0.008	5	LOS A	0.2	0.047	4.5	LOS A	1
	Approach	0.008	5	LOS A	0.2	0.047	4.5	LOS A	0
All Vehicles		0.403	3.6	NA	13.2	0.447	2.6	NA	6.7

**Table 5.21: Cudgen Road / Kingscliff TAFE SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)**

Approach	Year 2033 AM Peak - MVT					Year 2033 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: TAFE Access (S)	L2	0.082	11.3	LOS A	2	0.43	20.7	LOS B	12
	T1	0.04	27.9	LOS B	0.9	0.288	36.6	LOS C	7.3
	Approach	0.082	13.5	LOS A	2	0.43	24.4	LOS B	12
East: Cudgen Road €	L2	0.04	5.6	LOS A	0	0.007	5.6	LOS A	0
	T1	0.406	0	LOS A	0	0.528	0	LOS A	0
	Approach	0.406	0.5	NA	0	0.528	0.1	NA	0
West: Cudgen Road (W)	R2	0.565	17.1	LOS B	22.5	0.09	16.4	LOS B	2.1
	T1	0.478	0	LOS A	0	0.438	0	LOS A	0
	Approach	0.565	17.1	NA	22.5	0.438	16.4	NA	2.1
South: Median Storage Area	R2	0.013	6.6	LOS A	0.3	0.068	5.7	LOS A	1.4
	Approach	0.013	6.6	LOS A	0.3	0.068	5.7	LOS A	1.4
All Vehicles		0.565	4.8	NA	22.5	0.528	3.9	NA	12

Table 5.22: Cudgen Road / Kingscliff TAFE SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)

Approach	Year 2023 PM Peak - PVT					Year 2033 PM Peak - PVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: TAFE Access (S)	L2	0.235	12.9	LOS A	6.2	0.686	18.3	LOS B	10.7
	T1	0.14	20.6	LOS B	3.5	0.25	31.5	LOS C	6.4
	Approach	0.235	14.7	LOS B	6.2	0.383	21.3	LOS B	10.7
East: Cudgen Road €	L2	0.006	5.6	LOS A	0	0.007	5.6	LOS A	0
	T1	0.427	0	LOS A	0	0.504	0	LOS A	0
	Approach	0.427	0.1	NA	0	0.504	0.1	NA	0
West: Cudgen Road (W)	R2	0.05	11.9	LOS A	1.2	0.08	15.1	LOS B	1.9
	T1	0.368	0	LOS A	0	0.436	0	LOS A	0
	Approach	0.368	11.9	NA	1.2	0.436	15.1	NA	1.9
South: Median Storage Area	R2	0.047	4.4	LOS A	1	0.068	5.6	LOS A	1.4
	Approach	0.047	4.4	LOS A	1	0.068	5.6	LOS A	1.4
All Vehicles		0.427	2.5	NA	6.2	0.504	3.5	NA	10.7

As demonstrated in Table 5.20-5.22, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a priority-controlled intersection in the Year 2023 and 2033 design traffic scenarios.

The results of the analysis for design traffic volumes under the sensitivity scenario are summarised in Tables 5.23-5.24. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 5.23: Cudgen Road / Kingscliff TAFE SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)

Approach	Year 2033 AM Sensitivity Peak - MVT					Year 2033 PM Sensitivity Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: TAFE Access (S)	L2	0.082	11.4	LOS A	2	0.436	21	LOS B	12.2
	T1	0.04	28.2	LOS B	0.9	0.292	37.3	LOS C	7.4
	Approach	0.082	13.6	LOS A	2	0.436	24.8	LOS B	12.2
East: Cudgen Road €	L2	0.04	5.6	LOS A	0	0.007	5.6	LOS A	0
	T1	0.409	0	LOS A	0	0.531	0	LOS A	0
	Approach	0.409	0.5	NA	0	0.531	0.1	NA	0
West: Cudgen Road (W)	R2	0.571	17.3	LOS B	22.8	0.091	16.6	LOS B	2.1
	T1	0.478	0	LOS A	0	0.438	0	LOS A	0
	Approach	0.571	17.3	NA	22.8	0.438	16.6	NA	2.1
South: Median Storage Area	R2	0.013	6.6	LOS A	0.3	0.068	5.7	LOS A	1.4
	Approach	0.013	6.6	LOS A	0.3	0.068	5.7	LOS A	1.4
All Vehicles		0.571	4.9	NA	22.8	0.528	3.9	NA	12.2

Table 5.24: Cudgen Road / Kingscliff TAFE SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)

Approach	Year 2033 PM Sensitivity Peak - PVT				
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: TAFE Access (S)	L2	0.394	18.8	LOS B	11
	T1	0.259	32.7	LOS C	6.6
	Approach	0.394	22	LOS B	11
East: Cudgen Road E	L2	0.007	5.6	LOS A	0
	T1	0.51	0	LOS A	0
	Approach	0.51	0.14	NA	0
West: Cudgen Road (W)	R2	0.082	15.4	LOS B	1.9
	T1	0.436	0	LOS A	0
	Approach	0.736	15.4	NA	1.9
South: Median Storage Area	R2	0.068	5.6	LOS A	0.2
	Approach	0.068	5.6	LOS A	0.2
All Vehicles		0.51	4.9	NA	11

As demonstrated in Tables 5.23-5.24, overall delay and level of service is within acceptable performance limits. The impacts of the sensitivity scenario in comparison to the design traffic scenario are shown to be negligible.

#### 5.4.6 Cudgen Road / Turnock Street Roundabout

Analysis of the Cudgen Road / Turnock Street / Elrond Drive intersection was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) and Year 2033 Design traffic volumes. A north-western leg has been added for the site access. The new intersection leg has a single approach lane and a single departure lane. During consultation with Council the safe operations of the roundabout were raised. A review of the roundabout operations identified that the current roundabout design does not facilitate service vehicle / heavy vehicle operations simultaneous with other vehicle movements which is a design requirement of Austroads. Particularly:

- the northbound through movement does not cater for Heavy Rigid Vehicles / Buses / Articulated Vehicles to travel through the intersection adjacent to other vehicles;
- the southbound through movement does not cater for Heavy Rigid Vehicles / Buses / Articulated Vehicles to travel through the intersection adjacent to other vehicles; and
- the southbound through movement does not cater for Heavy Rigid Vehicles / Buses / Articulated Vehicles to turn left at the intersection adjacent to other vehicles travelling through.

A number of other intersection changes are proposed with the addition of the site access. This includes:

- Widening on the western side of the roundabout to provide additional width through the intersection (to cater for multiple vehicles travelling on the roundabout simultaneously);
- Change of the southern approach to a through-left lane and a right lane. This results in only one-vehicle travelling through and removes the short merge on the egress side. The departure lane will be changed to a single lane; and
- Reduction of the northern leg to one approach lane (to remove the conflict caused by larger vehicles). This will be removed with chevron line marking and a pedestrian buildout. The southern leg will be reduced to one departure lane (to remove the conflict caused by larger vehicles) This will be removed with chevron line marking.

Construction of the new roundabout leg for site access and the above intersection changes will be undertaken as part of the Stage 1 approval and subsequent Section 138 applications. The design layout prepared by Robert Bird Group and lodged as part of the Section 138 application is included in Appendix E for reference. The layout of the intersection used in SIDRA is shown in Figure 5.7.



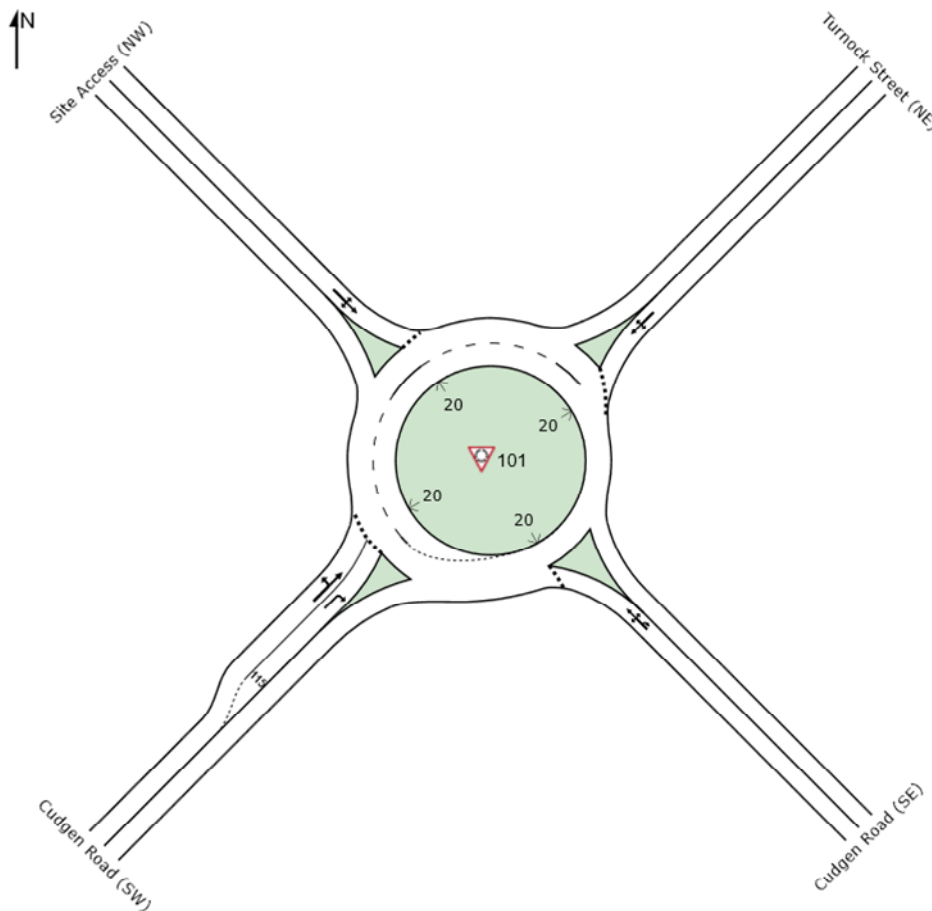


Figure 5.7: Cudgen Road / Turnock Street SIDRA Intersection Layout (With Access)

The results of the analysis are summarised in Tables 5.25-5.27. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 5.25: Cudgen Road / Turnock Street SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)

Approach	Year 2023 AM Peak - MVT					Year 2023 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Cudgen Road (SE)	L2	0.578	5.2	LOS A	40.8	0.611	9.8	LOS A	47.1
	T1	0.578	5.1	LOS A	40.8	0.611	9.6	LOS A	47.1
	R2	0.578	9.7	LOS A	40.8	0.611	14.2	LOS A	47.1
	U	0.578	11.4	LOS A	40.8	0.611	15.9	LOS B	47.1
	Approach	0.578	6	LOS A	40.8	0.611	10.6	LOS A	47.1
NorthEast: Turnock Street (NE)	L2	0.412	8.9	LOS A	19.4	0.44	10.4	LOS A	21.4
	T1	0.412	9.3	LOS A	19.4	0.44	10.3	LOS A	21.4
	R2	0.412	13.7	LOS A	19.4	0.44	15	LOS B	21.4
	Approach	0.412	9.2	LOS A	19.4	0.44	10.5	LOS A	21.4
NorthWest: Site Access (NW)	L2	0.072	5.4	LOS A	2.2	0.362	6.2	LOS A	12.9
	T1	0.072	5	LOS A	2.2	0.362	5.8	LOS A	12.9
	R2	0.072	9.3	LOS A	2.2	0.362	10.1	LOS A	12.9
	Approach	0.072	8.9	LOS A	2.2	0.362	9.7	LOS A	12.9
SouthWest: Cudgen Road (SW)	L2	0.264	4.9	LOS A	12	0.281	4.6	LOS A	13.7
	T1	0.264	4.9	LOS A	12	0.281	4.6	LOS A	13.7
	R2	0.4	9.5	LOS A	22	0.316	9.3	LOS A	16.6
	Approach	0.4	7.9	LOS A	22	0.316	7.2	LOS A	16.6
All Vehicles		0.578	7.4	LOS A	40.8	0.611	9	LOS A	47.1

Table 5.26: Cudgen Road / Turnock Street SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)

Approach	Year 2033 AM Peak - MVT					Year 2033 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)
SouthEast: Cudgen Road (SE)	L2	0.72	8	LOS A	72.3	0.788	17.8	LOS B	92
	T1	0.72	7.9	LOS A	72.3	0.788	17.6	LOS B	92
	R2	0.72	12.5	LOS A	72.3	0.788	22.3	LOS B	92
	U	0.72	14.2	LOS A	72.3	0.788	23.9	LOS B	92
	Approach	0.72	8.8	LOS A	72.3	0.788	18.6	LOS B	92
NorthEast: Turnock Street (NE)	L2	0.55	12.7	LOS A	33.2	0.584	15.3	LOS B	36.4
	T1	0.55	13.1	LOS A	33.2	0.584	15.1	LOS B	36.4
	R2	0.55	17.5	LOS B	33.2	0.584	19.8	LOS B	36.4
	Approach	0.55	13.1	LOS A	33.2	0.584	15.3	LOS B	36.4
NorthWest: Site Access (NW)	L2	0.094	6.1	LOS A	2.9	0.462	7.9	LOS A	18.4
	T1	0.094	5.8	LOS A	2.9	0.462	7.6	LOS A	18.4
	R2	0.094	10	LOS A	2.9	0.462	11.8	LOS A	18.4
	Approach	0.094	9.6	LOS A	2.9	0.462	11.4	LOS A	18.4
SouthWest: Cudgen Road (SW)	L2	0.323	5.1	LOS A	15.9	0.342	4.8	LOS A	18
	T1	0.323	5.1	LOS A	15.9	0.342	4.8	LOS A	18
	R2	0.486	9.7	LOS A	60.4	0.383	9.5	LOS A	22
	Approach	0.486	8.1	LOS A	60.4	0.383	7.3	LOS A	22
All Vehicles		0.72	9.2	LOS A	72.3	0.788	12.4	LOS A	92

Table 5.27: Cudgen Road / Turnock Street SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)

Approach	Year 2023 PM Peak - PVT					Year 2033 PM Peak - PVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)	DOS	Ave Delay (s)	LOS	95 <sup>th</sup> ile Queue (m)
SouthEast: Cudgen Road (SE)	L2	0.594	8.8	LOS A	44.3	0.763	15.4	LOS B	84
	T1	0.594	8.6	LOS A	44.3	0.763	15.2	LOS B	84
	R2	0.594	13.3	LOS A	44.3	0.763	19.8	LOS B	84
	U	0.594	14.9	LOS B	44.3	0.763	21.5	LOS B	84
	Approach	0.594	9.6	LOS A	44.3	0.763	16.2	LOS B	84
NorthEast: Turnock Street (NE)	L2	0.437	9.7	LOS A	20.9	0.579	14	LOS A	35.8
	T1	0.437	9.7	LOS A	20.9	0.579	13.9	LOS A	35.8
	R2	0.437	14.3	LOS A	20.9	0.579	18.6	LOS B	35.8
	Approach	0.437	9.9	LOS A	20.9	0.579	14.2	LOS A	35.8
NorthWest: Site Access (NW)	L2	0.288	5.7	LOS A	9.5	0.366	6.9	LOS A	13.1
	T1	0.288	5.3	LOS A	9.5	0.366	6.5	LOS A	13.1
	R2	0.288	9.6	LOS A	9.5	0.366	10.8	LOS A	13.1
	Approach	0.288	9.2	LOS A	9.5	0.366	10.4	LOS A	13.1
SouthWest: Cudgen Road (SW)	L2	0.283	4.7	LOS A	13.5	0.344	4.9	LOS A	17.8
	T1	0.283	4.7	LOS A	13.5	0.344	4.9	LOS A	17.8
	R2	0.319	9.3	LOS A	16.4	0.388	9.5	LOS A	21.9
	Approach	0.319	7.2	LOS A	16.4	0.388	7.4	LOS A	21.9
All Vehicles		0.596	8.6	LOS A	44.3	0.763	11.5	LOS A	84

As demonstrated in Tables 5.25-5.27, the intersection (with the inclusion of an additional leg for site access) is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a roundabout intersection in the Year 2023 and 2033 design traffic scenarios.

The results of the analysis for design traffic volumes under the sensitivity scenario are summarised in Tables 5.28-5.29. A copy of the SIDRA movement summaries is provided in Appendix C.

**Table 5.28: Cudgen Road / Turnock Street SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)**

Approach	Year 2033 AM Sensitivity Peak - MVT					Year 2033 PM Sensitivity Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Cudgen Road (SE)	L2	0.726	8.3	LOS A	74.4	0.797	18.8	LOS B	95.5
	T1	0.726	8.2	LOS A	74.4	0.797	18.5	LOS B	95.5
	R2	0.726	12.8	LOS A	74.4	0.797	23.2	LOS B	95.5
	U	0.726	14.6	LOS B	74.4	0.797	24.8	LOS B	95.5
	Approach	0.726	9.1	LOS A	74.4	0.797	19.5	LOS B	95.5
NorthEast: Turnock Street (NE)	L2	0.556	12.9	LOS A	33.9	0.59	15.7	LOS B	37.2
	T1	0.556	13.3	LOS A	33.9	0.59	15.2	LOS B	37.2
	R2	0.556	17.7	LOS B	33.9	0.59	20.2	LOS B	37.2
	Approach	0.556	13.3	LOS A	33.9	0.59	15.7	LOS B	37.2
NorthWest: Site Access (NW)	L2	0.101	6.2	LOS A	3.2	0.481	8.2	LOS A	19.6
	T1	0.101	5.8	LOS A	3.2	0.481	7.8	LOS A	19.6
	R2	0.101	10.1	LOS A	3.2	0.481	12.1	LOS A	19.6
	Approach	0.101	9.7	LOS A	3.2	0.481	11.7	LOS A	19.6
SouthWest: Cudgen Road (SW)	L2	0.324	5.1	LOS A	16	0.342	4.8	LOS A	18
	T1	0.324	5.2	LOS A	16	0.342	4.8	LOS A	18
	R2	0.488	9.7	LOS A	30.5	0.383	9.5	LOS A	22
	Approach	0.488	8.1	LOS A	30.5	0.383	7.3	LOS A	22
All Vehicles		0.726	9.1	LOS A	74.4	0.797	12.8	LOS A	95.5

**Table 5.29: Cudgen Road / Turnock Street SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)**

Approach	Year 2033 PM Sensitivity Peak - PVT				
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Cudgen Road (SE)	L2	0.776	16.5	LOS B	88.1
	T1	0.776	16.3	LOS B	88.1
	R2	0.776	20.9	LOS B	88.1
	U	0.776	22.6	LOS B	88.1
	Approach	0.776	17.3	LOS B	88.1
NorthEast: Turnock Street (NE)	L2	0.589	14.5	LOS B	37.2
	T1	0.589	14.4	LOS A	37.2
	R2	0.589	19.1	LOS B	37.2
	Approach	0.589	14.7	LOS B	37.2
NorthWest: Site Access (NW)	L2	0.391	7.1	LOS A	14.4
	T1	0.391	6.8	LOS A	14.4
	R2	0.391	11	LOS A	14.4
	Approach	0.391	10.6	LOS A	14.4
SouthWest: Cudgen Road (SW)	L2	0.345	4.9	LOS A	17.9
	T1	0.345	4.9	LOS A	17.9
	R2	0.388	9.5	LOS A	21.9
	Approach	0.388	7.4	LOS A	21.9
All Vehicles		0.776	11.9	LOS A	88.1

As demonstrated in Tables 5.28-5.29, overall delay and level of service is within acceptable performance limits. The impacts of the sensitivity scenario in comparison to the design traffic scenario are shown to be negligible.

#### 5.4.7 Turnock Street / Elrond Drive roundabout

Analysis of the Turnock Street / Elrond Drive intersection was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) and Year 2033 (10-year design horizon) design traffic volumes. The existing geometric layout for the intersection was used consistent with the background traffic modelling.

The results of the analysis for design traffic volumes are summarised in Table 5.30-5.32. A copy of the SIDRA movement summaries is provided in Appendix C.

**Table 5.30: Turnock Street / Elrond Drive Intersection SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)**

Approach	Year 2023 AM Peak - MVT					Year 2023 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Turnock Street (S)	L1	0.094	3.4	LOS A	2.8	0.119	3.5	LOS A	3.5
	R1	0.183	8.2	LOS A	6.1	0.224	8.3	LOS A	7.6
	U	0.183	11.7	LOS A	6.1	0.224	11.8	LOS A	7.6
	Approach	0.183	7.2	LOS A	6.1	0.224	7	LOS A	7.6
NorthEast: Turnock Street (NE)	L1	0.137	3.5	LOS A	4.5	0.164	3.3	LOS A	5.7
	R2	0.137	9.5	LOS A	4.5	0.164	9.4	LOS A	5.7
	U	0.137	11.8	LOS A	4.5	0.164	11.7	LOS A	5.7
	Approach	0.137	4.7	LOS A	4.5	0.164	5.1	LOS A	5.7
NorthWest: Elrond Drive (NW)	L2	0.071	4.6	LOS A	2	0.046	4.8	LOS A	1.5
	R1	0.078	8.9	LOS A	2.3	0.047	9	LOS A	1.5
	U	0.078	12.4	LOS A	2.3	0.047	12.5	LOS A	1.5
	Approach	0.078	7	LOS A	2.3	0.047	7.1	LOS A	1.5
All Vehicles		0.183	6.4	LOS A	6.1	0.224	6.3	LOS A	7.6

**Table 5.31: Turnock Street / Elrond Drive Intersection SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)**

Approach	Year 2033 AM Peak - MVT					Year 2033 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Turnock Street (S)	L1	0.112	3.4	LOS A	3.5	0.143	3.6	LOS A	4.4
	R1	0.219	8.2	LOS A	7.6	0.269	8.4	LOS A	9.6
	U	0.219	11.7	LOS A	7.6	0.269	11.9	LOS A	9.6
	Approach	0.219	7.2	LOS A	7.6	0.269	7	LOS A	9.6
NorthEast: Turnock Street (NE)	L1	0.165	3.6	LOS A	5.6	0.197	3.4	LOS A	7.1
	R2	0.165	9.5	LOS A	5.6	0.197	9.4	LOS A	7.1
	U	0.165	11.9	LOS A	5.6	0.197	11.7	LOS A	7.1
	Approach	0.165	4.8	LOS A	5.6	0.197	5.1	LOS A	7.1
NorthWest: Elrond Drive (NW)	L2	0.087	4.9	LOS A	2.5	0.057	5.1	LOS A	1.8
	R1	0.095	9.1	LOS A	2.9	0.058	9.3	LOS A	1.9
	U	0.095	12.5	LOS A	2.9	0.058	12.8	LOS A	1.9
	Approach	0.095	7.2	LOS A	2.9	0.058	7.4	LOS A	1.9
All Vehicles		0.219	6.5	LOS A	7.6	0.269	6.4	LOS A	9.6

Table 5.32: Turnock Street / Elrond Drive Intersection SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)

Approach	Year 2023 PM Peak - PVT					Year 2033 PM Peak - PVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Turnock Street (S)	L1	0.118	3.5	LOS A	3.5	0.142	3.6	LOS A	4.3
	R1	0.22	8.3	LOS A	7.4	0.263	8.4	LOS A	9.4
	U	0.22	11.8	LOS A	7.4	0.263	11.9	LOS A	9.4
	Approach	0.22	6.9	LOS A	7.4	0.263	7	LOS A	9.4
NorthEast: Turnock Street (NE)	L1	0.173	3.3	LOS A	6	0.206	3.4	LOS A	7.6
	R2	0.173	9.4	LOS A	6	0.206	9.4	LOS A	7.6
	U	0.173	11.7	LOS A	6	0.206	11.7	LOS A	7.6
	Approach	0.173	5	LOS A	6	0.206	5.1	LOS A	7.6
NorthWest: Elrond Drive (NW)	L2	0.045	4.8	LOS A	1.4	0.057	5.1	LOS A	1.8
	R1	0.047	9	LOS A	1.5	0.058	9.2	LOS A	1.9
	U	0.047	12.5	LOS A	1.5	0.058	12.7	LOS A	1.9
	Approach	0.047	7.1	LOS A	1.5	0.058	7.3	LOS A	1.9
All Vehicles		0.22	6.2	LOS A	7.4	0.263	6.3	LOS A	9.4

As demonstrated in Table 5.30-5.32, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a roundabout intersection in the Year 2023 and 2033 design traffic scenarios.

The results of the analysis for design traffic volumes under the sensitivity scenario are summarised in Tables 5.33-5.34. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 5.33: Turnock Street / Elrond Drive Intersection SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)

Approach	Year 2033 AM Sensitivity Peak - MVT					Year 2033 PM Sensitivity Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Turnock Street (S)	L1	0.112	3.4	LOS A	3.5	0.14	3.6	LOS A	4.3
	R1	0.217	8.2	LOS A	7.6	0.254	8.4	LOS A	9
	U	0.217	11.7	LOS A	7.6	0.254	11.9	LOS A	9
	Approach	0.217	7.2	LOS A	7.6	0.254	7	LOS A	9
NorthEast: Turnock Street (NE)	L1	0.166	3.6	LOS A	5.7	0.196	3.4	LOS A	7.1
	R2	0.166	9.5	LOS A	5.7	0.196	9.4	LOS A	7.1
	U	0.166	11.9	LOS A	5.7	0.196	11.7	LOS A	7.1
	Approach	0.166	4.8	LOS A	5.7	0.196	5.1	LOS A	7.1
NorthWest: Elrond Drive (NW)	L2	0.087	4.9	LOS A	2.5	0.056	5	LOS A	1.8
	R1	0.095	9.1	LOS A	2.9	0.057	9.2	LOS A	1.9
	U	0.095	12.5	LOS A	2.9	0.057	12.7	LOS A	1.9
	Approach	0.095	7.2	LOS A	2.9	0.057	7.3	LOS A	1.9
All Vehicles		0.217	6.5	LOS A	7.6	0.254	6.4	LOS A	9



**Table 5.34: Turnock Street / Elrond Drive Intersection SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)**

Approach	Year 2033 PM Sensitivity Peak - PVT				
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
South: Turnock Street (S)	L1	0.14	3.6	LOS A	4.3
	R1	0.252	8.4	LOS A	8.9
	U	0.252	11.9	LOS A	8.9
	Approach	0.252	7	LOS A	8.9
NorthEast: Turnock Street (NE)	L1	0.207	3.4	LOS A	7.5
	R2	0.207	9.4	LOS A	7.5
	U	0.207	11.7	LOS A	7.5
	Approach	0.207	5.1	LOS A	7.5
NorthWest: Elrond Drive (NW)	L2	0.056	5	LOS A	1.8
	R1	0.057	9.2	LOS A	1.8
	U	0.057	12.7	LOS A	1.8
	Approach	0.057	7.2	LOS A	1.8
All Vehicles		0.252	6.3	LOS A	8.9

As demonstrated in Tables 5.33-5.34, overall delay and level of service is within acceptable performance limits. The impacts of the sensitivity scenario in comparison to the design traffic scenario are shown to be negligible.

#### 5.4.8 Turnock Street / Pearl Street Roundabout

Analysis of the Turnock Street / Pearl Street intersection was undertaken using SIDRA Intersection 7 for the Year 2023 (year of opening) and Year 2033 (10-year design horizon) design traffic volumes. The existing geometric layout for the intersection was used consistent with the background traffic modelling.

The results of the analysis for design traffic volumes are summarised in Tables 5.35-5.37. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 5.35: Turnock Street / Pearl Street Intersection SIDRA Results Summary (Year 2023 MVT and EVT Design Traffic Volumes)

Approach	Year 2023 AM Peak - MVT					Year 2023 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Pearl Street (SE)	L2	0.529	4.9	LOS A	33.2	0.592	5.1	LOS A	39.2
	T1	0.529	4.5	LOS A	33.2	0.592	4.8	LOS A	39.2
	R2	0.529	7.4	LOS A	33.2	0.592	7.8	LOS A	39.2
	U	0.529	8.5	LOS A	33.2	0.592	8.9	LOS A	39.2
	Approach	0.529	5.5	LOS A	33.2	0.592	5.7	LOS A	39.2
NorthEast: Turnock Street (NE)	L2	0.174	6.4	LOS A	7.3	0.162	6	LOS A	6.6
	T1	0.174	6.1	LOS A	7.3	0.162	5.8	LOS A	6.6
	R2	0.174	9.1	LOS A	7.3	0.162	8.8	LOS A	6.6
	U	0.174	10.5	LOS A	7.3	0.162	10.2	LOS A	6.6
	Approach	0.174	6.5	LOS A	7.3	0.162	6.2	LOS A	6.6
NorthWest: Pearl Street (NW)	L2	0.375	8.1	LOS A	19.1	0.347	7.6	LOS A	17.3
	T1	0.375	8.1	LOS A	19.1	0.347	7.8	LOS A	17.3
	R2	0.375	11	LOS A	19.1	0.347	10.5	LOS A	17.3
	U	0.375	12.4	LOS A	19.1	0.347	12	LOS A	17.3
	Approach	0.375	9.1	LOS A	19.1	0.347	8.9	LOS A	17.3
SouthWest: Turnock Street (SW)	L2	0.497	10.2	LOS A	29.6	0.51	9.8	LOS A	27.9
	T1	0.497	10	LOS A	29.6	0.51	9.7	LOS A	27.9
	R2	0.497	13.1	LOS A	29.6	0.51	13	LOS A	27.9
	U	0.497	14.3	LOS A	29.6	0.51	14.1	LOS A	27.9
	Approach	0.497	11.1	LOS A	29.6	0.51	10.5	LOS A	27.9
All Vehicles		0.529	7.8	LOS A	33.2	0.592	7.6	LOS A	39.2

Table 5.36: Turnock Street / Pearl Street Intersection SIDRA Results Summary (Year 2033 MVT and EVT Design Traffic Volumes)

Approach	Year 2033 AM Peak - MVT					Year 2033 PM Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Pearl Street (SE)	L2	0.653	6.2	LOS A	50.5	0.733	8	LOS A	71.3
	T1	0.653	5.7	LOS A	50.5	0.733	7.6	LOS A	71.3
	R2	0.653	8.6	LOS A	50.5	0.733	10.6	LOS A	71.3
	U	0.653	9.8	LOS A	50.5	0.733	11.7	LOS A	71.3
	Approach	0.653	6.8	LOS A	50.5	0.733	8.5	LOS A	71.3
NorthEast: Turnock Street (NE)	L2	0.224	7.1	LOS A	9.9	0.207	6.5	LOS A	8.9
	T1	0.224	6.8	LOS A	9.9	0.207	6.4	LOS A	8.9
	R2	0.224	9.8	LOS A	9.9	0.207	9.4	LOS A	8.9
	U	0.224	11.2	LOS A	9.9	0.207	10.8	LOS A	8.9
	Approach	0.224	7.2	LOS A	9.9	0.207	6.7	LOS A	8.9
NorthWest: Pearl Street (NW)	L2	0.493	10.4	LOS A	29.5	0.453	9	LOS A	25.2
	T1	0.493	10.5	LOS A	29.5	0.453	9.2	LOS A	25.2
	R2	0.493	13.3	LOS A	29.5	0.453	11.9	LOS A	25.2
	U	0.493	14.7	LOS B	29.5	0.453	13.3	LOS A	25.2
	Approach	0.493	11.5	LOS A	29.5	0.453	10.3	LOS A	25.2
SouthWest: Turnock Street (SW)	L2	0.68	16.6	LOS B	55.6	0.695	16.3	LOS B	58.7
	T1	0.68	16.5	LOS B	55.6	0.695	16.2	LOS B	58.7
	R2	0.68	19.6	LOS B	55.6	0.695	19.6	LOS B	58.7
	U	0.68	20.8	LOS B	55.6	0.695	20.5	LOS B	58.7
	Approach	0.68	17.6	LOS B	55.6	0.695	17	LOS B	58.7
All Vehicles		0.68	10.6	LOS A	55.6	0.733	10.9	LOS A	71.3

Table 5.37: Turnock Street / Pearl Street Intersection SIDRA Results Summary (Year 2023 and 2033 PVT Design Traffic Volumes)

Approach	Year 2023 PM Peak - PVT					Year 2033 PM Peak - PVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Pearl Street (SE)	L2	0.602	5.2	LOS A	40.3	0.746	8.5	LOS A	75.7
	T1	0.602	4.9	LOS A	40.3	0.746	8.1	LOS A	75.7
	R2	0.602	7.9	LOS A	40.3	0.746	11.1	LOS A	75.7
	U	0.602	9	LOS A	40.3	0.746	12.2	LOS A	75.7
	Approach	0.602	5.8	LOS A	40.3	0.746	9	LOS A	75.7
NorthEast: Turnock Street (NE)	L2	0.163	6	LOS A	6.7	0.209	6.6	LOS A	9
	T1	0.163	5.8	LOS A	6.7	0.209	6.4	LOS A	9
	R2	0.163	8.8	LOS A	6.7	0.209	9.4	LOS A	9
	U	0.163	10.3	LOS A	6.7	0.209	10.9	LOS A	9
	Approach	0.163	6.2	LOS A	6.7	0.209	6.8	LOS A	9
NorthWest: Pearl Street (NW)	L2	0.355	7.7	LOS A	18.1	0.462	9.2	LOS A	26.2
	T1	0.355	7.8	LOS A	18.1	0.462	9.3	LOS A	26.2
	R2	0.355	10.6	LOS A	18.1	0.462	12.1	LOS A	26.2
	U	0.355	12	LOS A	18.1	0.462	13.5	LOS A	26.2
	Approach	0.355	9	LOS A	18.1	0.462	10.5	LOS A	26.2
SouthWest: Turnock Street (SW)	L2	0.515	9.9	LOS A	31.6	0.702	16.5	LOS B	60
	T1	0.515	9.8	LOS A	31.6	0.702	16.4	LOS B	60
	R2	0.515	13.1	LOS A	31.6	0.702	19.8	LOS B	60
	U	0.515	14.2	LOS A	31.6	0.702	20.8	LOS B	60
	Approach	0.515	10.6	LOS A	31.6	0.702	17.2	LOS B	60
All Vehicles		0.602	7.7	LOS A	40.3	0.746	11.2	LOS A	75.7

As demonstrated in Table 5.35-5.37, the intersection is shown to operate within acceptable performance limits in terms of degree of saturation, average delay and 95<sup>th</sup> percentile queue for a roundabout intersection in the Year 2023 and 2033 design traffic scenarios.

The results of the analysis for design traffic volumes under the sensitivity scenario are summarised in Tables 5.38-5.39. A copy of the SIDRA movement summaries is provided in Appendix C.

Table 5.38: Turnock Street / Pearl Street Intersection SIDRA Results Summary – (Year 2033 MVT and EVT Sensitivity Test Design Traffic Volumes)

Approach	Year 2033 AM Sensitivity Peak - MVT					Year 2033 PM Sensitivity Peak - EVT			
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Pearl Street (SE)	L2	0.654	6.3	LOS A	51	0.733	8	LOS A	71.4
	T1	0.654	5.8	LOS A	51	0.733	7.6	LOS A	71.4
	R2	0.654	8.7	LOS A	51	0.733	10.6	LOS A	71.4
	U	0.654	9.8	LOS A	51	0.733	11.7	LOS A	71.4
	Approach	0.654	6.8	LOS A	51	0.733	8.5	LOS A	71.4
NorthEast: Turnock Street (NE)	L2	0.224	7	LOS A	9.9	0.205	6.4	LOS A	8.8
	T1	0.224	6.8	LOS A	9.9	0.205	6.3	LOS A	8.8
	R2	0.224	9.8	LOS A	9.9	0.205	9.3	LOS A	8.8
	U	0.224	11.2	LOS A	9.9	0.205	10.7	LOS A	8.8
	Approach	0.224	7.2	LOS A	9.9	0.205	6.7	LOS A	8.8
NorthWest: Pearl Street (NW)	L2	0.493	10.4	LOS A	29.5	0.446	8.7	LOS A	24.4
	T1	0.493	10.4	LOS A	29.5	0.446	8.9	LOS A	24.4
	R2	0.493	13.2	LOS A	29.5	0.446	11.6	LOS A	24.4
	U	0.493	14.7	LOS B	29.5	0.446	13	LOS A	24.4
	Approach	0.493	11.4	LOS A	29.5	0.446	10	LOS A	24.4
SouthWest: Turnock Street (SW)	L2	0.673	16.4	LOS B	54.4	0.658	14.9	LOS B	51.8
	T1	0.673	16.2	LOS B	54.4	0.658	14.8	LOS B	51.8
	R2	0.673	19.4	LOS B	54.4	0.658	18.2	LOS B	51.8
	U	0.673	20.5	LOS B	54.4	0.658	19.2	LOS B	51.8
	Approach	0.673	17.3	LOS B	54.4	0.658	15.6	LOS B	51.8
All Vehicles		0.673	10.5	LOS A	54.4	0.733	10.4	LOS A	71.4

Table 5.39: Turnock Street / Pearl Street Intersection SIDRA Results Summary – (Year 2033 PVT Sensitivity Test Design Traffic Volumes)

Approach	Year 2033 PM Sensitivity Peak -PVT				
	OD Movement	DOS	Ave Delay (s)	LOS	95%ile Queue (m)
SouthEast: Pearl Street (SE)	L2	0.748	8.6	LOS A	76.3
	T1	0.748	8.2	LOS A	76.3
	R2	0.748	11.2	LOS A	76.3
	U	0.748	12.2	LOS A	76.3
	Approach	0.748	9.1	LOS A	76.3
NorthEast: Turnock Street (NE)	L2	0.208	6.5	LOS A	9
	T1	0.208	6.4	LOS A	9
	R2	0.208	9.4	LOS A	9
	U	0.208	10.8	LOS A	9
	Approach	0.208	6.8	LOS A	9
NorthWest: Pearl Street (NW)	L2	0.459	9	LOS A	25.8
	T1	0.459	9.2	LOS A	25.8
	R2	0.459	11.9	LOS A	25.8
	U	0.459	13.3	LOS A	25.8
	Approach	0.459	10.4	LOS A	25.8
SouthWest: Turnock Street (SW)	L2	0.677	15.6	LOS B	55.1
	T1	0.677	15.5	LOS B	55.1
	R2	0.677	18.9	LOS B	55.1
	U	0.677	19.8	LOS B	55.1
	Approach	0.677	16.2	LOS B	55.1
All Vehicles		0.748	10.9	LOS A	55.1

As demonstrated in Tables 5.38-5.39, overall delay and level of service is within acceptable performance limits. The impacts of the sensitivity scenario in comparison to the design traffic scenario are shown to be negligible.

## 5.5 IMPACT ON TRAFFIC SAFETY

While higher traffic volumes inherently increases crash risk, the Project manages the impact to traffic safety by:

- providing formalised access with suitable capacity to ensure safe and efficient operations and designed to meet the relevant standards;
- improving pedestrian safety by providing a signalised crossing across Cudgen Road; and
- reducing existing deficiencies on the immediate road network (e.g. removal of the existing deficient eastbound bus stop which conflicts with the adjacent pedestrian refuge).

## 5.6 PUBLIC AND ACTIVE TRANSPORT

### 5.6.1 Public Transport Demand

The Project will generate additional demand for public transport facilities in the area and it is understood that catering for public transport demands was an issue raised during public consultation for the Project Site selection as well as subsequent community consultation as part of the project development. During site observations deficiencies were observed with the existing infrastructure. The existing eastbound stop conflicts with a pedestrian refuge crossing and the westbound stop is located in the left turn lane for the TAFE access. For further details refer Section 3.11.

Details of recommended infrastructure upgrades for bus stop facilities are provided in Section 5.8.4.

A number of service improvements have been announced for the Tweed Shire including over 300 additional weekly bus services. This includes doubling the service frequency between Kingscliff and Tweed Heads West, via Tweed Mall (which is located in close proximity to the existing The Tweed Hospital), on route 601 on weekdays. The current service operates on an hourly frequency. With the proposed service changes this will result in a 30-minute service frequency on weekdays. This results in a high frequency public transport shuttle-like service between the Tweed Valley Hospital and the area surrounding the existing The Tweed Hospital. Further details on public transport infrastructure improvements and service improvements are detailed in Section 5.8.4.

With the inclusion of the proposed bus stop infrastructure and future route modifications, the public transport network and infrastructure will suitably service the Tweed Valley Hospital.

Access for community and aged care transport vehicles (B99 vehicles, mini-busses up to 7m) has been catered for within the site geometry. Specifically, the site caters for drop-off and pick-up with these vehicles across all three drop-off areas. The Transit Lounge also provides a dedicated pick-up / drop-off area for patient transport vehicles (mini-busses up to 7m and ambulances).

Tweed Byron and Ballina Community Transport is an existing community transport provider that provides a range of transport services to people who live in the Tweed, Byron, and Ballina shires on the far north coast of NSW. Tweed Byron and Ballina Community Transport is a not-for-profit, public institution, governed by a community management committee and funded to assist older people, people with a disability, their carers and others who have difficulty accessing public transport, or are disadvantaged by the lack of transport options in their area. They are a registered provider with the NDIS and also offer a brokerage service, whereby they assist other organisations to provide transport for their clients. Tweed Byron and Ballina Community Transport provide transport to medical appointments locally and where necessary within the region and north to South East Queensland. They take transport bookings for a variety of health appointments, for example to a local GP or allied health service (such as community health, podiatrist or optometrist) or for a specialist appointment or hospital stay. It is understood that these services will continue and will cater for trips to and from the new Tweed Valley Hospital.



Strategies for relocating existing community and aged car transport from the existing hospital to the new hospital as well as provision of new services will be investigated as part of subsequent operational planning.

Further information on community transport strategies is provided in the Social and Economic Assessment.

Further details on public transport facilities and targets are provided in the draft Green Travel Plan which is attached as Appendix F.

### 5.6.2 Active Transport

The Project Site is well serviced by the existing active (i.e. walking and cycling) transport network, including pathways along the Project Site frontage, connections to residential areas to the west and residential, commercial, community and education areas to the east. Active transport access will be further improved with a new signalised crossing on Cudgen Road (i.e. site's main access intersection) and pathway connection on the southern side of the Cudgen Road between the existing pathway, new bus stop and signalised crossing. A network of pathways are proposed throughout the site to connect the Hospital entries, car parking, pick-up drop-off areas, bus stops and the external pathways.

The internal ring road also includes an allocation for on-road cycle through the site. This provides an alternate route for cyclists travelling both eastbound or westbound on Cudgen Road and allows cyclists to bypass the Access A and B of the hospital as well as the Kingscliff TAFE access intersection. The ring road will also carry lower traffic volumes than the parallel section of Cudgen Road.

A pedestrian access plan has been prepared by Turf and is included as Appendix G for reference. The pedestrian access plan shows pedestrian routes through and around the Hospital, including to the proposed new bus stops and to the existing pathway network (which connects to Kingscliff and the surrounding area).

### 5.6.3 Green Travel Plan

A draft Green Travel Plan has been prepared for the Tweed Valley Hospital. The Green Travel Plan includes:

- a review of existing infrastructure conditions and mode share;
- objectives and targets for alternate transport utilisation;
- actions required to achieve the objectives; and
- a monitoring and review process

The draft Green Travel Plan should be finalised prior to commencement of opening and reviewed annually. The draft Green Travel Plan is attached as Appendix F.

In addition to the Green Travel plan a draft Transport Access Guide (TAG) has been prepared. This detail:

- bus stop locations;
- bus routes and service times;
- community transport services;
- pedestrian and cycle routes;
- bicycle parking and end of trip facility locations; and
- PWD parking locations.

The TAG should be a publicly facing document available via the Tweed Valley Hospital website and provided in physical form at various locations in the area (e.g. GP clinics, aged care centres, community centres etc.). The draft Transport Access Guide is provided as Appendix H.

## 5.7 AGRICULTURAL VEHICLES

Agricultural vehicle movements on Cudgen Road are infrequent as confirmed during a number of site visits and drive-throughs on the surrounding road network. The demand for agricultural vehicles is driven by agricultural activity. The Project site has been recently rezoned from RU1 Primary Production to SP2

Infrastructure and will no longer be used as farmland. This results in a reduction of agricultural activity on Cudgen Road to the east of Tweed Coast Road. Areas to the north, east and south are predominantly residential or special use land zonings (i.e. no agricultural activity).

Agricultural vehicles are subject to the permits and requirements of the National Heavy Vehicle Regulator. The National Heavy Vehicle Regulator dictates mitigation measures that must be implemented by agricultural vehicles including signage and warning lights that must be displayed.

Implementation of further mitigation measures are not warranted.

## 5.8 RECOMMENDED WORKS

### 5.8.1 Improvements to Site Access and Circulation

The Project Site is a greenfield site. All accesses and internal circulation roads will be provided as new infrastructure. As such, no "improvements" to existing access and circulation infrastructure are proposed.

### 5.8.2 Intersection Improvements

Upgrades have been identified for the Tweed Coast Road / Cudgen Road intersection to increase capacity and improve efficiency and operations. The proposed upgrade works are as follows:

- addition of a 100m southbound left-turn lane on Tweed Coast Road;
- phase sequence change to allow the southbound left-turn to overlap with the westbound right-turn (i.e. possible with the provision of a dedicated southbound left-turn lane);
- lane discipline change for the two approach lanes on the south-eastern approach:
  - Change of the left through lane to a through and right lane;
  - Change of the right through and right lane to a right only lane;
- extension of the northbound departure lane from approximately 85m to approximately 200m; and
- conversion of the north-western leg departure to a single lane (no physical changes. i.e. through provision of chevron line marking). With the lane discipline changes on the south-eastern approach, there is only one lane travelling through to the north-western departure lane; and
- extension of the northbound right-turn on Tweed Coast Road (i.e. on the southern leg) by approximately 50m (increasing the total length from approximately 95m to approximately 145m).

Further upgrades are expected to be undertaken as part of the four-lane upgrade of Tweed Coast Road. The specific capacity requirements and ultimate design of the intersection is expected to be refined as part of future planning and detailed design of the corridor upgrade.

It is understood that Tweed Shire Council has no planning for "interim" works at the intersection (i.e. prior to the four-lane upgrade of Tweed Coast Road). In this regard, upgrades proposed are commensurate with planning for the ultimate design scenario (i.e. with the four-lane upgrade).

Concept design plans for the upgrade works are included in Appendix E. The works will need to be undertaken under a Works Authorisation Deed (WAD) and will require a Section 138 application. Detailed design of the upgrade works will be prepared and provided as part of this process. The intersection upgrade works should be complete at the time the Hospital opens.

A number of changes are proposed to the Cudgen Road / Turnock Street roundabout as part of the construction of the new access. These works are detailed in Section 5.4.6. The works will be undertaken as part of Stage 1 and are not proposed as part of Stage 2.

### 5.8.3 Pedestrian Facility Improvements

New signalised pedestrian crossing facilities will be provided as part of the signalised access intersection for the Tweed Valley Hospital. The signalised crossing across Cudgen Road will improve pedestrian safety and amenity for existing pedestrians and new pedestrians generated by the Project. A new pedestrian connection will be provided on the southern side of Cudgen Road near the existing TAFE access,

connecting the existing footpath with the new westbound bus stop and the new signalised access intersection.

#### 5.8.4 Public Transport Facility Improvements

To cater for the public transport demand generated by the Project, provide direct public transport access for the Project and to resolve deficiencies with the existing bus stop infrastructure, two new bus stops will be provided on Cudgen Road, to the east of the primary signalised access intersection. The bus stops will be indented, minimising impact to through traffic and will include shelters and seating. The existing bus stops will be removed once the new facilities are provided. The proposed bus stops are shown on the SSD Stage 2 Plan Set is attached as Appendix B of the EIS.

TfNSW in coordination with Surfside are in the process of a service planning review. A number of service improvements have been announced for the Tweed Shire including over 300 additional weekly bus services, with extended hours and a focus on delivering better connections to local TAFEs, hospitals and better cross-border connections. Specific improvements include:

- direct links between Murwillumbah and Kingscliff TAFEs and the new hospital from new bus routes. This will be via a new direct route (609) to link Murwillumbah and Kingscliff – 5 trips weekday only
- double frequency between Kingscliff and Tweed Heads West, via Tweed Mall, on route 601 on weekdays
- a new route 600 will be introduced to link Banora Point to Tweed Mall and the Qld border; and
- additional late afternoon and evening services on routes 600 and 601 on weekdays and Saturdays.

In addition, it is noted that TfNSW are currently trialling On-Demand services across Greater Sydney including the Central Coast and Illawarra regions. Tweed Valley Hospital's inclusion within any updates to the service planning and the inclusion of On-Demand services will continue to occur over the coming years in consultation with TfNSW, Surfside and other transport operators.

Potential future modification / extension of Route 601 has also been identified. The route currently terminates within Kingscliff TAFE. Potential changes to the route may include:

- extension of the route to terminate within the Project Site (i.e. using the site's primary signalised access and turning around at the site's internal roundabout);
- continuation of the service west along Cudgen Road and north on Tweed Coast Road; or
- once provided, utilising the future planned east-west links between Tweed Coast Road and Kingscliff.

The main access intersection and internal roundabout fronting the building entry has been refined to cater for a bus to turn around in the site, so as not to preclude this operation in the future.

The Project site and proposed public transport infrastructure is well located to align with future bus routes and services changes as part of growth in the local area and consistent with the Kingscliff Locality Plan.

Further route planning and service reviews will be undertaken parallel to construction and in the lead-up to opening of the Hospital.

#### 5.8.5 Provision of LATM Measures

Following a review of the speed environment (refer Section 3.6) and traffic safety (Section 3.8) as well as the Project, Local Area Traffic Management (LATM) measures are not considered warranted for the surrounding road network.

#### 5.8.6 Funding of Proposed Improvement Measures

All transport "enabling works" will be funded by Health Infrastructure as part of the Project. Enabling works include:

- the four site access intersections on Cudgen Road;
- intersection upgrade works at Tweed Coast Road / Cudgen Road intersection; and
- provision of the new bus stops and associated infrastructure.

It is understood that Health Infrastructure will work with Tweed Shire Council and RMS on the delivery external traffic infrastructure commensurate with future planning for the surrounding road network.

#### **5.8.7 Way Finding Signage**

A Way Finding Signage Plan has been developed for external and access signage. The Way Finding Signage Plan has been prepared to:

- direct visitors to the Hospital from the broader road network (Pacific Highway, Tweed Coast Road, Cudgen Road, Turnock Street, Peal Street Marine Parade); and
- clearly identify the access points and access purpose (e.g. staff, service vehicles, emergency vehicle access, main access).

The Way Finding Signage Plan has been developed in consultation with RMS (refer Section 5.2). The plan includes a summary of the process and signage used in developing the plan. The Way Finding Signage Plan is included as Appendix I.

#### **5.8.8 Noise Attenuation Measures**

Appropriate noise attenuation measures for traffic and servicing should be provided and required as part of the Project approvals. It is understood that noise attenuation requirements are being assessed by the acoustic consultant Acoustic Studio.

## 6. CONSTRUCTION TRAFFIC MANAGEMENT PLAN - PRELIMINARY CONSIDERATIONS

### 6.1 OVERVIEW

Assessment of construction parking and traffic should be considered with the context and current stage of the proposal (i.e. the EIS is seeking approval for Stage 2 only as part of this application). Detailed construction methodologies and documentation are prepared by the construction contractor (Lendlease). For further details refer to construction documentation provided by Lendlease. Key considerations are detailed as follows:

- construction does not typically require a Transport Impact Assessment, as the nature of construction is temporary;
- in order to commence construction, the construction contractor is required to have in place all relevant approvals and applications with Tweed Shire Council (e.g. Construction Certificate, Section 138 approval, approval for Temporary or Partial Road Closure Including Road Related Areas etc.); and
- if oversize and/or over mass vehicles and loads are required, approval is required from RMS.

### 6.2 CONSTRUCTION TRAFFIC MANAGEMENT PLAN

All construction traffic and any impacts to the external road network due to works on Cudgen Road, Turnock Street or in providing construction access to the Project Site will be managed under a Construction Traffic Management Plan (CTMP) and traffic control plan (TCP).

The construction contractor will be required to develop and seek approval for the implementation of the CTMP prior to commencement of construction to ensure safe and efficient management of traffic.

Key construction traffic management considerations are summarised within Section 6 of this report.

### 6.3 CONSTRUCTION PARKING

The Project Site is expected to have sufficient area to cater for construction parking on-site in the form of temporary hardstand parking. Access to these parking areas will be provided via a temporary site access or accesses which will be constructed as part of Stage 1.

### 6.4 CONSTRUCTION TRAFFIC VOLUMES

Traffic generated as a result of construction works for Stage 2 are expected to include:

- Heavy vehicle movements for the delivery and removal of construction equipment and machinery, spoil and waste management;
- Small and medium sized vehicles for material delivery; and
- Light vehicles for movement of construction personnel, including contractors, labour force and supervisor / management staff.

Construction traffic volumes for heavy vehicles for Stage 2 have been provided by Lendlease. These are summarised in Figure 6.1



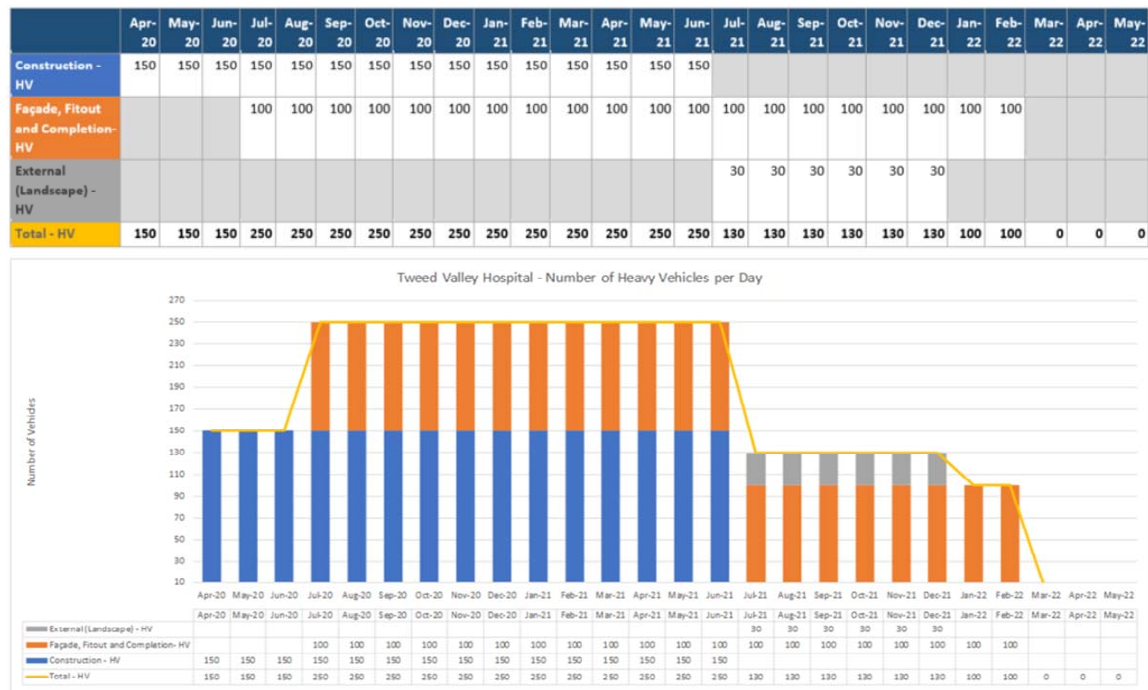


Figure 6.1: Construction Traffic Volumes

Construction traffic is expected to be spread throughout a typical day. Over a 12-hour period, this equates to approximately 20 heavy vehicle movements per hour.

## 6.5 INTERSECTION OPERATIONS

Construction works for Stage 2 is estimated to generate additional traffic movements (in the order of 250 heavy vehicle movements). This may result in some additional delays at key intersections on the haulage route and key travel routes. It is recommended that heavy vehicle movements take place outside the commuter and school peak periods. It is likely that much of the labour force will arrive prior to the typical AM peak period.

Where required, vehicle movements (e.g. along the Project Site frontage and at site access locations) will be managed under the afore mentioned CTPMP.

## 6.6 ALTERNATE TRANSPORT ACCESS

Public and active transport (walking and cycling) trips generated by construction activities are expected to be low. Regardless, the Project Site is well serviced by alternate transport including eastbound and westbound bus stops on Cudgen Road and shared path facilities on Cudgen Road and Turnock Street on the Project Site frontage (refer Section 3.11.2 and 3.12.1). The existing infrastructure will adequately cater for any additional demand generated by construction activities.

## 6.7 PUBLIC TRANSPORT IMPACTS

There is expected to be minimal impacts to public transport during construction works associated with Stage 2. It is expected that during construction of the new bus stops, the existing bus stops can be retained and used as required until the new bus stops are finalised and operational.

Some minor travel time delays may occur to bus services as a result of additional construction vehicles and particularly heavy vehicles on the surrounding road network.

## 6.8 ACTIVE TRANSPORT IMPACTS

There is expected to be minimal impacts to pedestrians and cyclists in the area during construction due to the observed low pedestrian and cyclist movements. Any impacts to pedestrian pathways or cycle routes will be managed under the CTMP. During construction of the site accesses the existing pathway on the

northern side of Cudgen Road will be impacted and, in some sections, will require removal and re-instatement of the path. The CTMP will detail interim pedestrian routes.

## **6.9 HAULAGE ROUTES**

Haulage routes have not been confirmed at this stage, however the main access / haulage routes are expected to be via Cudgen Road, Tweed Coast Road and the Pacific Highway. Given expected construction volumes, impacts are expected to be minimal.

Haulage of material should be managed through the scheduling of deliveries and availability of fleet to minimise the number of haulage and delivery vehicles during peak periods.

## **6.10 CONSTRUCTION TRAFFIC SAFETY CONSIDERATIONS**

Safety of the surrounding road network will be managed under a CTMP and TCP. Safety mitigation measures are likely to include:

- Implementation of roadwork zones;
- Temporary speed reductions;
- Temporary signage;
- Temporary delineation (cones, bollards etc.); and
- Temporary barriers.

## 7. SUMMARY AND CONCLUSIONS

The key findings from the traffic impact assessment for the proposed Tweed Valley Hospital located at 771 Cudgen Road, Cudgen NSW are as follows:

- the Stage 2 SSD component seeks consent for the Main Works and Operation of the Tweed Valley Hospital
- access to the Project Site is proposed via four new accesses including a primary all-movements signalised access on Cudgen Road, a secondary all-movements access by way of an additional leg to the Cudgen Road / Tweed Coast Road roundabout and two left-in only access on Cudgen Road;
- the Project provides in the order of 1,538 car parking spaces, with the potential to cater for additional parking on-site (i.e. overflow parking) if required. At the year of opening a minimum of 1,201 car parking spaces will be provided, catering for the Year 2023/2024 demand;
- the Project provides 52 staff bicycle parking spaces and 20 visitor bicycle parking spaces;
- the Project requires servicing from a range of service vehicles (ranging from an SRV to a 19m AV) and refuse collection vehicles;
- the Project's car parks and internal circulation roads have been designed in accordance with the relevant Australian Standards (AS2890.1, AS2890.2 and AS2890.6);
- the Tweed Valley Hospital is estimated to generate a maximum of between 694-742 peak hour trips and in the order of 5,232-5,894 trips per day;
- the proposed accesses have been designed to cater for design traffic volumes (including ensuring access intersections operate within acceptable performance limits);
- the Tweed Valley Hospital is not expected to generate any internal queues that will impact the external road network;
- the external road network and intersections are expected to cater for the future background and design traffic scenarios, with the exception of the Tweed Coast Road / Cudgen Road intersection. A range of capacity and performance upgrades have been identified to cater for design traffic volumes including the addition of a turning lane, extension of stand-up lanes, lane discipline and phase changes. The proposed adequately mitigate against the Project's impacts and also improves operations for the forecast background traffic scenario (irrespective of the Project) relative to the current intersection design and operations. Further upgrades are required in Year 2033 including the four-lane upgrade of Tweed Coast Road, which is expected to be completed by 2033;
- the Project proposes two new indented bus bays on Cudgen Road and associated infrastructure, replacing the existing bus stops.;
- transport enabling works including the four access intersections will be funded by Health Infrastructure;
- it is understood that Health Infrastructure will work with Tweed Shire Council and RMS on the delivery external traffic infrastructure commensurate with future planning for the surrounding road network;
- Construction parking will be catered for on the Project Site by way of temporary hardstand parking facilities;
- all construction traffic and any impacts to the external road network due to works on Cudgen Road or Turnock Street will be managed under a CTMP; and
- the existing public and active transport infrastructure will adequately cater for any additional demand generated by construction activities (trips of this nature are expected to be low).

## APPENDIX A

### TRAFFIC SURVEYS

*SURVEY INFORMATION*

Site ID: 1

Location: Pacific Mwy & Tweed Coast Rd Interchange, Chinderah

Date: 31 / May / 2018

Time Period 1: 07:00 to 10:00

Time Period 2: 14:00 to 18:00

**Primary Classes:**

- 1 Light Vehicles ▼
- 2 Light Trucks (3-5) ▼
- 3 Heavy Trucks (6-12) ▼
- 4 Bicycles on Road ▼
- 5 None ▼

**Secondary Classes:**

- 1 Pedestrians ▼
- 2 None ▼

Weather Conditions 1: Fine ▼ Weather Conditions 2: Fine ▼

Intersection Legs:

North	<input checked="" type="checkbox"/> Ch	Chinderah Rd SB
East	<input checked="" type="checkbox"/> Ch	Pacific Mwy on/off-ramp WB
South	<input checked="" type="checkbox"/> Ch	Tweed Coast Rd NB
West	<input checked="" type="checkbox"/> Ch	Pacific Mwy on/off-ramp EB

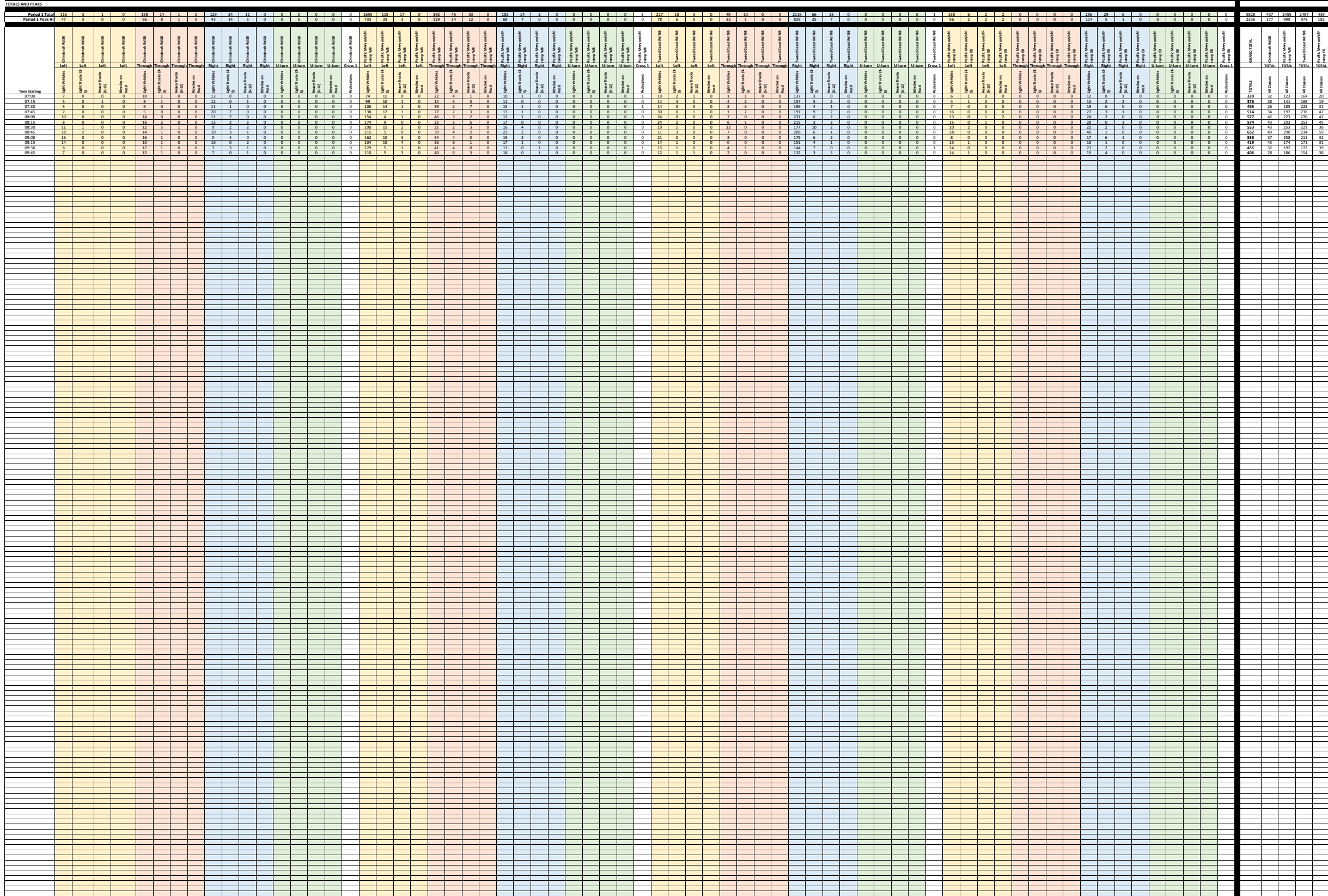
Output time interval: 15 mins ▼



*MAP*







[illegible]

## Turning Movement Count Summary

Site ID: 1

Location: Pacific Mwy & Tweed Coast Rd Interchange, Chinderah

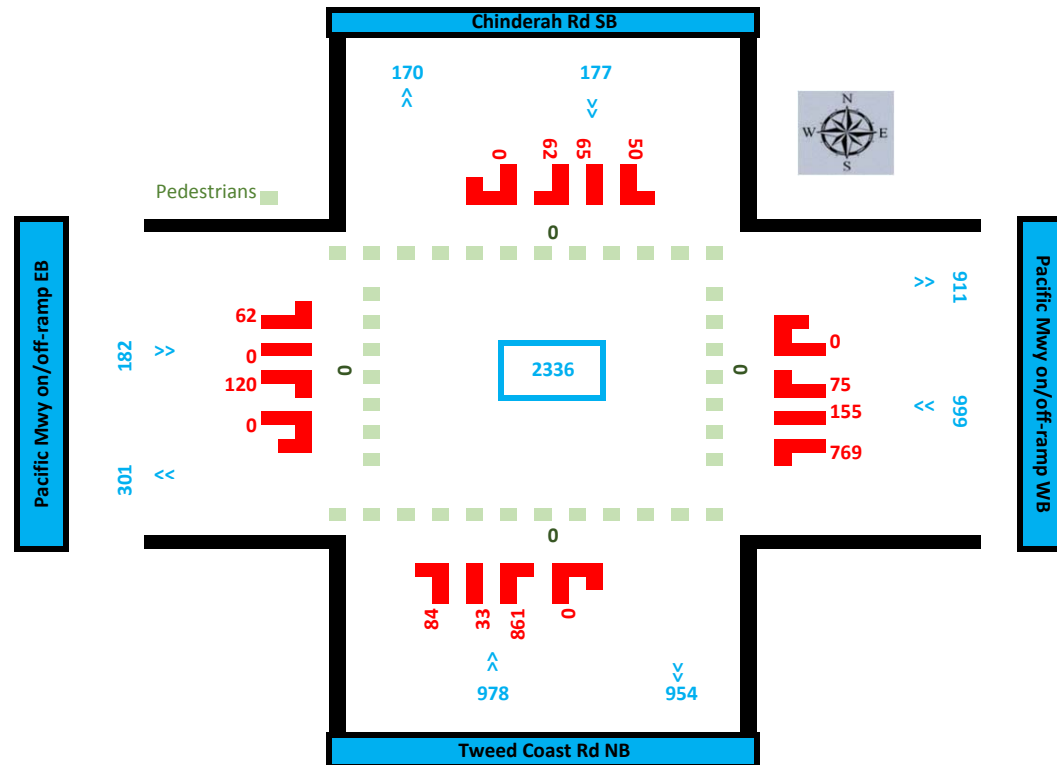
Date: 31-May-2018

Surveyed Time: 7:00 AM to 10:00 AM

Weather: Fine

Data for hour starting: 8:00 AM to 9:00 AM

Vehicle Class: ALL VEHICLES



## Turning Movement Count Summary

Site ID: 1

Location: Pacific Mwy & Tweed Coast Rd Interchange, Chinderah

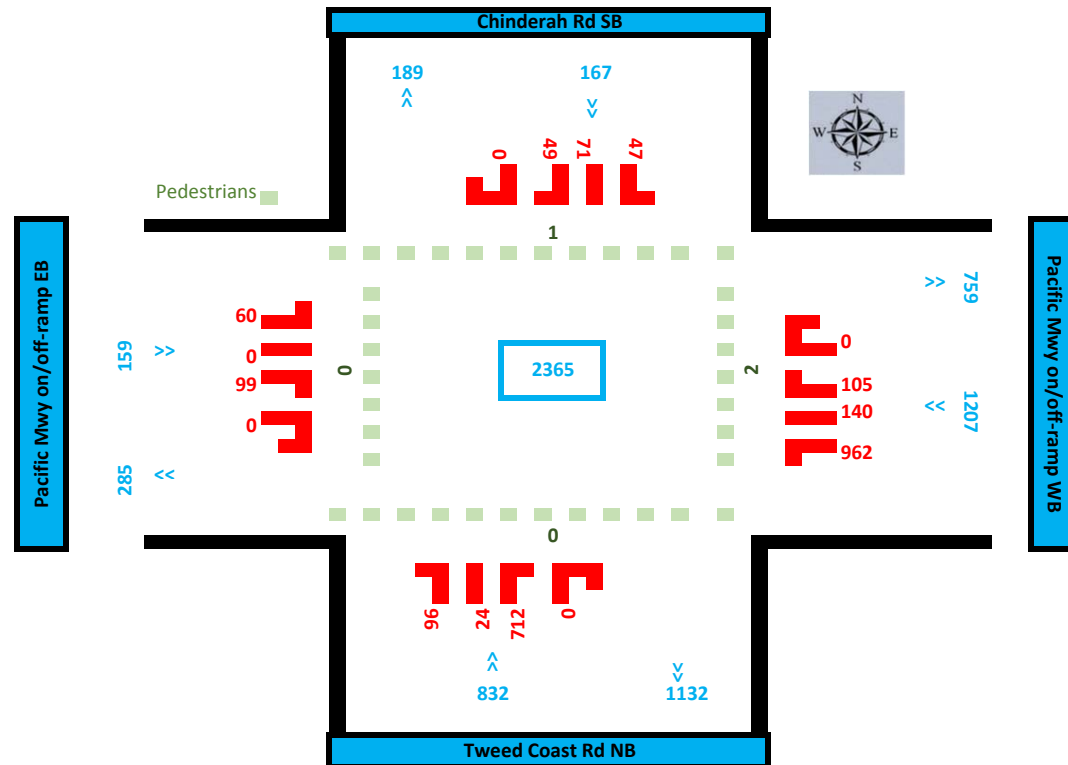
Date: 31-May-2018

Surveyed Time: 2:00 PM to 6:00 PM

Weather: Fine

Data for hour starting: 3:15 PM to 4:15 PM

Vehicle Class: ALL VEHICLES



*SURVEY INFORMATION*

*MAP*



**Site ID:** 2

**Location:** Tweed Coast Rd & Morton St, Chinderah

**Date:** 31 / May / 2018

**Time Period 1:** 07:00 to 10:00

**Time Period 2:** 14:00 to 18:00

**Primary Classes:**

- 1 Light Vehicles ▼
- 2 Light Trucks (3-5) ▼
- 3 Heavy Trucks (6-12) ▼
- 4 Bicycles on Road ▼
- 5 None ▼

**Secondary Classes:**

- 1 Pedestrians ▼
- 2 None ▼

**Weather Conditions 1:** Fine ▼ **Weather Conditions 2:** Fine ▼

**Intersection Legs:**

North	<input checked="" type="checkbox"/> Ch	Tweed Coast Rd SB
East	<input checked="" type="checkbox"/> Ch	Morton St WB
South	<input checked="" type="checkbox"/> Ch	Tweed Coast Rd NB
West	<input type="checkbox"/> Ch	

**Output time interval:** 15 mins ▼









## Turning Movement Count Summary

Site ID: 2

Location: Tweed Coast Rd & Morton St, Chinderah

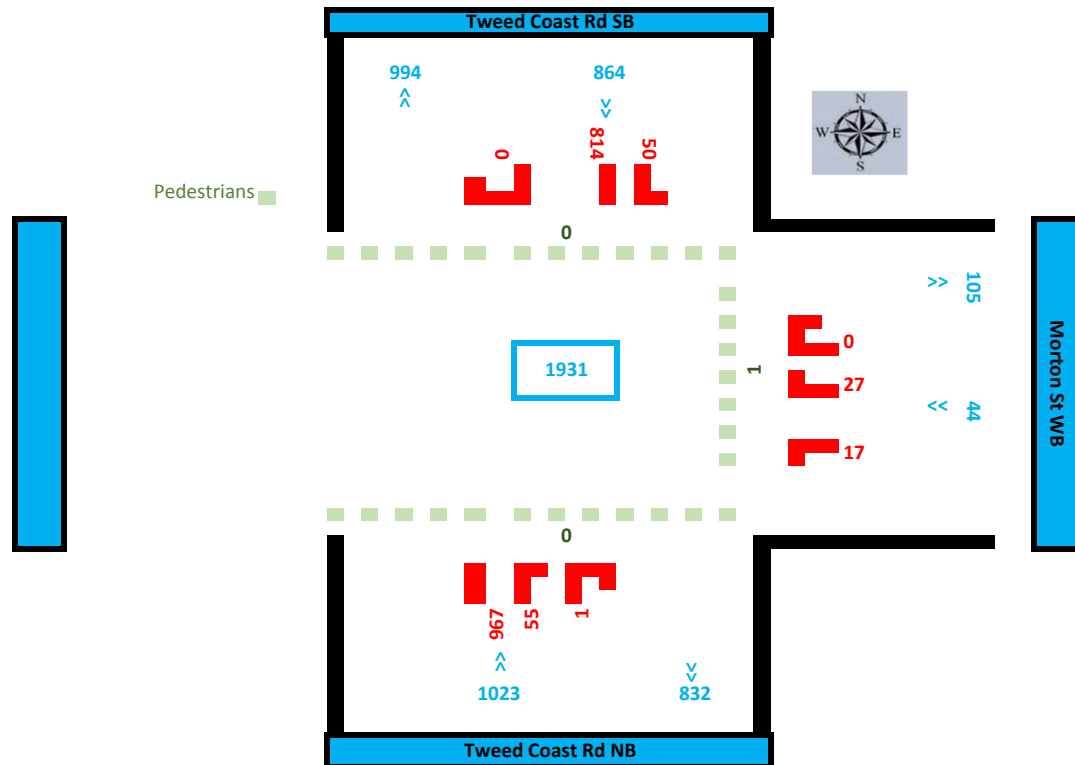
Date: 31-May-2018

Surveyed Time: 7:00 AM to 10:00 AM

Weather: Fine

Data for hour starting: 8:00 AM to 9:00 AM

Vehicle Class: ALL VEHICLES



## Turning Movement Count Summary

Site ID: 2

Location: Tweed Coast Rd & Morton St, Chinderah

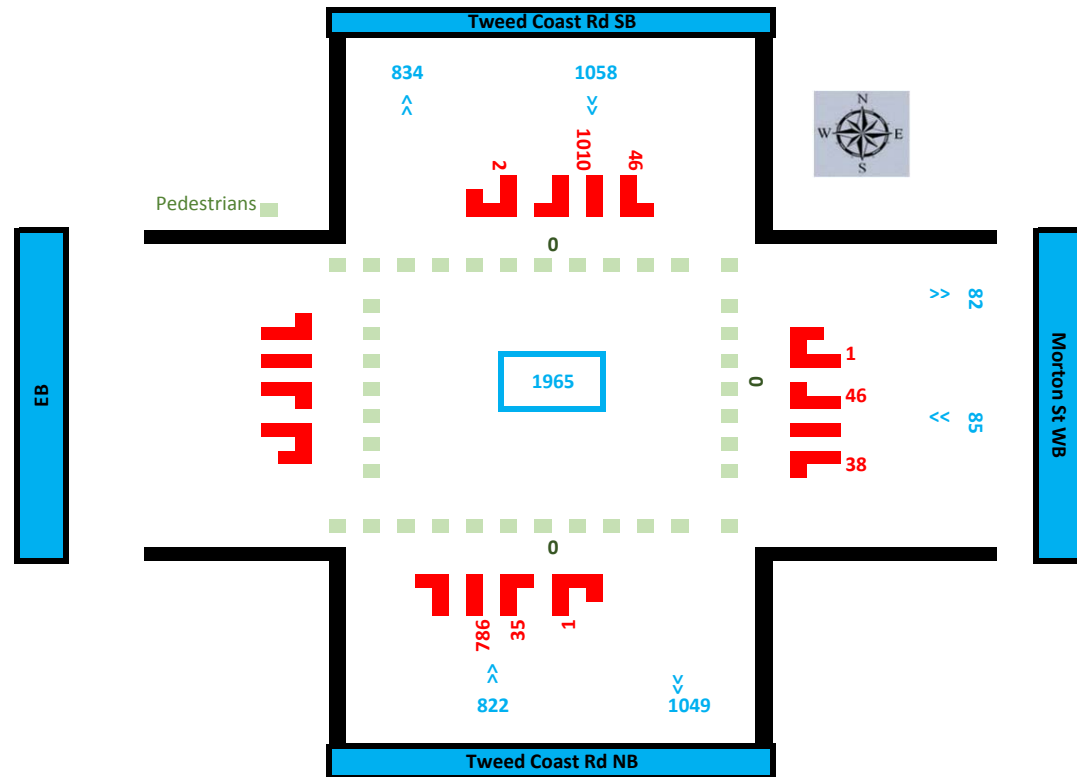
Date: 31-May-2018

Surveyed Time: 2:00 PM to 6:00 PM

Weather: Fine

Data for hour starting: 3:15 PM to 4:15 PM

Vehicle Class: ALL VEHICLES



SURVEY INFORMATION

Site ID: 3

Location: Tweed Coast Rd & Cudgen St, Cudgen

Date: 31 / May / 2018

Time Period 1: 07:00 to 10:00

Time Period 2: 14:00 to 18:00

**Primary Classes:**

- 1 Light Vehicles ▼
- 2 Light Trucks (3-5) ▼
- 3 Heavy Trucks (6-12) ▼
- 4 Bicycles on Road ▼
- 5 None ▼

**Secondary Classes:**

- 1 Pedestrians ▼
- 2 None ▼

Weather Conditions 1: Fine ▼ Weather Conditions 2: Fine ▼

**Intersection Legs:**

North	<input checked="" type="checkbox"/> Ch	Tweed Coast Rd SB
East	<input checked="" type="checkbox"/> Ch	Cudgen Rd WB
South	<input checked="" type="checkbox"/> Ch	Tweed Coast Rd NB
West	<input checked="" type="checkbox"/> Ch	Cudgen Rd EB

Output time interval: 15 mins ▼



MAP





[illegible]



## Turning Movement Count Summary

Site ID: 3

Location: Tweed Coast Rd & Cudgen St, Cudgen

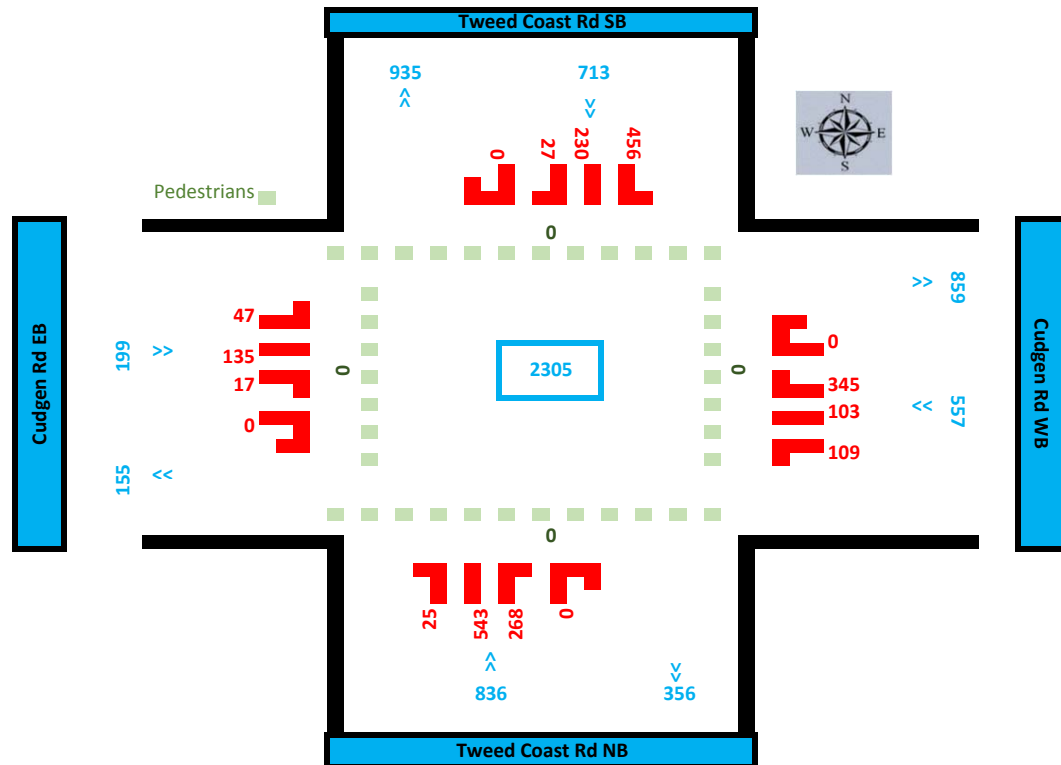
Date: 31-May-2018

Surveyed Time: 7:00 AM to 10:00 AM

Weather: Fine

Data for hour starting: 8:00 AM to 9:00 AM

Vehicle Class: ALL VEHICLES



## Turning Movement Count Summary

Site ID: 3

Location: Tweed Coast Rd & Cudgen St, Cudgen

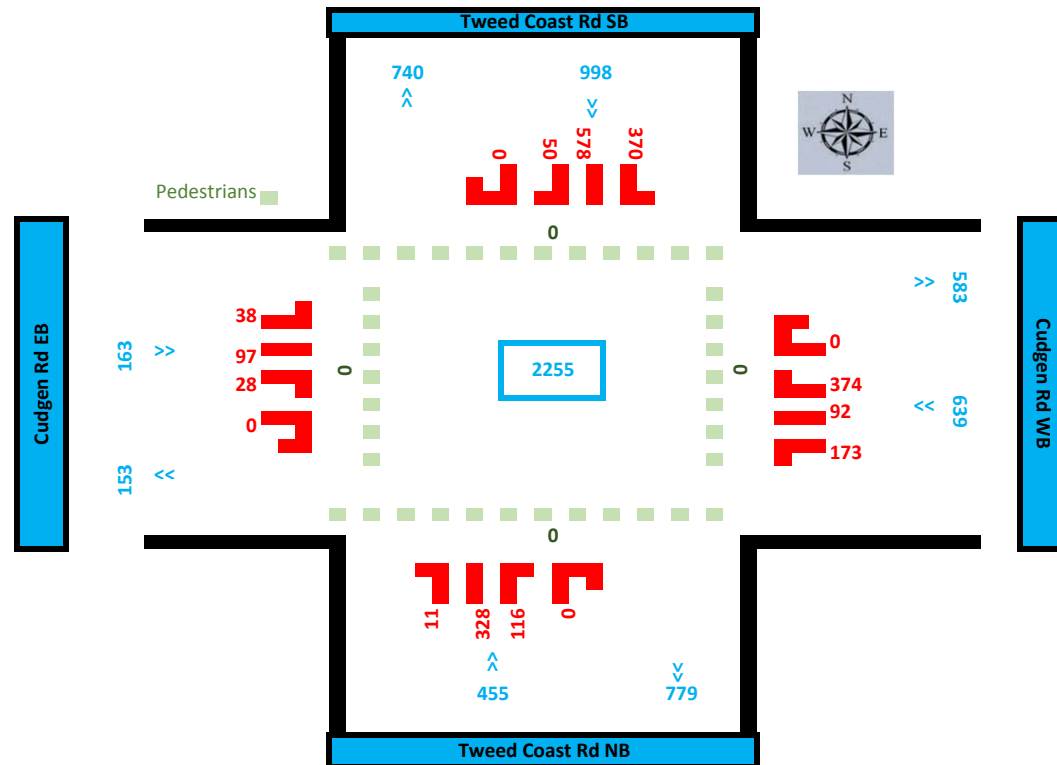
Date: 31-May-2018

Surveyed Time: 2:00 PM to 6:00 PM

Weather: Fine

Data for hour starting: 3:15 PM to 4:15 PM

Vehicle Class: ALL VEHICLES





### SURVEY INFORMATION

Site ID: 4

Location: Cudgen Rd & Kingscliff TAFE access, Cudgen

Date: 31 / May / 2018

Time Period 1: 07:00 to 10:00

Time Period 2: 14:00 to 18:00

#### Primary Classes:

- 1 Light Vehicles
- 2 Light Trucks (3-5)
- 3 Heavy Trucks (6-12)
- 4 Bicycles on Road
- 5 None

#### Secondary Classes:

- 1 Pedestrians
- 2 None

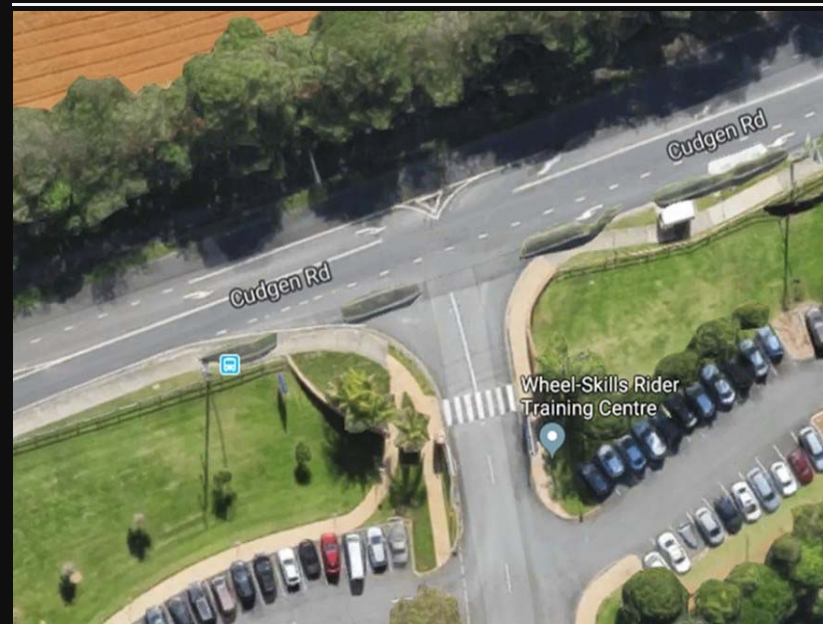
Weather Conditions 1: Fine Weather Conditions 2: Fine

Intersection Legs:

Direction	Ch	Leg
North	<input type="checkbox"/>	
East	<input checked="" type="checkbox"/>	Cudgen Rd WB
South	<input checked="" type="checkbox"/>	Kingscliff TAFE access NB
West	<input checked="" type="checkbox"/>	Cudgen Rd EB

Output time interval: 15 mins

### MAP









## Turning Movement Count Summary

Site ID: 4

Location: Cudgen Rd & Kingscliff TAFE access, Cudgen

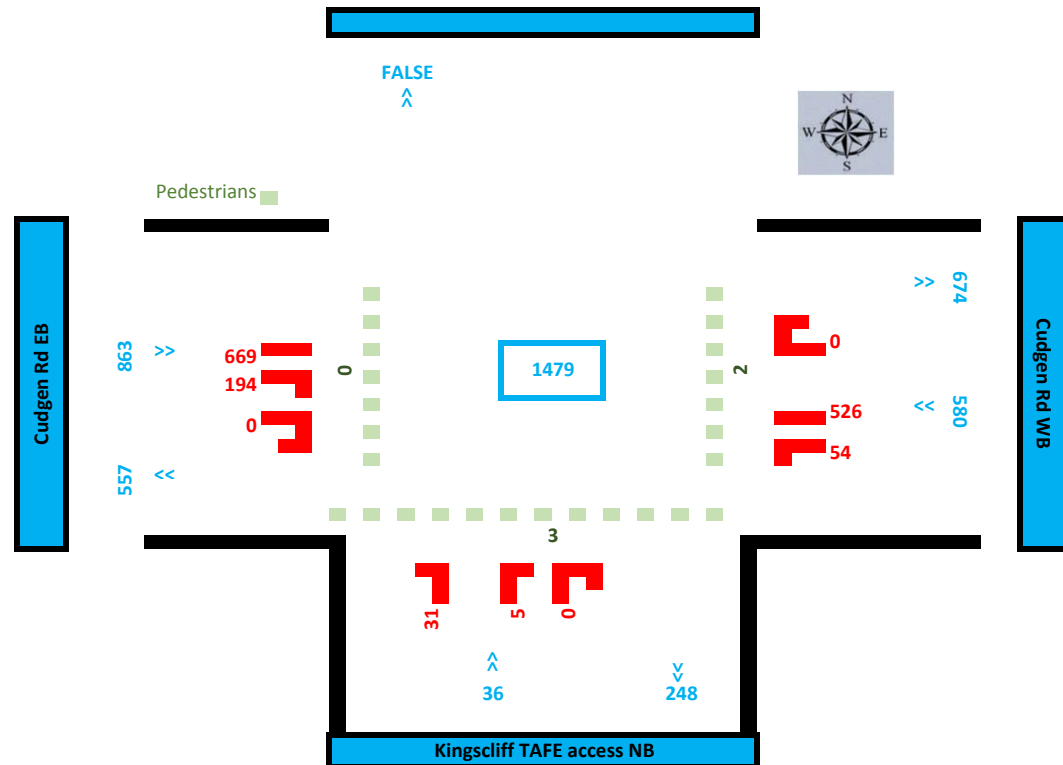
Date: 31-May-2018

Surveyed Time: 7:00 AM to 10:00 AM

Weather: Fine

Data for hour starting: 8:00 AM to 9:00 AM

Vehicle Class: ALL VEHICLES



## Turning Movement Count Summary

Site ID: 4

Location: Cudgen Rd & Kingscliff TAFE access, Cudgen

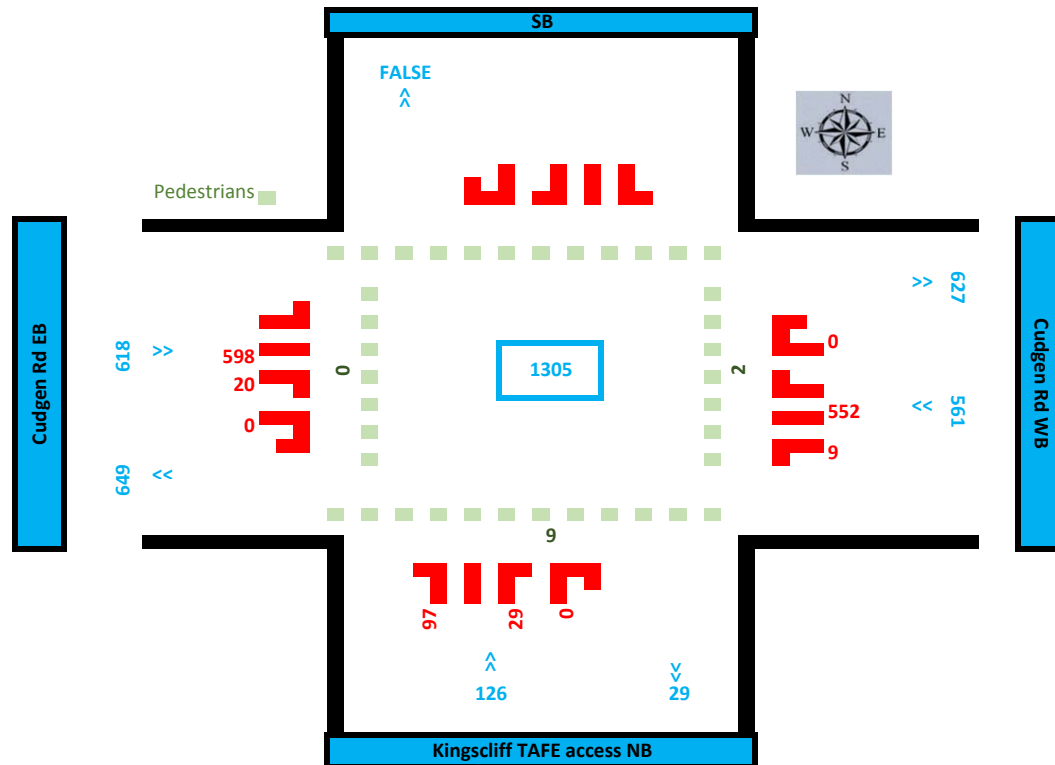
Date: 31-May-2018

Surveyed Time: 2:00 PM to 6:00 PM

Weather: Fine

Data for hour starting: 2:45 PM to 3:45 PM

Vehicle Class: ALL VEHICLES



*SURVEY INFORMATION*

*MAP*



**Site ID:** 5

**Location:** Cudgen Rd & Turnock St/McPhail Ave, Kingscliff

**Date:** 31 / May / 2018

**Time Period 1:** 07:00 to 10:00

**Time Period 2:** 14:00 to 18:00

**Primary Classes:**

- 1 Light Vehicles ▼
- 2 Light Trucks (3-5) ▼
- 3 Heavy Trucks (6-12) ▼
- 4 Bicycles on Road ▼
- 5 None ▼

**Secondary Classes:**

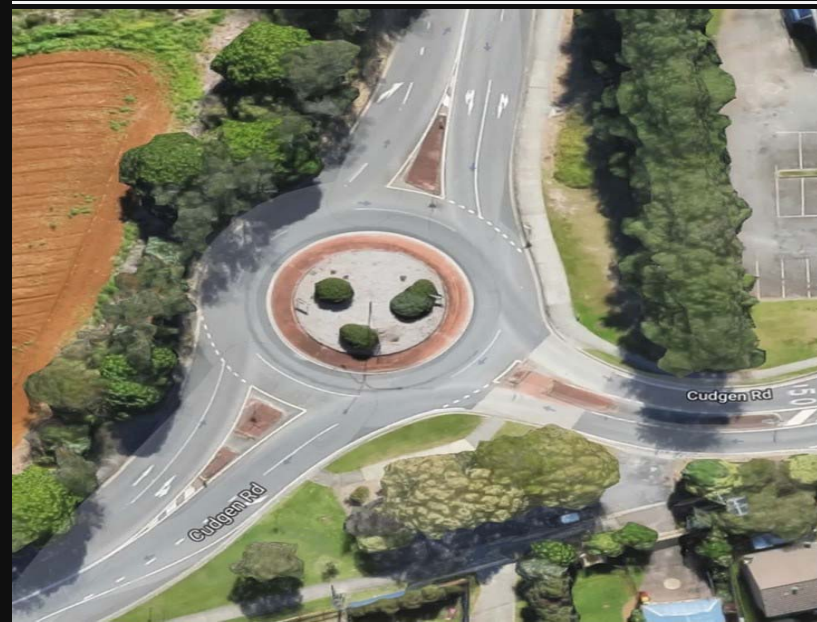
- 1 Pedestrians ▼
- 2 None ▼

**Weather Conditions 1:** Fine ▼ **Weather Conditions 2:** Fine ▼

**Intersection Legs:**

North	<input checked="" type="checkbox"/> Ch	Turnock St SB
East	<input checked="" type="checkbox"/> Ch	McPhail Ave WB
South	<input type="checkbox"/> Ch	
West	<input checked="" type="checkbox"/> Ch	Cudgen Rd EB

**Output time interval:** 15 mins ▼







[illegible]

## Turning Movement Count Summary

Site ID: 5

Location: Cudgen Rd & Turnock St/McPhail Ave, Kingscliff

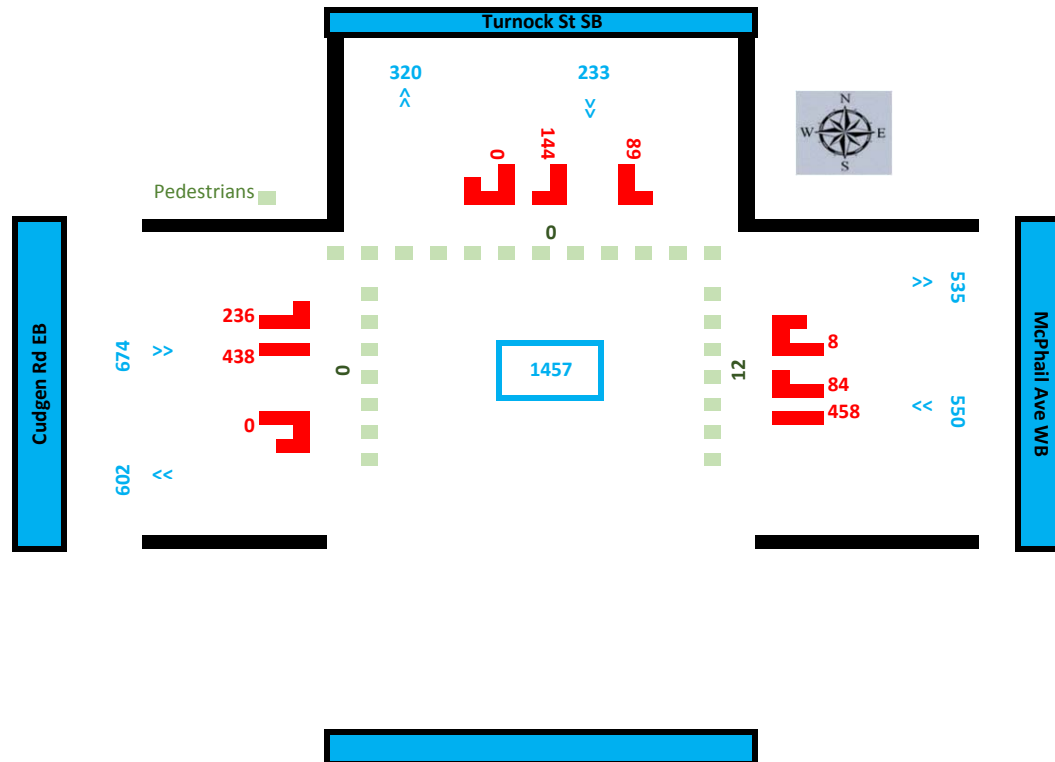
Date: 31-May-2018

Surveyed Time: 7:00 AM to 10:00 AM

Weather: Fine

Data for hour starting: 8:00 AM to 9:00 AM

Vehicle Class: ALL VEHICLES



## Turning Movement Count Summary

Site ID: 5

Location: Cudgen Rd & Turnock St/McPhail Ave, Kingscliff

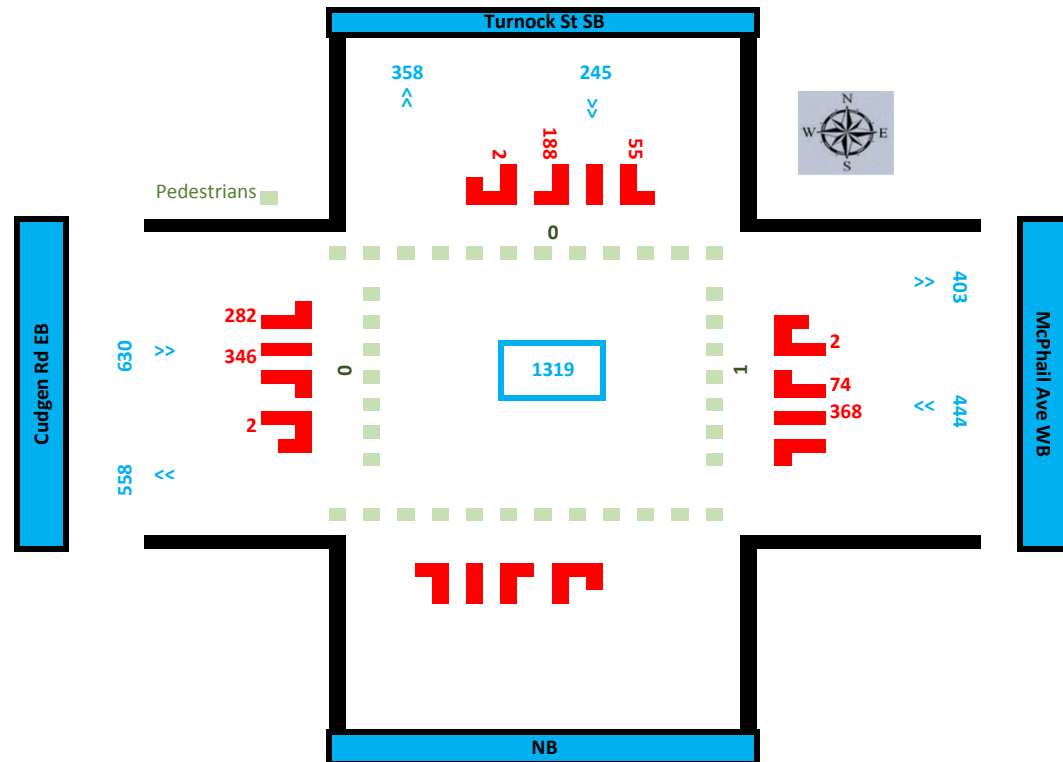
Date: 31-May-2018

Surveyed Time: 2:00 PM to 6:00 PM

Weather: Fine

Data for hour starting: 2:45 PM to 3:45 PM

Vehicle Class: ALL VEHICLES



*SURVEY INFORMATION*

*MAP*



**Site ID:** 6

**Location:** Turnock St & Elrond Dr, Kingscliff

**Date:** 31 / May / 2018

**Time Period 1:** 07:00 to 10:00

**Time Period 2:** 14:00 to 18:00

**Primary Classes:**

- 1 Light Vehicles ▼
- 2 Light Trucks (3-5) ▼
- 3 Heavy Trucks (6-12) ▼
- 4 Bicycles on Road ▼
- 5 None ▼

**Secondary Classes:**

- 1 Pedestrians ▼
- 2 None ▼

**Weather Conditions 1:** Fine ▼ **Weather Conditions 2:** Fine ▼

**Intersection Legs:**

North	<input checked="" type="checkbox"/> Ch	Elrond St SB
East	<input checked="" type="checkbox"/> Ch	Turnock St WB
South	<input checked="" type="checkbox"/> Ch	Turnock St NB
West	<input type="checkbox"/> Ch	

**Output time interval:** 15 mins ▼



[illegible]

[illegible]



## Turning Movement Count Summary

Site ID: 6

Location: Turnock St & Elrond Dr, Kingscliff

Date: 31-May-2018

Surveyed Time: 7:00 AM to 10:00 AM

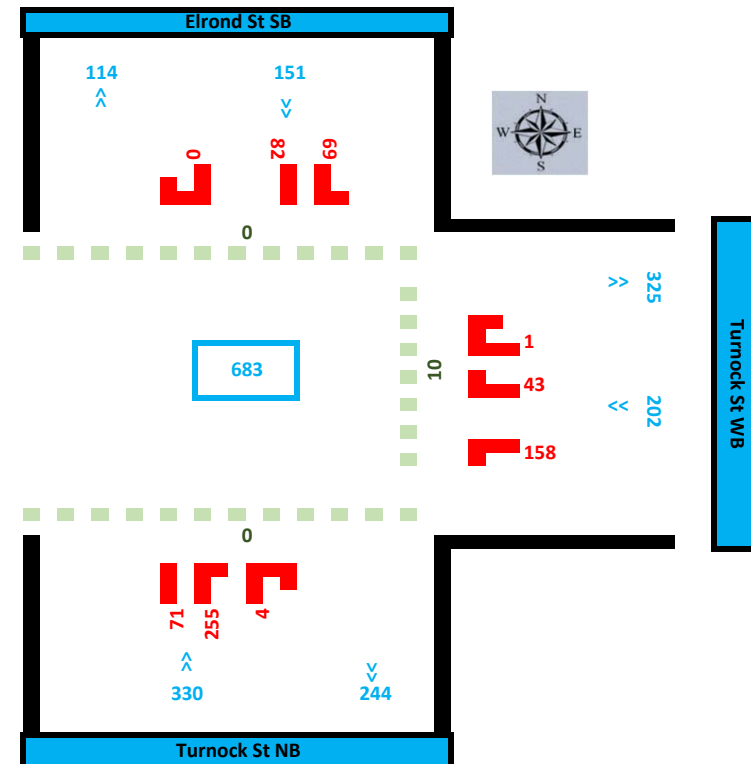
Weather: Fine

Data for hour starting: 8:15 AM to 9:15 AM

Vehicle Class: ALL VEHICLES



Pedestrians



## Turning Movement Count Summary

Site ID: 6

Location: Turnock St & Elrond Dr, Kingscliff

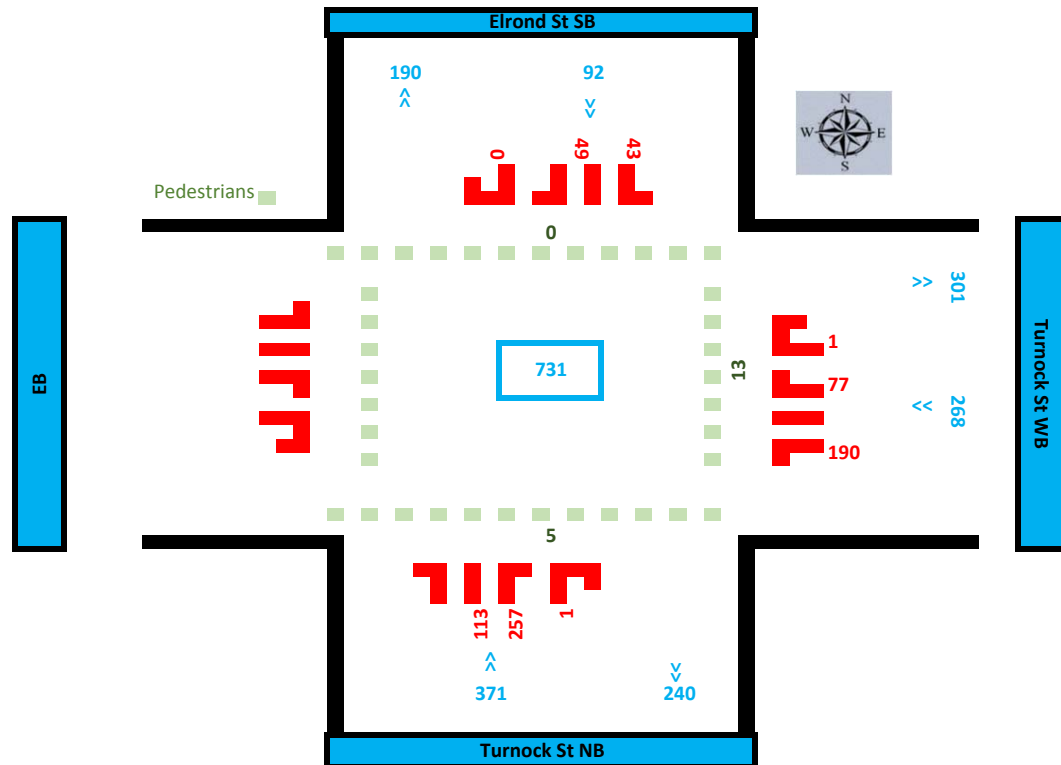
Date: 31-May-2018

Surveyed Time: 2:00 PM to 6:00 PM

Weather: Fine

Data for hour starting: 3:00 PM to 4:00 PM

Vehicle Class: ALL VEHICLES



*SURVEY INFORMATION*

Site ID: 7

Location: Turnock St & Pearl St, Kingscliff

Date: 31 / May / 2018

Time Period 1: 07:00 to 10:00

Time Period 2: 14:00 to 18:00

**Primary Classes:**

- 1 Light Vehicles ▼
- 2 Light Trucks (3-5) ▼
- 3 Heavy Trucks (6-12) ▼
- 4 Bicycles on Road ▼
- 5 None ▼

**Secondary Classes:**

- 1 Pedestrians ▼
- 2 None ▼

Weather Conditions 1: Fine ▼ Weather Conditions 2: Fine ▼

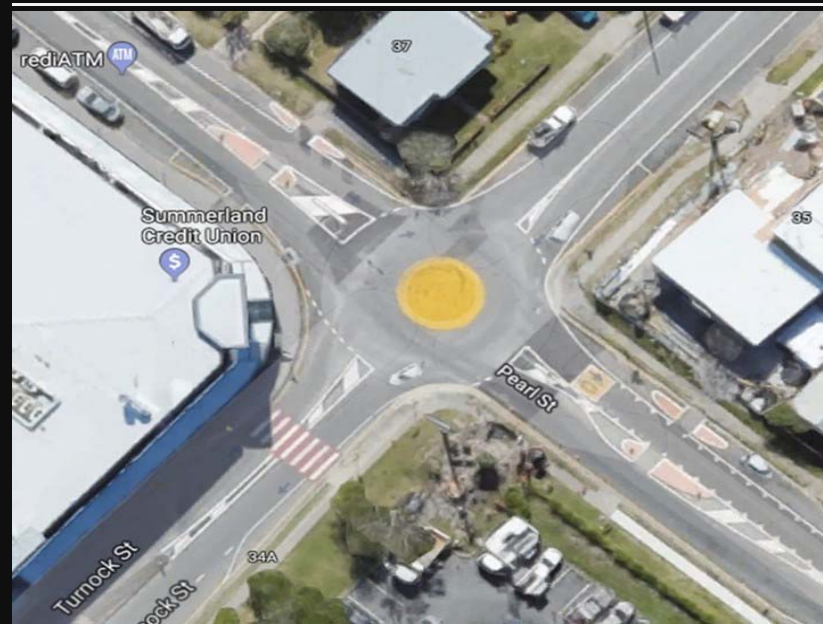
**Intersection Legs:**

North	<input checked="" type="checkbox"/> Ch	Pearl St SB
East	<input checked="" type="checkbox"/> Ch	Turnock St WB
South	<input checked="" type="checkbox"/> Ch	Pearl St NB
West	<input checked="" type="checkbox"/> Ch	Turnock St EB

Output time interval: 15 mins ▼



*MAP*



The diagram shows a four-way intersection with a central square area. Four approach lanes are labeled: Pearl St SB (top), Pearl St NB (bottom), Turnock St EB (left), and Turnock St WB (right). Each lane is represented by a blue line with a white center, converging at the intersection.

[illegible]

TOTALS AND PERCENTS		Percent 2 Total		Percent 3 Total		Percent 4 Total		Percent 5 Total		Percent 6 Total		Percent 7 Total		Percent 8 Total		Percent 9 Total		Percent 10 Total		Percent 11 Total		Percent 12 Total		Percent 13 Total		Percent 14 Total		Percent 15 Total		Percent 16 Total		Percent 17 Total		Percent 18 Total		Percent 19 Total		Percent 20 Total		Percent 21 Total		Percent 22 Total		Percent 23 Total		Percent 24 Total		Percent 25 Total		Percent 26 Total		Percent 27 Total		Percent 28 Total		Percent 29 Total		Percent 30 Total		Percent 31 Total		Percent 32 Total		Percent 33 Total		Percent 34 Total		Percent 35 Total		Percent 36 Total		Percent 37 Total		Percent 38 Total		Percent 39 Total		Percent 40 Total		Percent 41 Total		Percent 42 Total		Percent 43 Total		Percent 44 Total		Percent 45 Total		Percent 46 Total		Percent 47 Total		Percent 48 Total		Percent 49 Total		Percent 50 Total		Percent 51 Total		Percent 52 Total		Percent 53 Total		Percent 54 Total		Percent 55 Total		Percent 56 Total		Percent 57 Total		Percent 58 Total		Percent 59 Total		Percent 60 Total		Percent 61 Total		Percent 62 Total		Percent 63 Total		Percent 64 Total		Percent 65 Total		Percent 66 Total		Percent 67 Total		Percent 68 Total		Percent 69 Total		Percent 70 Total		Percent 71 Total		Percent 72 Total		Percent 73 Total		Percent 74 Total		Percent 75 Total		Percent 76 Total		Percent 77 Total		Percent 78 Total		Percent 79 Total		Percent 80 Total		Percent 81 Total		Percent 82 Total		Percent 83 Total		Percent 84 Total		Percent 85 Total		Percent 86 Total		Percent 87 Total		Percent 88 Total		Percent 89 Total		Percent 90 Total		Percent 91 Total		Percent 92 Total		Percent 93 Total		Percent 94 Total		Percent 95 Total		Percent 96 Total		Percent 97 Total		Percent 98 Total		Percent 99 Total		Percent 100 Total																																																																																																																																																																																																																					
475	3	0	0	0	474	5	1	0	468	2	0	0	466	2	0	0	464	2	0	0	462	2	0	0	460	2	0	0	458	2	0	0	456	2	0	0	454	2	0	0	452	2	0	0	450	2	0	0	448	2	0	0	446	2	0	0	444	2	0	0	442	2	0	0	440	2	0	0	438	2	0	0	436	2	0	0	434	2	0	0	432	2	0	0	430	2	0	0	428	2	0	0	426	2	0	0	424	2	0	0	422	2	0	0	420	2	0	0	418	2	0	0	416	2	0	0	414	2	0	0	412	2	0	0	410	2	0	0	408	2	0	0	406	2	0	0	404	2	0	0	402	2	0	0	400	2	0	0	398	2	0	0	396	2	0	0	394	2	0	0	392	2	0	0	390	2	0	0	388	2	0	0	386	2	0	0	384	2	0	0	382	2	0	0	380	2	0	0	378	2	0	0	376	2	0	0	374	2	0	0	372	2	0	0	370	2	0	0	368	2	0	0	366	2	0	0	364	2	0	0	362	2	0	0	360	2	0	0	358	2	0	0	356	2	0	0	354	2	0	0	352	2	0	0	350	2	0	0	348	2	0	0	346	2	0	0	344	2	0	0	342	2	0	0	340	2	0	0	338	2	0	0	336	2	0	0	334	2	0	0	332	2	0	0	330	2	0	0	328	2	0	0	326	2	0	0	324	2	0	0	322	2	0	0	320	2	0	0	318	2	0	0	316	2	0	0	314	2	0	0	312	2	0	0	310	2	0	0	308	2	0	0	306	2	0	0	304	2	0	0	302	2	0	0	300	2	0	0	298	2	0	0	296	2	0	0	294	2	0	0	292	2	0	0	290	2	0	0	288	2	0	0	286	2	0	0	284	2	0	0	282	2	0	0	280	2	0	0	278	2	0	0	276	2	0	0	274	2	0	0	272	2	0	0	270	2	0	0	268	2	0</

## Turning Movement Count Summary

Site ID: 7

Location: Turnock St & Pearl St, Kingscliff

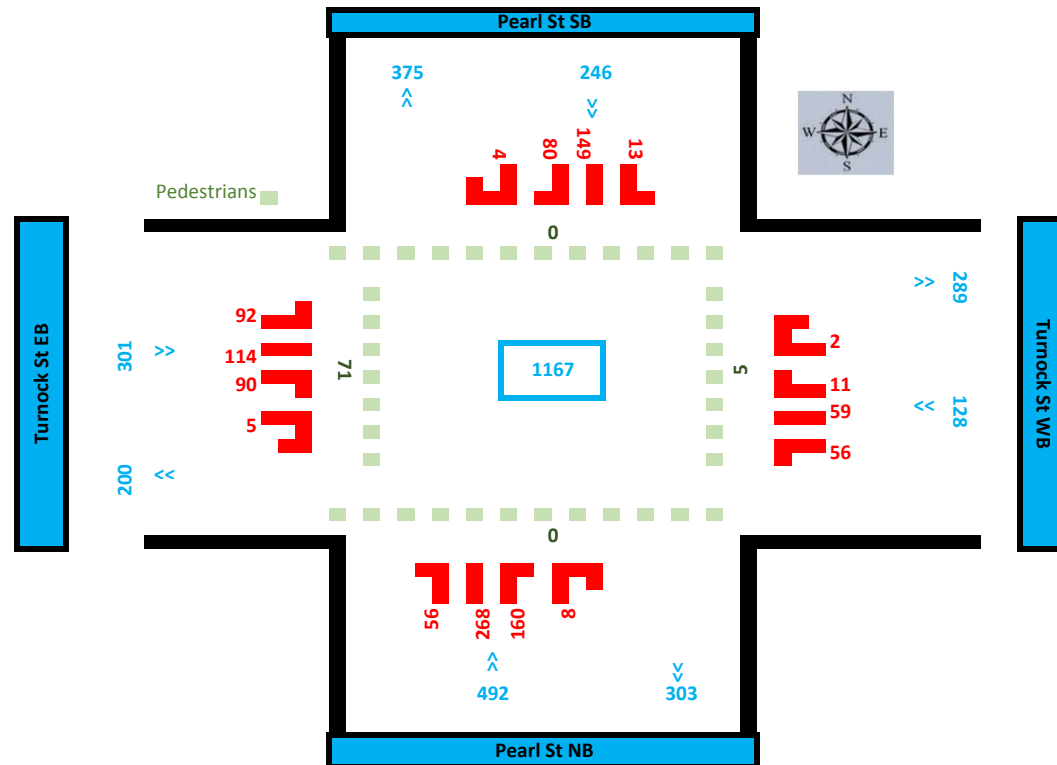
Date: 31-May-2018

Surveyed Time: 7:00 AM to 10:00 AM

Weather: Fine

Data for hour starting: 8:15 AM to 9:15 AM

Vehicle Class: ALL VEHICLES





## Turning Movement Count Summary

Site ID: 7

Location: Turnock St & Pearl St, Kingscliff

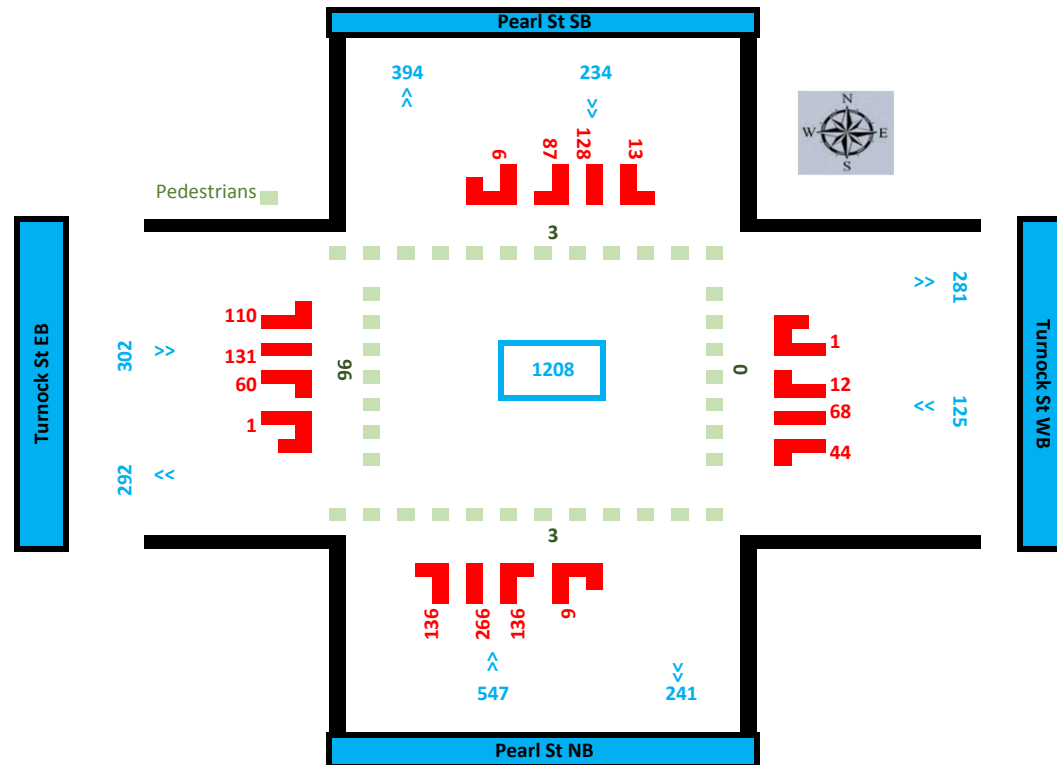
Date: 31-May-2018

Surveyed Time: 2:00 PM to 6:00 PM

Weather: Fine

Data for hour starting: 3:00 PM to 4:00 PM

Vehicle Class: ALL VEHICLES



## Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
 Description - north of Cudgen Rd  
 Direction - Northbund



Thursday, 31 May 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	8	7	1	0	78	-
0015	4	4	0	0	83.1	-
0030	3	3	0	0	77.7	-
0045	4	4	0	0	79.1	-
0100	0	0	0	0	-	-
0115	3	2	1	0	93.8	-
0130	2	2	0	0	89.2	-
0145	3	3	0	0	75.5	-
0200	2	2	0	0	80.8	-
0215	1	1	0	0	78.1	-
0230	0	0	0	0	-	-
0245	2	2	0	0	72.9	-
0300	3	2	1	0	88.4	-
0315	3	2	1	0	87.2	-
0330	7	6	1	0	80.9	-
0345	8	8	0	0	84.5	-
0400	14	13	1	0	78.9	89.1
0415	23	21	2	0	80.2	86.6
0430	27	25	2	0	80	82.6
0445	37	36	1	0	83.1	91.4
0500	56	53	2	1	77.8	83.1
0515	51	49	2	0	78.3	84.5
0530	66	66	0	0	78	84.7
0545	94	92	2	0	77.3	82.1
0600	67	67	0	0	76.2	81.2
0615	122	115	7	0	73.8	79.3
0630	155	151	4	0	73.3	79.4
0645	153	148	5	0	73.1	76.7
0700	159	152	7	0	72.9	77.9
0715	184	179	5	0	72.6	77.1
0730	222	212	10	0	72.9	77.8
0745	232	228	2	2	72	76
0800	270	262	6	2	72	77
0815	240	237	3	0	71.7	76.5
0830	221	216	5	0	71.7	76.7
0845	228	221	7	0	69.5	74.6
0900	179	176	3	0	72.5	76.7
0915	161	158	3	0	71.1	77.5
0930	121	120	1	0	71.2	77.4
0945	55	45	10	0	64.5	72.2
1000	147	122	23	2	67.5	76.1
1015	139	113	24	2	72.6	78.8
1030	135	114	20	1	72.7	79
1045	116	99	15	2	73.3	80.5
1100	135	110	23	2	69.8	77.2
1115	127	99	27	1	74.1	80.6
1130	119	98	18	3	74.7	82.8
1145	145	113	30	2	72.8	81.2
1200	144	123	16	5	72.1	78.5
1215	122	98	24	0	73.6	80.2
1230	125	111	14	0	74.9	83.4
1245	118	96	21	1	73.2	80.3
1300	134	114	19	1	72.9	79.5
1315	124	101	23	0	76	83.4
1330	128	110	14	4	74.7	81.8
1345	129	107	20	2	74.9	80.3
1400	144	123	19	2	71.9	78.6
1415	172	154	18	0	72.5	79.7
1430	175	137	35	3	71.7	79.1
1445	153	126	23	4	70.8	79.7
1500	192	163	28	1	72.1	81.4
1515	221	186	33	2	68.7	74.8
1530	175	149	23	3	69.4	76
1545	161	139	20	2	72.7	80.5
1600	171	149	20	2	71.9	79.4
1615	167	146	20	1	70.4	77.8
1630	142	124	18	0	73.2	79.8
1645	132	120	12	0	72.1	79.7
1700	176	154	21	1	71.6	78.5
1715	137	127	9	1	72.1	78.3
1730	114	98	16	0	72.2	78.7
1745	114	106	8	0	73.1	81
1800	105	95	9	1	75.3	82.3
1815	89	78	11	0	75	81.3
1830	59	49	9	1	78.5	85.3
1845	59	50	9	0	77.3	84.1
1900	42	36	6	0	77	84.1
1915	37	35	2	0	77.2	87.9
1930	36	32	4	0	79.1	85.9
1945	39	34	5	0	74.6	83
2000	53	43	10	0	77	88.1
2015	48	40	8	0	78.9	84.4
2030	29	26	2	1	78.7	83.7
2045	37	33	4	0	74.7	80.4
2100	54	50	4	0	74	82.2
2115	28	25	3	0	79.2	86.9
2130	29	27	2	0	78.5	86
2145	17	16	1	0	79.2	86.7
2200	10	8	2	0	78.9	-
2215	12	9	3	0	81.2	90.4
2230	8	7	1	0	86.5	-
2245	12	11	0	1	78.9	92.5
2300	11	10	1	0	85.6	101.2
2315	6	5	1	0	74.7	-
2330	7	5	2	0	76.8	-
2345	5	5	0	0	87.5	-
07-09	1756	1707	45	4	71.8	76.9
09-16	3996	3404	547	45	72.1	79.4
16-18	1153	1024	124	5	72	78.8
00-00	8655	7748	848	59	72.9	79.7

# Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Northbund



Friday, 1 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	4	3	1	0	77.6	-
0015	5	4	1	0	82.1	-
0030	0	0	0	0	-	-
0045	2	2	0	0	78.1	-
0100	5	4	1	0	81	-
0115	4	3	1	0	80.9	-
0130	2	2	0	0	79.8	-
0145	1	0	1	0	73	-
0200	0	0	0	0	-	-
0215	5	5	0	0	80.6	-
0230	3	1	2	0	94.3	-
0245	4	3	1	0	88.9	-
0300	0	0	0	0	-	-
0315	5	3	2	0	84.7	-
0330	6	2	4	0	80.9	-
0345	8	6	2	0	82.7	-
0400	14	8	6	0	88.1	106.3
0415	27	19	8	0	83.5	95.7
0430	37	24	13	0	81.2	89.9
0445	31	19	10	2	83.5	96.5
0500	44	25	17	2	83.2	91.3
0515	55	37	18	0	81.8	90.5
0530	76	52	22	2	78.7	86.8
0545	72	52	20	0	80.4	89.3
0600	94	63	28	3	77.4	84.5
0615	97	59	37	1	78.8	87.4
0630	134	94	39	1	76	83.5
0645	124	85	38	1	76.5	85
0700	147	116	30	1	74	79.7
0715	171	139	32	0	74.3	82.3
0730	205	179	26	0	74.6	81.9
0745	217	195	19	3	70.8	79.8
0800	247	228	18	1	69.7	77.4
0815	227	203	24	0	72.5	79
0830	185	165	17	3	61.9	71.8
0845	173	156	16	1	63.7	73.3
0900	184	172	12	0	66.1	73.3
0915	149	125	23	1	68	75.9
0930	139	119	19	1	68.6	74.7
0945	165	137	26	2	68.7	75.1
1000	126	109	17	0	71.3	76.5
1015	150	127	23	0	67.9	74.8
1030	115	104	10	1	67.2	76.3
1045	117	103	14	0	66.1	74.9
1100	146	124	22	0	69.6	76
1115	165	139	26	0	68.8	75.4
1130	160	130	30	0	69.3	79
1145	151	123	28	0	73.9	81.8
1200	144	124	18	2	71.7	78.3
1215	135	117	18	0	73.7	83
1230	166	132	33	1	73	80.8
1245	121	91	30	0	75.3	84.1
1300	149	123	24	2	72.9	80.4
1315	120	97	22	1	74.8	82.1
1330	136	109	26	1	75.4	82.8
1345	135	109	25	1	73.3	82.2
1400	167	137	26	4	73	81.5
1415	152	133	16	3	72.6	79.9
1430	152	126	24	2	74.1	80.7
1445	166	144	22	0	73.8	80.5
1500	225	184	36	5	70.3	77.8
1515	183	162	21	0	71	77.1
1530	204	177	27	0	70.8	76.6
1545	135	119	16	0	73.1	80.5
1600	149	131	17	1	72.3	80.5
1615	150	135	15	0	73.1	79.9
1630	125	110	14	1	73.2	81.7
1645	126	115	11	0	76.7	82.1
1700	100	88	12	0	73.4	80.9
1715	130	109	20	1	73.4	81.6
1730	121	110	11	0	72.2	79.1
1745	93	87	6	0	74.7	78.8
1800	97	85	10	2	75.6	83.6
1815	74	69	4	1	75	82.6
1830	77	68	9	0	78.1	85.7
1845	54	47	7	0	74.7	83.8
1900	48	45	3	0	79.1	88.7
1915	40	35	5	0	77.7	84.2
1930	32	26	6	0	77.7	85.9
1945	49	41	7	1	76.3	86.4
2000	43	35	8	0	77.1	87.8
2015	46	43	3	0	75.1	84
2030	38	34	3	1	76.3	86.6
2045	39	32	7	0	76.1	84.1
2100	45	41	4	0	77.4	86.8
2115	31	25	6	0	77	83.4
2130	29	28	1	0	74.5	86
2145	33	29	4	0	77.3	86.9
2200	20	20	0	0	79.5	90.6
2215	20	18	2	0	76.1	84.3
2230	20	19	1	0	77.9	91.5
2245	20	17	2	1	79.3	85.8
2300	14	10	3	1	78.5	86.1
2315	16	10	6	0	76.7	93.3
2330	11	10	1	0	83.6	94.9
2345	13	11	2	0	78.6	93.2
07-09	1572	1381	182	9	70.2	78.8
09-16	4257	3596	634	27	71.2	78.8
16-18	994	885	106	3	73.6	80.5
00-00	8591	7235	1298	58	72.7	81.2

## Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Northbound



Saturday, 2 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	8	6	2	0	88.7	-
0015	11	9	2	0	77.1	99.4
0030	5	4	1	0	85.7	-
0045	2	2	0	0	88.1	-
0100	3	2	1	0	80.2	-
0115	6	6	0	0	80	-
0130	3	3	0	0	82	-
0145	7	7	0	0	91.6	-
0200	3	2	1	0	82.7	-
0215	5	4	1	0	75.3	-
0230	3	1	2	0	76.1	-
0245	6	5	1	0	75.8	-
0300	7	6	1	0	83.5	-
0315	2	1	1	0	70.2	-
0330	3	2	1	0	80.9	-
0345	6	5	0	1	84.2	-
0400	9	7	2	0	73.9	-
0415	15	11	3	1	77.5	93.3
0430	20	17	3	0	83.5	93.1
0445	22	15	7	0	84	92.3
0500	24	18	6	0	83.7	91.5
0515	21	15	6	0	80	87
0530	32	25	7	0	83.1	91.6
0545	38	27	11	0	77.2	86.8
0600	32	23	9	0	78.8	85.8
0615	42	31	10	1	78.8	90.7
0630	59	43	14	2	79.6	89.6
0645	45	34	11	0	79.1	86.1
0700	62	48	12	2	78.1	87.2
0715	93	76	15	2	75.6	81.2
0730	90	68	22	0	74.8	82.5
0745	114	94	20	0	75.7	83.8
0800	109	95	14	0	77.3	86
0815	133	115	17	1	74.7	81.4
0830	115	102	13	0	77	85
0845	144	124	19	1	74.7	82.7
0900	137	114	21	2	76	85.1
0915	161	144	16	1	74.6	81.7
0930	163	142	21	0	72.7	80.6
0945	168	143	24	1	71.3	78.3
1000	206	180	26	0	70.6	77
1015	211	187	23	1	69.3	77.5
1030	190	156	31	3	71.9	80.6
1045	210	179	31	0	70.7	76.9
1100	205	186	18	1	70.2	78.1
1115	186	159	26	1	71	78.8
1130	155	133	22	0	72.9	81
1145	189	168	21	0	71.2	78.4
1200	164	147	15	2	72.2	82.2
1215	148	124	24	0	73.3	81
1230	134	118	16	0	74.9	82.1
1245	131	112	19	0	73.5	82.1
1300	146	129	17	0	72.1	81.5
1315	139	117	22	0	74.6	80.5
1330	129	111	18	0	76.2	84
1345	124	112	12	0	74.5	81.3
1400	138	123	15	0	75.3	82.1
1415	126	111	15	0	75	83.9
1430	129	113	15	1	74.5	82
1445	145	127	17	1	74.9	82.4
1500	115	103	12	0	73.4	81.3
1515	126	110	15	1	72.7	82.5
1530	141	121	20	0	75.6	81.5
1545	94	80	13	1	73.7	81.5
1600	132	108	23	1	72.6	78.3
1615	90	78	12	0	75.1	83.6
1630	100	92	8	0	75.2	80.9
1645	109	97	12	0	75.7	81.9
1700	108	96	12	0	74.8	82.6
1715	103	86	17	0	74	79.9
1730	77	65	11	1	74.1	81.5
1745	81	68	12	1	75.8	83.1
1800	63	54	9	0	75	81.9
1815	42	38	4	0	78.1	85.7
1830	58	49	8	1	79.6	90.2
1845	38	33	5	0	74.7	83.7
1900	32	30	2	0	78.2	87.7
1915	34	26	8	0	77.7	84.2
1930	25	20	5	0	74.5	82.7
1945	37	33	4	0	75.7	84.8
2000	30	29	1	0	77.1	85.9
2015	33	31	2	0	76	84.7
2030	33	28	5	0	75.7	84.8
2045	28	25	3	0	77	84.3
2100	40	37	3	0	77.8	85.2
2115	29	23	6	0	76.5	89
2130	31	26	4	1	76.8	83.7
2145	28	27	0	1	75.5	84.4
2200	32	29	3	0	78.5	88.6
2215	38	32	6	0	74.4	81.8
2230	21	18	3	0	77.7	83.7
2245	24	21	3	0	74.1	81.6
2300	23	21	2	0	76	84.1
2315	14	10	4	0	77.1	87.8
2330	15	9	6	0	77.4	88.3
2345	17	10	6	1	82	90.5
07-09	860	722	132	6	75.9	83.7
09-16	4310	3749	545	16	72.9	80.6
16-18	800	690	107	3	74.6	81
00-00	7174	6151	989	34	74.3	82.3

## Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Northbound



Sunday, 3 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	13	10	3	0	86.3	107.7
0015	13	12	1	0	76.7	84.3
0030	9	7	2	0	78.5	-
0045	8	6	2	0	73.8	-
0100	10	10	0	0	81.3	-
0115	9	8	1	0	76.1	-
0130	11	8	3	0	83.2	92.3
0145	6	4	2	0	85.9	-
0200	6	6	0	0	88	-
0215	6	5	1	0	79	-
0230	4	4	0	0	81.4	-
0245	3	3	0	0	90.5	-
0300	4	3	1	0	86	-
0315	6	6	0	0	81.3	-
0330	2	2	0	0	92.9	-
0345	2	2	0	0	84.4	-
0400	7	6	1	0	86	-
0415	2	1	1	0	96.2	-
0430	13	10	3	0	79.2	92.4
0445	12	9	2	1	85.4	97.4
0500	12	9	3	0	80.4	98.5
0515	21	14	7	0	83.4	92.1
0530	22	19	3	0	78	87.3
0545	31	25	5	1	80	91.3
0600	23	19	4	0	77.4	85.9
0615	19	14	5	0	79.2	87.5
0630	45	39	6	0	76.7	85
0645	39	32	6	1	75.5	82.4
0700	30	24	5	1	79	84.5
0715	55	44	11	0	77.7	85.5
0730	48	40	7	1	77.2	85.1
0745	58	46	11	1	78.8	87
0800	70	66	4	0	76.4	83.9
0815	86	74	12	0	74.2	80.6
0830	91	77	14	0	77	83.4
0845	104	85	19	0	76.2	82.5
0900	112	91	19	2	75.6	81.2
0915	148	130	17	1	74.8	82.6
0930	152	128	23	1	73.6	81.9
0945	162	137	25	0	74	81.7
1000	178	154	23	1	73	79.6
1015	161	144	17	0	74.9	81.5
1030	146	120	24	2	72.3	79.2
1045	159	142	15	2	71.7	78.3
1100	161	142	19	0	74.1	80.7
1115	182	164	17	1	72.8	80.6
1130	163	137	25	1	74.8	82
1145	189	163	24	2	70	79.2
1200	153	131	22	0	73.9	80.8
1215	149	130	18	1	73.2	81.2
1230	135	119	16	0	75	82
1245	170	141	28	1	72.7	79.9
1300	140	122	18	0	73.9	81.7
1315	149	127	19	3	73.1	80.3
1330	154	140	14	0	72	78.4
1345	155	129	25	1	70.9	80.1
1400	124	116	8	0	75.2	82.8
1415	135	124	11	0	73.7	81.3
1430	157	130	26	1	72.9	81.2
1445	140	118	19	3	72	79.7
1500	130	116	14	0	75.7	83
1515	132	109	23	0	74.6	81.5
1530	140	126	14	0	74.6	81.4
1545	113	102	10	1	76.2	83
1600	122	110	12	0	72.2	80
1615	123	109	14	0	74.3	84.1
1630	143	126	16	1	73.1	79.8
1645	106	89	17	0	75.2	84.2
1700	94	81	13	0	74.7	82
1715	98	90	8	0	73.8	79.6
1730	63	57	6	0	75.5	83.8
1745	68	63	5	0	77.9	85.6
1800	39	31	8	0	77.2	83
1815	50	40	10	0	76.3	86.2
1830	46	39	6	1	74.5	82.1
1845	32	26	6	0	76.4	83.4
1900	40	36	4	0	76.2	86
1915	38	34	4	0	78.6	88.6
1930	40	34	6	0	75.9	84.9
1945	32	28	4	0	80.7	88.9
2000	36	31	5	0	73.5	84.6
2015	24	19	5	0	81.4	94.4
2030	26	19	6	1	81.2	90
2045	13	10	3	0	81.1	93
2100	26	23	3	0	78.1	89.8
2115	12	11	0	1	80.6	90.3
2130	10	6	3	1	81	-
2145	14	11	3	0	77.8	88.2
2200	10	9	1	0	77.8	-
2215	9	8	1	0	79.3	-
2230	7	7	0	0	85.8	-
2245	7	7	0	0	81.7	-
2300	5	5	0	0	92.5	-
2315	6	6	0	0	79.6	-
2330	3	1	2	0	78.2	-
2345	3	3	0	0	80.7	-
07-09	542	456	83	3	76.7	83.5
09-16	4189	3632	533	24	73.5	80.8
16-18	817	725	91	1	74.3	81.9
00-00	6434	5550	849	35	74.6	82.3

## Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Northbound



Monday, 4 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	3	3	0	0	90.4	-
0015	0	0	0	0	-	-
0030	4	4	0	0	68.9	-
0045	0	0	0	0	-	-
0100	2	2	0	0	77	-
0115	0	0	0	0	-	-
0130	3	2	1	0	83.6	-
0145	2	2	0	0	70.7	-
0200	0	0	0	0	-	-
0215	5	2	2	1	86	-
0230	4	3	1	0	75.3	-
0245	3	1	2	0	88.5	-
0300	2	2	0	0	72.7	-
0315	5	2	3	0	76.3	-
0330	6	3	3	0	83.5	-
0345	9	5	4	0	83.5	-
0400	13	6	7	0	87.9	95.2
0415	26	15	11	0	78.5	87
0430	44	28	15	1	82.2	90.4
0445	41	30	10	1	80.1	89.8
0500	53	28	25	0	84.3	92.4
0515	58	36	20	2	82	89.7
0530	73	52	20	1	79.2	88.9
0545	78	48	29	1	77.6	85.2
0600	90	72	17	1	78.7	87.3
0615	125	89	33	3	78.1	84.6
0630	143	114	28	1	76.7	84.3
0645	145	115	28	2	75.9	82.1
0700	138	117	20	1	76.6	83.4
0715	172	146	25	1	75.2	80.5
0730	210	180	28	2	74.3	80.4
0745	225	201	23	1	72.9	79.2
0800	260	235	23	2	70.6	78.3
0815	269	228	39	2	70.6	79.7
0830	225	198	27	0	70.2	78.3
0845	213	188	21	4	69.7	77.9
0900	199	166	32	1	69.7	76.3
0915	135	110	22	3	72.3	79.4
0930	150	112	38	0	71.4	78.8
0945	145	129	14	2	70.2	76.4
1000	148	130	18	0	70.6	78.1
1015	146	122	23	1	71.3	76.3
1030	139	122	15	2	74.2	80.1
1045	156	138	17	1	70.3	77.1
1100	119	96	21	2	71.3	78.1
1115	121	99	18	4	72.8	80.8
1130	118	93	22	3	72.3	79.2
1145	145	114	31	0	71.4	79.4
1200	104	91	13	0	75.6	82.4
1215	114	98	15	1	73	81
1230	127	110	17	0	73.2	79.9
1245	119	92	25	2	74	82.1
1300	146	115	30	1	73.9	82.1
1315	104	88	15	1	71.3	77.4
1330	143	118	22	3	73.3	80.1
1345	107	91	15	1	75.7	82.4
1400	127	107	19	1	73.6	80.6
1415	138	113	23	2	73.3	79.4
1430	167	133	34	0	73.1	80.7
1445	130	113	15	2	73.5	79.4
1500	171	142	26	3	70.9	78.7
1515	201	174	27	0	72.2	78.7
1530	195	166	27	2	72	81.3
1545	155	125	26	4	73.7	80.5
1600	154	125	27	2	73.6	80.6
1615	139	126	13	0	74.6	81.4
1630	170	149	18	3	73.5	79.2
1645	114	99	13	2	74.1	81.7
1700	133	113	18	2	71.3	78.1
1715	128	121	5	2	71.4	77.5
1730	115	104	11	0	70.2	77.9
1745	80	72	8	0	73.4	79.7
1800	95	84	11	0	75.8	82.1
1815	62	49	13	0	75.6	84.3
1830	50	43	5	2	76	81.8
1845	52	39	13	0	77.5	81.6
1900	33	28	5	0	76	86.4
1915	43	40	3	0	77	84.9
1930	26	16	10	0	77.8	88.2
1945	25	22	2	1	80.2	87
2000	33	32	1	0	76.2	85.7
2015	31	28	3	0	75.2	82.8
2030	20	16	4	0	80	91.7
2045	20	15	5	0	75.9	82.6
2100	22	20	1	1	75.6	85.8
2115	8	8	0	0	77.2	-
2130	14	13	1	0	86.8	102.8
2145	12	11	1	0	79.8	87.7
2200	10	9	1	0	78	-
2215	9	5	4	0	77.3	-
2230	4	4	0	0	81.1	-
2245	3	3	0	0	88.6	-
2300	6	5	1	0	82.1	-
2315	2	2	0	0	78.8	-
2330	0	0	0	0	-	-
2345	5	3	2	0	72	-
07-09	1712	1493	206	13	72.1	79.6
09-16	3969	3307	620	42	72.4	79.4
16-18	1033	909	113	11	72.8	79.7
00-00	8236	6868	1284	84	73.4	81



## Tweed Coast Automatic Report

**Site Name** - #1 Tweed Coast Rd  
**Description** - north of Cudgen Rd  
**Direction** - Northbund



Tuesday, 5 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	5	5	0	0	88.4	-
0015	3	2	1	0	83.2	-
0030	2	2	0	0	75.9	-
0045	0	0	0	0	-	-
0100	2	2	0	0	83.8	-
0115	0	0	0	0	-	-
0130	0	0	0	0	-	-
0145	1	0	1	0	77	-
0200	0	0	0	0	-	-
0215	0	0	0	0	-	-
0230	1	0	1	0	88.9	-
0245	3	3	0	0	68.2	-
0300	5	5	0	0	77.6	-
0315	3	2	1	0	82.3	-
0330	8	6	2	0	76.2	-
0345	6	3	3	0	83.6	-
0400	12	10	2	0	87.8	96
0415	24	14	9	1	78.7	90.6
0430	37	23	14	0	83.6	90.8
0445	32	18	13	1	82.3	91.5
0500	58	39	19	0	80	86.7
0515	58	29	29	0	81.8	89.3
0530	70	58	10	2	77.5	86.2
0545	84	60	23	1	78.2	86.1
0600	81	47	32	2	78.8	87.1
0615	131	94	36	1	76.5	84.8
0630	144	111	30	3	75.9	81.5
0645	144	115	29	0	76.6	83.2
0700	147	112	34	1	75.4	82.6
0715	194	165	28	1	73.5	80.1
0730	226	188	36	2	73.7	81.9
0745	217	197	20	0	72.7	79.4
0800	263	232	30	1	71.5	79.9
0815	250	213	32	5	69.7	80.1
0830	236	207	25	4	71.6	78.9
0845	185	155	29	1	72	80.1
0900	182	155	24	3	71.1	77
0915	169	140	25	4	74	80.5
0930	150	122	28	0	71.8	79.5
0945	130	111	19	0	74.1	81.4
1000	146	117	27	2	75.3	82.4
1015	146	115	28	3	72	78.8
1030	121	99	21	1	74.1	79.5
1045	134	103	29	2	71.1	78.9
1100	157	127	26	4	70.1	76.8
1115	126	97	28	1	72.2	79
1130	102	78	23	1	74.7	83
1145	115	91	21	3	73.2	78.5
1200	123	93	27	3	74.9	81.6
1215	119	104	14	1	77.1	83.2
1230	121	93	23	5	73.1	80.1
1245	99	86	13	0	75.2	80.5
1300	123	99	23	1	75.3	81.8
1315	118	94	20	4	72.9	81
1330	110	95	15	0	73.8	80.5
1345	136	113	22	1	73.4	79.6
1400	145	127	15	3	74.6	82.8
1415	151	124	26	1	73.8	81.3
1430	150	136	11	3	73.6	80.3
1445	153	125	26	2	73.7	81.3
1500	159	134	22	3	73	79.7
1515	193	165	28	0	69.5	76.6
1530	201	175	23	3	71.1	79.1
1545	158	139	19	0	72.8	80.3
1600	191	167	20	4	70.3	77.6
1615	153	135	17	1	74.2	82.4
1630	130	113	15	2	74.6	82.3
1645	133	117	15	1	74.8	82.3
1700	126	112	12	2	74.6	81.5
1715	136	119	17	0	73.8	80.8
1730	99	94	5	0	74.1	80.3
1745	79	73	6	0	73.8	81.5
1800	63	50	12	1	77.1	84.9
1815	56	44	12	0	75.3	80.8
1830	69	56	12	1	78.2	88.4
1845	47	42	5	0	78	85.3
1900	30	25	5	0	81.8	88.7
1915	23	20	3	0	75.5	85.3
1930	30	23	6	1	78.4	87.5
1945	22	19	3	0	74.1	82.4
2000	42	37	5	0	74.8	85.1
2015	50	43	5	2	76.3	85.3
2030	27	22	5	0	77.4	86.7
2045	31	27	4	0	78.7	88.9
2100	25	23	2	0	77.4	83.6
2115	20	16	3	1	78.2	92.1
2130	32	27	5	0	78	89.9
2145	20	17	3	0	70.7	82.9
2200	9	8	1	0	78	-
2215	12	10	2	0	77	88.2
2230	9	9	0	0	81	-
2245	4	4	0	0	87.4	-
2300	5	4	0	1	85.8	-
2315	8	7	1	0	85.7	-
2330	4	4	0	0	89	-
2345	3	3	0	0	85.2	-
07-09	1718	1469	234	15	72.3	80.1
09-16	3937	3257	626	54	73.1	80.2
16-18	1047	930	107	10	73.6	81
00-00	8257	6844	1316	97	73.9	81.7

## Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Northbund



Wednesday, 6 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	8	8	0	0	89.8	-
0015	2	2	0	0	96.8	-
0030	0	0	0	0	-	-
0045	4	2	2	0	77.2	-
0100	2	2	0	0	72	-
0115	1	1	0	0	82.1	-
0130	0	0	0	0	-	-
0145	1	0	1	0	73.5	-
0200	0	0	0	0	-	-
0215	0	0	0	0	-	-
0230	0	0	0	0	-	-
0245	1	0	1	0	87.9	-
0300	1	1	0	0	81.8	-
0315	2	1	1	0	79.8	-
0330	5	3	2	0	75.5	-
0345	8	7	1	0	81.2	-
0400	20	10	10	0	86	94.4
0415	19	9	10	0	83.5	93.1
0430	31	22	9	0	82.4	94
0445	34	21	13	0	81.7	93.5
0500	62	38	23	1	80.6	89.4
0515	47	25	20	2	81.9	89.7
0530	72	49	21	2	81	87
0545	87	57	29	1	79.3	85.9
0600	65	50	14	1	81	89.7
0615	126	91	33	2	75.7	83
0630	153	108	43	2	77	82.6
0645	133	103	29	1	77.6	84.5
0700	154	128	26	0	75.2	82.2
0715	179	154	24	1	73.9	81.2
0730	210	181	27	2	73.6	80.7
0745	238	214	24	0	72.4	78.9
0800	239	216	20	3	70.2	78.5
0815	276	244	31	1	69.9	77.9
0830	221	194	26	1	71.3	76.9
0845	231	196	30	5	71.9	79.6
0900	143	122	20	1	74.3	81.4
0915	170	141	27	2	71.3	78.2
0930	146	122	22	2	73.3	81.1
0945	165	137	27	1	73.6	80.6
1000	136	119	16	1	73.3	81.1
1015	143	120	21	2	72.7	82.2
1030	156	124	29	3	71.1	79.3
1045	132	107	25	0	73	80.1
1100	100	76	24	0	72.6	83
1115	128	106	20	2	72.1	81.2
1130	132	107	25	0	74.4	83
1145	119	94	23	2	74.6	81.4
1200	106	82	24	0	74.9	80.8
1215	108	89	19	0	74.1	81.2
1230	149	119	29	1	74.7	80.6
1245	130	115	15	0	73.8	79.6
1300	113	83	29	1	73.2	80.1
1315	120	95	23	2	75.2	83.3
1330	119	95	23	1	73.6	79.7
1345	131	106	23	2	75.4	82.5
1400	126	104	22	0	75.2	80.8
1415	152	122	28	2	73.6	78.9
1430	139	116	22	1	72.1	80.3
1445	131	112	18	1	72.9	79.2
1500	174	153	21	0	70.9	77.4
1515	179	156	20	3	71.6	79.2
1530	164	139	19	6	73.6	81.2
1545	139	124	15	0	70.5	77.4
1600	144	131	12	1	69	75.5
1615	141	121	20	0	74.5	81.8
1630	151	135	14	2	73.5	80.6
1645	103	92	10	1	72.6	81.6
1700	110	102	8	0	73.4	81.4
1715	100	89	11	0	72.2	77.9
1730	110	98	12	0	73.2	82.2
1745	75	71	4	0	72	81.1
1800	66	59	7	0	72.9	79.9
1815	67	62	5	0	72	78.9
1830	70	59	11	0	72.4	81.3
1845	36	32	4	0	75.3	82.1
1900	28	25	3	0	75.4	84.9
1915	38	34	4	0	76.1	85
1930	35	33	2	0	74.2	84
1945	23	22	1	0	74.5	85
2000	28	23	5	0	75.9	83.4
2015	25	17	8	0	81.5	89.7
2030	30	26	4	0	75.3	84.1
2045	17	14	3	0	76.3	84.3
2100	18	17	1	0	75.9	84.8
2115	19	16	3	0	79.6	87.5
2130	24	24	0	0	80.3	87.4
2145	13	12	1	0	75.9	85.1
2200	11	10	0	1	76.5	83.1
2215	38	32	6	0	75.5	87.9
2230	18	17	1	0	80.8	91.1
2245	15	12	3	0	76.9	89.4
2300	10	8	2	0	71.9	-
2315	9	6	3	0	81.4	-
2330	1	1	0	0	65.3	-
2345	6	5	1	0	83.7	-
07-09	1748	1527	208	13	72	79.6
09-16	3850	3185	629	36	73.2	80.5
16-18	934	839	91	4	72.5	80.3
00-00	8061	6727	1268	66	73.7	81.5

# Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Southbound



Thursday, 31 May 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	5	5	0	0	82.6	-
0015	11	9	2	0	85.9	98.7
0030	6	6	0	0	85.3	-
0045	3	3	0	0	76.5	-
0100	6	4	2	0	87.4	-
0115	2	2	0	0	90.1	-
0130	6	5	1	0	80.4	-
0145	6	6	0	0	91.9	-
0200	3	2	0	1	81.7	-
0215	3	2	1	0	85.8	-
0230	2	2	0	0	83.8	-
0245	3	2	1	0	79.5	-
0300	1	0	1	0	87	-
0315	2	1	1	0	87.6	-
0330	0	0	0	0	-	-
0345	10	7	3	0	86.4	-
0400	2	0	2	0	95.9	-
0415	4	4	0	0	87.9	-
0430	8	6	1	1	88.1	-
0445	13	9	4	0	82.7	92.8
0500	9	7	2	0	80.8	-
0515	11	10	1	0	84.8	93.3
0530	20	15	5	0	87.4	99.6
0545	44	34	10	0	82	85.8
0600	54	29	24	1	82.9	88.3
0615	80	59	17	4	82.4	89.8
0630	99	73	26	0	84.3	89.6
0645	121	85	32	4	82.2	89.4
0700	94	69	21	4	81.5	88.9
0715	132	109	18	5	81.7	87.3
0730	145	119	25	1	82.9	87.7
0745	183	156	27	0	82.6	87.7
0800	210	195	15	0	81.6	85.9
0815	249	224	24	1	80.9	85.3
0830	211	186	25	0	80.2	85.3
0845	221	209	9	3	79.9	86.9
0900	188	174	13	1	80.7	85.7
0915	125	104	20	1	80	86.1
0930	104	87	15	2	80.8	86.2
0945	58	56	2	0	63.4	69.7
1000	115	109	3	3	64.2	70.8
1015	103	97	6	0	64.3	71
1030	126	123	3	0	63.9	72
1045	124	119	5	0	65.4	73.3
1100	133	126	5	2	66.1	73.1
1115	122	114	7	1	68.4	75.6
1130	130	123	6	1	68.4	75.1
1145	129	123	3	3	70.1	75.5
1200	141	138	3	0	67.3	74.3
1215	142	136	5	1	69.3	75.2
1230	174	169	4	1	68.1	73.6
1245	128	123	5	0	70	76.3
1300	151	147	4	0	68.2	75.2
1315	135	132	2	1	69.4	74.5
1330	162	159	1	2	68.5	74.2
1345	170	161	9	0	69.8	76.5
1400	172	160	12	0	69	75.2
1415	160	155	5	0	67.2	74.3
1430	205	199	5	1	64.6	70.4
1445	205	200	5	0	67.3	73.6
1500	180	175	5	0	68.2	73.3
1515	239	235	4	0	65.1	70.7
1530	268	261	7	0	64.4	69.8
1545	260	252	8	0	67.1	73.6
1600	245	242	3	0	64.5	72.4
1615	223	220	3	0	67.4	73.4
1630	239	236	3	0	67	73.3
1645	234	232	2	0	65.7	72
1700	225	221	3	1	66.7	73.3
1715	254	253	1	0	66.2	71.5
1730	216	215	1	0	66.3	71.8
1745	242	241	1	0	65.3	71.1
1800	172	171	1	0	68.7	73.4
1815	156	156	0	0	65.9	71.6
1830	123	121	2	0	68.7	74.7
1845	104	104	0	0	69.2	75.8
1900	89	88	1	0	71.5	78.8
1915	74	74	0	0	70.3	76.8
1930	90	87	2	1	70.3	75.7
1945	75	73	2	0	70.4	76.8
2000	70	69	1	0	69.6	75.3
2015	57	57	0	0	71.8	80.2
2030	55	55	0	0	72.6	80.7
2045	49	49	0	0	70.1	77
2100	48	47	1	0	67.1	71.5
2115	46	46	0	0	70	75.4
2130	44	43	1	0	70.2	77.8
2145	33	32	1	0	71.1	76.7
2200	24	23	0	1	68.7	78.5
2215	23	23	0	0	71.1	78.3
2230	19	19	0	0	69.2	78.8
2245	19	19	0	0	71.5	81
2300	16	16	0	0	75.3	83.2
2315	19	19	0	0	74.7	85.9
2330	18	18	0	0	73.6	83.2
2345	8	8	0	0	73	-
07-09	1445	1267	164	14	81.3	86.6
09-16	4349	4157	172	20	68.4	76
16-18	1878	1860	17	1	66.1	72.4
00-00	9637	9088	501	48	70.9	81.2

## Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Southbound



Friday, 1 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	6	6	0	0	73.8	-
0015	3	3	0	0	65	-
0030	3	3	0	0	72.8	-
0045	3	3	0	0	70.7	-
0100	7	7	0	0	68.7	-
0115	3	3	0	0	78.3	-
0130	1	1	0	0	62.1	-
0145	3	3	0	0	66.1	-
0200	5	5	0	0	77.8	-
0215	3	3	0	0	81.2	-
0230	3	3	0	0	65.7	-
0245	3	3	0	0	81.7	-
0300	4	4	0	0	63.4	-
0315	3	3	0	0	73.1	-
0330	4	3	1	0	74.6	-
0345	7	5	2	0	81	-
0400	4	4	0	0	75.2	-
0415	2	2	0	0	79	-
0430	5	5	0	0	74.4	-
0445	11	11	0	0	73.3	81.4
0500	11	10	1	0	67.1	77.4
0515	23	22	1	0	73	84.1
0530	20	19	1	0	74.4	80.1
0545	41	37	3	1	73	78.6
0600	54	51	3	0	73.1	79.9
0615	87	82	3	2	71.1	77.7
0630	102	95	6	1	69.7	77.2
0645	131	120	8	3	68.3	76
0700	95	89	6	0	70.5	78
0715	106	97	9	0	69.8	76.7
0730	128	121	7	0	69.8	76.3
0745	178	169	8	1	67.5	74
0800	171	166	5	0	67.6	74.1
0815	213	206	7	0	57	70.9
0830	179	170	7	2	28.7	33.8
0845	212	199	12	1	27.5	38.3
0900	193	184	9	0	41.2	63.7
0915	127	122	5	0	59.5	68.3
0930	132	121	8	3	53.6	65.7
0945	116	108	8	0	53	68.6
1000	119	113	6	0	64.1	70.4
1015	142	132	10	0	54.6	68.8
1030	119	114	5	0	16.7	26.3
1045	167	153	12	2	21.1	36.6
1100	142	131	9	2	58.4	64.4
1115	121	116	5	0	60.7	67.1
1130	125	122	2	1	68	73.8
1145	146	143	3	0	70.4	75.8
1200	156	150	6	0	68.5	74.3
1215	168	157	9	2	67	74.6
1230	162	154	8	0	70.2	76.1
1245	145	140	5	0	68.3	74.2
1300	157	147	8	2	68.4	74.2
1315	148	144	4	0	67.2	74.1
1330	174	168	4	2	68.5	74.5
1345	206	199	7	0	66.1	73.8
1400	189	174	15	0	66.6	73.4
1415	176	169	7	0	67.5	72.5
1430	234	229	5	0	66.6	72.9
1445	218	213	5	0	67.6	72.4
1500	208	202	5	1	66.6	72.2
1515	249	244	5	0	66.9	71.7
1530	272	266	6	0	65.3	70.7
1545	240	234	6	0	68.1	74.2
1600	264	261	3	0	67.9	73.1
1615	252	247	5	0	68.1	73.6
1630	234	230	3	1	67.3	74.2
1645	247	246	1	0	68.2	73.8
1700	248	245	3	0	67.5	73.2
1715	214	211	2	1	65.2	71.4
1730	230	229	1	0	65.7	72.2
1745	209	209	0	0	66.7	71.9
1800	154	152	1	1	68	74.5
1815	133	132	1	0	67.7	73.8
1830	145	142	3	0	67.3	72.9
1845	124	124	0	0	71.4	76.6
1900	66	63	1	2	70.7	77.6
1915	77	75	2	0	70.2	77.5
1930	77	75	2	0	69.4	75.6
1945	64	63	0	1	69.3	75.2
2000	44	44	0	0	70.6	77.1
2015	60	60	0	0	67.3	76.6
2030	52	52	0	0	72.1	80
2045	64	63	1	0	69.6	75.7
2100	59	59	0	0	67.5	74.3
2115	34	34	0	0	71.6	78.5
2130	56	56	0	0	69.3	77.7
2145	35	35	0	0	70.9	78
2200	40	39	0	1	68.8	77
2215	25	25	0	0	76.9	83.4
2230	29	29	0	0	73.2	80.9
2245	35	35	0	0	68.3	75.3
2300	24	24	0	0	68.9	77
2315	24	24	0	0	69.2	78.8
2330	13	13	0	0	70.8	83.7
2345	18	17	1	0	73.7	82.7
07-09	1282	1217	61	4	54.4	72.9
09-16	4751	4549	187	15	61.6	72.5
16-18	1898	1878	18	2	67.1	73.1
00-00	9935	9595	307	33	63.4	73.8

## Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Southbound



Saturday, 2 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	17	17	0	0	73.1	80.1
0015	10	10	0	0	71.2	-
0030	10	10	0	0	71.1	-
0045	7	7	0	0	67.9	-
0100	9	9	0	0	74.1	-
0115	6	5	1	0	78.4	-
0130	6	6	0	0	75.3	-
0145	1	0	1	0	62.7	-
0200	5	5	0	0	70.3	-
0215	9	9	0	0	73.6	-
0230	7	6	1	0	64	-
0245	1	1	0	0	83.3	-
0300	6	5	1	0	74.9	-
0315	4	4	0	0	76.1	-
0330	7	7	0	0	74.5	-
0345	7	5	2	0	73.8	-
0400	4	4	0	0	79.1	-
0415	10	8	2	0	72.5	-
0430	8	8	0	0	67.8	-
0445	14	13	1	0	75.6	80.8
0500	16	16	0	0	72.5	80.8
0515	16	16	0	0	74.7	78.6
0530	26	25	0	1	72.7	82
0545	33	33	0	0	74.4	81.4
0600	24	24	0	0	74.2	79.7
0615	37	36	1	0	71.8	80.3
0630	49	46	3	0	73.3	79.8
0645	62	59	3	0	71.6	78.1
0700	60	58	2	0	73.3	82.8
0715	62	61	0	1	72.3	77.3
0730	92	90	2	0	71.5	77.9
0745	122	119	3	0	71.3	79.2
0800	88	88	0	0	72.8	79.2
0815	119	116	3	0	69.1	76.5
0830	119	117	2	0	69.7	76.3
0845	130	128	2	0	69.2	77.2
0900	123	119	3	1	69.7	77.3
0915	123	121	2	0	71.3	77.5
0930	153	151	2	0	69.9	76.1
0945	148	147	1	0	69.7	76.1
1000	139	135	3	1	70.2	75.1
1015	145	143	1	1	69.2	75.1
1030	160	157	3	0	69.6	75
1045	169	167	2	0	69.7	75.7
1100	135	134	1	0	70.5	76.2
1115	172	172	0	0	68.9	75.3
1130	174	171	3	0	68	73
1145	192	190	1	1	67.7	74.5
1200	191	188	2	1	66	72.8
1215	185	184	1	0	67.7	76.4
1230	180	177	3	0	67.5	74.3
1245	187	185	2	0	67.4	72.7
1300	167	165	2	0	70.6	76
1315	149	148	1	0	70.3	75.9
1330	170	169	1	0	69.3	76.3
1345	175	173	2	0	69.9	74.6
1400	171	167	4	0	69.5	74.5
1415	175	173	0	2	67.9	75.3
1430	166	164	2	0	69.9	75.2
1445	165	164	1	0	67.8	73.8
1500	150	148	2	0	68.9	75.8
1515	172	172	0	0	69.7	74.7
1530	168	165	2	1	70.1	77.2
1545	173	173	0	0	68.9	75.2
1600	133	132	1	0	69.2	76.5
1615	161	159	2	0	67.8	73.7
1630	144	143	1	0	68.1	75.9
1645	152	149	3	0	69.7	76
1700	138	135	3	0	69.9	76
1715	117	116	1	0	65.6	72.4
1730	120	119	0	1	67.1	73.2
1745	87	87	0	0	68	73.5
1800	77	76	1	0	68.5	73.6
1815	89	87	2	0	69.1	74.6
1830	78	78	0	0	69.3	74.3
1845	64	64	0	0	70.4	76.7
1900	49	49	0	0	70.8	79
1915	45	45	0	0	70.6	79.1
1930	59	59	0	0	70.9	77.2
1945	60	59	1	0	70.4	79.6
2000	58	58	0	0	70.4	75.7
2015	50	47	3	0	70.8	78.8
2030	53	53	0	0	70.6	79.7
2045	43	43	0	0	70.1	79.1
2100	47	47	0	0	70	76.5
2115	36	35	1	0	69.5	75.6
2130	38	38	0	0	71.3	78.2
2145	46	45	1	0	71.3	78.4
2200	40	38	2	0	69.1	75.3
2215	29	29	0	0	71.8	81.3
2230	37	36	0	1	72.3	79.7
2245	38	38	0	0	68.4	74.3
2300	31	30	1	0	69.4	75.6
2315	32	30	2	0	66.9	76.7
2330	29	29	0	0	67.1	75.2
2345	20	20	0	0	71.9	77.3
07-09	792	777	14	1	70.8	78.1
09-16	4577	4522	47	8	69	75.2
16-18	1052	1040	11	1	68.3	74.7
00-00	7980	7866	102	12	69.4	76

# Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Southbound



Sunday, 3 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	13	13	0	0	72.4	81.3
0015	13	13	0	0	72.9	83
0030	11	11	0	0	73.6	80.6
0045	11	11	0	0	75.7	84.1
0100	6	6	0	0	68.6	-
0115	4	4	0	0	81.5	-
0130	8	8	0	0	72.5	-
0145	4	4	0	0	70.1	-
0200	8	8	0	0	75.4	-
0215	5	5	0	0	76.1	-
0230	5	5	0	0	73.8	-
0245	8	7	1	0	75.1	-
0300	7	6	1	0	75.6	-
0315	2	2	0	0	82.5	-
0330	12	12	0	0	77.4	86.6
0345	4	3	1	0	66.9	-
0400	5	5	0	0	74.1	-
0415	5	5	0	0	80.7	-
0430	5	5	0	0	76.7	-
0445	6	6	0	0	70.5	-
0500	9	9	0	0	74.4	-
0515	11	11	0	0	74	88
0530	20	20	0	0	73.8	82.8
0545	21	21	0	0	70.3	77.3
0600	28	27	1	0	73.8	81.6
0615	21	20	0	1	73.2	80.4
0630	22	21	1	0	73.3	80.8
0645	44	42	2	0	71.9	80.5
0700	30	29	1	0	72.7	80
0715	44	44	0	0	72.3	79.2
0730	58	57	1	0	71.1	79.2
0745	71	70	1	0	70.2	76.5
0800	63	61	2	0	71.6	79.4
0815	81	79	2	0	71.2	78
0830	76	75	1	0	69.5	75.2
0845	90	89	1	0	69.7	75
0900	99	99	0	0	69	75.6
0915	99	99	0	0	71.5	77
0930	124	123	1	0	69.1	75.2
0945	109	108	1	0	69.4	76.7
1000	122	121	1	0	68.8	73.8
1015	110	110	0	0	69	76.4
1030	132	130	2	0	69.9	77.2
1045	165	163	2	0	69.7	76.2
1100	179	175	3	1	67.6	74.9
1115	159	157	2	0	67	73.3
1130	155	153	2	0	68.3	74.1
1145	166	164	1	1	68.9	74.7
1200	195	194	1	0	69	74.3
1215	162	160	1	1	68	74.6
1230	183	181	2	0	67.8	74.2
1245	175	175	0	0	69.2	75.4
1300	150	149	1	0	69.5	75.3
1315	107	107	0	0	69	75.2
1330	139	136	3	0	70.5	77
1345	153	153	0	0	70.4	75.6
1400	171	168	3	0	68	74.6
1415	147	144	1	2	69.1	74.7
1430	124	123	1	0	69	74.7
1445	124	124	0	0	67.9	74.7
1500	121	120	1	0	69.3	73.6
1515	150	150	0	0	67.2	74
1530	138	137	1	0	69.4	74.7
1545	152	151	1	0	68.2	74.5
1600	131	129	1	1	68.5	73.7
1615	138	138	0	0	68.8	74.9
1630	138	135	3	0	68.2	74.3
1645	115	113	2	0	68.9	74.6
1700	112	112	0	0	70.2	78.5
1715	99	99	0	0	69.4	75.4
1730	82	80	2	0	67.7	75.4
1745	88	88	0	0	68.7	76.9
1800	62	62	0	0	70.9	75.5
1815	75	72	3	0	69.6	77
1830	57	57	0	0	72	78.7
1845	43	43	0	0	71.5	79.1
1900	31	31	0	0	69.7	75.9
1915	38	37	1	0	72.8	78.8
1930	34	34	0	0	71.3	77.9
1945	38	38	0	0	72.4	81
2000	29	28	0	1	70.8	81.4
2015	34	34	0	0	72.5	78.2
2030	32	31	1	0	70.1	78.3
2045	29	29	0	0	72.4	80
2100	22	21	0	1	68.3	73.6
2115	25	25	0	0	71.8	79.3
2130	24	24	0	0	73.7	80.2
2145	11	11	0	0	75.2	87.5
2200	20	20	0	0	71.7	79.2
2215	22	22	0	0	70.7	80
2230	16	16	0	0	74.7	80.6
2245	16	15	1	0	69.8	84.7
2300	11	9	2	0	71.6	83.4
2315	3	3	0	0	77.6	-
2330	12	12	0	0	63.9	72.6
2345	4	4	0	0	76.8	-
07-09	513	504	9	0	70.8	77
09-16	4010	3974	31	5	68.8	74.9
16-18	903	894	8	1	68.8	75.2
00-00	6432	6360	63	9	69.5	75.8



## Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Southbound



Monday, 4 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	9	9	0	0	68.9	-
0015	9	9	0	0	71	-
0030	5	5	0	0	71.9	-
0045	8	8	0	0	70.6	-
0100	1	1	0	0	85.9	-
0115	3	2	1	0	74.6	-
0130	1	1	0	0	66.5	-
0145	3	2	1	0	75.2	-
0200	2	2	0	0	78.7	-
0215	4	4	0	0	77.2	-
0230	3	3	0	0	83	-
0245	2	2	0	0	75.5	-
0300	4	3	1	0	71.1	-
0315	1	0	1	0	61.1	-
0330	3	2	1	0	76.4	-
0345	4	3	1	0	75.2	-
0400	5	5	0	0	74.4	-
0415	4	4	0	0	76.1	-
0430	10	10	0	0	73	-
0445	12	12	0	0	74.7	87.9
0500	15	14	0	1	74.4	85.4
0515	23	19	4	0	68.4	73.3
0530	23	20	2	1	72	81.7
0545	39	35	4	0	72.9	77.8
0600	50	49	1	0	71.3	76.7
0615	94	91	1	2	74.1	81
0630	102	96	5	1	70.2	76.9
0645	141	130	11	0	68.6	75.4
0700	107	99	8	0	70.8	77
0715	117	106	10	1	70.7	77.2
0730	133	126	7	0	67.9	74.1
0745	139	135	2	2	70.7	75.4
0800	170	164	6	0	66.6	72.2
0815	183	178	5	0	67.2	73.3
0830	198	191	7	0	65.9	72.4
0845	199	198	1	0	66.1	72.9
0900	163	157	5	1	69.5	74.7
0915	152	146	6	0	66.9	73.1
0930	119	112	7	0	70.7	76.1
0945	127	121	6	0	68.3	74.9
1000	131	124	7	0	68.2	75.3
1015	129	122	6	1	68.3	74.5
1030	118	110	8	0	68.1	74.9
1045	124	119	4	1	70.2	76.3
1100	125	124	1	0	68.7	76
1115	129	123	6	0	67.3	75.2
1130	126	117	8	1	69.3	75.4
1145	133	126	7	0	68.5	74.5
1200	140	129	9	2	66.8	73.9
1215	135	128	6	1	68.3	76
1230	147	140	7	0	66.1	72.3
1245	142	135	5	2	67.7	73.3
1300	145	138	7	0	67.1	74.2
1315	149	143	6	0	67.7	73.7
1330	144	136	7	1	68.3	74.2
1345	124	120	4	0	68.4	74.3
1400	147	137	9	1	68.2	74.7
1415	139	129	10	0	69.3	75.8
1430	167	162	5	0	67.9	73.4
1445	164	161	3	0	67.9	74.9
1500	178	173	4	1	67.6	73.3
1515	219	214	5	0	66.7	72.7
1530	265	258	6	1	66.6	73.4
1545	196	190	6	0	68	73.9
1600	232	227	5	0	66.8	72.4
1615	266	261	4	1	65	72
1630	239	235	4	0	64	70.7
1645	228	228	0	0	66.7	72.7
1700	214	212	1	1	65.9	71.4
1715	275	273	2	0	62.9	69.1
1730	190	186	4	0	64.8	71.2
1745	195	193	2	0	64.9	71.4
1800	148	146	1	1	67.6	74.1
1815	148	146	2	0	69.7	76
1830	100	99	1	0	69.4	75.2
1845	68	67	1	0	69.1	77.2
1900	66	66	0	0	73	78.3
1915	75	74	1	0	69.7	76.4
1930	52	50	1	1	72	78.1
1945	68	68	0	0	73.2	80.5
2000	47	47	0	0	69.7	76.6
2015	39	39	0	0	68.5	76.1
2030	53	53	0	0	71.6	77.5
2045	40	40	0	0	71.7	77.8
2100	35	35	0	0	71.9	81
2115	30	30	0	0	69.5	77.5
2130	28	27	1	0	75.2	84.2
2145	31	31	0	0	72.5	82.7
2200	28	28	0	0	74.3	79.8
2215	19	19	0	0	74.8	83.9
2230	13	13	0	0	70.8	81.1
2245	6	6	0	0	77.5	-
2300	7	7	0	0	69.5	-
2315	16	16	0	0	70.4	77.7
2330	3	3	0	0	80.5	-
2345	4	4	0	0	72.3	-
07-09	1246	1197	46	3	67.8	74.2
09-16	4177	3994	170	13	68	74.3
16-18	1839	1815	22	2	65.1	71.5
00-00	8966	8661	280	25	67.9	74.5

## Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Southbound



Tuesday, 5 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	9	9	0	0	71.8	-
0015	1	1	0	0	54.7	-
0030	2	2	0	0	58.7	-
0045	4	3	1	0	76.2	-
0100	2	2	0	0	69.1	-
0115	1	1	0	0	76.4	-
0130	2	2	0	0	53.6	-
0145	4	4	0	0	77.2	-
0200	1	1	0	0	86.3	-
0215	4	4	0	0	78.6	-
0230	3	3	0	0	71.2	-
0245	2	2	0	0	86.3	-
0300	1	1	0	0	79.5	-
0315	3	2	1	0	68.9	-
0330	2	2	0	0	76.5	-
0345	8	7	1	0	75.3	-
0400	2	2	0	0	71.9	-
0415	11	9	2	0	77.3	83.1
0430	4	3	0	1	68.3	-
0445	9	8	0	1	67.6	-
0500	6	6	0	0	71.7	-
0515	19	18	1	0	73.9	80.6
0530	22	20	2	0	74.7	82.6
0545	35	33	1	1	72.6	78.9
0600	56	54	1	1	71.5	78.8
0615	78	74	3	1	71.3	77.1
0630	111	106	3	2	72.1	78.3
0645	145	134	11	0	69	76
0700	111	99	11	1	70.4	76.6
0715	129	120	8	1	69.8	73.9
0730	136	131	4	1	69.2	74.3
0745	161	158	3	0	69.1	73.7
0800	175	167	7	1	67.9	74
0815	165	158	5	2	66.2	73.4
0830	195	186	6	3	66.3	72.9
0845	205	197	8	0	66.4	72.9
0900	157	153	4	0	69.9	74.7
0915	155	152	2	1	69.3	74.9
0930	122	113	8	1	67.8	74
0945	140	138	2	0	68.4	75.5
1000	113	107	5	1	68.8	75
1015	131	127	4	0	68.9	75.1
1030	127	116	9	2	67.9	73.6
1045	94	89	4	1	67.9	75.8
1100	138	129	8	1	68.6	74.4
1115	137	129	8	0	68.3	73.4
1130	129	125	2	2	69.1	76.7
1145	129	122	5	2	69.5	76
1200	117	110	7	0	69.9	75.8
1215	140	137	3	0	69.8	76.3
1230	112	107	5	0	66.7	74.2
1245	143	134	7	2	68.8	75
1300	121	112	9	0	69.4	75.1
1315	142	137	4	1	68	74.4
1330	135	129	5	1	67.6	74.2
1345	154	150	3	1	68.3	75.2
1400	130	126	3	1	67.1	73.2
1415	148	140	8	0	67	74.3
1430	206	199	7	0	67.2	74.2
1445	174	170	3	1	67	72.2
1500	192	188	4	0	65.7	72.2
1515	221	215	6	0	66.8	72.5
1530	265	256	8	1	65	71.3
1545	242	238	4	0	66.6	72.1
1600	227	222	4	1	67.6	73.6
1615	263	258	5	0	64.7	73
1630	254	252	2	0	66.4	72.1
1645	253	250	3	0	66.5	74
1700	269	268	0	1	64.6	70.3
1715	230	228	1	1	65.5	71.6
1730	189	185	3	1	65.6	71.4
1745	224	217	7	0	66.9	73.1
1800	168	165	3	0	68.5	75.1
1815	115	115	0	0	67.6	73.3
1830	107	105	2	0	68.1	76.5
1845	91	89	1	1	69.1	75.5
1900	68	67	1	0	69.7	76.9
1915	48	48	0	0	71.5	77.3
1930	65	65	0	0	69.8	76.5
1945	69	68	1	0	68.4	75.9
2000	41	41	0	0	71.4	77.4
2015	63	62	1	0	69.4	75.1
2030	49	49	0	0	68.4	80.2
2045	46	46	0	0	70.2	75.2
2100	40	40	0	0	69.2	73.7
2115	32	32	0	0	71.2	77.8
2130	27	27	0	0	74.1	83.6
2145	22	21	0	1	67	77.2
2200	22	22	0	0	75.4	81.5
2215	12	12	0	0	70.5	80
2230	18	17	1	0	77.1	84
2245	10	10	0	0	68.5	-
2300	4	4	0	0	71.2	-
2315	8	7	1	0	72.2	-
2330	3	2	1	0	70	-
2345	2	2	0	0	72.7	-
07-09	1277	1216	52	9	67.9	73.8
09-16	4214	4048	147	19	67.8	74.2
16-18	1909	1880	25	4	65.9	72.4
00-00	9077	8773	263	41	67.9	74.3

## Tweed Coast Automatic Report

Site Name - #1 Tweed Coast Rd  
Description - north of Cudgen Rd  
Direction - Southbound



Wednesday, 6 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	8	8	0	0	69	-
0015	9	9	0	0	73.7	-
0030	4	4	0	0	71.3	-
0045	2	2	0	0	66.3	-
0100	1	1	0	0	74.9	-
0115	1	1	0	0	71	-
0130	3	3	0	0	63.5	-
0145	2	1	1	0	70.3	-
0200	2	1	1	0	82.8	-
0215	3	3	0	0	72.5	-
0230	2	2	0	0	80.7	-
0245	5	4	1	0	76	-
0300	2	2	0	0	76.8	-
0315	2	2	0	0	78.3	-
0330	1	0	1	0	76.3	-
0345	7	6	1	0	78.6	-
0400	1	1	0	0	75	-
0415	4	4	0	0	77.3	-
0430	10	9	1	0	76.7	-
0445	10	9	1	0	71.6	-
0500	12	12	0	0	66.8	76.5
0515	14	14	0	0	72.8	79.5
0530	23	22	1	0	73.2	80.4
0545	37	32	4	1	71	79.3
0600	50	44	5	1	68.3	74.6
0615	69	67	2	0	71.1	76.2
0630	126	118	8	0	68.3	75
0645	142	136	6	0	69.8	76.1
0700	99	95	4	0	71.1	79.4
0715	114	101	12	1	70.8	76.5
0730	130	124	6	0	69.7	74.4
0745	188	178	9	1	68.3	74.7
0800	145	138	7	0	68.2	73.8
0815	206	198	6	2	66.4	71.3
0830	190	186	4	0	68.1	73.1
0845	182	179	3	0	69.5	75.2
0900	153	146	7	0	69.1	74.1
0915	160	156	4	0	67.9	73.2
0930	111	110	1	0	71.3	76.7
0945	110	108	2	0	68.5	75.5
1000	127	123	4	0	69.6	75
1015	106	95	11	0	70	76
1030	97	96	1	0	68.6	73.7
1045	147	136	9	2	67.9	74.8
1100	102	95	6	1	69.1	74.3
1115	123	119	4	0	68.3	74.8
1130	129	125	4	0	69.7	74.7
1145	132	129	3	0	67.9	74.3
1200	154	145	9	0	66.5	73.2
1215	133	127	6	0	69.5	75.2
1230	154	150	4	0	68.3	73.6
1245	130	125	5	0	68.8	75.4
1300	134	127	7	0	68.4	75.4
1315	136	133	3	0	68.5	74.5
1330	143	136	6	1	68.9	74.3
1345	150	147	3	0	68	73.6
1400	145	134	10	1	68.4	76.2
1415	126	123	3	0	69.4	76.1
1430	193	184	8	1	64.4	70.7
1445	214	208	5	1	67.8	73
1500	189	185	3	1	66.4	71.9
1515	220	214	6	0	66.7	71.8
1530	236	230	6	0	65.6	71.4
1545	239	231	7	1	65.6	71.8
1600	247	240	6	1	63.8	70.4
1615	229	224	5	0	65.3	70.7
1630	228	227	1	0	66.9	72.4
1645	259	254	5	0	64.5	70.9
1700	260	257	3	0	61.7	69.5
1715	270	265	5	0	62.4	69.1
1730	208	208	0	0	66	71.2
1745	186	182	4	0	66.5	71.5
1800	143	142	1	0	63.7	69.3
1815	131	130	1	0	62.9	69.9
1830	120	120	0	0	64.2	69.9
1845	91	91	0	0	67.4	73.8
1900	73	72	1	0	67.7	74.5
1915	54	53	1	0	67.8	75.8
1930	56	56	0	0	67.7	74
1945	54	54	0	0	67.7	73.8
2000	40	38	2	0	70.7	77.9
2015	25	25	0	0	71.6	76
2030	34	34	0	0	70	76.6
2045	33	31	2	0	72	78.4
2100	21	21	0	0	67.4	76
2115	37	35	1	1	70.7	76.2
2130	21	19	2	0	69.1	77.5
2145	21	21	0	0	70.3	78.8
2200	17	17	0	0	70.9	81.5
2215	29	29	0	0	71.4	75
2230	32	31	1	0	71.8	78.1
2245	28	28	0	0	70	77
2300	15	14	1	0	65.7	75.3
2315	12	12	0	0	66.3	75.6
2330	16	15	1	0	71.2	80.9
2345	4	4	0	0	82.5	-
07-09	1254	1199	51	4	68.7	74.7
09-16	4193	4037	147	9	67.9	74
16-18	1887	1857	29	1	64.5	70.9
00-00	8993	8702	274	17	67.3	74

## Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Eastbound



Thursday, 31 May 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	1	1	0	0	57.5	-
0015	3	2	1	0	71.5	-
0030	3	3	0	0	65.3	-
0045	0	0	0	0	-	-
0100	2	2	0	0	74.1	-
0115	0	0	0	0	-	-
0130	3	3	0	0	55.1	-
0145	2	2	0	0	71.2	-
0200	0	0	0	0	-	-
0215	3	2	1	0	70.7	-
0230	1	1	0	0	53.8	-
0245	2	2	0	0	53.1	-
0300	1	0	1	0	56.5	-
0315	0	0	0	0	-	-
0330	1	1	0	0	63.6	-
0345	6	4	2	0	67.8	-
0400	2	2	0	0	64	-
0415	5	4	1	0	69.7	-
0430	5	4	1	0	61.8	-
0445	10	10	0	0	63.4	-
0500	5	4	1	0	64.8	-
0515	10	10	0	0	62	-
0530	11	10	1	0	60.2	68.3
0545	34	30	4	0	65.1	72.1
0600	16	11	5	0	62.6	68.3
0615	45	43	1	1	60.2	67.7
0630	46	40	6	0	63	69.1
0645	69	62	7	0	61.7	68.8
0700	61	58	1	2	60.9	65.9
0715	87	83	4	0	60.8	65.3
0730	99	94	5	0	61.2	66.2
0745	158	147	11	0	57.9	62.3
0800	169	159	10	0	57.4	62.8
0815	252	232	20	0	53.6	60.7
0830	218	210	8	0	58.2	62.6
0845	224	212	12	0	59.1	63.9
0900	182	177	5	0	59.4	63.5
0915	123	118	4	1	60.4	64.5
0930	96	89	7	0	60.8	66.9
0945	103	94	9	0	59.9	65.2
1000	99	95	4	0	60.3	64.1
1015	73	64	9	0	61.4	65.7
1030	87	80	7	0	61.2	69.2
1045	106	102	4	0	59.9	65.5
1100	83	76	7	0	61.4	66.1
1115	78	71	7	0	60.4	65.4
1130	91	84	6	1	59.7	66.6
1145	93	84	8	1	60.5	64.4
1200	107	98	8	1	61.1	66.4
1215	89	81	8	0	60.4	67
1230	101	93	8	0	59.4	65.5
1245	83	80	2	1	62	67.7
1300	99	92	7	0	60.3	66.4
1315	90	84	6	0	61.9	67
1330	86	79	6	1	59.4	65.5
1345	114	107	7	0	60.9	67.4
1400	102	91	11	0	59.7	67.2
1415	112	101	11	0	60.7	67.1
1430	117	110	7	0	60.9	66.4
1445	150	143	6	1	59	66.1
1500	145	135	10	0	56.8	63.9
1515	160	149	11	0	60.1	66.1
1530	155	141	13	1	59.1	65.1
1545	143	136	7	0	61.9	69.5
1600	126	119	6	1	62.6	67.5
1615	128	122	6	0	63.3	67.3
1630	142	133	9	0	62.3	68.3
1645	136	127	9	0	59.3	66
1700	99	92	7	0	62.3	66.6
1715	116	107	9	0	62.3	65.7
1730	91	84	7	0	61.3	66.6
1745	107	102	5	0	61	66.4
1800	71	63	8	0	61.1	67.8
1815	75	64	11	0	61.8	65.5
1830	64	57	7	0	63.4	69.2
1845	36	35	1	0	62.1	67.4
1900	33	32	1	0	62.8	67.5
1915	37	31	6	0	60.6	70
1930	30	27	3	0	63.2	68.8
1945	33	31	2	0	64.3	71.8
2000	35	34	1	0	64	66.6
2015	29	28	1	0	64.5	69.4
2030	23	23	0	0	64.2	71.1
2045	24	22	2	0	61.3	64.3
2100	23	22	1	0	66.1	73.1
2115	24	23	1	0	62.7	66.3
2130	23	22	1	0	61.5	65.2
2145	9	9	0	0	61.7	-
2200	12	12	0	0	61.1	66.3
2215	8	8	0	0	57.1	-
2230	5	5	0	0	66.2	-
2245	11	11	0	0	64.6	74.3
2300	6	6	0	0	59.5	-
2315	6	6	0	0	67.1	-
2330	8	8	0	0	64.5	-
2345	3	3	0	0	67.5	-
07-09	1268	1195	71	2	57.8	63.4
09-16	3067	2854	205	8	60.2	66.1
16-18	945	886	58	1	61.8	66.6
00-00	6194	5770	412	12	60.3	66.1

## Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Eastbound



Friday, 1 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	2	2	0	0	53	-
0015	1	1	0	0	62.5	-
0030	0	0	0	0	-	-
0045	1	1	0	0	64.3	-
0100	1	1	0	0	62.7	-
0115	3	3	0	0	60	-
0130	0	0	0	0	-	-
0145	2	2	0	0	68.8	-
0200	2	2	0	0	60.6	-
0215	3	3	0	0	52.6	-
0230	2	2	0	0	63	-
0245	1	1	0	0	63.4	-
0300	4	4	0	0	57.4	-
0315	2	2	0	0	66	-
0330	3	1	2	0	65.4	-
0345	4	4	0	0	65.8	-
0400	4	4	0	0	66.2	-
0415	2	1	1	0	65.3	-
0430	7	5	2	0	63.9	-
0445	12	12	0	0	63.5	69.1
0500	5	4	1	0	65.2	-
0515	13	12	1	0	61.5	65.4
0530	15	15	0	0	66.7	74.7
0545	18	16	2	0	66.2	74.9
0600	21	17	3	1	62.9	67.7
0615	40	39	1	0	61.9	66.2
0630	47	45	2	0	64.5	71.1
0645	60	54	6	0	62.8	68.9
0700	51	47	4	0	61	67
0715	60	57	2	1	60.4	67.2
0730	110	97	12	1	58.6	64.8
0745	151	143	8	0	59.4	64.4
0800	167	157	10	0	59.1	64.1
0815	209	195	14	0	59.4	63.9
0830	229	216	13	0	57.4	62.4
0845	202	192	9	1	58	62.5
0900	181	173	8	0	58.5	63.8
0915	115	110	5	0	59.7	64.2
0930	92	88	4	0	61.6	66.1
0945	86	73	13	0	62.3	68.2
1000	97	93	4	0	61.1	66.7
1015	91	84	7	0	58.9	65.2
1030	96	88	8	0	61.7	67
1045	103	99	4	0	59.6	64.9
1100	103	97	6	0	58.2	65.2
1115	98	93	5	0	58.1	62.7
1130	76	73	3	0	55.3	64.8
1145	102	96	5	1	61.6	66.8
1200	124	113	10	1	60.3	65.6
1215	101	98	3	0	59.7	66.2
1230	106	99	7	0	61	65.5
1245	103	98	4	1	62.3	68.3
1300	110	102	6	2	60.4	65
1315	98	93	5	0	60.2	65.4
1330	92	86	6	0	61.4	67.3
1345	113	105	8	0	58.6	64.8
1400	109	98	11	0	60.9	67.8
1415	111	109	2	0	59.8	66.8
1430	128	118	9	1	60	66.2
1445	137	127	10	0	59.9	65.3
1500	157	147	10	0	56.5	64.1
1515	158	152	5	1	59.4	64.3
1530	148	136	12	0	60.3	67.1
1545	129	120	9	0	62.2	66.9
1600	124	117	7	0	62.5	68.1
1615	130	119	10	1	61.3	67.5
1630	124	118	6	0	62	68.4
1645	127	125	2	0	60.2	64.8
1700	108	96	12	0	61.7	67.6
1715	108	98	9	1	62	68.1
1730	130	125	4	1	62.3	68.6
1745	106	98	8	0	61.8	67.7
1800	80	74	6	0	62.5	67.7
1815	60	53	7	0	64.1	70.2
1830	61	57	4	0	63.3	67.8
1845	58	53	5	0	64	68.1
1900	39	37	2	0	64.2	70.2
1915	39	36	3	0	64.6	73.4
1930	30	26	4	0	66.2	72.4
1945	28	28	0	0	62.6	69.4
2000	25	24	1	0	65.4	69
2015	25	24	1	0	58.5	66.8
2030	14	12	2	0	62.4	68.4
2045	29	25	4	0	62.8	66.5
2100	31	28	3	0	62.9	67.7
2115	18	17	1	0	64.5	68.8
2130	26	26	0	0	63.7	67.8
2145	20	20	0	0	64.2	70.9
2200	12	10	1	1	60.3	66.2
2215	12	11	1	0	66.8	71.9
2230	18	18	0	0	62	69.7
2245	14	14	0	0	64.8	75.5
2300	12	12	0	0	64.8	69.8
2315	19	19	0	0	66.7	72.7
2330	1	1	0	0	62.5	-
2345	12	12	0	0	66.5	77.2
07-09	1179	1104	72	3	58.8	64.1
09-16	3164	2968	189	7	59.9	65.9
16-18	957	896	58	3	61.7	67.5
00-00	6258	5858	385	15	60.5	66.4

# Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Eastbound



Saturday, 2 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	3	3	0	0	62.4	-
0015	2	2	0	0	64	-
0030	7	7	0	0	62.7	-
0045	1	1	0	0	70.6	-
0100	3	3	0	0	63.6	-
0115	3	3	0	0	60	-
0130	4	4	0	0	61.6	-
0145	1	1	0	0	62.2	-
0200	5	5	0	0	63.5	-
0215	5	4	1	0	63.4	-
0230	2	1	1	0	57	-
0245	2	2	0	0	61.7	-
0300	2	1	1	0	52.3	-
0315	6	6	0	0	64.7	-
0330	4	4	0	0	61.5	-
0345	5	5	0	0	59.7	-
0400	2	2	0	0	70.7	-
0415	8	7	1	0	52.5	-
0430	4	4	0	0	61.5	-
0445	12	11	1	0	65.7	75.4
0500	6	5	1	0	66.9	-
0515	9	9	0	0	56.4	-
0530	9	6	2	1	61.7	-
0545	23	20	3	0	63.9	71.3
0600	23	21	2	0	65.2	73.4
0615	36	35	1	0	65.6	73.4
0630	25	23	2	0	62.9	69.4
0645	37	36	1	0	67.8	73.2
0700	49	44	4	1	61.1	69.9
0715	54	51	3	0	61.4	68.3
0730	75	68	7	0	61.9	68
0745	87	82	5	0	60.2	66.9
0800	70	65	5	0	61.7	68.1
0815	93	85	7	1	60.3	65
0830	96	92	4	0	62.4	66.8
0845	111	107	4	0	60.1	66.2
0900	77	72	5	0	61.5	67.8
0915	75	71	4	0	62	67.2
0930	115	109	5	1	60.5	63.8
0945	120	116	4	0	60.4	65.7
1000	89	87	2	0	61.7	67.7
1015	111	105	5	1	60.9	65.2
1030	104	98	6	0	60.9	66.8
1045	100	98	2	0	61.6	66.5
1100	96	94	2	0	60.9	66.2
1115	106	100	6	0	59.8	66.8
1130	108	101	7	0	62	68.2
1145	94	89	5	0	60.4	66.7
1200	127	124	2	1	59.4	65.6
1215	111	99	12	0	62.2	68.3
1230	105	100	5	0	61.7	66.4
1245	96	90	6	0	61.7	65.5
1300	83	76	7	0	60.6	68.1
1315	87	82	5	0	62	67.1
1330	75	73	2	0	60.9	64.7
1345	111	104	7	0	62.9	68.3
1400	86	85	1	0	65.3	71.8
1415	93	87	6	0	61.5	67.1
1430	74	74	0	0	63.1	67.4
1445	110	107	3	0	62	67
1500	83	82	1	0	63.2	68.4
1515	98	95	3	0	63.5	68.8
1530	101	93	8	0	62.9	68.3
1545	73	67	6	0	62.9	67.3
1600	85	80	5	0	62.8	69.3
1615	84	79	5	0	62.8	67.9
1630	77	72	5	0	60.6	64.3
1645	95	88	7	0	61.9	67.7
1700	80	70	10	0	59.7	64.4
1715	85	81	4	0	60.3	66.7
1730	97	89	8	0	61.9	68.3
1745	72	65	7	0	61.4	65
1800	52	47	5	0	62.7	68.4
1815	37	35	2	0	65.8	68.6
1830	31	30	1	0	63.3	69
1845	51	50	1	0	61.8	66.7
1900	26	25	1	0	64.9	72.4
1915	29	28	1	0	63.5	66.7
1930	31	28	3	0	65.5	72.8
1945	27	26	1	0	62.9	69.2
2000	27	26	1	0	62.5	67.2
2015	24	24	0	0	63.8	71.5
2030	33	33	0	0	63.6	68.2
2045	18	18	0	0	60.2	65.3
2100	25	23	2	0	62.4	67.2
2115	17	17	0	0	65.5	72
2130	13	13	0	0	63	67.8
2145	18	17	1	0	62.4	68.5
2200	17	17	0	0	62.1	70.7
2215	12	12	0	0	65.5	73.4
2230	30	30	0	0	63.6	68.4
2245	27	27	0	0	61.6	65.7
2300	14	14	0	0	62.2	72.1
2315	16	16	0	0	63.5	70.2
2330	15	15	0	0	65.7	77.5
2345	15	14	1	0	65	69.2
07-09	635	594	39	2	61.1	67
09-16	2708	2578	127	3	61.6	67.1
16-18	675	624	51	0	61.4	67
00-00	4872	4612	254	6	61.9	67.5



# Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Eastbound



Sunday, 3 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	4	4	0	0	68	-
0015	7	7	0	0	64.4	-
0030	6	6	0	0	68.3	-
0045	8	8	0	0	65.6	-
0100	3	2	1	0	74	-
0115	1	1	0	0	71.2	-
0130	6	6	0	0	64	-
0145	1	1	0	0	68.8	-
0200	2	2	0	0	70.9	-
0215	1	1	0	0	79.8	-
0230	2	2	0	0	68.9	-
0245	1	1	0	0	70.6	-
0300	6	5	1	0	71.9	-
0315	0	0	0	0	-	-
0330	8	7	1	0	65.4	-
0345	2	0	2	0	63.1	-
0400	3	3	0	0	67.2	-
0415	4	4	0	0	68.5	-
0430	2	1	1	0	63.3	-
0445	4	4	0	0	60.1	-
0500	4	4	0	0	62.6	-
0515	6	6	0	0	67.4	-
0530	13	13	0	0	63.5	68.8
0545	12	11	1	0	66.8	72.9
0600	16	14	2	0	60.9	70
0615	16	16	0	0	63.8	72.2
0630	13	11	2	0	66.4	76.7
0645	43	39	4	0	62.3	70.1
0700	27	24	3	0	60.9	66.5
0715	28	28	0	0	61.5	67.6
0730	41	38	3	0	61.4	66.7
0745	58	51	7	0	61.2	67
0800	44	41	3	0	62.9	66.4
0815	59	52	7	0	62.2	67.1
0830	60	57	3	0	61.4	66.6
0845	86	82	3	1	60.3	66.4
0900	45	44	0	1	62	69.3
0915	63	56	6	1	62.7	68.7
0930	66	60	5	1	62.6	69.3
0945	101	96	4	1	60.8	67.3
1000	85	79	6	0	61.2	67.2
1015	88	86	1	1	61.6	65.3
1030	82	77	5	0	62.4	67.1
1045	107	102	5	0	60.2	65.9
1100	94	85	8	1	60.3	64.8
1115	92	85	7	0	59.8	65.2
1130	100	95	5	0	61.1	67.5
1145	92	88	4	0	60.1	65.2
1200	113	104	9	0	62.3	66.6
1215	123	120	3	0	61.5	66.5
1230	115	108	7	0	59	65.5
1245	110	104	6	0	60.4	65.2
1300	110	107	3	0	60.8	66.6
1315	70	66	4	0	60.6	65.9
1330	78	73	5	0	62.9	68.4
1345	106	102	4	0	62	68.2
1400	92	90	2	0	61.3	67
1415	83	77	6	0	62.1	69.4
1430	81	77	4	0	62.1	67.1
1445	79	73	6	0	61.2	67
1500	73	68	5	0	61.3	66.6
1515	88	85	3	0	62.8	67.6
1530	82	80	2	0	61.7	66.9
1545	94	92	2	0	63.2	69.4
1600	63	60	3	0	63.9	68.3
1615	73	70	3	0	62.9	69.1
1630	67	61	6	0	61.6	68.1
1645	61	57	4	0	61.4	67.5
1700	57	55	2	0	63.1	68.6
1715	62	60	2	0	63.4	68.9
1730	45	44	1	0	59.8	67.5
1745	52	48	4	0	63.1	67.9
1800	25	22	3	0	65.9	71.7
1815	44	42	2	0	65.3	70
1830	32	30	2	0	64	69.8
1845	26	25	1	0	67.7	74.2
1900	22	22	0	0	65	70.7
1915	17	17	0	0	61.1	64.3
1930	17	15	2	0	63	67.7
1945	23	21	2	0	64.4	72
2000	14	14	0	0	63.8	69.8
2015	17	14	3	0	64.7	71.7
2030	14	13	1	0	64.5	73.7
2045	14	13	1	0	63.1	72.7
2100	10	5	4	1	61.4	-
2115	9	7	2	0	65.3	-
2130	7	7	0	0	61.7	-
2145	6	6	0	0	61.2	-
2200	4	4	0	0	59.7	-
2215	13	13	0	0	63.8	70.4
2230	6	6	0	0	67	-
2245	7	7	0	0	65.8	-
2300	3	3	0	0	66.9	-
2315	3	3	0	0	64.1	-
2330	4	4	0	0	69.2	-
2345	4	4	0	0	65.2	-
07-09	403	373	29	1	61.4	66.8
09-16	2512	2379	127	6	61.3	66.8
16-18	480	455	25	0	62.5	68.2
00-00	3930	3703	219	8	61.9	67.5

# Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Eastbound



Monday, 4 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	4	4	0	0	61.6	-
0015	2	2	0	0	61.9	-
0030	3	2	1	0	62.4	-
0045	1	1	0	0	68.1	-
0100	0	0	0	0	-	-
0115	0	0	0	0	-	-
0130	1	1	0	0	66.1	-
0145	0	0	0	0	-	-
0200	2	2	0	0	74	-
0215	2	1	1	0	54	-
0230	2	2	0	0	63.7	-
0245	0	0	0	0	-	-
0300	3	2	1	0	60.5	-
0315	0	0	0	0	-	-
0330	0	0	0	0	-	-
0345	5	4	1	0	62.4	-
0400	4	4	0	0	74.2	-
0415	2	2	0	0	68.7	-
0430	7	6	1	0	67.2	-
0445	9	9	0	0	65.1	-
0500	8	8	0	0	68	-
0515	11	9	2	0	61.8	69.2
0530	13	12	1	0	63.9	69.3
0545	25	25	0	0	61.4	67.4
0600	28	24	4	0	63.2	70.1
0615	40	33	7	0	64	72.4
0630	34	33	1	0	63.8	66.7
0645	63	55	6	2	62.1	67.9
0700	62	54	8	0	62.3	67.8
0715	64	57	7	0	61.9	65
0730	104	90	14	0	59.7	65.3
0745	140	131	9	0	59.7	64.9
0800	159	142	15	2	59.9	64.8
0815	206	194	12	0	60.2	65.5
0830	222	207	14	1	58.2	63.3
0845	244	238	6	0	59.9	64.3
0900	150	145	5	0	60.6	67.2
0915	138	129	9	0	59.3	65.2
0930	106	99	7	0	60.6	66.4
0945	91	83	8	0	61	65.2
1000	98	95	3	0	62.1	69.3
1015	107	101	6	0	61.9	66.7
1030	86	80	6	0	59.9	63.9
1045	92	86	6	0	60.9	66.2
1100	102	93	8	1	61.2	65.8
1115	81	73	8	0	59.9	66.7
1130	89	83	6	0	60.3	66.2
1145	84	81	3	0	61.9	67.5
1200	89	82	7	0	62.1	66.9
1215	109	102	5	2	59.4	64.4
1230	94	90	4	0	61.1	66.2
1245	79	73	6	0	61.8	67.3
1300	108	104	4	0	60.4	66.2
1315	123	113	10	0	59.2	64.7
1330	90	85	5	0	61.8	65.8
1345	80	74	4	2	61	66
1400	90	83	7	0	61.8	69.5
1415	111	101	10	0	60.3	65.2
1430	100	91	9	0	61.6	67.2
1445	115	106	9	0	61.4	66.2
1500	142	133	8	1	56.6	65.5
1515	159	152	7	0	60.6	66.1
1530	162	151	11	0	61.4	67.4
1545	130	121	9	0	62.5	69.1
1600	125	120	5	0	59	66.1
1615	136	126	10	0	61.9	66.7
1630	132	125	7	0	61.3	67.1
1645	125	115	10	0	61.9	67.7
1700	127	119	7	1	60.5	66.6
1715	151	146	5	0	60.8	66.2
1730	96	87	8	1	60.7	66
1745	95	90	5	0	61.5	67.7
1800	62	60	2	0	61.5	66.8
1815	48	46	2	0	65.6	71.3
1830	48	44	4	0	63.3	67.6
1845	31	28	3	0	64.7	69.3
1900	29	28	1	0	63.6	67
1915	37	35	2	0	64.4	69
1930	35	33	2	0	63.4	71.4
1945	33	31	2	0	63.1	68.6
2000	23	21	2	0	60.7	65.6
2015	22	20	1	1	61.8	67.5
2030	22	21	1	0	65.4	70.2
2045	22	19	3	0	65.6	70.9
2100	13	13	0	0	63.3	71.4
2115	14	13	1	0	61.6	69.7
2130	13	12	1	0	63.3	67.9
2145	13	13	0	0	63.8	74.1
2200	12	12	0	0	67.2	78
2215	10	9	1	0	67.3	-
2230	3	3	0	0	69	-
2245	4	4	0	0	63.9	-
2300	5	5	0	0	60.1	-
2315	4	4	0	0	66.7	-
2330	2	2	0	0	68.6	-
2345	2	1	1	0	58.8	-
07-09	1201	1113	85	3	59.8	64.8
09-16	3005	2809	190	6	60.7	66.2
16-18	987	928	57	2	60.9	66.8
00-00	5969	5568	387	14	60.9	66.4

# Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Eastbound



Tuesday, 5 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	3	3	0	0	64.4	-
0015	1	1	0	0	60.2	-
0030	0	0	0	0	-	-
0045	2	2	0	0	69.6	-
0100	2	2	0	0	60.7	-
0115	0	0	0	0	-	-
0130	2	2	0	0	46.7	-
0145	3	3	0	0	58.8	-
0200	0	0	0	0	-	-
0215	3	3	0	0	63.5	-
0230	1	1	0	0	66.7	-
0245	1	1	0	0	62.1	-
0300	1	1	0	0	80.2	-
0315	2	2	0	0	72.9	-
0330	0	0	0	0	-	-
0345	5	4	1	0	66.8	-
0400	4	4	0	0	63.9	-
0415	5	4	1	0	59.9	-
0430	8	8	0	0	61	-
0445	9	8	1	0	64.4	-
0500	11	11	0	0	65.4	71.5
0515	12	11	1	0	64.5	73.3
0530	11	10	1	0	66.7	80
0545	24	20	4	0	65.7	73.2
0600	35	31	4	0	62.7	65.6
0615	28	26	2	0	60.2	69
0630	46	44	2	0	63.9	70.5
0645	56	50	6	0	63.2	68.4
0700	58	53	5	0	63.1	66.4
0715	79	70	7	2	61.2	66.4
0730	102	89	12	1	60.3	66.1
0745	165	157	8	0	59.4	64.8
0800	177	171	5	1	60.2	65
0815	178	168	9	1	59.9	65.3
0830	226	215	10	1	57.6	63.2
0845	209	197	12	0	58.8	64.4
0900	158	147	10	1	60.1	66.3
0915	133	126	6	1	61.2	65.7
0930	92	86	6	0	61.1	68.4
0945	109	105	4	0	61.3	65.6
1000	108	103	5	0	61.8	68.2
1015	103	90	13	0	61.8	66.6
1030	95	88	7	0	61.1	66.3
1045	89	87	2	0	61.7	67.8
1100	96	90	5	1	62.1	68
1115	96	91	5	0	62.3	66.9
1130	94	89	5	0	61.1	66.5
1145	96	89	7	0	61.3	66.1
1200	81	77	4	0	61.8	67.1
1215	95	89	6	0	61.5	67.7
1230	81	75	6	0	60	66.4
1245	98	93	5	0	61.6	66.3
1300	86	80	6	0	62.5	69.1
1315	106	93	13	0	59.4	67
1330	80	74	6	0	61.3	66.9
1345	97	89	7	1	62.1	67.9
1400	86	80	6	0	61.7	67.7
1415	98	87	11	0	60.8	64.6
1430	136	125	11	0	57.8	66.4
1445	120	113	7	0	61.1	67.3
1500	147	142	5	0	59.7	64.5
1515	157	145	11	1	60.2	65
1530	161	152	9	0	59.2	65
1545	155	143	12	0	61.6	67.5
1600	112	101	11	0	61.6	66.1
1615	140	132	8	0	62.2	67.1
1630	116	111	5	0	59.8	65.7
1645	126	120	6	0	62.5	67.7
1700	120	116	4	0	61.7	66.4
1715	130	124	6	0	61.4	66
1730	84	74	10	0	62	68
1745	99	92	7	0	59.1	65.5
1800	80	76	4	0	62.2	68
1815	67	63	3	1	60	68.8
1830	50	41	9	0	62.4	68.3
1845	30	26	4	0	64.7	71.3
1900	39	39	0	0	63	67.1
1915	29	28	1	0	66.2	71
1930	26	24	2	0	63.5	67.8
1945	36	33	3	0	62.5	68.1
2000	25	24	1	0	68	74
2015	38	34	3	1	62.5	69.1
2030	20	19	1	0	62.8	67.9
2045	16	13	3	0	64.9	73.2
2100	11	11	0	0	62.2	67.9
2115	16	14	2	0	62.1	66.5
2130	12	12	0	0	66.7	73.9
2145	9	9	0	0	64	-
2200	10	10	0	0	65	-
2215	5	4	1	0	71.1	-
2230	14	14	0	0	64.3	68.4
2245	2	2	0	0	68.9	-
2300	2	2	0	0	58.9	-
2315	2	1	1	0	69.9	-
2330	3	3	0	0	64.4	-
2345	1	1	0	0	74.4	-
07-09	1194	1120	68	6	59.5	64.8
09-16	3053	2848	200	5	60.9	66.6
16-18	927	870	57	0	61.3	66.6
00-00	5992	5593	386	13	61	66.6

## Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Eastbound



Wednesday, 6 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	3	3	0	0	69.2	-
0015	3	3	0	0	65.9	-
0030	3	3	0	0	61.6	-
0045	0	0	0	0	-	-
0100	0	0	0	0	-	-
0115	1	1	0	0	63.3	-
0130	3	3	0	0	55.9	-
0145	2	2	0	0	67.5	-
0200	3	3	0	0	65.8	-
0215	0	0	0	0	-	-
0230	1	1	0	0	65	-
0245	3	2	1	0	69.8	-
0300	1	1	0	0	61	-
0315	0	0	0	0	-	-
0330	0	0	0	0	-	-
0345	5	5	0	0	64.2	-
0400	3	3	0	0	69.2	-
0415	3	2	1	0	64.6	-
0430	8	7	1	0	64.4	-
0445	9	8	1	0	61	-
0500	7	6	1	0	62.7	-
0515	9	9	0	0	63.5	-
0530	14	13	1	0	67.3	71.8
0545	30	27	2	1	63.3	68.8
0600	23	20	2	1	59.2	68.9
0615	34	30	3	1	62.4	68
0630	48	46	2	0	62.5	66.3
0645	67	60	7	0	65.5	70.1
0700	64	56	8	0	61.8	67.4
0715	67	58	8	1	62.9	68.4
0730	103	94	8	1	57.9	64.1
0745	167	149	18	0	58.3	63.7
0800	165	159	5	1	38.3	55.4
0815	254	246	7	1	37	49.2
0830	223	216	7	0	45.8	56.3
0845	209	202	7	0	50.1	57.8
0900	142	139	3	0	55.8	61.3
0915	138	133	4	1	57.8	63
0930	97	93	4	0	59.4	65.1
0945	103	98	4	1	59.3	64.5
1000	99	94	5	0	59.1	64.3
1015	91	75	16	0	58.9	64.1
1030	90	85	5	0	56.9	61.9
1045	107	99	8	0	58.4	65.5
1100	74	68	6	0	57.9	61.9
1115	90	80	10	0	58.3	62.8
1130	95	85	10	0	58.3	63.9
1145	99	94	5	0	57	63
1200	83	79	4	0	60.6	66.1
1215	103	96	7	0	59.5	64.7
1230	98	89	9	0	56.7	62.5
1245	98	90	5	3	63	67.6
1300	83	74	9	0	59.5	65.2
1315	102	93	9	0	60.8	65.1
1330	79	70	9	0	62.7	67.9
1345	90	80	10	0	61.3	67.4
1400	107	96	10	1	61.6	68.1
1415	89	83	6	0	61.2	66.3
1430	113	107	5	1	57.5	63.4
1445	173	160	13	0	55.9	63.7
1500	134	122	11	1	58.3	64.9
1515	133	126	7	0	59.6	66.7
1530	121	110	11	0	60.8	67.3
1545	144	134	9	1	59.2	67.1
1600	121	113	8	0	61.1	67.1
1615	118	104	13	1	61	64.8
1630	114	109	5	0	62.1	67.5
1645	135	129	6	0	61	65.1
1700	129	122	7	0	61	65.7
1715	130	123	7	0	62.2	67.7
1730	97	89	8	0	62.6	69
1745	81	75	6	0	60.4	66.7
1800	51	43	8	0	61.7	67.5
1815	62	57	5	0	60	64.8
1830	62	59	3	0	61.2	67.9
1845	39	38	1	0	63.5	68.9
1900	44	42	2	0	61.6	68.3
1915	33	30	3	0	61.8	67.8
1930	32	30	2	0	62.9	69
1945	29	26	3	0	63.4	67.9
2000	24	22	2	0	65	69.7
2015	20	19	1	0	62	65.4
2030	20	20	0	0	62.4	67.6
2045	15	15	0	0	60.8	64.6
2100	11	11	0	0	61.3	66.7
2115	14	11	2	1	61.4	70
2130	8	7	1	0	64.9	-
2145	10	9	1	0	60.7	-
2200	8	8	0	0	66.9	-
2215	16	16	0	0	64.6	69.2
2230	22	20	2	0	65.5	73.5
2245	12	11	1	0	63.2	67.3
2300	6	6	0	0	60.6	-
2315	4	4	0	0	63.2	-
2330	4	3	1	0	72.4	-
2345	4	4	0	0	55.9	-
07-09	1252	1180	68	4	48.1	60.3
09-16	2975	2752	214	9	58.9	65.2
16-18	925	864	60	1	61.4	66.6
00-00	5985	5565	402	18	57.6	65.5

## Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Westbound



Thursday, 31 May 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	2	2	0	0	68.8	-
0015	1	1	0	0	62.4	-
0030	1	1	0	0	54.7	-
0045	2	2	0	0	76.6	-
0100	1	1	0	0	72.7	-
0115	3	2	1	0	72.7	-
0130	0	0	0	0	-	-
0145	0	0	0	0	-	-
0200	1	1	0	0	62.4	-
0215	1	0	1	0	56.6	-
0230	0	0	0	0	-	-
0245	2	2	0	0	61.7	-
0300	1	1	0	0	75.9	-
0315	2	1	1	0	62.5	-
0330	2	1	1	0	58.5	-
0345	3	2	1	0	68.8	-
0400	2	2	0	0	58.8	-
0415	12	10	2	0	61.9	71.7
0430	4	4	0	0	61.4	-
0445	9	8	1	0	64.4	-
0500	18	17	1	0	63.2	68.7
0515	10	9	1	0	67.2	-
0530	22	20	2	0	63.6	72.8
0545	31	27	4	0	60.2	64.9
0600	25	23	2	0	60.1	65.5
0615	44	42	2	0	58.3	68.1
0630	57	55	2	0	60.1	68.5
0645	79	75	4	0	61.8	67.3
0700	57	54	2	1	60	66.2
0715	82	78	4	0	62	68.8
0730	94	87	7	0	59.4	63.7
0745	128	124	4	0	56	59.7
0800	143	137	5	1	56.4	60.5
0815	136	129	7	0	56	59.8
0830	161	154	7	0	56.5	60.6
0845	145	140	5	0	56.6	59.8
0900	116	112	4	0	55.8	60.1
0915	77	76	1	0	57.6	63.2
0930	97	93	4	0	56.7	63.5
0945	87	83	4	0	56.2	62
1000	81	80	1	0	57.1	61.7
1015	97	93	4	0	58.2	63.8
1030	81	75	5	1	57.3	63.4
1045	88	83	5	0	57.5	62.1
1100	90	85	5	0	57	63.1
1115	79	77	2	0	57.8	63.7
1130	88	84	3	1	56.9	61.7
1145	92	89	3	0	57.9	63.5
1200	106	101	5	0	57.3	62.6
1215	79	75	4	0	57.5	62.5
1230	80	77	3	0	59.5	65.3
1245	91	89	2	0	59.4	64.8
1300	86	84	2	0	58.3	63
1315	81	79	2	0	58.6	62.8
1330	88	85	2	1	57.8	64.4
1345	86	84	2	0	58.8	63.5
1400	115	110	3	2	56.1	63.5
1415	138	129	9	0	56.3	61.7
1430	129	125	4	0	56.9	61.1
1445	132	129	3	0	58.7	63.9
1500	170	166	4	0	54.1	62.3
1515	227	222	5	0	54.7	60.8
1530	127	121	6	0	56.1	62.1
1545	132	122	10	0	58.1	62.5
1600	131	127	4	0	59.2	63.9
1615	135	130	5	0	58.9	63.6
1630	135	132	3	0	59.5	63.6
1645	135	131	4	0	60	64.8
1700	136	132	4	0	57.7	62.6
1715	109	107	2	0	57.6	62.2
1730	68	67	1	0	58.3	64.3
1745	93	91	2	0	59.6	64.8
1800	81	81	0	0	58.8	63.7
1815	74	72	2	0	58.5	64.5
1830	57	55	1	1	59.7	64.7
1845	40	38	2	0	60.4	65.1
1900	33	33	0	0	62.9	68.9
1915	34	34	0	0	59.1	66.8
1930	23	22	1	0	60.2	66.9
1945	36	35	1	0	59.3	65.9
2000	45	45	0	0	60.3	65.2
2015	33	32	1	0	63.1	66.4
2030	27	27	0	0	65.2	75
2045	16	15	1	0	58.1	65.6
2100	60	60	0	0	60.7	66.6
2115	23	23	0	0	62.3	67.5
2130	19	18	1	0	63.4	67.7
2145	11	11	0	0	61.4	73.7
2200	9	9	0	0	59.7	-
2215	9	9	0	0	59.7	-
2230	3	3	0	0	59.9	-
2245	5	4	0	1	62.2	-
2300	5	5	0	0	58.8	-
2315	3	3	0	0	59.7	-
2330	5	5	0	0	58.9	-
2345	2	2	0	0	73.1	-
07-09	946	903	41	2	57.3	61.9
09-16	2940	2828	107	5	57	62.6
16-18	942	917	25	0	58.9	63.7
00-00	5816	5598	209	9	58	63.5

# Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Westbound



Friday, 1 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	2	2	0	0	70.7	-
0015	1	1	0	0	59.1	-
0030	1	1	0	0	65.1	-
0045	0	0	0	0	-	-
0100	2	2	0	0	69	-
0115	4	4	0	0	65.7	-
0130	0	0	0	0	-	-
0145	0	0	0	0	-	-
0200	0	0	0	0	-	-
0215	2	2	0	0	64	-
0230	1	1	0	0	64.4	-
0245	1	0	1	0	65.3	-
0300	0	0	0	0	-	-
0315	2	2	0	0	77.3	-
0330	2	0	2	0	58.3	-
0345	3	3	0	0	63.3	-
0400	5	4	1	0	63.2	-
0415	7	7	0	0	64.9	-
0430	10	8	2	0	60.8	-
0445	10	8	1	1	65.9	-
0500	12	10	2	0	66.4	72.2
0515	23	23	0	0	64.8	69.2
0530	21	21	0	0	59.8	66.2
0545	36	35	1	0	62.4	69
0600	45	44	1	0	62.6	70.3
0615	41	38	3	0	60.7	65.4
0630	54	54	0	0	61.2	66
0645	60	59	1	0	62.3	68.4
0700	71	68	3	0	61.6	65.9
0715	78	75	3	0	61.6	65.9
0730	86	81	5	0	60.2	65
0745	115	106	9	0	60.6	64.9
0800	135	127	7	1	57.7	62.6
0815	146	139	7	0	58.4	63.5
0830	154	145	9	0	56.6	63
0845	145	141	4	0	57	61.9
0900	113	112	1	0	55.4	62
0915	93	91	2	0	58.9	64.4
0930	93	87	6	0	59.1	66.6
0945	86	81	5	0	58.7	63.3
1000	82	80	2	0	58.8	64.3
1015	86	82	4	0	57.7	62.5
1030	89	83	6	0	59.4	64.3
1045	92	87	5	0	58.5	64.1
1100	101	98	3	0	56.7	62.3
1115	107	105	2	0	58.9	64.5
1130	86	83	3	0	53.6	63.1
1145	95	92	3	0	59.2	64.3
1200	88	86	2	0	59.1	64.4
1215	95	94	1	0	58.9	63.5
1230	94	85	9	0	58	63.5
1245	86	84	2	0	59.8	65.7
1300	88	85	2	1	59.2	63.5
1315	73	70	3	0	60	66.2
1330	112	108	4	0	58	62
1345	106	101	5	0	58.7	63.9
1400	106	102	3	1	59.9	66.1
1415	134	125	9	0	58.7	62.5
1430	104	100	4	0	59.2	64.3
1445	145	144	1	0	57	62.5
1500	175	165	8	2	56.5	61.1
1515	199	189	9	1	54.6	59.9
1530	167	160	7	0	57.2	63.3
1545	97	86	11	0	59.8	64.3
1600	134	132	2	0	58.8	62.1
1615	116	113	3	0	58.5	63.2
1630	117	114	3	0	59.3	64.8
1645	89	86	2	1	60.3	64.8
1700	93	92	1	0	60.8	65.6
1715	100	98	2	0	59.4	63.9
1730	103	103	0	0	59.1	64.1
1745	86	86	0	0	58.6	63
1800	56	56	0	0	60.3	64.8
1815	57	57	0	0	60.9	65.9
1830	58	57	1	0	59.8	64.8
1845	61	60	1	0	61.4	67.5
1900	35	35	0	0	58.4	63.7
1915	45	44	1	0	61.3	66.9
1930	42	40	2	0	60.3	68.7
1945	31	31	0	0	57.7	63.9
2000	34	33	1	0	59	65.2
2015	40	40	0	0	61.6	68.9
2030	27	26	1	0	61.9	67
2045	30	30	0	0	61.4	66.9
2100	31	30	1	0	59	64.7
2115	15	15	0	0	62.9	72
2130	23	23	0	0	59.9	67.6
2145	19	18	1	0	63.4	69.3
2200	18	18	0	0	59.6	67.6
2215	17	17	0	0	63.8	70.8
2230	18	18	0	0	65.5	72.9
2245	11	10	0	1	61.5	73.5
2300	8	8	0	0	63.4	-
2315	7	7	0	0	56.8	-
2330	9	9	0	0	64.4	-
2345	10	10	0	0	59	-
07-09	930	882	47	1	58.7	64.1
09-16	2992	2865	122	5	58	63.5
16-18	838	824	13	1	59.3	63.5
00-00	5807	5592	206	9	58.9	64.4



# Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Westbound



Saturday, 2 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	4	4	0	0	65.6	-
0015	7	5	2	0	67.5	-
0030	5	5	0	0	64.5	-
0045	1	1	0	0	65	-
0100	2	2	0	0	66.1	-
0115	1	1	0	0	66.3	-
0130	6	6	0	0	63	-
0145	6	6	0	0	64.7	-
0200	6	5	1	0	62.6	-
0215	5	5	0	0	59.3	-
0230	2	2	0	0	67.2	-
0245	4	3	1	0	60	-
0300	0	0	0	0	-	-
0315	1	0	1	0	48.3	-
0330	2	2	0	0	61.3	-
0345	4	4	0	0	64	-
0400	5	5	0	0	61.1	-
0415	8	6	2	0	59.3	-
0430	3	3	0	0	64	-
0445	5	3	2	0	66.4	-
0500	10	10	0	0	61.6	-
0515	6	6	0	0	69.4	-
0530	11	11	0	0	65	78.5
0545	19	17	2	0	60.1	69.3
0600	14	14	0	0	63.6	73.2
0615	23	22	0	1	61.6	71.2
0630	22	21	1	0	61.5	71.5
0645	24	24	0	0	65.3	70.8
0700	42	42	0	0	64.1	69
0715	47	47	0	0	60.9	66.3
0730	55	52	3	0	61.1	68
0745	53	53	0	0	61.6	68.9
0800	59	56	3	0	60.2	66.2
0815	63	59	4	0	61.4	65.7
0830	69	66	3	0	59.2	65.1
0845	76	76	0	0	59.1	64.7
0900	83	82	1	0	58.2	64
0915	89	86	3	0	59	64.4
0930	112	110	2	0	58.6	63.5
0945	97	94	3	0	59	64.3
1000	115	111	4	0	59	62.5
1015	141	139	2	0	57.4	61.9
1030	127	122	4	1	56.7	61.5
1045	115	108	7	0	58.2	63.4
1100	118	115	3	0	56.9	63.1
1115	110	108	2	0	57.9	63.1
1130	108	106	1	1	58.9	63.2
1145	118	115	2	1	56.8	62.6
1200	89	86	3	0	59.4	65.2
1215	89	88	1	0	59.5	64.4
1230	92	89	3	0	60.6	65.2
1245	83	80	3	0	57.6	62.8
1300	92	89	3	0	56.7	61.4
1315	79	79	0	0	61.1	66.2
1330	80	77	3	0	60.3	64.7
1345	74	74	0	0	60.7	65
1400	75	73	2	0	61	65.7
1415	69	67	2	0	60.5	65.8
1430	81	80	1	0	59.9	66
1445	83	80	3	0	59.1	63.5
1500	60	60	0	0	61.2	66.8
1515	74	74	0	0	59.4	63.9
1530	73	72	1	0	59.9	63.9
1545	74	72	2	0	58.9	63.8
1600	78	75	3	0	59.6	65
1615	75	72	3	0	59.7	64.6
1630	50	49	1	0	60.1	66.1
1645	65	64	1	0	60.2	63.4
1700	70	67	3	0	58	63.4
1715	62	62	0	0	58.9	63.9
1730	56	54	2	0	59.3	64.4
1745	66	64	2	0	58.4	62.3
1800	51	51	0	0	61.4	66.6
1815	35	35	0	0	60.4	66.5
1830	42	42	0	0	61.7	69.2
1845	28	27	1	0	57	64.7
1900	39	39	0	0	60.9	66.2
1915	26	26	0	0	62.2	69.4
1930	25	25	0	0	59.7	67.1
1945	31	29	2	0	60.9	69.1
2000	28	28	0	0	58.3	63.3
2015	18	17	1	0	59.8	64.3
2030	21	20	1	0	61.5	68.7
2045	25	25	0	0	58.5	65.3
2100	36	35	1	0	61.8	70.6
2115	23	22	1	0	60.8	68.9
2130	22	21	1	0	59.4	65.3
2145	20	20	0	0	61.5	67.8
2200	35	34	1	0	63.6	70.7
2215	33	33	0	0	60.5	65.6
2230	26	26	0	0	62.3	64.6
2245	28	28	0	0	60.3	67.4
2300	18	18	0	0	63.2	69.5
2315	15	15	0	0	61.9	70.2
2330	11	10	0	1	62.1	70
2345	13	13	0	0	65.3	71.3
07-09	464	451	13	0	60.7	66.8
09-16	2600	2536	61	3	58.8	63.9
16-18	522	507	15	0	59.2	63.9
00-00	4441	4326	110	5	59.6	65

# Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Westbound



Sunday, 3 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	7	7	0	0	66.3	-
0015	9	9	0	0	59.3	-
0030	9	9	0	0	58.8	-
0045	8	8	0	0	62	-
0100	9	9	0	0	61.1	-
0115	4	4	0	0	56.4	-
0130	7	7	0	0	67	-
0145	5	5	0	0	63.7	-
0200	2	2	0	0	64.4	-
0215	1	1	0	0	70.1	-
0230	1	1	0	0	82.3	-
0245	2	2	0	0	72.8	-
0300	4	4	0	0	68	-
0315	5	4	1	0	72.5	-
0330	2	2	0	0	62.3	-
0345	1	1	0	0	67.2	-
0400	2	2	0	0	65.2	-
0415	1	1	0	0	68.5	-
0430	5	2	3	0	66.2	-
0445	2	2	0	0	59.7	-
0500	8	8	0	0	67.9	-
0515	11	11	0	0	62.3	69.4
0530	11	9	2	0	64	73.4
0545	11	10	1	0	63.2	71.3
0600	17	14	1	2	52.4	67.3
0615	12	11	1	0	61.8	73.9
0630	26	24	2	0	61.1	69.9
0645	27	27	0	0	57.3	62.9
0700	26	25	1	0	64.6	72.2
0715	34	34	0	0	62	65.8
0730	37	37	0	0	62.3	67.7
0745	32	31	1	0	62.6	69.6
0800	38	37	1	0	61.7	67
0815	50	49	1	0	59.7	65.2
0830	55	51	4	0	60.6	65
0845	59	58	1	0	61.5	66.1
0900	48	48	0	0	60.6	65.8
0915	68	68	0	0	60.2	66
0930	86	84	2	0	60.4	65.5
0945	89	88	0	1	58.3	63.3
1000	98	94	4	0	60.3	65.4
1015	100	100	0	0	58.7	64.4
1030	97	95	2	0	60.1	64
1045	86	86	0	0	59.5	63.5
1100	99	97	2	0	59.4	64.1
1115	104	103	1	0	58.5	63
1130	93	90	3	0	59.7	65.8
1145	114	113	1	0	60	65.3
1200	82	81	1	0	59.8	65.2
1215	68	66	2	0	60.2	64.9
1230	74	74	0	0	59.6	64.9
1245	78	76	2	0	59.3	66.6
1300	78	78	0	0	59.5	64.5
1315	76	74	2	0	59.6	65.6
1330	59	57	2	0	60.4	66.6
1345	57	57	0	0	60.4	66.9
1400	71	69	2	0	61	66.1
1415	81	79	2	0	58.4	65.4
1430	97	93	4	0	60.3	65.3
1445	66	66	0	0	60.5	66.6
1500	90	90	0	0	60.1	64.5
1515	62	60	2	0	58	63.5
1530	74	72	2	0	59.2	63.9
1545	77	75	2	0	59.4	64.7
1600	65	64	1	0	61.1	67.5
1615	59	58	1	0	59.3	65.2
1630	52	51	1	0	60.2	65
1645	51	51	0	0	61	66.7
1700	59	58	1	0	61.2	66.4
1715	65	65	0	0	59.1	63.5
1730	43	40	3	0	59.5	64.9
1745	32	32	0	0	61.8	68.4
1800	25	24	1	0	59.8	65.5
1815	27	26	1	0	63.2	68.8
1830	36	35	1	0	58.2	63.8
1845	20	18	2	0	60.8	66.8
1900	24	23	1	0	60.4	67
1915	30	30	0	0	59.4	62.8
1930	25	24	1	0	58.1	64.8
1945	19	19	0	0	62.2	66.2
2000	15	15	0	0	59.5	65.2
2015	13	13	0	0	63	72.2
2030	15	14	1	0	65.2	73.4
2045	12	12	0	0	62.8	71.3
2100	21	21	0	0	61.5	67.8
2115	5	5	0	0	60.3	-
2130	5	4	0	1	64.5	-
2145	7	7	0	0	61.6	-
2200	10	10	0	0	64.5	-
2215	4	4	0	0	64.1	-
2230	6	6	0	0	64.9	-
2245	9	9	0	0	65.9	-
2300	0	0	0	0	-	-
2315	3	3	0	0	58.4	-
2330	3	3	0	0	56.8	-
2345	2	2	0	0	58.2	-
07-09	331	322	9	0	61.6	67
09-16	2272	2233	38	1	59.7	64.8
16-18	426	419	7	0	60.3	66.1
00-00	3574	3497	73	4	60.2	65.5

# Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Westbound



Monday, 4 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	2	2	0	0	72.4	-
0015	1	1	0	0	59.1	-
0030	2	2	0	0	56.1	-
0045	0	0	0	0	-	-
0100	1	1	0	0	55.3	-
0115	0	0	0	0	-	-
0130	3	2	1	0	64.8	-
0145	0	0	0	0	-	-
0200	0	0	0	0	-	-
0215	2	2	0	0	64.1	-
0230	0	0	0	0	-	-
0245	0	0	0	0	-	-
0300	0	0	0	0	-	-
0315	3	3	0	0	61.3	-
0330	2	2	0	0	62	-
0345	4	3	1	0	60.2	-
0400	5	4	1	0	64.5	-
0415	6	5	1	0	61.1	-
0430	12	10	2	0	63.9	69.9
0445	11	11	0	0	65.6	74.5
0500	16	14	2	0	65.6	80
0515	19	19	0	0	65.2	71.1
0530	33	33	0	0	62.4	71.1
0545	37	35	2	0	62.6	69.6
0600	35	32	3	0	59	64.7
0615	48	47	1	0	62.2	67.5
0630	60	59	1	0	61.1	68.4
0645	59	55	4	0	62.1	66.1
0700	61	57	4	0	60.3	65.2
0715	57	56	1	0	60.3	65.3
0730	89	82	7	0	60.7	65.5
0745	105	100	5	0	60.5	64.8
0800	141	137	4	0	59.4	63.5
0815	155	148	7	0	59.6	64.1
0830	139	131	8	0	60	63.9
0845	169	167	2	0	58.2	61.2
0900	111	108	3	0	58.7	62.7
0915	79	76	3	0	57.5	64.1
0930	81	79	2	0	58.2	62.8
0945	83	80	3	0	58.9	63.7
1000	97	93	4	0	58	63.9
1015	77	72	5	0	60.7	65.1
1030	82	80	2	0	59.5	64
1045	81	74	7	0	60.6	65.8
1100	69	66	3	0	59.7	67
1115	72	67	5	0	59.7	63.9
1130	85	80	5	0	58.8	63.9
1145	100	95	5	0	58.5	62.8
1200	67	66	1	0	57.9	62.9
1215	82	77	5	0	57.2	63.9
1230	91	88	3	0	57.8	61.8
1245	92	90	1	1	58.2	64.3
1300	91	86	4	1	57.5	63
1315	106	105	1	0	56.9	61.4
1330	79	78	1	0	57.5	62.3
1345	85	82	3	0	58	64
1400	78	74	4	0	59.6	65.1
1415	113	107	5	1	57.5	63.1
1430	135	133	2	0	59.9	64.2
1445	104	100	4	0	59.2	63.9
1500	165	159	6	0	57.8	63.2
1515	175	168	7	0	57.2	61.8
1530	155	145	10	0	58.8	63
1545	130	124	6	0	58.9	63.7
1600	115	109	6	0	58.7	63.9
1615	152	150	2	0	58.7	63
1630	170	168	2	0	58.6	63.5
1645	108	102	6	0	59.7	64.4
1700	129	125	4	0	59.5	64.1
1715	159	156	3	0	56.6	61.7
1730	96	94	2	0	58.3	63.2
1745	86	86	0	0	58.5	65.1
1800	66	63	3	0	58.5	63.7
1815	51	49	2	0	60.8	65.3
1830	47	46	1	0	60.9	65.7
1845	30	30	0	0	62.2	67.1
1900	27	25	1	1	60.7	69.3
1915	31	29	2	0	61	68.2
1930	17	17	0	0	59.5	66.1
1945	17	17	0	0	60.1	68.8
2000	22	22	0	0	58.8	63.4
2015	15	15	0	0	57.8	61.7
2030	19	18	1	0	62.2	67.7
2045	19	18	1	0	60	66.2
2100	12	10	1	1	60.9	68.9
2115	11	11	0	0	61.4	71.1
2130	8	8	0	0	62.3	-
2145	9	9	0	0	61.9	-
2200	7	7	0	0	64	-
2215	9	8	1	0	63.1	-
2230	3	3	0	0	67.4	-
2245	1	1	0	0	67.6	-
2300	4	4	0	0	59	-
2315	4	4	0	0	58.9	-
2330	2	2	0	0	60.7	-
2345	3	3	0	0	51	-
07-09	916	878	38	0	59.7	64.1
09-16	2765	2652	110	3	58.5	63.5
16-18	1015	990	25	0	58.5	63.5
00-00	5491	5281	205	5	59.1	64.1

# Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Westbound



Tuesday, 5 June 2018

Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	4	4	0	0	63.8	-
0015	1	1	0	0	74.4	-
0030	1	1	0	0	68.3	-
0045	0	0	0	0	-	-
0100	2	2	0	0	70	-
0115	0	0	0	0	-	-
0130	1	1	0	0	69.6	-
0145	1	0	1	0	53.3	-
0200	0	0	0	0	-	-
0215	0	0	0	0	-	-
0230	0	0	0	0	-	-
0245	0	0	0	0	-	-
0300	2	2	0	0	64.3	-
0315	3	2	1	0	57.9	-
0330	2	2	0	0	69.3	-
0345	2	2	0	0	68.5	-
0400	5	5	0	0	64.2	-
0415	10	7	3	0	62.8	-
0430	14	13	1	0	59.3	65.7
0445	11	11	0	0	65.9	73.2
0500	14	14	0	0	61.4	68.7
0515	25	22	3	0	60	66.8
0530	37	35	2	0	63.4	69.3
0545	34	32	1	1	61.9	66.2
0600	38	37	1	0	63.3	70
0615	54	53	1	0	60.6	66
0630	66	66	0	0	61.9	67.3
0645	57	55	2	0	61.6	67.5
0700	58	56	2	0	62.6	66.2
0715	74	72	2	0	63.4	68.5
0730	93	88	5	0	61.2	65
0745	110	99	9	2	59.4	64.3
0800	147	144	3	0	59.4	64.3
0815	144	136	8	0	58	63.5
0830	157	152	5	0	58.3	62.5
0845	117	113	3	1	59.1	63.4
0900	104	101	3	0	59.9	66.1
0915	92	90	2	0	58.7	63.6
0930	77	76	1	0	60.1	65.9
0945	72	69	3	0	59.5	64.5
1000	86	81	4	1	58.5	61.9
1015	104	103	1	0	57.8	62.4
1030	77	74	3	0	60.3	65.8
1045	97	92	5	0	58	62.5
1100	84	79	5	0	59.4	63
1115	78	75	3	0	59.8	65.6
1130	77	72	5	0	58.9	63.2
1145	80	75	4	1	60.1	65.3
1200	81	77	3	1	58.3	63.7
1215	103	100	3	0	60	66.2
1230	89	81	8	0	58.4	64.9
1245	72	71	1	0	59.8	65.3
1300	81	80	1	0	59	63.2
1315	69	63	4	2	57.1	63.6
1330	107	105	2	0	57.2	62.1
1345	92	87	5	0	58.6	63.2
1400	99	95	4	0	59.1	63.9
1415	117	111	6	0	58.4	62.2
1430	119	118	1	0	58.7	64.3
1445	112	108	4	0	59.4	64.1
1500	145	142	3	0	58.9	64.3
1515	183	177	6	0	56.7	60.9
1530	160	147	13	0	56.1	61.9
1545	118	109	9	0	60.2	65.5
1600	150	143	7	0	58	63.4
1615	133	130	3	0	59.3	64.7
1630	145	143	2	0	59.4	63.2
1645	105	104	1	0	61.6	65.6
1700	123	123	0	0	59.6	63.7
1715	118	117	1	0	59.4	64.8
1730	78	77	1	0	58.2	62.7
1745	56	54	2	0	60.2	65.5
1800	71	69	2	0	59.2	64.3
1815	36	36	0	0	62.3	70.9
1830	51	50	1	0	59.7	66.1
1845	38	37	1	0	59.3	64.1
1900	29	28	1	0	61.9	68
1915	29	27	2	0	60.4	70.5
1930	26	24	2	0	62.9	67.5
1945	23	23	0	0	60.3	71.9
2000	46	45	1	0	59.4	63.9
2015	36	35	0	1	59.9	65.4
2030	18	17	1	0	63.1	74.2
2045	26	26	0	0	62.7	69.5
2100	25	25	0	0	58.1	65.3
2115	25	24	1	0	62.7	66.7
2130	39	38	1	0	60.7	67.9
2145	15	14	1	0	61.9	71.8
2200	4	4	0	0	64.8	-
2215	4	3	1	0	66.6	-
2230	10	10	0	0	63.2	-
2245	0	0	0	0	-	-
2300	2	1	0	1	56.7	-
2315	7	6	1	0	67.8	-
2330	1	1	0	0	56.1	-
2345	1	1	0	0	59.8	-
07-09	900	860	37	3	59.6	64.6
09-16	2775	2658	112	5	58.7	63.7
16-18	908	891	17	0	59.4	64.1
00-00	5529	5320	198	11	59.4	64.6

# Tweed Coast Automatic Report

Site Name - #2 Cudgen Rd  
Description - east of Tweed Coast Rd  
Direction - Westbound

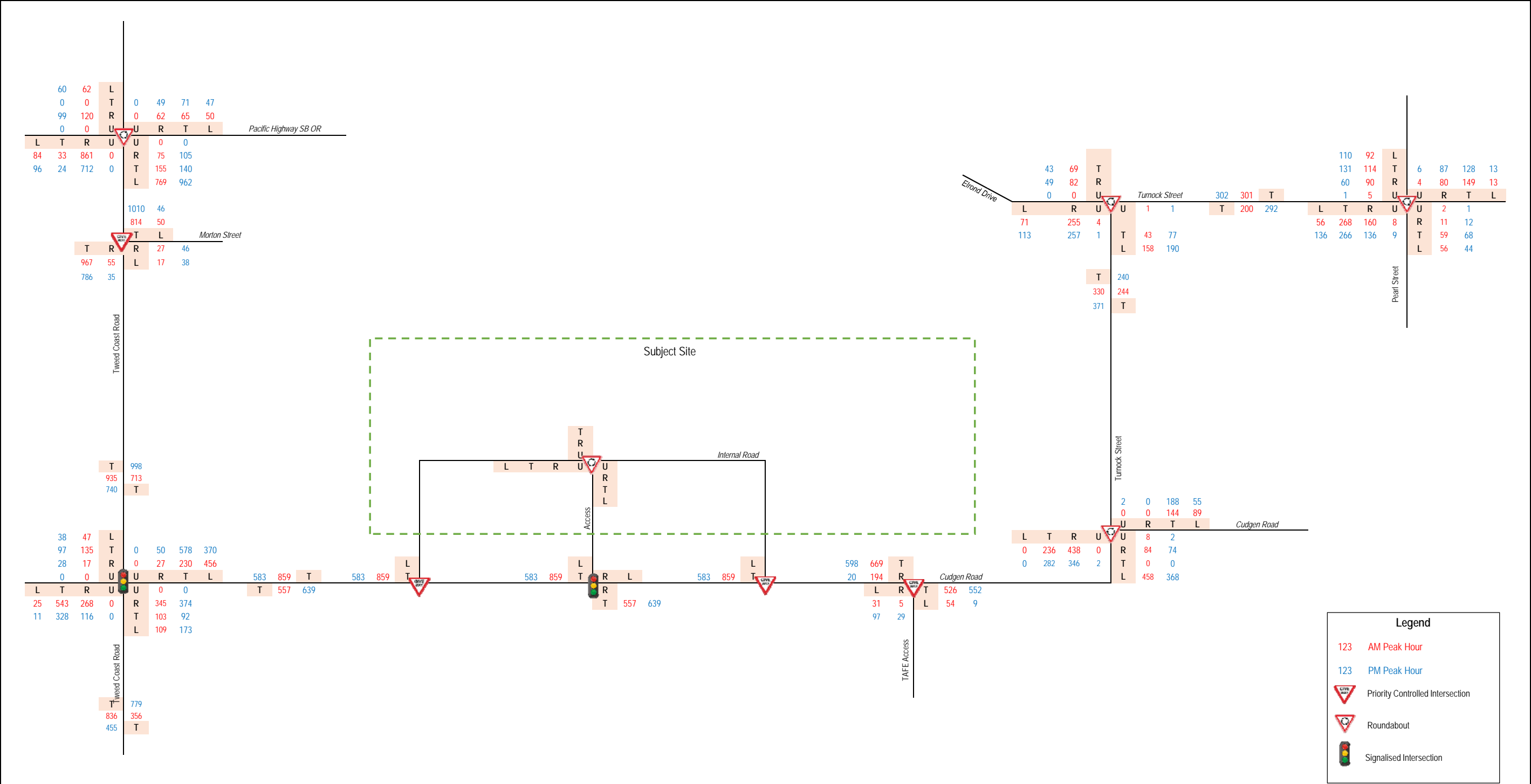


Wednesday, 6 June 2018

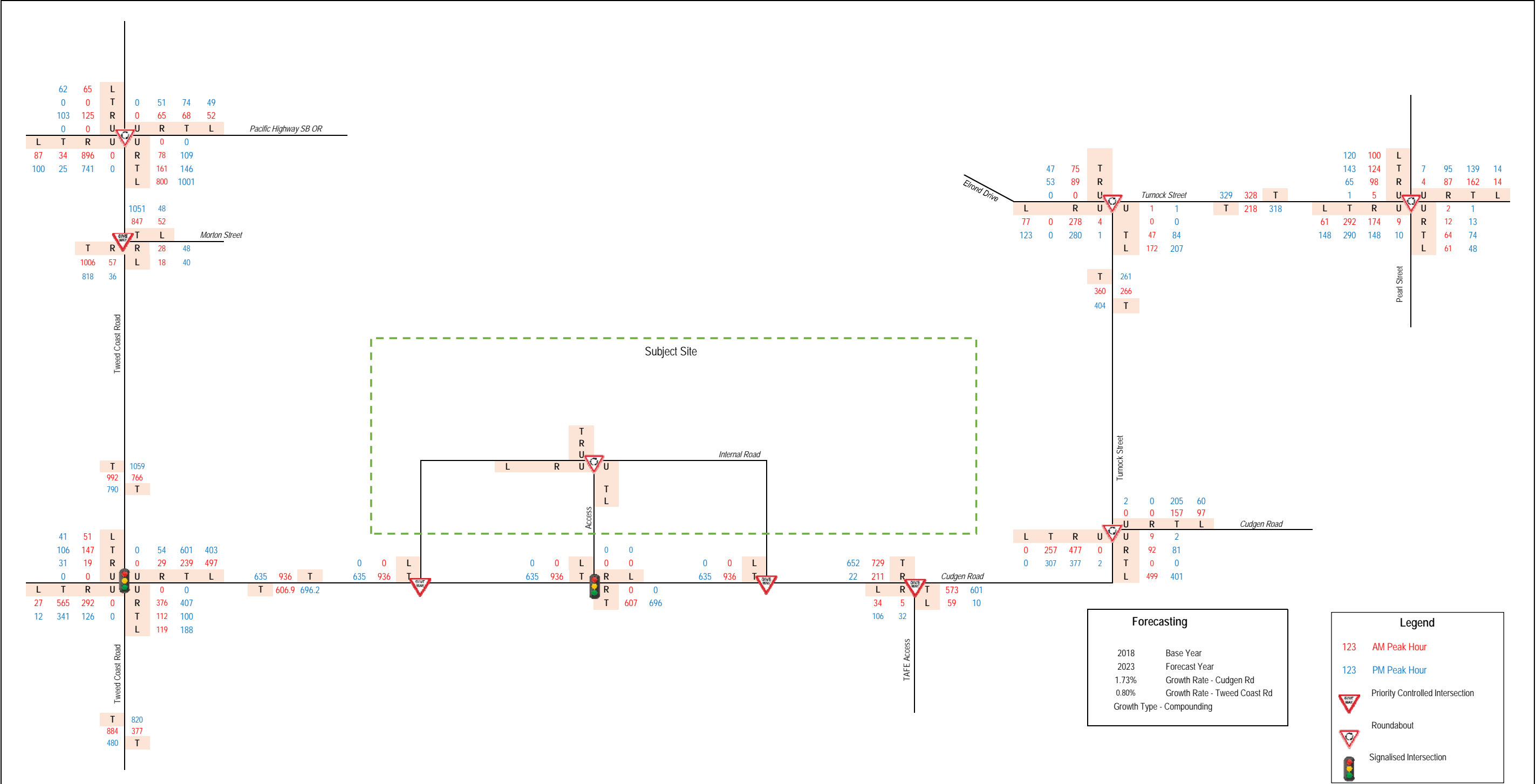
Time	Total	Cars	Light Trucks	Heavy Trucks	Average Speed	85th %ile
0000	3	3	0	0	61.2	-
0015	1	1	0	0	60.6	-
0030	1	1	0	0	60.6	-
0045	3	2	1	0	74.6	-
0100	3	3	0	0	62.3	-
0115	0	0	0	0	-	-
0130	0	0	0	0	-	-
0145	1	1	0	0	65.5	-
0200	1	1	0	0	64.2	-
0215	1	0	1	0	56.4	-
0230	1	1	0	0	58.2	-
0245	1	1	0	0	59.3	-
0300	1	1	0	0	69	-
0315	1	0	1	0	51.3	-
0330	0	0	0	0	-	-
0345	3	3	0	0	57.4	-
0400	5	4	1	0	66.2	-
0415	7	6	1	0	63	-
0430	11	9	2	0	62	67.4
0445	11	10	1	0	65.8	77.5
0500	19	18	1	0	63.5	67.3
0515	19	17	2	0	64.6	69.8
0530	25	25	0	0	63.1	69.3
0545	34	32	2	0	61.6	68.2
0600	33	31	2	0	60.5	66.9
0615	55	54	1	0	61.2	66.3
0630	61	59	2	0	63.7	68.3
0645	57	56	1	0	60.5	64.4
0700	78	75	3	0	62.2	67.2
0715	76	72	4	0	60.6	66.5
0730	104	97	7	0	59.5	67
0745	110	104	6	0	59.2	63.2
0800	112	102	8	2	47.4	58.5
0815	163	158	5	0	47.5	55.1
0830	159	152	7	0	52.1	57.6
0845	147	144	3	0	51.7	58.9
0900	85	78	6	1	54.6	58.2
0915	83	81	2	0	59.4	63.9
0930	87	85	2	0	56.3	60
0945	79	76	3	0	58.8	65.7
1000	76	72	4	0	57.7	60.9
1015	65	63	2	0	57.9	64.3
1030	86	81	5	0	54.3	60.5
1045	78	76	2	0	58.4	62.5
1100	79	75	4	0	58.7	63.2
1115	92	88	4	0	57.8	62.1
1130	103	101	2	0	59.3	64.3
1145	79	78	1	0	60.5	64.8
1200	90	90	0	0	58.1	62.6
1215	85	82	3	0	58.5	64.7
1230	81	79	2	0	59.1	63.7
1245	112	110	2	0	59.1	63.7
1300	73	70	3	0	57.5	62.6
1315	80	80	0	0	58.5	63.3
1330	65	62	3	0	60.2	65.5
1345	89	87	2	0	59.1	64.3
1400	85	82	3	0	61	64.6
1415	113	106	7	0	58.8	63.7
1430	143	137	4	2	57.9	63
1445	121	118	3	0	59.5	63.2
1500	174	170	4	0	56.4	61.4
1515	175	165	10	0	57.8	62.5
1530	160	149	11	0	54.7	61.6
1545	115	111	4	0	57.8	63.3
1600	129	126	3	0	58.5	63.5
1615	122	118	4	0	59.7	65.3
1630	137	133	3	1	59.2	64.1
1645	86	86	0	0	60.3	65
1700	106	103	3	0	59.7	64.3
1715	85	83	2	0	59.4	64
1730	85	84	1	0	58.3	63.2
1745	69	69	0	0	58.8	64.2
1800	59	58	1	0	57.3	61
1815	59	57	2	0	57.4	65
1830	62	61	1	0	59.3	64.3
1845	34	32	2	0	60.8	66.7
1900	42	42	0	0	60.6	67
1915	26	25	1	0	59	64.4
1930	42	41	1	0	59.1	62.9
1945	13	13	0	0	59.5	65.3
2000	31	30	1	0	58.8	63.4
2015	18	16	2	0	65.4	71.4
2030	19	18	1	0	62.4	69.5
2045	16	15	1	0	62.4	67.4
2100	17	17	0	0	61.4	69.1
2115	15	15	0	0	60.8	64.2
2130	21	21	0	0	59.2	63.1
2145	17	16	1	0	61.4	70.2
2200	17	16	0	1	64	68.6
2215	38	36	2	0	59.3	64
2230	15	14	1	0	59.2	64.6
2245	17	17	0	0	61.8	69.9
2300	6	6	0	0	54.4	-
2315	3	2	1	0	62.4	-
2330	1	1	0	0	58.2	-
2345	4	3	1	0	64.9	-
07-09	949	904	43	2	53.8	62.6
09-16	2753	2652	98	3	58	63.2
16-18	819	802	16	1	59.2	64.1
00-00	5471	5269	195	7	57.9	63.9

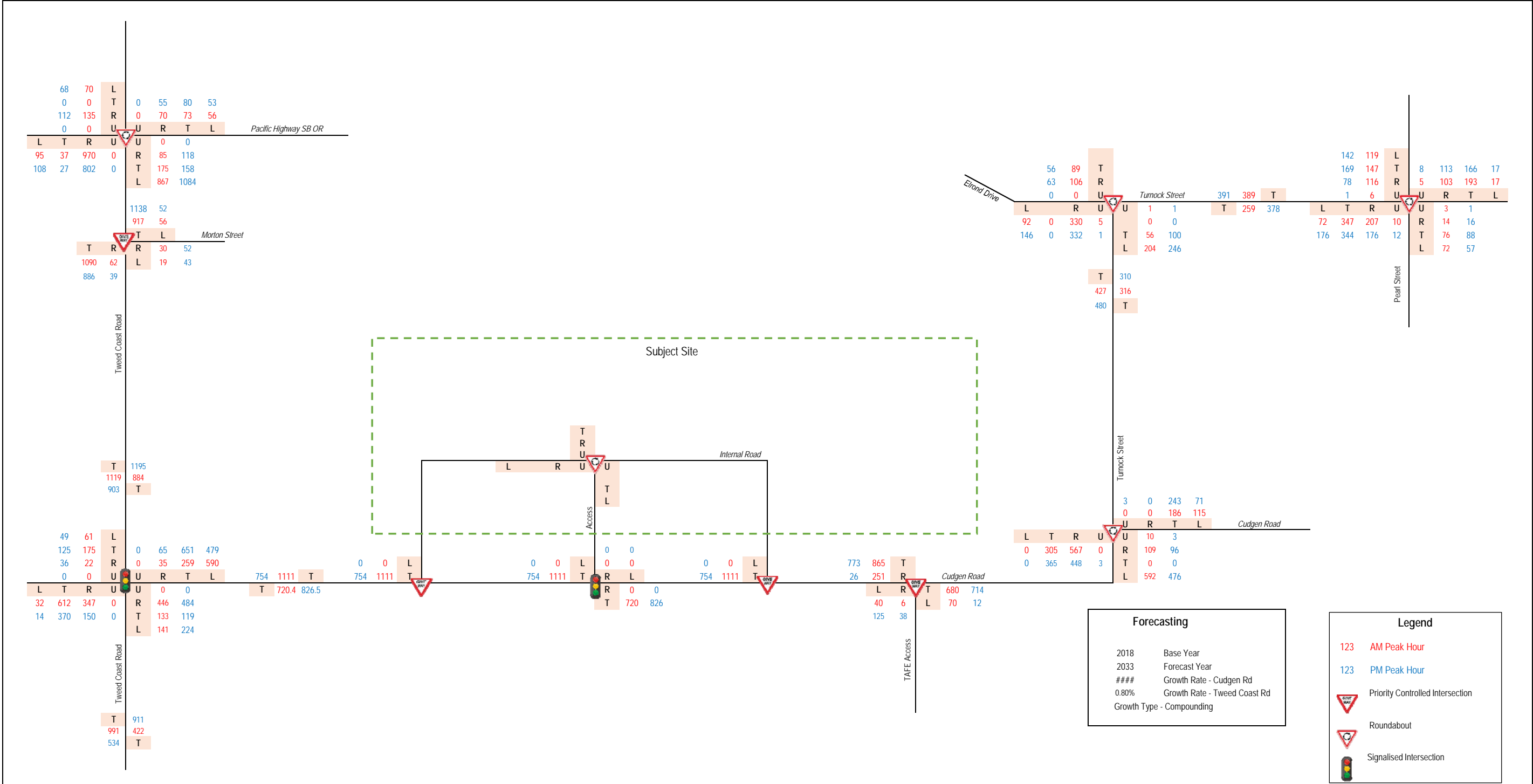
## APPENDIX B

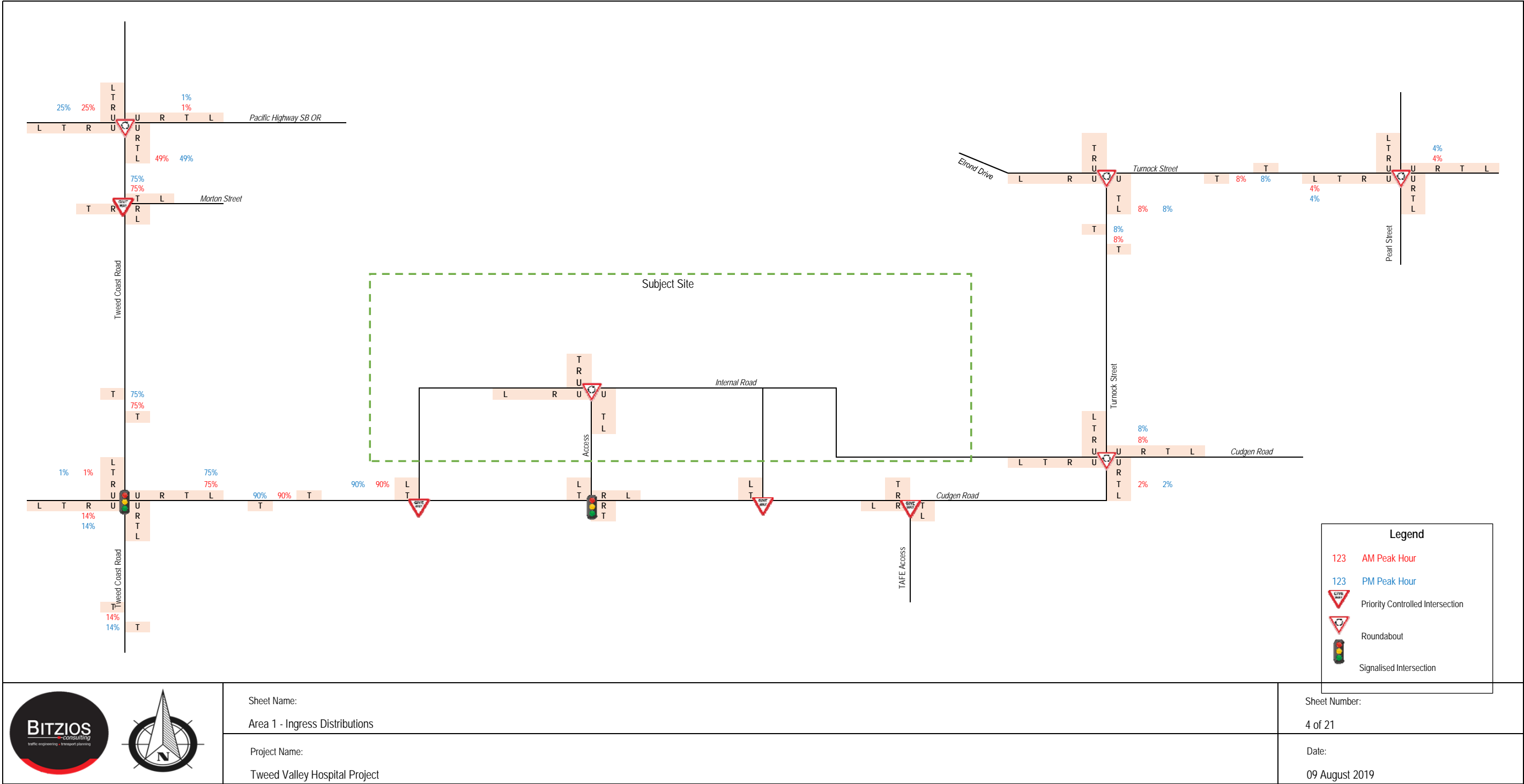
### NETWORK DIAGRAMS









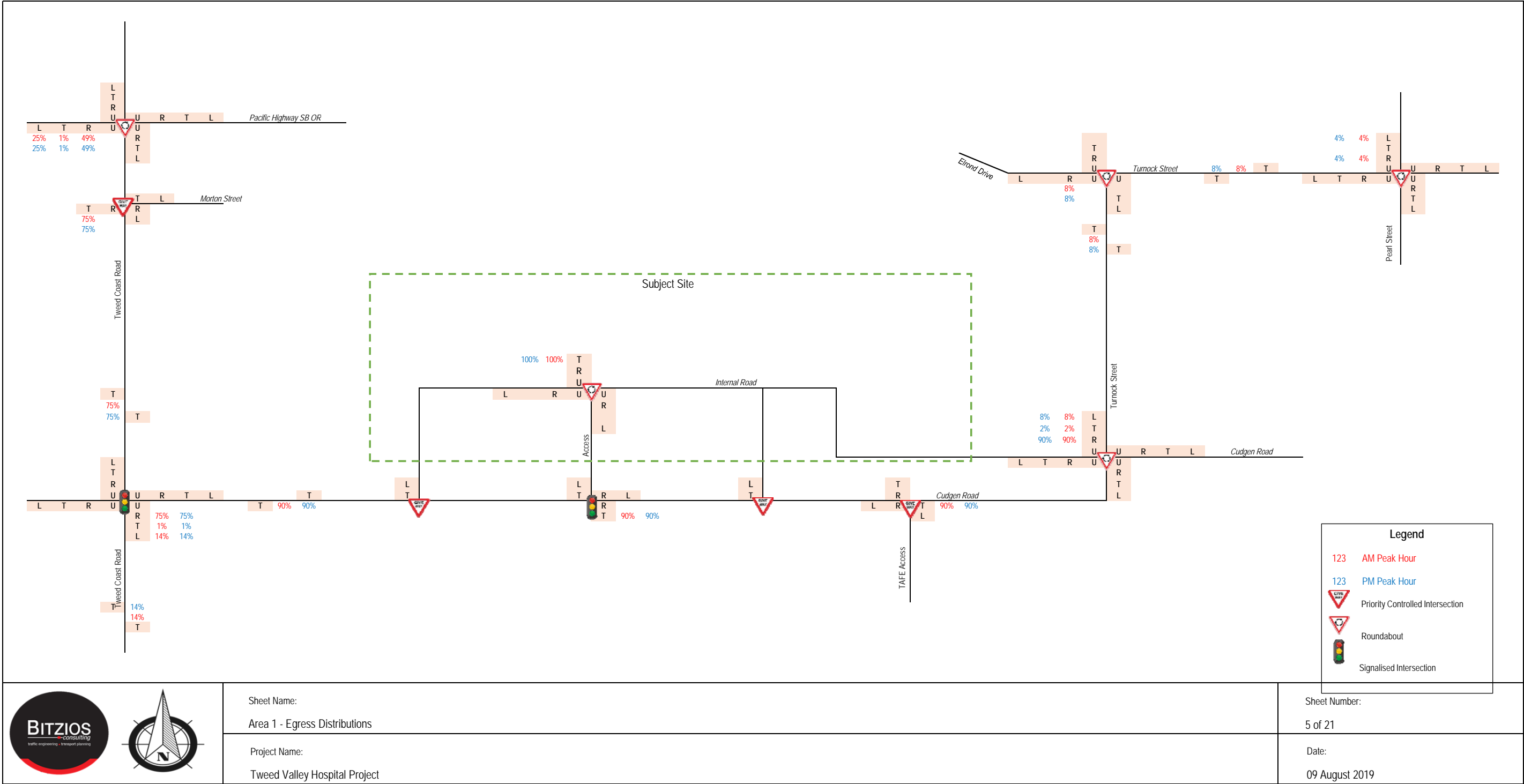


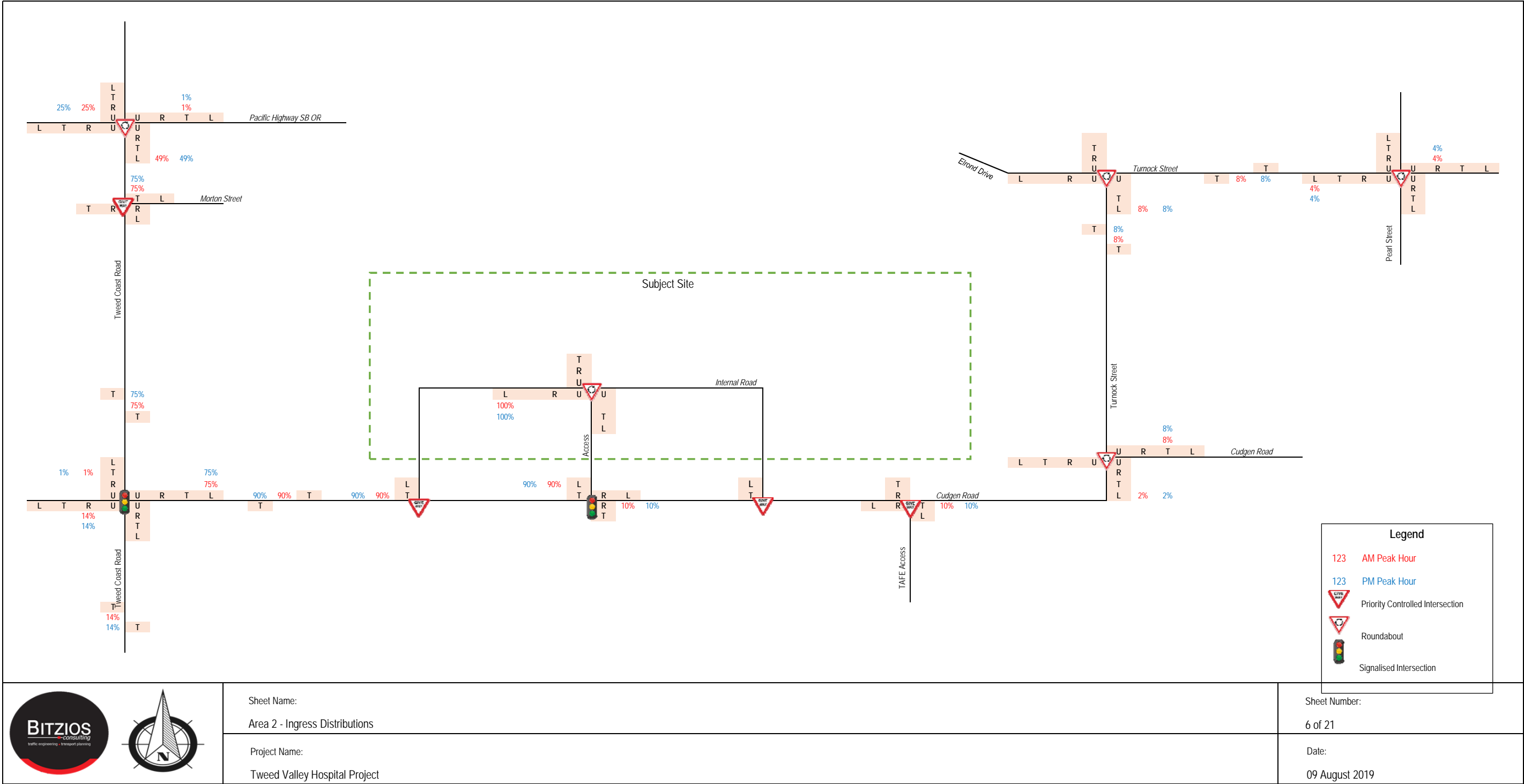
Sheet Name:  
Area 1 - Ingress Distributions

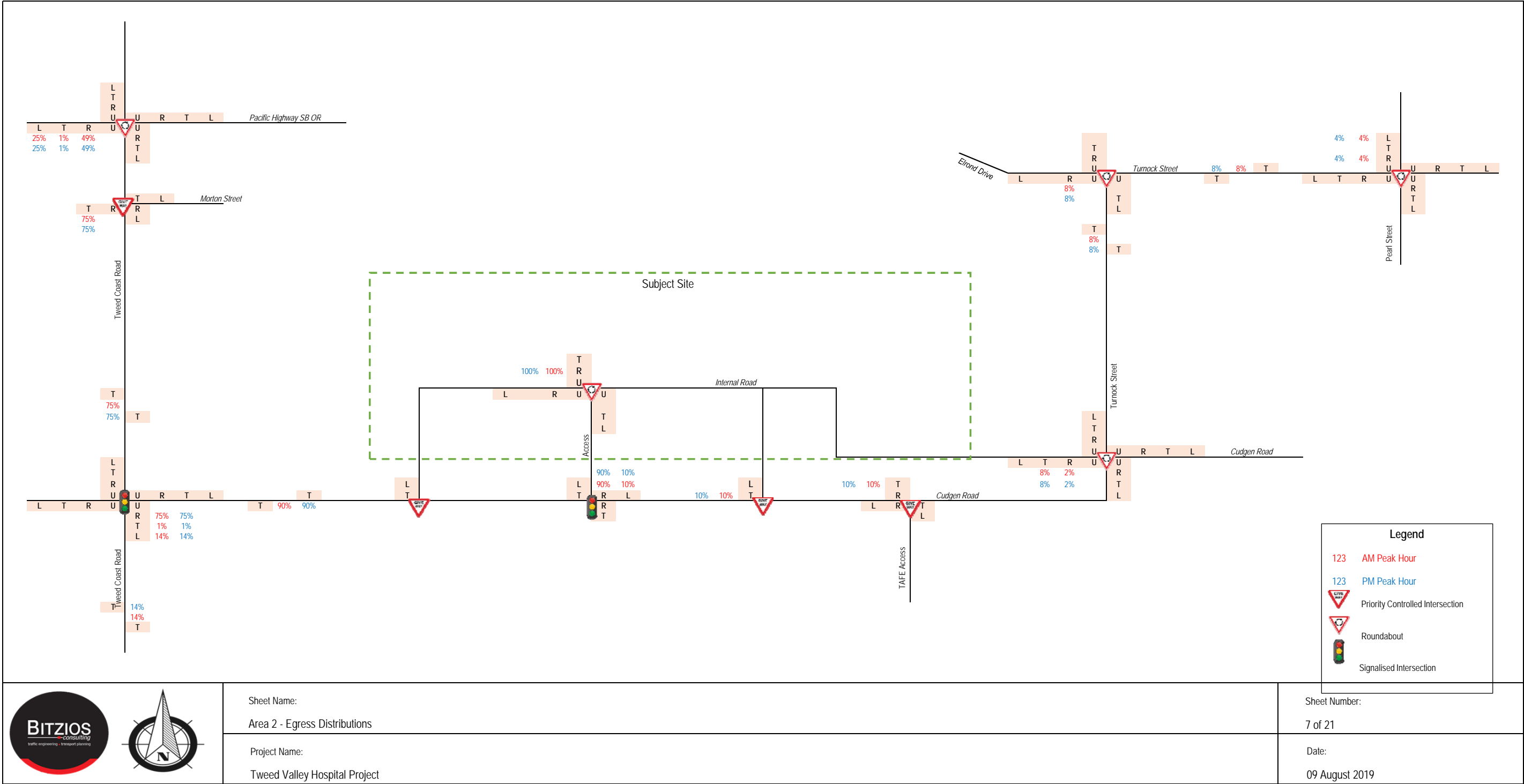
Project Name:  
Tweed Valley Hospital Project

Sheet Number:  
4 of 21

Date:  
09 August 2019





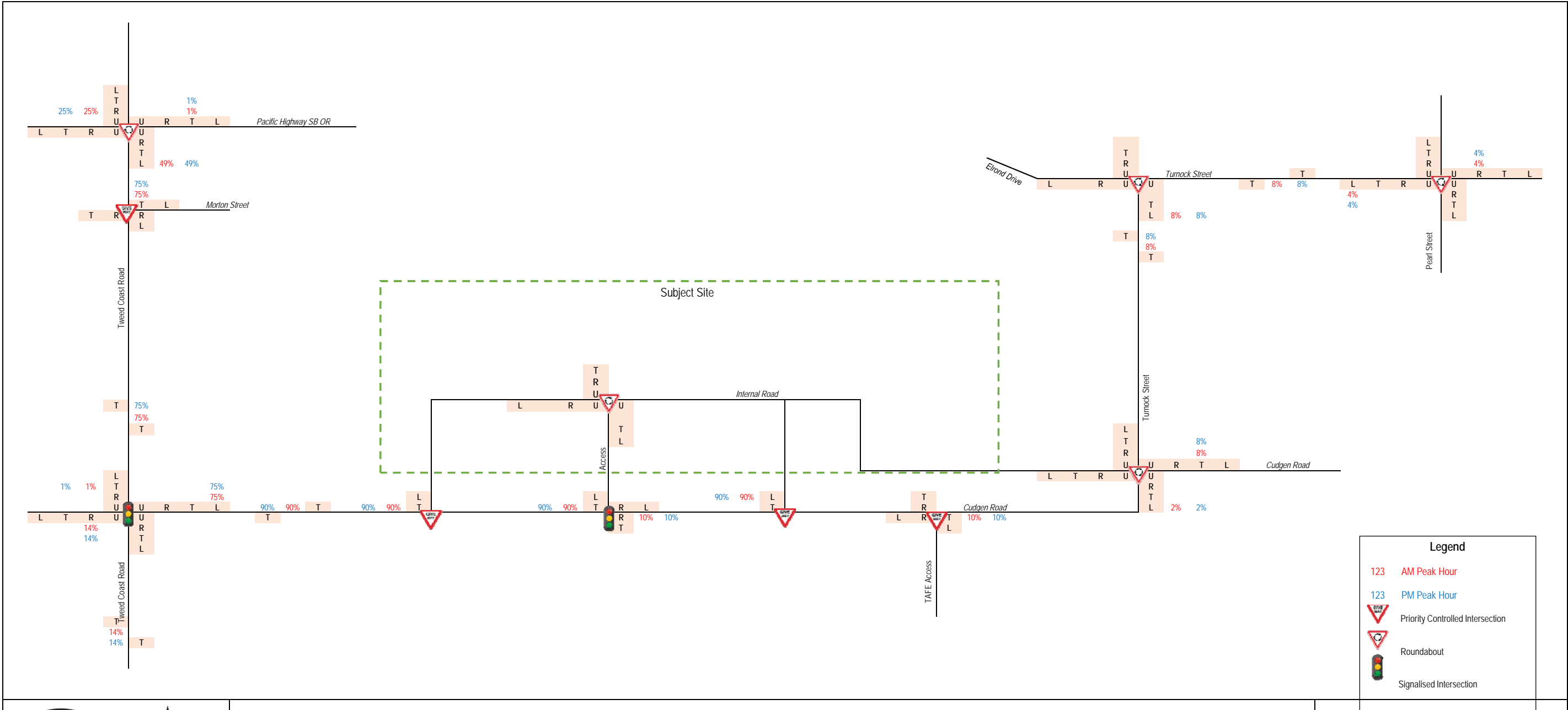


Sheet Name:  
Area 2 - Egress Distributions

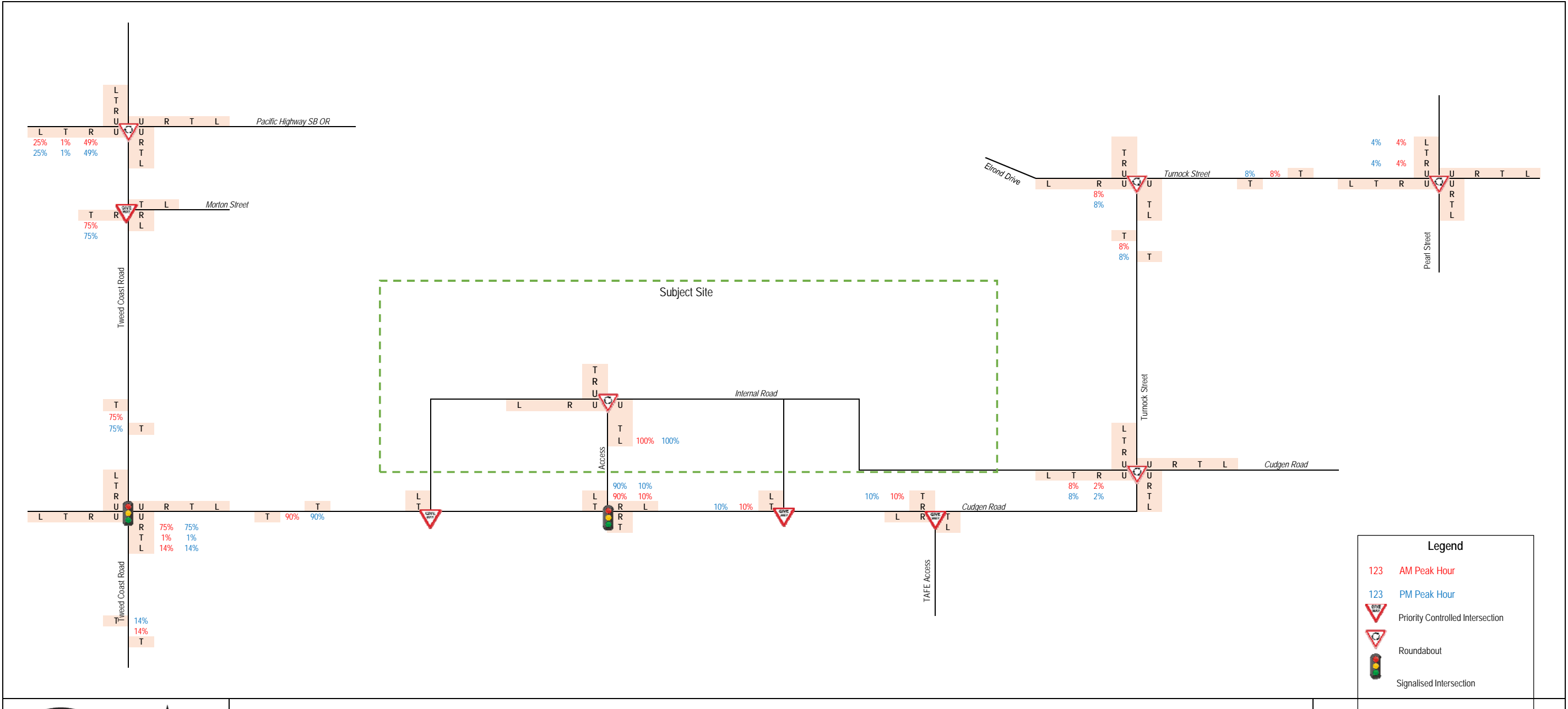
Project Name:  
Tweed Valley Hospital Project

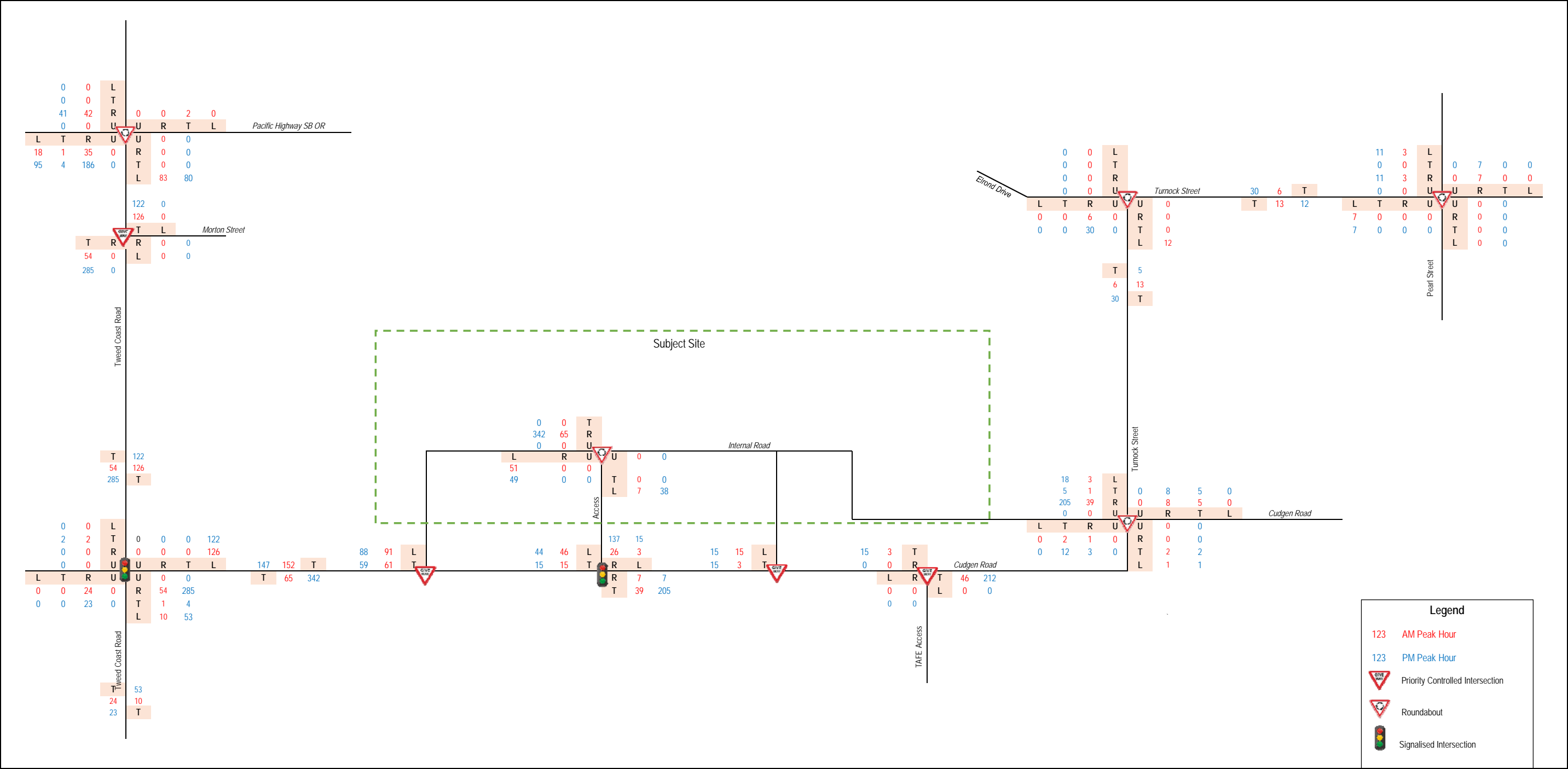
Sheet Number:  
7 of 21

Date:  
09 August 2019







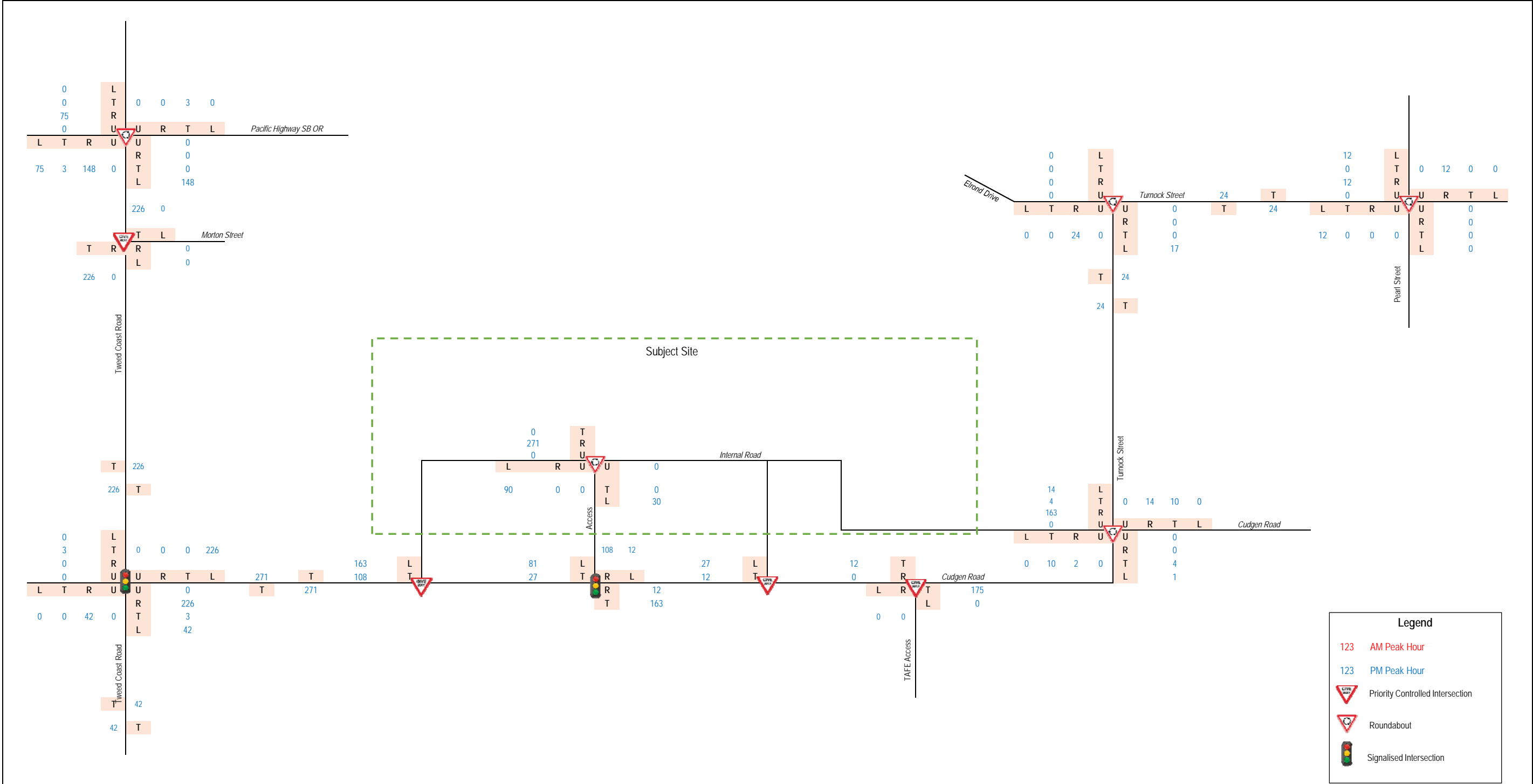


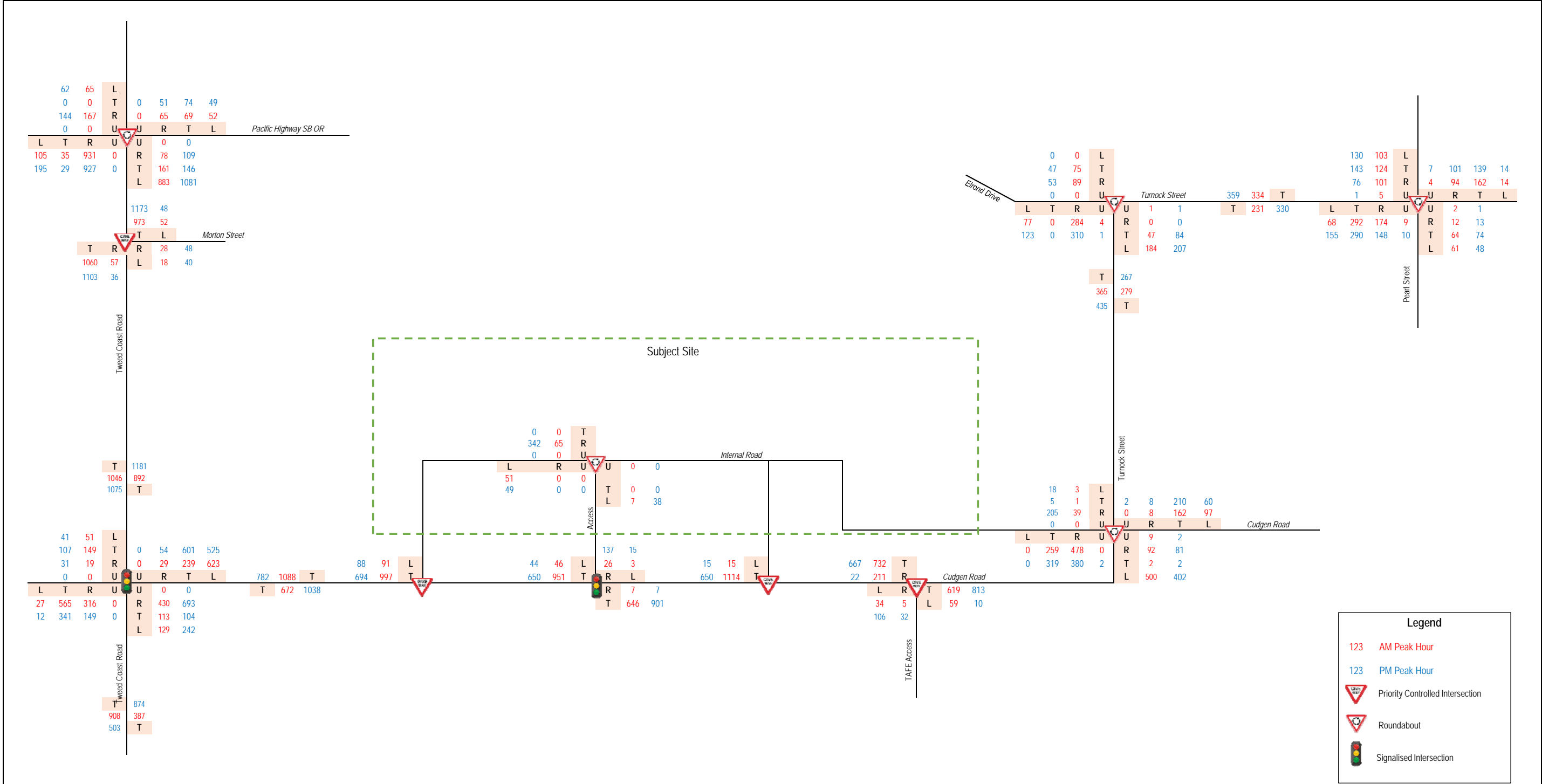
Sheet Name:  
MVT and EVT Trip Assignment

Project Name:  
Tweed Valley Hospital Project

Sheet Number:  
10 of 21

Date:  
09 August 2019



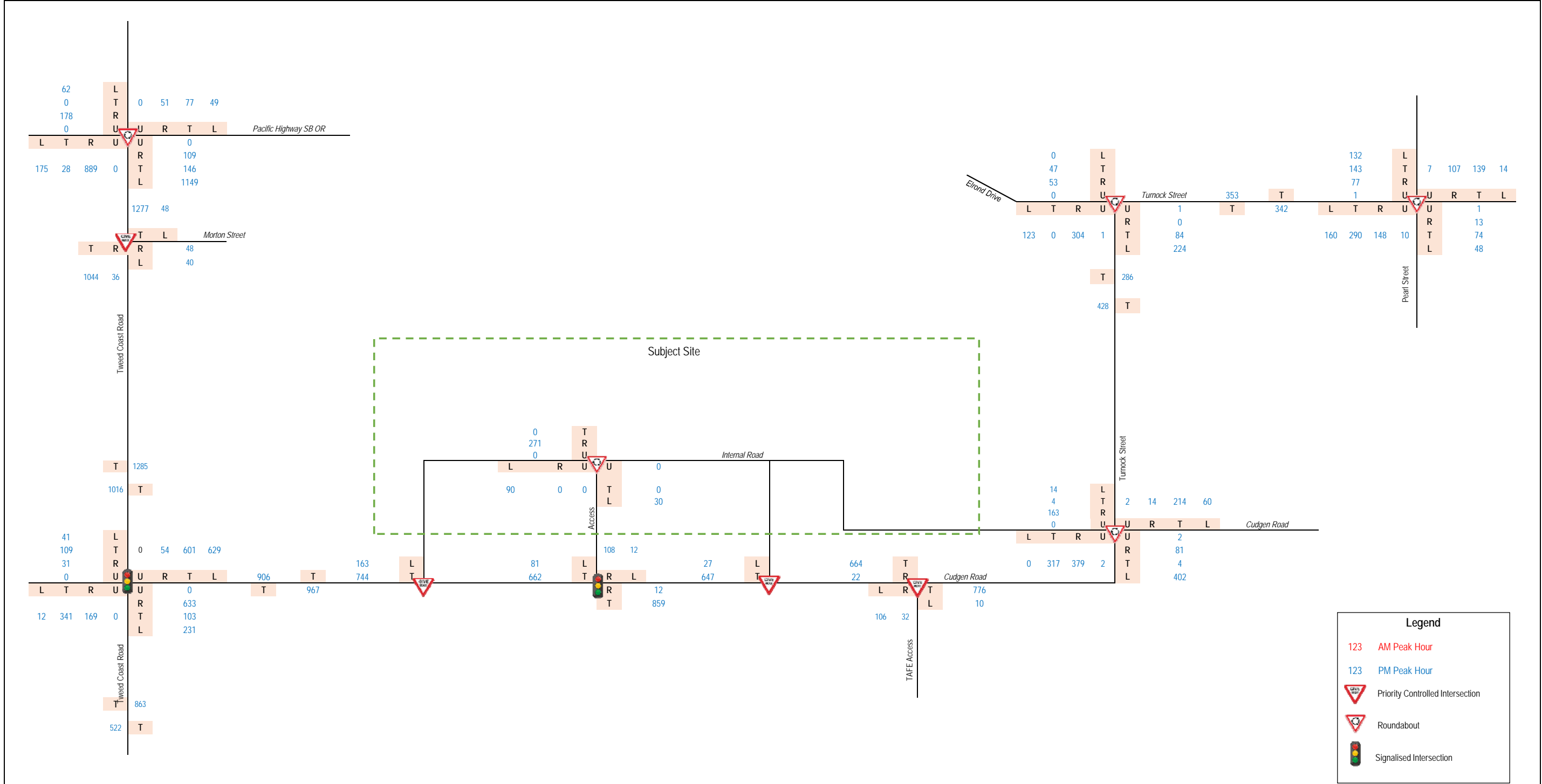


Sheet Name:  
Year 2023 Design Traffic - Morning and Evening Commuter Peak Periods (MVT and EVT)

Project Name:  
Tweed Valley Hospital Project

Sheet Number:  
12 of 21

Date:  
09 August 2019

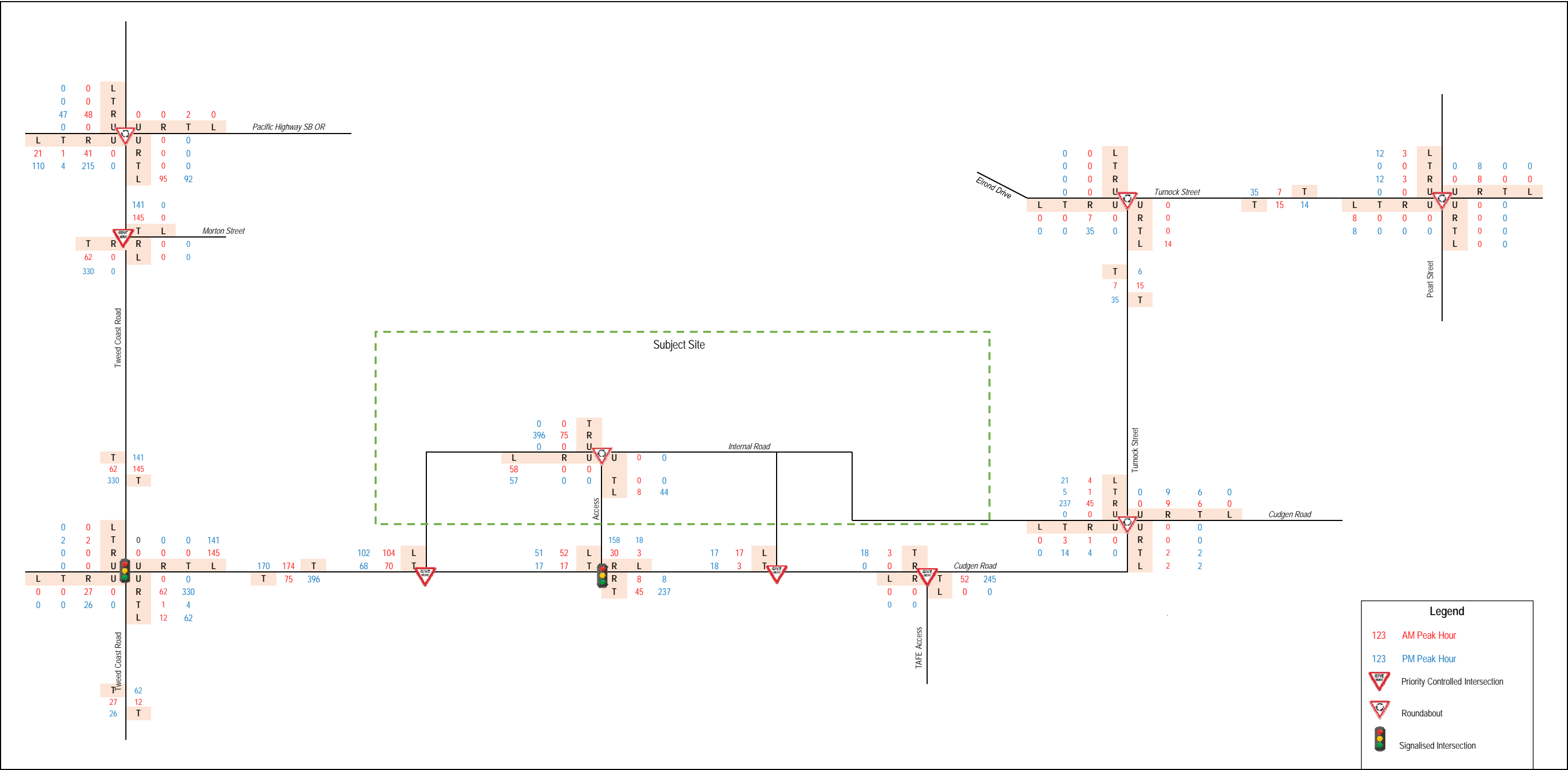


Sheet Name:  
Year 2023 Design Traffic - Development Peak Period (PVT)

Project Name:  
Tweed Valley Hospital Project

Sheet Number:  
13 of 21

Date:  
09 August 2019



Legend

123

AM Peak Hour

123

PM Peak Hour

Priority Controlled Intersection

Roundabout

Signalised Intersection



Sheet Name:

2033 MVT and EVT Trip Assignment

Project Name:

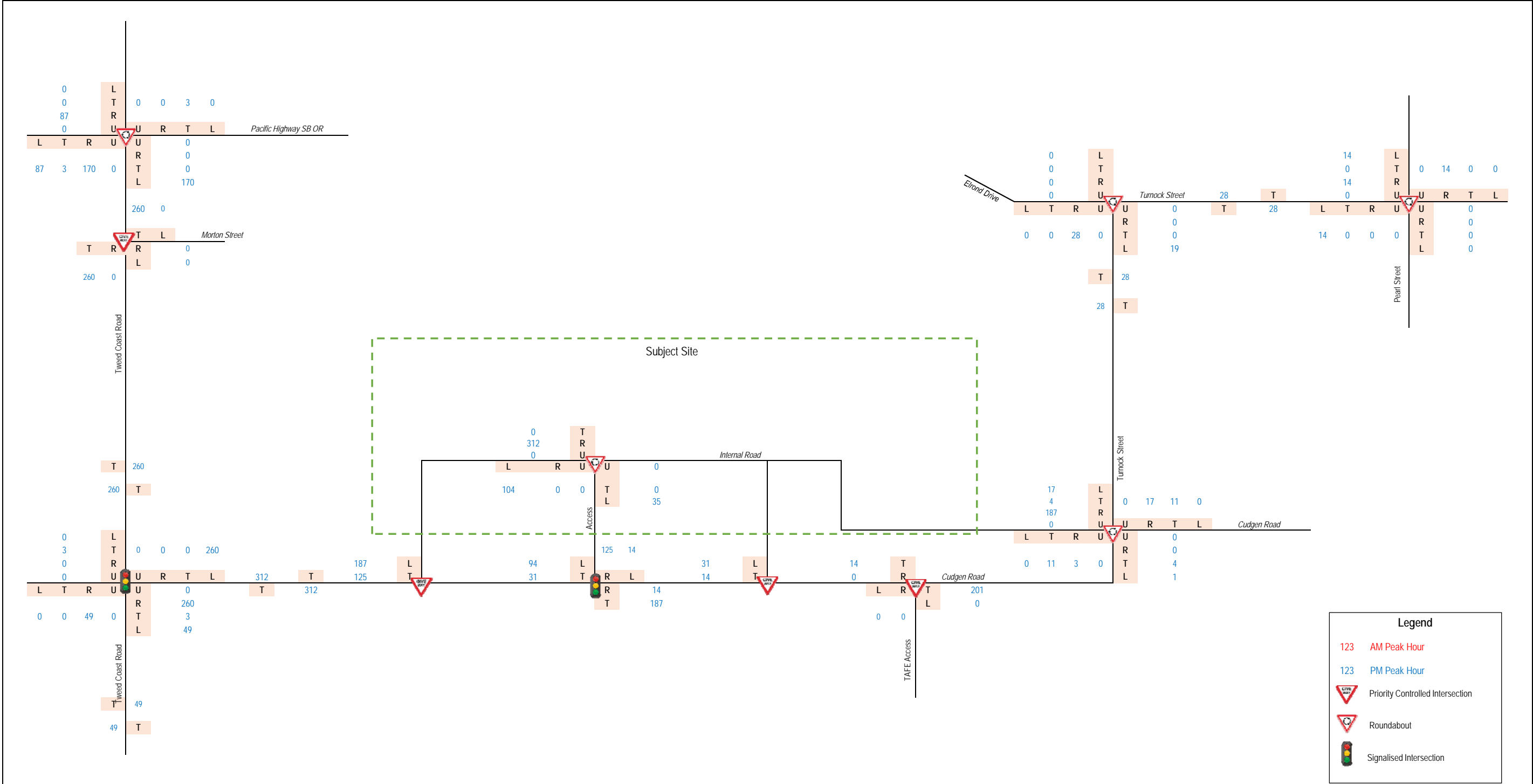
Tweed Valley Hospital Project

Sheet Number:

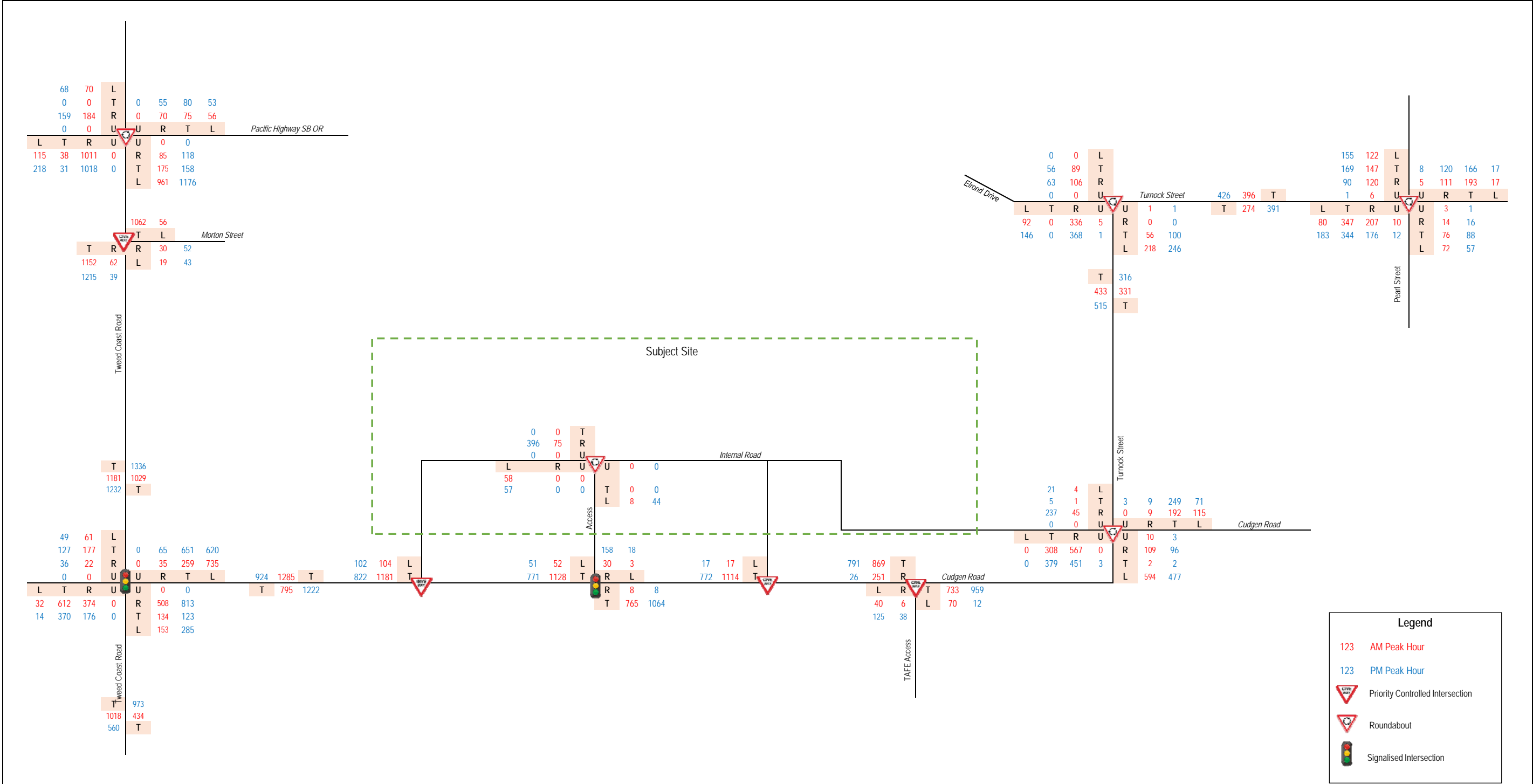
14 of 21

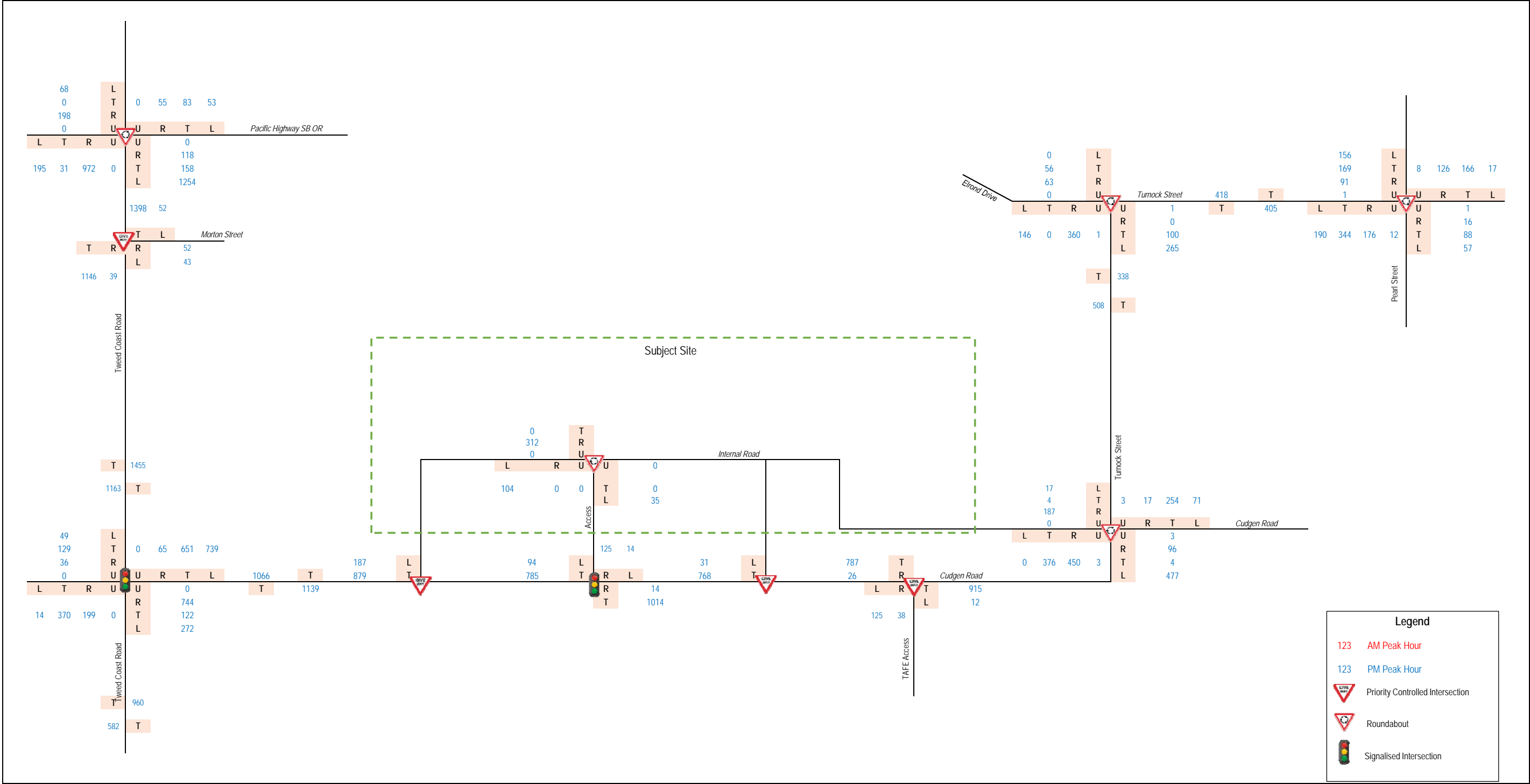
Date:

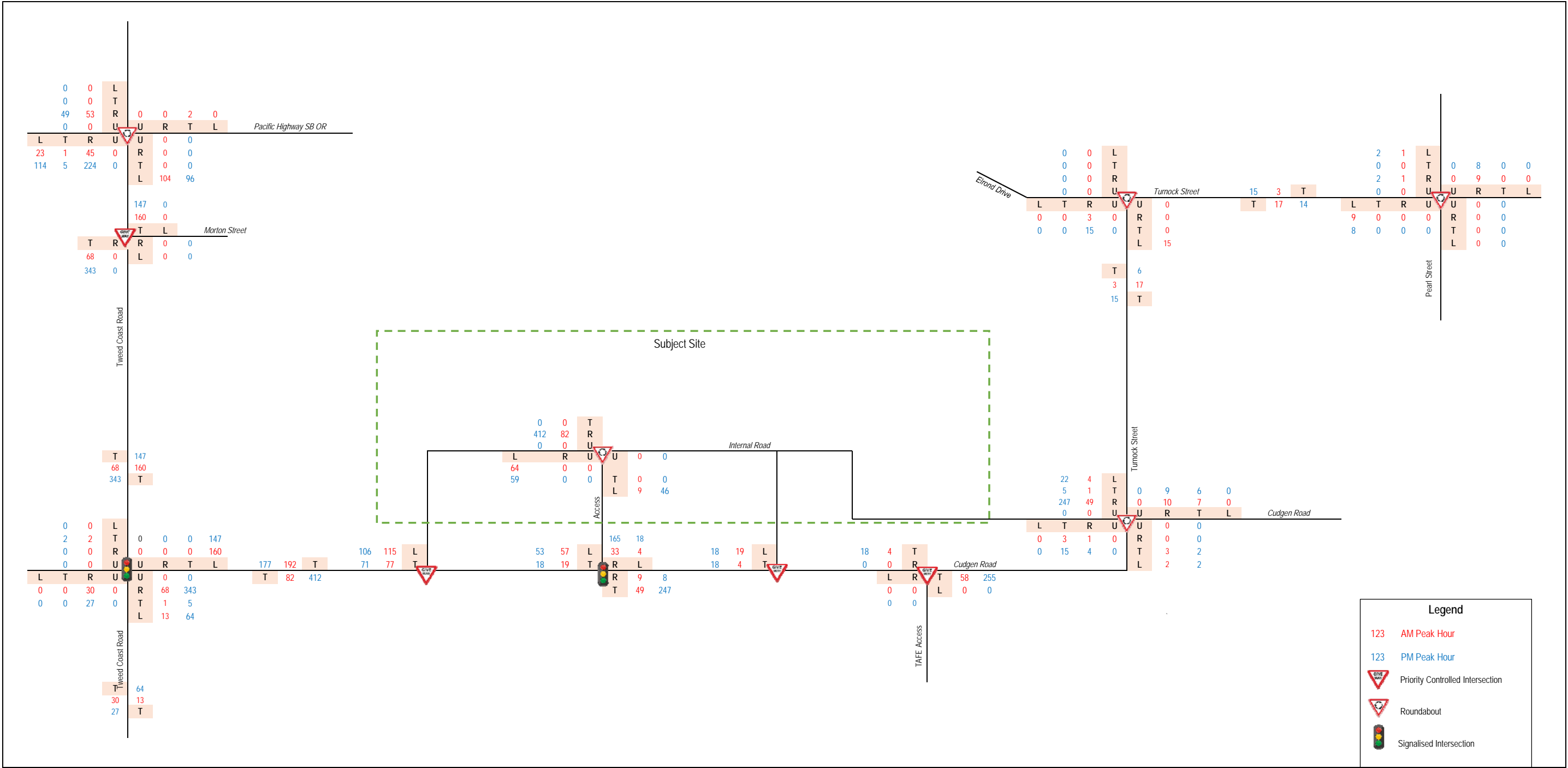
09 August 2019











Legend

123

AM Peak Hour

123

PM Peak Hour

Priority Controlled Intersection

Roundabout

Signalised Intersection



Sheet Name:

2033 Sensitivity Test MVT and EVT Trip Assignment

Project Name:

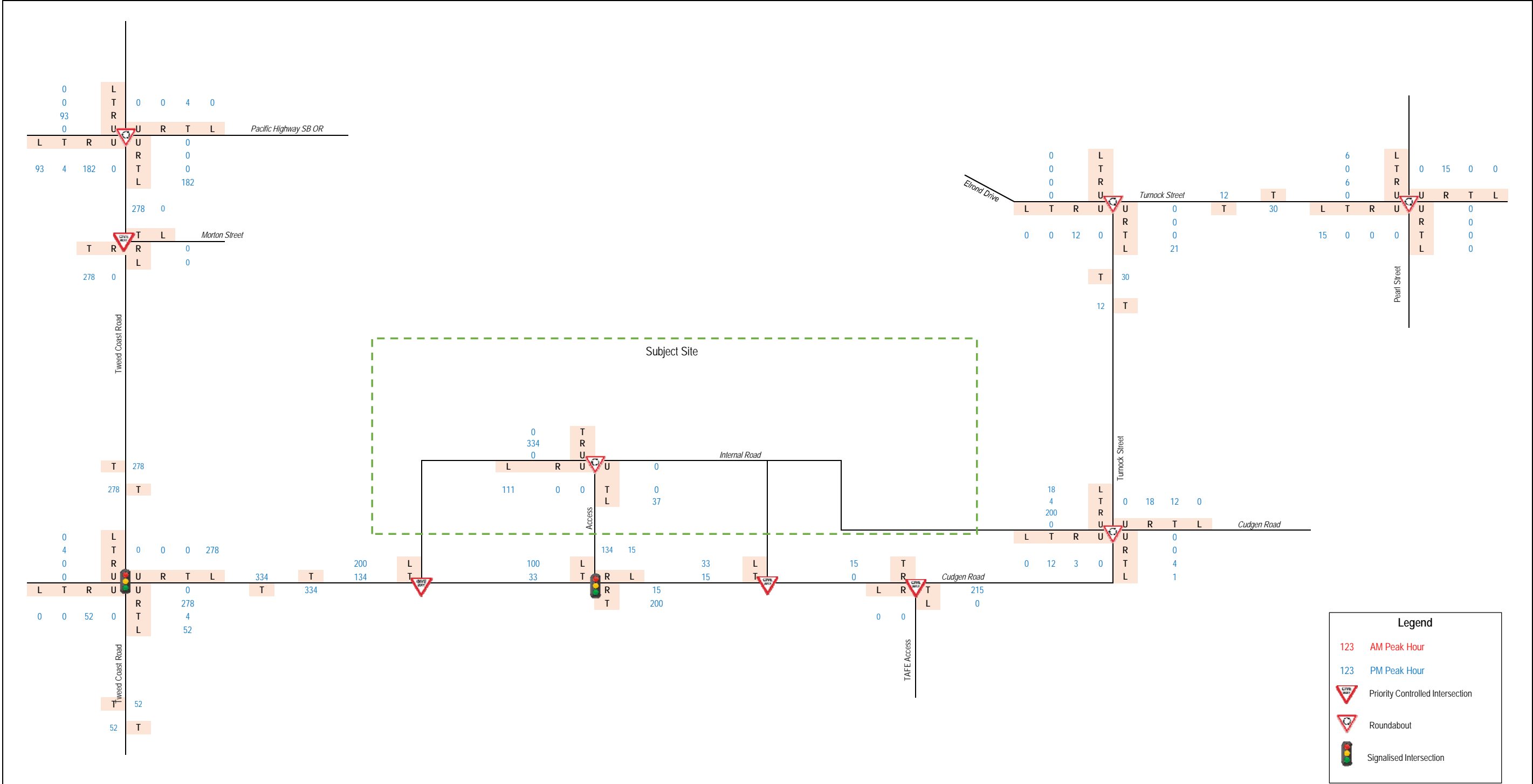
Tweed Valley Hospital Project

Sheet Number:

18 of 21

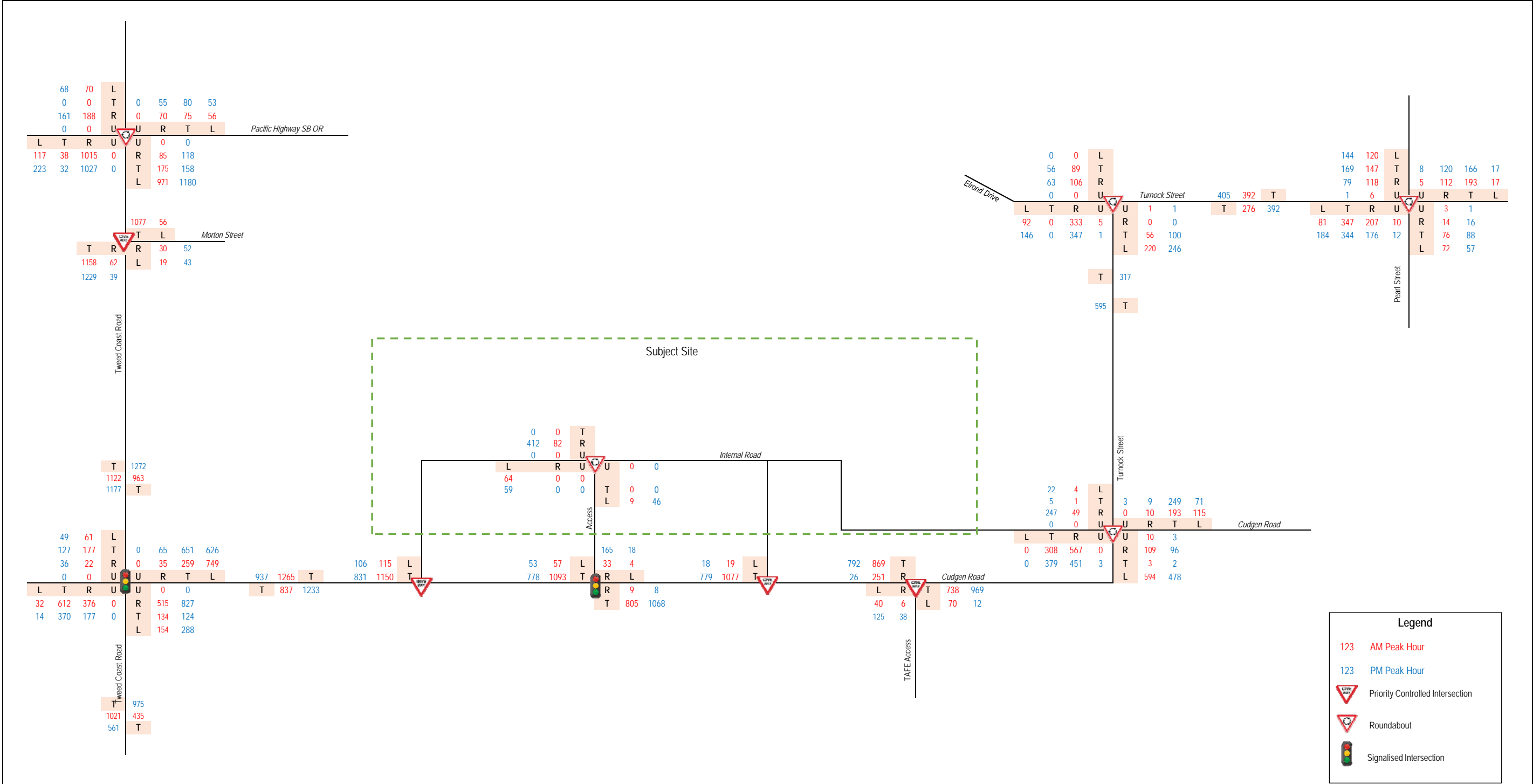
Date:

09 August 2019



**Legend**

- 123 AM Peak Hour
- 123 PM Peak Hour
- Priority Controlled Intersection
- Roundabout
- Signalised Intersection



Legend

123

AM Peak Hour

123

PM Peak Hour

Priority Controlled Intersection

Roundabout

Signalised Intersection

