Koala Park Traffic Management Study

Study Summary Report

City of Gold Coast

27 October 2022

Gold Coast
Suite 26, 58 Riverwalk Avenue
Robina QLD 4226
P: (07) 5562 5377

Brisbane
Level 2, 428 Upper Edward Street
Spring Hill QLD 4000
P: (07) 3831 4442

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

W: www.bitziosconsulting.com.au

E: admin@bitziosconsulting.com.au

Document Issue History

Report File Name	Prepared	Reviewed	Issued	Date	Issued to
P5288.001T Koala Park Traffic Study_Summary Report	[redacted]	[redacted]	[redacted]	27/10/2022	Jake Matuzic, sent via: JMATUZIC@goldcoast.qld.gov.au

CONTENTS

Tables

Figures

Appendices

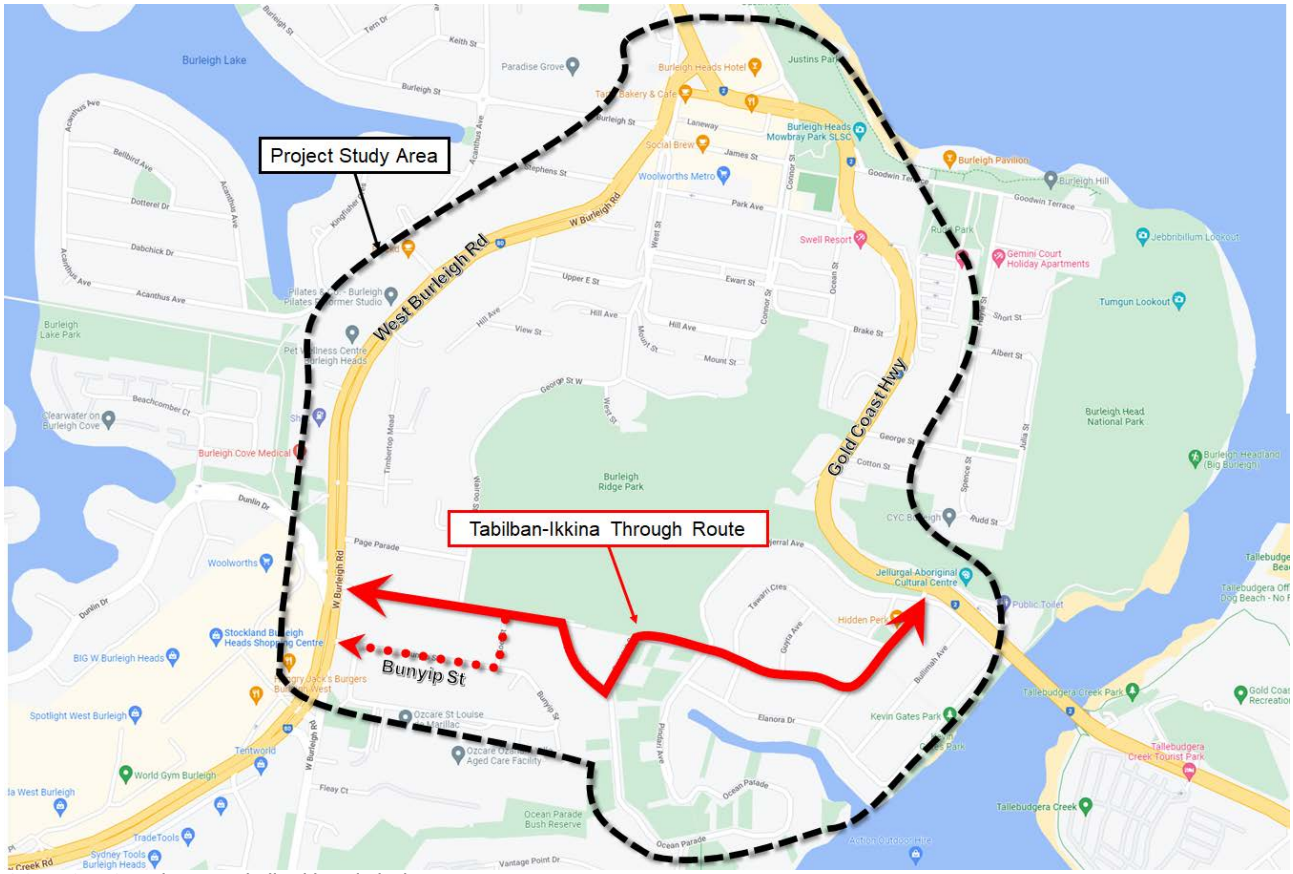
1. INTRODUCTION

1.1 Background

City of Gold Coast (Council) commissioned Bitzios Consulting to complete the Koala Park Traffic Management Study to inform investigations into the Burleigh Heads / Koala Park area, with a focus on the Tabilban Street-Ikkina Road route. The investigations respond to a petition received in 2021 requesting Council to consider closing Reserve Street to through traffic and to construct the so-called 'missing link' at Tabilban Street. The route services local residents, however through traffic continues to use the route as a 'rat-run' to avoid the Gold Coast Highway and West Burleigh Road.

The study included development of a Local Area Transport Model, completion of an independent Road Safety Audit, options development and testing, public consultation and identification of a preferred treatment option for corridor.

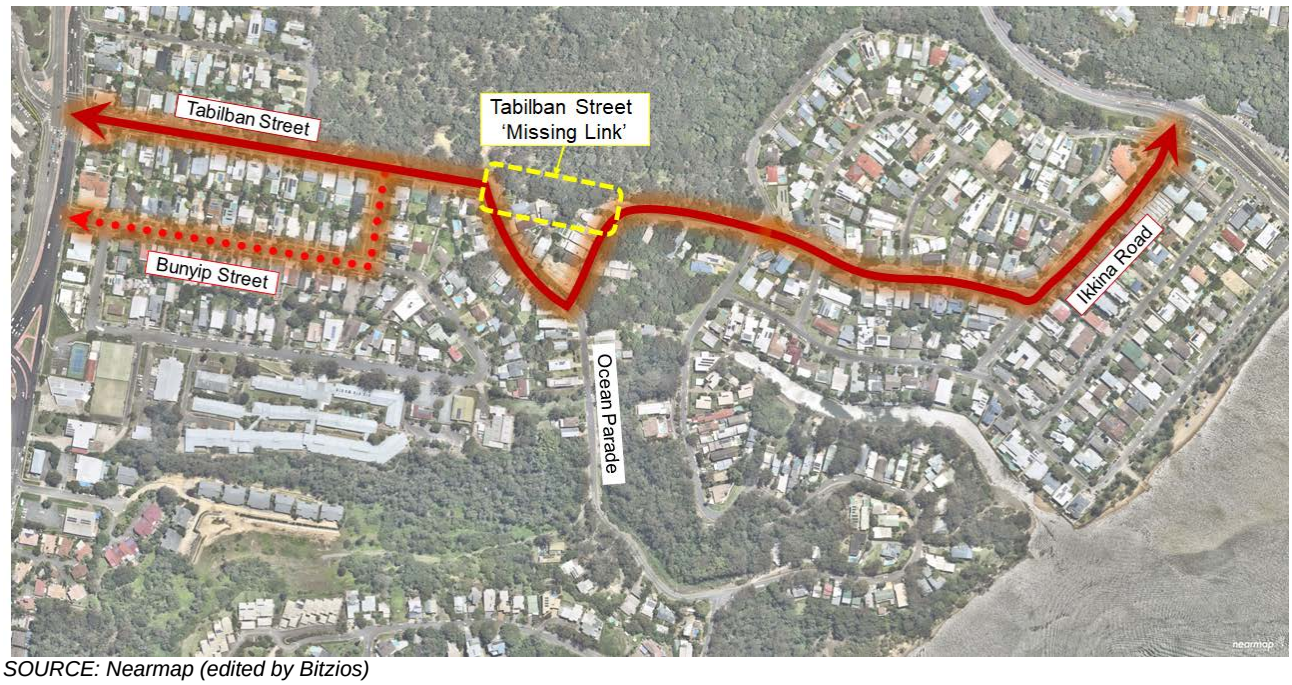
The study area considered and used for the development of the transport model is bound by Ocean Parade (south), West Burleigh Road (west), Gold Coast Highway (north) and Julia Street (east) in Burleigh Heads as shown in Figure 1.1.



SOURCE: Google Maps (edited by Bitzios)

Figure 1.1: Study Area

The Tabilban Street-Ikkina Road route, including the so-called 'missing link' within the unformed road reserve of Tabilban Street is shown in Figure 1.2.



SOURCE: Nearmap (edited by Bitzios)

Figure 1.2: Tabilban-Ikkina Route

1.2 Purpose of this Report

This report provides a summary of the overarching scope and findings for the Koala Park Traffic Management Study. It summarises the model development and options testing, Road Safety Audit completed, community consultation and the preferred outcome for the study area associated with the petition received by Council to close Reserve Street and connect the Tabilban Street link through Koala Park in Burleigh Heads.

1.3 Scope of the Assessment

The scope of work was divided over two (2) teams and run in parallel. One team completed the independent Road Safety Audit and kept separate from any modelling, options development and/or design work and entirely independent of the primary study team.

Specifically, the scope of work included:

- Traffic data collection to understand baseline conditions and for model development, including:
  - Traffic surveys (counts) to determine current traffic volumes, speeds and peaks
  - Origin-Destination (OD) survey to understand the level of through traffic using the Tabilban link
  - Travel time surveys to determine peak travel times using the state road network and Tabilban link
- An independent Existing Conditions Road Safety Audit (RSA)
- Development of a Local Area Transport Model using the Aimsun modelling software to replicate existing conditions and forecast future conditions for testing
- Development of options and testing through a 'strategic merit test' and a 'multi-criteria analysis' (MCA) process under the *Australian Transport Assessment and Planning* (ATAP) guidelines
- Community survey and public consultation to understand the local issues and sentiment regarding the Tabilban link and various options
- Development of a concept design package and strategic cost estimates for options developed
- Identification of a recommended preferred option for the study area.

1.4 Reference Documents

A number of reports were prepared by Bitzios Consulting for the Koala Park Traffic Management Study which have informed the findings and outcomes within the study and are included in the relevant appendices of this report. These included:

- Existing Conditions Road Safety Audit report (**Appendix A**)
- Base Model Calibration and Validation report (**Appendix B**)
- Future Base Traffic Model Development report (**Appendix C**)
- Options Modelling and Assessment report (**Appendix D**)
- Study Summary report (this report) (ref: *P5288.002R Koala Park Traffic Study_Summary Report)*

The above reports shall be read in conjunction with this report.

2. EXISTING CONDITIONS

2.1 Overview

The Koala Park local area is bound by the Gold Coast Highway to the east and West-Burleigh Road to the west. These two state controlled roads are connected via the Tabilban Street-Ikkina Road corridor consisting of Tabilban Street, Ocean Parade, Reserve Street and Ikkina Road. These roads – including Bunyip Street in the west, are being used as a through route, or perceived 'short-cut', between the two state controlled roads to reduce travel time and avoid up to six signalised intersections and the slower speed environment through the Burleigh Heads CBD.

2.2 Traffic Survey Results

The **travel time survey** results are presented graphically in Figure 2.1.

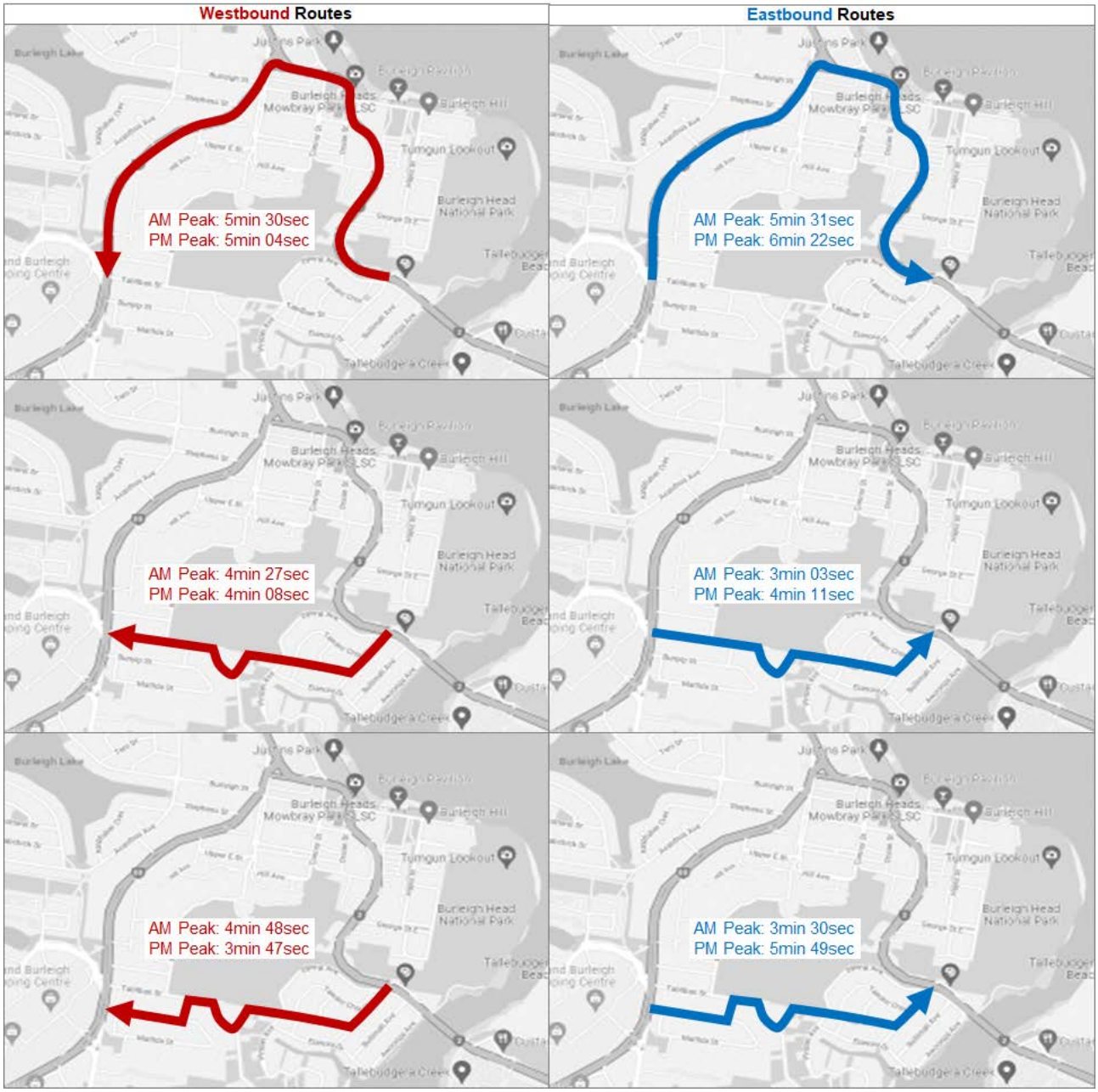


Figure 2.1: Travel Time Survey Results (Eastbound and Westbound)

The travel time differences determined from the surveys are outlined in Table 2.1 by direction.

Table 2.1: Travel Time Survey Difference (by direction)

Route / Direction	Peak Period	Travel Time Difference
Westbound		
via Tabilban Street	AM	1 minute 3 seconds faster
	PM	56 seconds faster
via Bunyip Street	AM	42 seconds faster
	PM	1 minute 17 seconds faster
Eastbound		
via Tabilban Street	AM	2 minutes 28 seconds faster
	PM	2 minutes 11 seconds faster
via Bunyip Street	AM	2 minutes 01 second faster
	PM	33 seconds faster

Key findings from the surveys showed the Tabilban-Ikkina route was generally faster compared to the state routes, however not significantly faster as perceived by drivers performing the 'rat-run'.

The **origin-destination (OD) survey** results are presented graphically in Figure 2.2.

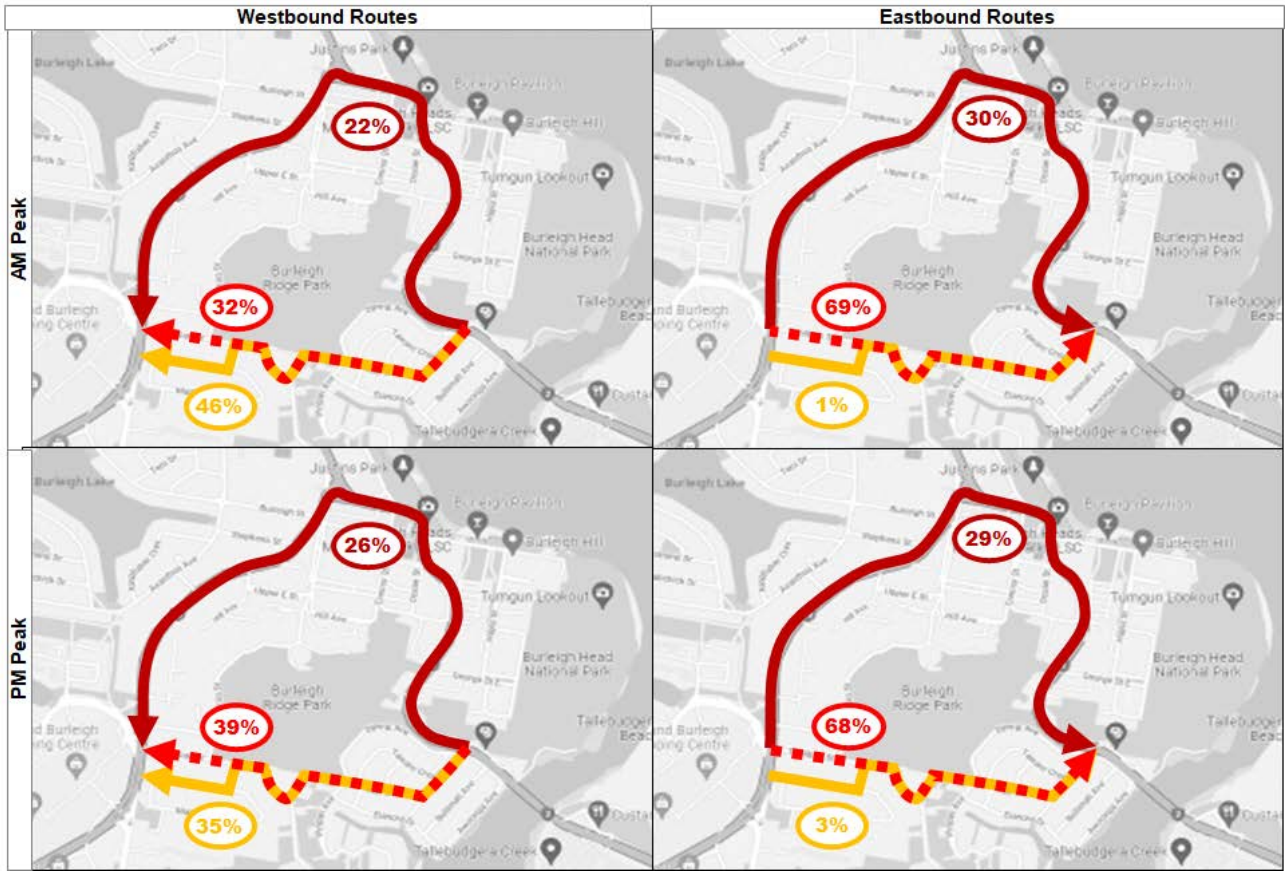


Figure 2.2: OD Survey Results (Eastbound and Westbound)

As shown, over 70% of peak period trips travelling between the Gold Coast Highway and West Burleigh Road (westbound and eastbound) use the Tabilban-Ikkina route instead of the state network.

The **traffic volume survey** results (based on tube count data collected) is outlined in Table 2.2.

Table 2.2: Tabilban Street Traffic Volume and Speed Information

Element	Data	Survey Date
Daily Traffic Volume (incl. weekends)	8,299 veh/day	April 2021
Weekday Traffic Volume (excl. weekends)	9,088 veh/day	April 2021
Weekday AM Peak (7-9am)	1,569 veh/h	April 2021
Weekday PM Peak (3-5pm)	1,691 veh/h	April 2021
Posted Speed Limit	40 km/h	April 2021
Average Speed	40.0 km/h	April 2021
85th Percentile Speed	47.4 km/h	April 2021

As shown Tabilban Street is carrying close to 10,000 veh/day during a typical weekday while accommodating direct property access along the route.

2.3 Cross-sections and Road Hierarchy

Table 2.3 details the characteristics of key roads within the study area and Table 2.4 shows the relevant road hierarchy, capacity and current volumes.

Table 2.3: Study Area Key Roads: Cross-sections

Road Name	Control	Width (approximate)			Lanes	Direct Access	Parking	Speed
		Reserve	Pavement	Verge				
Tabilban St	Council	20m	12m (varies)	4m / 4m	2	Yes	Yes	40km/h
Bunyip St	Council	19m	10m	4m / 5m	2	Yes	Yes	50km/h
Ocean Pde	Council	20m	7.5m (varies)	6.5m / 6m	2	Yes	Yes	50km/h
Reserve St	Council	20m	7m	3.5m / 9.5m	2	Yes	No	40km/h
Ikkina Rd	Council	20m (varies)	12m (varies)	4m / 4m	2	Yes	Yes	40km/h
Gold Coast Hwy	TMR	*Varies*			4 (divided)	No	No	60km/h
W Burleigh Rd	TMR	*Varies*			6 (divided)	No	Limited	60km/h

Table 2.4: Study Area Key Roads: Hierarchy

Road Name	Control	Hierarchy	Environmental Capacity	Current Volumes
Tabilban St	Council	Major Collector	7,500-10,000 veh/day	9,088 veh/day[1]
West Burleigh Rd	TMR	Sub-arterial	14,000-30,000 veh/day	31,659 veh/day[2]
Gold Coast Hwy	TMR	Arterial	>20,000 veh/day	42,809 veh/day[3]

[1]*Source: Average weekday tube count data between Reserve Street and Pindari Avenue, April 2021*
[2]*Source: Publicly available Annual Average Daily Traffic (AADT) Traffic Census (adjacent Stocklands shopping centre), 2020*
[3]*Source: Publicly available Annual Average Daily Traffic (AADT) Traffic Census (Tallebudgera Creek bridge), 2020*

The function of the existing Tabilban-Ikkina corridor is servicing the local residential catchment with direct property access while providing connections to the broader traffic carrying (arterial) network. It is therefore classified as a *Major Collector* which typically carry <10,000 veh/day. As evidenced by the traffic volume surveys, the route is approaching its environmental capacity and the existing Local Area Traffic Management (LATM) measures are aimed at discouraging through traffic and managing speeds.

3. PLANNING CONTEXT

3.1 Key Infrastructure Projects

A number of key infrastructure projects are planned and/or are currently underway in the vicinity of the study area. These projects and their expected timing of delivery at the time of this study were:

- Gold Coast Light Rail Stage 3 (GCLR3): *assumed to be operational by 2025*
- Pacific Motorway Varsity Lakes to Tugun (M1 VL2T): *assumed operational by 2025,* including:
  - Widening 10km of the M1 from 2 to a minimum of 3 lanes in both directions
  - Constructing a new two-way western service road between Tallebudgera (Exit 89) and Palm Beach (Exit 92) and a new bridge over Tallebudgera Creek connecting the new western service road
  - Access to the service road and the M1 via Nineteenth Avenue
- Gold Coast Light Rail Stage 4 (GCLR4): assumed operational by 2041.

These infrastructure projects are included within the *Gold Coast Strategic Transport Model – Multi Modal v2.2 PUG* (GCSTM-MM) which also includes demographic forecasts made by Council. The future traffic demands for the local area Aimsun modelling for this study came from the GCSTM-MM.

The timing of the above projects were based on current estimated timing published on the Department of Transport and Main Roads (TMR) website, and transport infrastructure assumptions included in the GCSTM-MM. While it is noted that GCLR4 may be operational prior to 2041, this timing simply aligns with the modelled design years and scenarios.

3.2 Local and State Government Infrastructure Planning

A review of Council's Local Government Infrastructure Plan (LGIP) and state government projects list does not identify any other transport projects that would be expected to influence the study area (outside of those identified in Section 3.1 above).

4. INDEPENDENT ROAD SAFETY AUDIT

4.1 Overview

Bitzios Consulting was commissioned by Council as part of the study to undertake an Existing Conditions Road Safety Audit (RSA) of the Tabilban Street / Ikkina Road corridor. A team of certified auditors, entirely independent of the team undertaking tasks on the broader Koala Park Traffic Management Study, carried out a day and night time inspection on 9 September 2021 for the RSA.

The subject corridor included Tabilban Street, Ikkina Road, Koel Street, and Bunyip Street in Burleigh Heads as shown in Figure 4.1.

Source: Nearmap

Figure 4.1: RSA Corridor Location

The Existing Conditions Road Safety Audit report is provided in **Appendix A**.

4.2 Methodology

The RSA was carried out as per the procedures set out in the Austroads *Guide to Road Safety Audit* 2019 (AGRS-2019). Items audited as part of this RSA included (but not limited to) the following:

- Road alignment (horizontal and vertical) and cross-section
- Sign and pavement markings
- Provision for special road users including pedestrians and cyclists and potential conflict points
- Roadside objects and hazards.

4.3 Crash Data Analysis

Council provided a crash detail (crash history) report of the subject corridor prepared by the Department of Transport and Main Roads (TMR) with crash data spanning 9 November 2010 to 23 December 2020, with the most recent five (5) year period from 2 January 2016 to 23 December 2020.

During the 10 year period, a total of 35 crashes were reported along the corridor, with 23 (66%) of these occurring in the most recent 5 year period. With the majority of crashes occurring in the most recent 5 years, this was the focus for the crash analysis consistent with typical procedures. Based on the review of the supplied crash data, the following summarised observations were noted:

- A total of 23 crashes were reported along the study corridor in the 5 year period
- 4 crashes resulted in hospitalisation and 13 resulted in medical treatment
- 6 crashes were categorised as DCA 301 (vehicles in the same lane)
- 3 crashes were categorised as DCA 202 (through and right from opposing directions)
- 2 crashes were categorised as DCA 104 (playing, working, lying or standing on carriageway).

Crash clusters were found to be grouped at intersections which included 15 crashes (65%). One pedestrian crash (DCA 003) occurred within the study area which resulted in a fatality in 2016.

Figure 4.2 shows the 5-year crash locations by severity. Detailed maps are included in the RSA report provided in **Appendix A**.

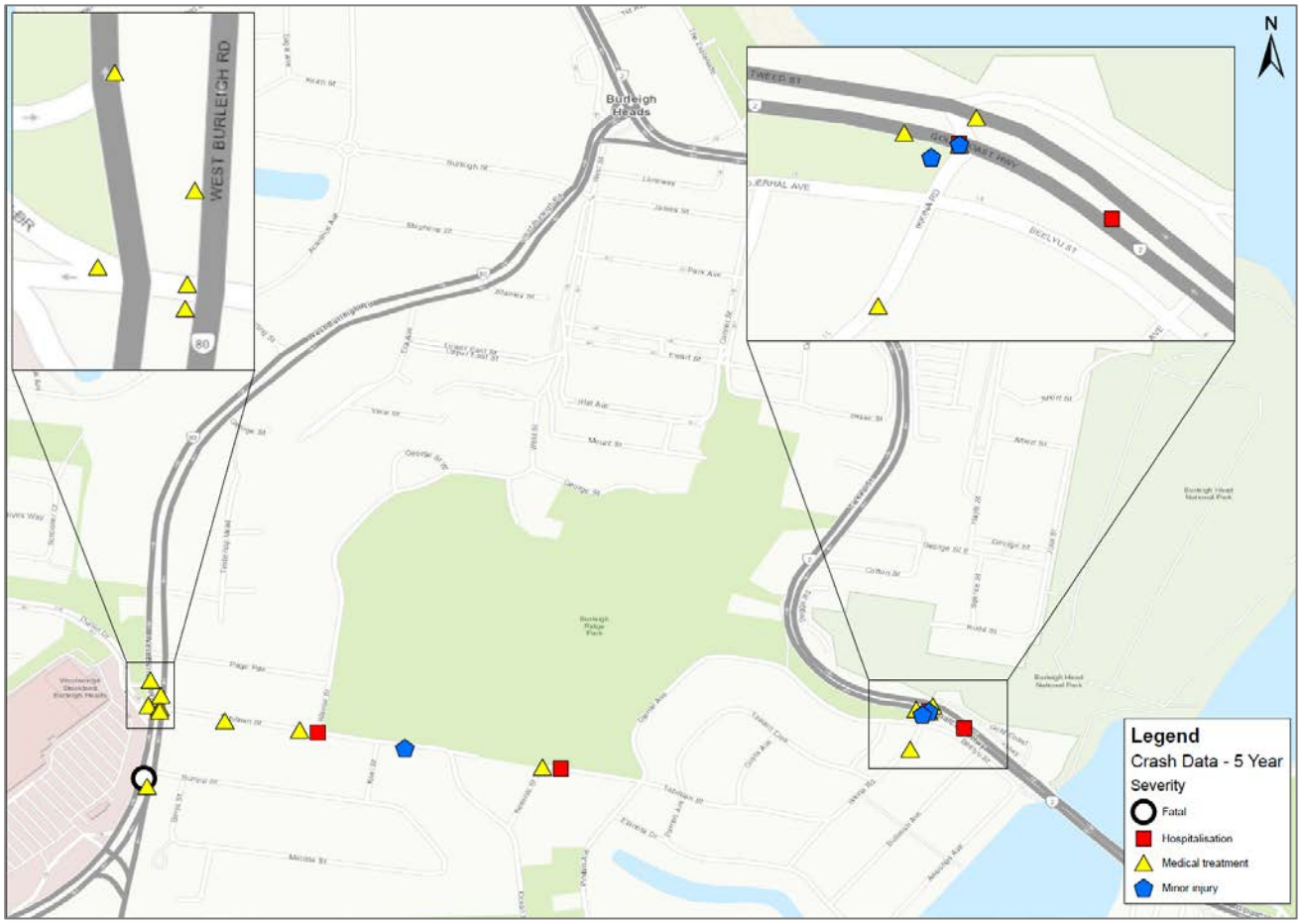


Figure 4.2: Crash Map (5-Year) by Crash Severity

4.4 Prioritisation of Safety Issues

Safety issues identified during the audit were prioritised based on the likely level of risk, in accordance with the process outlined in AGRS-2019 Part 6 and 6A.

To determine the level of risk, each item was reviewed to determine how often the problem will likely lead to a crash (frequency) and what the likely severity of the resulting crash type would be.

Following assignment of the frequency and severity levels associated with each safety issue, the resulting risk level was determined based on the adopted risk matrix summarised in Table 4.1.

Table 4.1: RSA Adopted Risk Matrix (Frequency vs. Severity)

Risk Matrix		Frequency			
		Improbable	Occasional	Probable	Frequent
Severity	Catastrophic	High	Intolerable	Intolerable	Intolerable
	Serious	Medium	High	Intolerable	Intolerable
	Minor	Low	Medium	High	Intolerable
	Limited	Low	Low	Medium	High

Table 4.2 below provides a suggested treatment approach for each risk level.

Table 4.2: RSA Suggest Treatment Approach

Risk	Definition
Intolerable	Must be corrected
High	Should be corrected or the risk significantly reduced, even if the treatment cost is high
Medium	Should be corrected or the risk significantly reduced, if the treatment cost is moderate but not too high
Low	Should be corrected or the risk reduced if the treatment cost is low

4.5 Key Audit Findings

A summary of the key audit findings is provided below:

- Pavement surface along the corridor is generally damaged and worn
- Traffic control devices (e.g. signs, line marking) are damaged, worn or absent, particularly at intersections
- Footpaths are narrow along some sections (e.g. Reserve Street) and obstructed by the presence of vegetation and power poles.

A total of 42 safety issues were identified along the corridor and documented in the RSA audit findings (see **Appendix A**). These issues were categorised by the relevant risk level and a potential remedial action identified. The location of each potential safety issue is shown in Figure 4.3.

It is noted that after the completion of the RSA, Council's *Tabilban Street Renewal Project* and Maintenance Program addressed a number of the safety issues within the corridor.

Figure 4.3: RSA Issues Identification Map

5. LOCAL AREA TRANSPORT MODEL

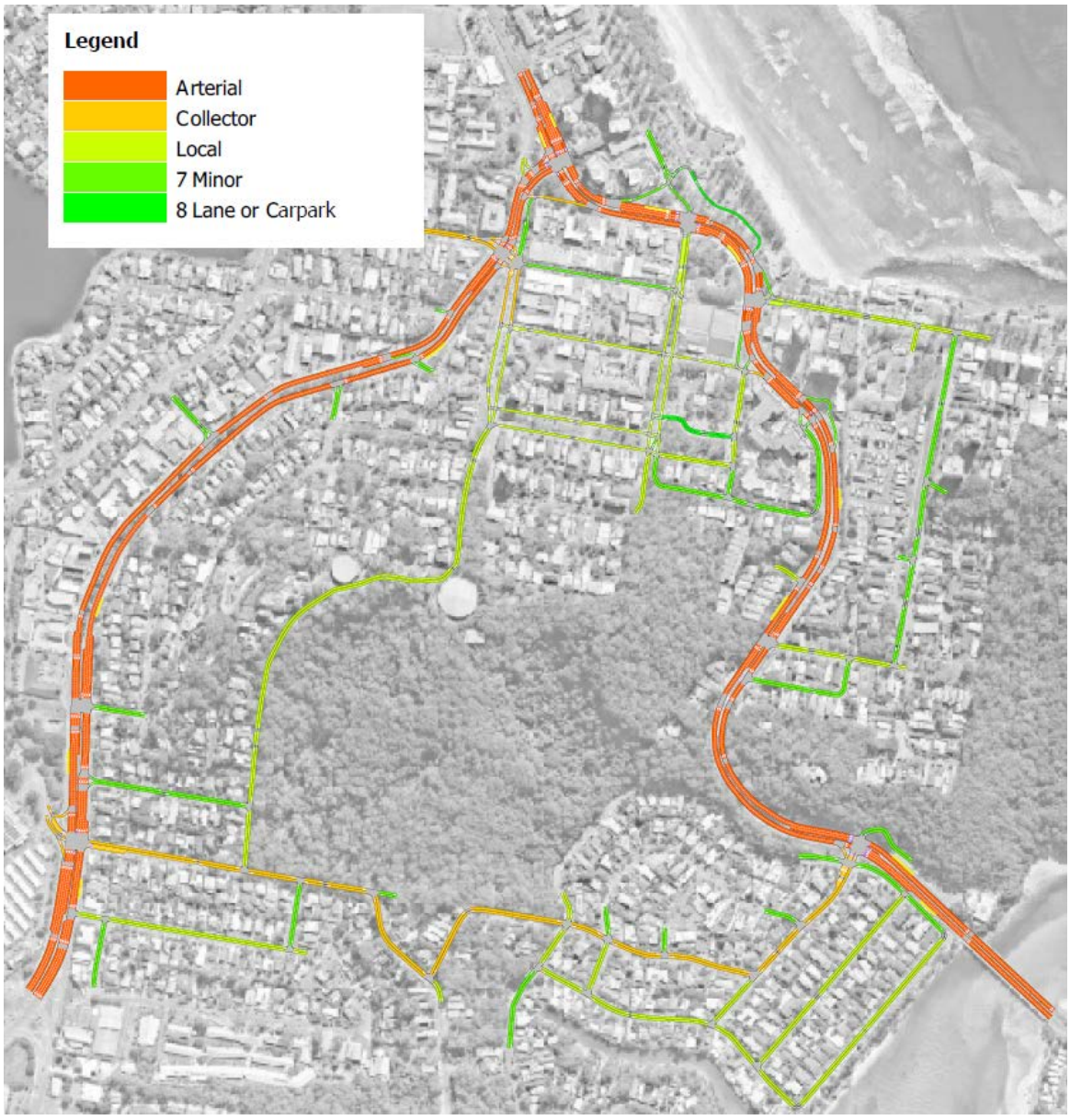
5.1 Calibrated and Validated Base Model

A 2021 Base model was developed using the Aimsun Next 20.0.1 modelling software. The model was calibrated and validated to replicate the existing conditions and operations experienced within the study area using a range of data sources in accordance with industry standards, including:

- Intersection traffic counts
- 24hr automatic count data (tube counts)
- Origin-Destination (OD) data
- Travel time data
- Traffic signal data.

5.1.1 Model Network

The road network was coded to reflect the existing network as shown in Figure 5.1.



SOURCE: Background image taken from Nearmap

Figure 5.1: Base Model Network and Road Types

5.1.2 Model Calibration

The model met the industry standard GEH calibration criteria, with all peak hour models showing:

- More than 85% of turn volumes with a GEH statistic below 5.0
- No volumes have a GEH statistic greater than 10.0.

The model demand was therefore considered calibrated and suitable for use.

OD calibration was also undertaken to ensure the base model reflected the surveyed route choice for key paths through the network (including the Tabilban through route). It was found that the model closely represented the observed route choice, with no more than ±4% difference overall, and ±2% for the direct Tabilban Street-Ikkina Road route.

In addition to the above, the model results tested across multiple seed values were generally consistent and hence the models were considered to be stable.

5.1.3 Travel Time Validation

Model travel time validation found that there were some discrepancies between the modelled and observed travel times, yet the overall modelled route choice across these routes is well replicated in the model, as shown in the OD comparison. As a result, the model is still considered suitably validated.

The model calibration and validation report is provided in **Appendix B**.

5.2 Future Year Base Models

5.2.1 Planned Infrastructure Projects

The development of the future year models was informed through use of the Gold Coast Strategic Transport Model – Multi Modal v2.2 PUG (GCSTM-MM) for the development of traffic demands. This includes the relevant infrastructure and land use planning forecast into the future years by road authorities. For network development, the key pieces of transport infrastructure and their timing of delivery were included in the assessment as outlined in Section 3.1.

5.2.2 Strategic Modelling

The *Gold Coast Strategic Transport Model – Multi Modal (GCSTM-MM) v2.2 PUG* was supplied by Council and used to determine demand forecasts for input into the developed Aimsun traffic models. Demand forecasts were adopted from a cordon of the 2021, 2026 and 2041 GCSTM-MM models which were unchanged from the strategic models supplied by Council.

The GCSTM-MM was found to forecast some significant traffic volume changes in the future based on the analysis of the 2026 and 2041 networks. This quantum of traffic volume change could be considered aspirational, hence for the purpose of the Koala Park modelling study, an interim 2024 design year scenario was considered. This 2024 scenario adopted more conventional traffic growth rates (rather than forecast reductions) applied to the study area to allow consideration of a 'worst case' in terms of traffic volumes.

Traffic modelling scenarios were therefore developed for the following future design years:

- **2024:** *Short-term, prior to GCLR3 and M1 VL2T, historical traffic growth applied*
- **2026:** *Medium-term, post GCLR3 and M1 VL2T, GCSTM-MM forecast demands applied*
- **2041:** *Long-term, post GCLR3, GCLR4 and M1 VL2T, GCSTM-MM forecast demands applied.*

5.2.3 Future Base Modelling Results

The future base Aimsun models were developed based on the methodology outlined above and tested for the relevant modelling design scenarios for 2024, 2026 and 2041 to:

- Determine congestion and delays on key links and critical intersections with the change in traffic
- Evaluate change in driver decisions with changed traffic volumes on the network
- Consider the proportion / quantity of drivers using the 'rat-run' route though Tabilban-Ikkina
- Inform options scoping and options development to address key network issues.

Key metrics adopted for assessing each of the modelled options included:

- Network statistics
- Route choice comparison
- Intersection link delays.

Network Statistics

The network statistics include the following key performance measures:

- Vehicle Hours Travelled (VHT): *representation of overall time spent in the network (delay)*
- Vehicle Kilometres Travelled (VKT): *representation of overall distance travelled in the network*
- Average Speed (km/h): *average speed travelled by all vehicles across the network.*

The results showed:

- Compared to the 2021 base, traffic volumes in the study area averaged across both peaks:
  - Increase by 4.4% in the 2024 scenario
  - Reduce by 14.6% in the 2026 scenario
  - Reduce by 4.9% in the 2041 scenario
- VHT and VKT values increase and reduce relative to the changes in input traffic volumes
- Average speed is reduced in the 2041 base model, indicative of the reduced speed limits on the Gold Coast Highway with construction of the light rail and localised congestion issues.

The reductions in traffic in 2026 and (less so) in 2041 compared to 2024 are associated with the opening of the M1 improvements through Palm Beach, and a general shift in traffic from the Gold Coast Highway (and some of this traffic that passes through Koala Park) and to the M1.

Route Choice Comparison

A key metric of the study was to determine the proportion of drivers choosing to use the 'rat-run' route via Tabilban Street and Ikkina Road as opposed to using the state controlled road network. The comparison routes are shown in Figure 5.2.

It was found in 2024 there is slight shift in the proportion of vehicles using the 'rat-run' (Routes 2 & 3) to instead use the state road network (Route 1) when travelling eastbound. The proportion of trips using the 'rat-run' westbound is similar between 2021 and 2024. Comparatively, in 2026 and 2041, a greater proportion of drivers are expected to choose the 'rat-run' route, most notably different in the 2041 scenario as they look to avoid the Burleigh CBD area and GCLR corridor and signals.

What is happening here is that some of the longer distance through traffic is relocating to the M1 route in 2026 and 2041, leaving lower volumes on the Gold Coast Highway but a larger proportion with more localised destinations, say at Burleigh Heads, Tallebudgera or West Burleigh. This means that whilst the scale of potential rat running traffic reduces in 2026 and 2041 compared to 2024, the percentage that get a benefit from local rat running is larger.

What is important to the options assessment is the relativities between options and the base case rather than the relativities between years in the base case (see Section 6.3.2).

Figure 5.2: Comparison Routes

Intersection Link Delays

Observations at key intersections in relation to approach delay are summarised below:

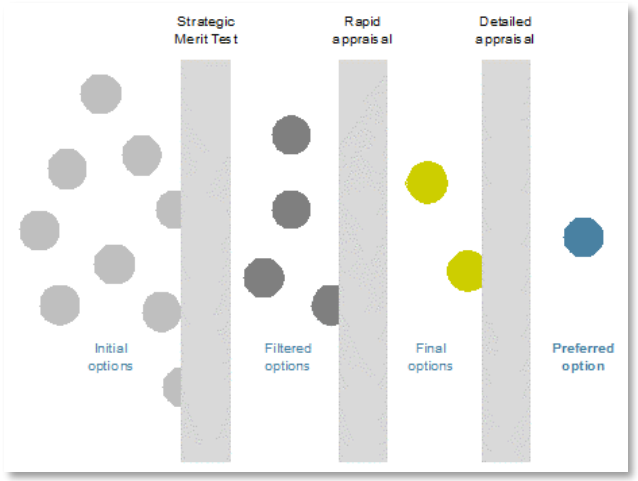
- Intersection delays at each end of the rat-run route generally fluctuate proportionately with network input traffic volumes, specifically:
  - 2024 intersection delays are increased in comparison to 2021 delays due to traffic growth
  - 2026 and 2041 intersection delays reduce in comparison to 2021 as volumes between external zones are lower coinciding with the construction of GCLR3, GCLR4 and M1 VL2T upgrades
- Aimsun modelling shows significant delays at the West Burleigh Road / Burleigh Street and Gold Coast Highway / West Burleigh Road intersections in the north of the study area. Contrary to delays at Tabilban-Ikkina Street intersections, delays in this area are expected to increase in 2041 due to traffic growth for movements that aren't offset by Light Rail mode change, as well as impacts to signal efficiency associated with Light Rail infrastructure.

The future base models were used as a basis for developing and testing the identified options.

The future base modelling report is provided in **Appendix C**.

6. OPTIONS DEVELOPMENT AND MODELLING

6.1 Methodology Overview



The *Australian Transport Assessment and Planning* (ATAP) guidelines were adopted as the basis for options development and assessment in this study, including:

- Developing an Options Long List (Initial Options)
- Stage 1: Strategic Merit Test (Filtered Options)
- Stage 2: Rapid Appraisal (Final Options)
- Stage 3: Detailed Appraisal (Preferred Option).

6.2 Options Scoping

Three (3) overarching option strategies were identified for the Tabilban-Ikkina route based on (but not limited to):

- Road hierarchy and network function
- Safety for all road users
- The petition option submitted to Council.

The three (3) overarching option strategies included:

- **Option A:** 'Do Minimum' including minor network improvements to the existing arrangement
- **Option B:** 'Promote Through Route' via construction of Tabilban Street 'missing link'
- **Option C:** 'Local Traffic Only' which removes/closes the east-west connection of Tabilban Street.

A total of **14 sub-options** were then created as the Options Long List and included different combinations of treatments within each overarching strategy. A strategic level review was undertaken of the Options Long List to filter out options based on their relative benefits and impacts. This process was undertaken in partnership with Council and considered:

- Road user safety (speeds, crash history, near misses, active transport provisions)
- Environmental impact
- Existing resident complaints / feedback
- Physical constraints (steep grades, limited sight lines, property access, etc.)
- The intent of each overarching option strategy and network function
- Social / amenity impacts to local residents (traffic volume, accessibility, noise, etc.).

This process resulted in a total of **seven (7) short listed options** which were taken forward for detailed Aimsun modelling to understand the operational performance of each one.

A summary of the short-listed options is included in Table 6.1 for ease of reference.

Table 6.1: Short Listed Options Summary

Option		Summary of Option Inclusions
Option A: 'Do Minimum'	A3	▪ Largely maintains existing arrangement with east-west through connection ▪ Includes a small roundabout treatment at Wairoo St to assist in slowing traffic and changing priorities of approaching traffic to improve gaps/ability for Wairoo St traffic to exit ▪ Includes a roundabout treatment at Ikkina Rd / Tabilban St to assist in slowing traffic and addressing key issues at the intersection identified in the Road Safety Audit
	AX	▪ As per Option A3, with exception to: ▪ Implements a one-way (northbound) treatment at Koel St to remove westbound rat-run
Option B: 'Promote Through Traffic'	B2	▪ Constructs the Tabilban St 'missing link' connection as per the petition option raised ▪ Closure of Reserve St at the top of the hill where it meets Tabilban St (provided as a cul-de-sac) ▪ Ocean Pde connection remains yet gives-way to Tabilban St as a traditional T-intersection ▪ Includes signal improvements at Gold Coast Hwy for left turns into Ikkina Rd (improved efficiency) ▪ Removal of LATM traffic calming along Ikkina Rd (excluding pedestrian crossing) and Tabilban St ▪ Reinstates the default urban speed limit of 50km/h on the through route
	B3	▪ As per B2, with exception to: ▪ Implements a one-way (northbound) treatment at Koel St to remove westbound rat-run ▪ Includes left turn slip lane at Tabilban St to W Burleigh Rd to improve capacity with one-way Koel St
	B4	▪ DOES NOT connect the Tabilban St 'missing link', promotes through traffic by other means ▪ Re-prioritises Ocean Pde / Reserve St intersection giving the through route priority ▪ Maintains the existing Reserve St & Ocean Pde access (stop/give-way priority) ▪ Includes signal improvements at Gold Coast Hwy for left turns into Ikkina Rd (improved efficiency) ▪ Removal of LATM traffic calming along Ikkina Rd (excluding pedestrian crossing) and Tabilban St ▪ Reinstates the default urban speed limit of 50km/h on the through route
Option C: 'Local Traffic Only'	C3	▪ DOES NOT connect Tabilban St link ▪ Closure of Ocean Pde at Tabilban St (provided as a cul-de-sac), east-west link completely severed ▪ Includes a roundabout at Ikkina Rd / Tabilban St only to slow traffic and address key safety issues
	C5	▪ DOES NOT connect Tabilban St link ▪ Closure of Reserve St at Tabilban St (provided as a cul-de-sac), east-west link kept via Ocean Pde ▪ Includes roundabout provided at Tabilban St / Ikkina Rd only

The Options Long List and Options Short List are documented in detail in **Appendix D**.

6.3 Options Modelling

6.3.1 Source Models and Scenarios

The options modelling was undertaken with the previously calibrated/validated base year models and associated future year models. The software that was used was Aimsun Next 20.0.1.

The following scenarios were developed and agreed with Council officers as the basis for testing each option across short, medium and long-term horizons, including:

- **2021:** Base Case, to understand an option's operational performance on existing conditions
- **2024:** Short-term, prior to GCLR3 and M1 VL2T, historical traffic growth applied
- **2026:** Medium-term, post GCLR3 and M1 VL2T, GCSTM-MM forecast demands applied
- **2041:** Long-term, post GCLR3, GCLR4 and M1 VL2T, GCSTM-MM forecast demands applied.

The traffic network for each scenario outlined above was modified to reflect each short-listed option. All other components of the model network i.e. external configurations and future infrastructure projects (e.g. GCLR and M1 VL2T) were kept consistent with the base case and future base case modelling. This approach allowed for consistency between external influences and direct performance comparisons between the base case and the options modelling results.

6.3.2 Modelling Results Overview

The options models were tested for the traffic demand years of the above scenarios to:

- Determine congestion and delays on key links and critical intersections with the option changes
- Evaluate change in driver decisions with changed volumes on the network given each option
- Consider the proportion / quantity of drivers using the Tabilban-Ikkina route given each option
- Inform the options assessment and development of a preferred option.

Key metrics adopted for assessing each of the modelled options included:

- Network statistics (VHT, VKT, Average Speed)
- Route choice comparison
- Traffic volume comparison
- Network link delay comparison.

Detailed modelling results are documented in the Options Modelling and Assessment Report provided in **Appendix D**.

Network Statistics Comparison

A summary of the overall findings is provided in Table 6.2 with a focus on key metrics of VHT which is the network delay / time spent in the network, and VKT which is the km travelled in the network.

Table 6.2: Network Statistics Comparison Key Findings Summary

Option	Summary of Findings
A3	Showed a general reduction in VHT across the AM peak except in 2021 while the PM peak showed similar results to the base case. VKT showed marginal differences overall.
AX	Mostly increases VHT across both peaks except for in the 2026 PM and 2041 AM periods. This translates to more time spent in the network. VKT was found to be similar across all years yet generally showing an increase in distance travelled; except for 2041 which yielded a minor reduction in VKT.
B2	Showed a general reduction in VHT and VKT across the years and peaks due to the direct connection through the study area.
B3	Resulted in further improvements to each metric from Option B2 predominantly due to the inclusion of the west-to-south left turn slip lane from Tabilban Street to West Burleigh Road.
B4	Yielded reductions in the AM peak for VHT and VKT while the PM peak showed results similar to the base case.
C	Both Option C networks resulted in significant increases in VHT and VKT with Option C3 showing the greatest increases / impacts to the network overall.

Route Choice Comparison

Route choice was a key metric for the options evaluation as it compares the proportion of drivers choosing to use the 'rat-run' route via Tabilban Street-Ikkina Road versus those using the state controlled road network.

The comparison routes throughout the network are presented above in Figure 5.2.

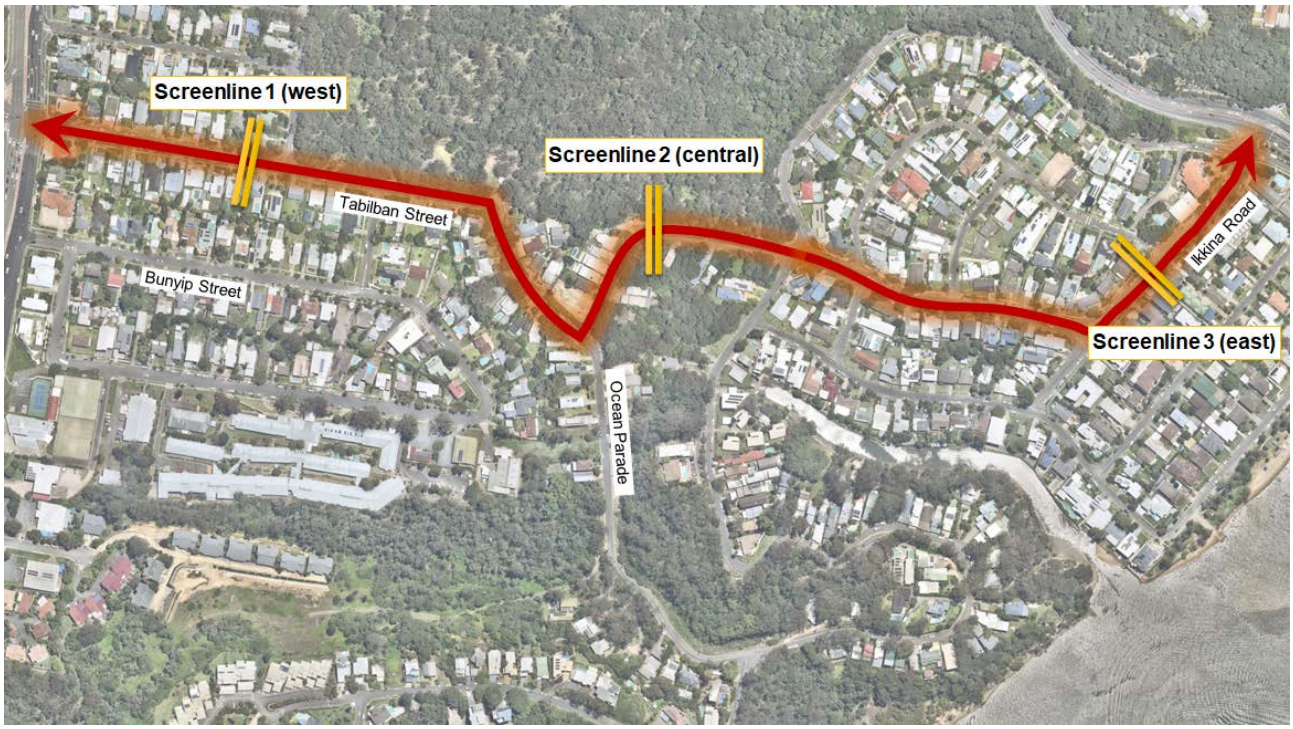
The route choice comparison findings are summarised in Table 6.3.

Table 6.3: Route Choice Comparison Key Findings Summary

Option	Summary of Findings
A	Option A models showed similar route choice patterns to the base network scenarios. The exception is Option AX in the westbound direction given the one-way Koel Street arrangement which pushes a greater proportion of traffic to Routes 1 and 2.
B	Option B2 and B3 result in a clear increase in traffic choosing Routes 2 and/or 3 ('rat-run' routes) which is expected given the intent of these options is to make east-west travel through the study area easier for through traffic. Option B4 shows this effect to a lesser extent given it does not connect the Tabilban Street 'missing link', however still prioritises through traffic which then increases from the base case.
C	Option C5 shows a clear shift of traffic to the state network which is expected due to closure of the direct east-west route. However, this option shows that some vehicles are still choosing the westbound route via the Ocean Parade-Pindari Avenue connection that remains in the AM peak in 2024 and in 2041. Option C3 was not included as it completely severs the east-west link and hence all traffic must use the state controlled network. That is, there is no rat running route to report on.

Traffic Volume Comparison

A review of traffic volumes along the Tabilban-Ikkina route was undertaken for each option and compared to the base case and for each assessment year. The model volumes were extracted at three (3) screenline locations along the route as shown in Figure 6.1.



SOURCE: Nearmap (edited by Bitzios)

Figure 6.1: Tabilban-Ikkina Route Traffic Volume Screenline Locations

The screenline volumes were presented as daily volume estimates along the route. As the Aimsun models developed are for AM and PM peak periods, a "peak-to-daily" expansion factor was calculated using the existing 24hr tube count data collected along the route for the study.

The expansion factor was calculated to be *3.16* which was applied to extracted AM (2hr) and PM (2hr) peak period volumes to create the estimated daily volumes as documented in **Appendix D**.

Similar to the network statistics, traffic volumes reduce in the study area in 2026 and 2041 due to the broader re-routing of traffic associated with GCLR and the completed M1 upgrade.

A review of the option volumes compared to the base case volumes is summarised in Table 6.4.

Table 6.4: Traffic Volume Comparison Key Findings Summary

Option	Summary of Findings
A	Option A models show volumes similar to those of the Base Case, with Option AX resulting in higher volumes at the western screenline due to the one-way arrangement of Koel Street, forcing more westbound traffic using the route along Tabilban Street (opposed to Bunyip Street).
B	Option B models result in an increase in volumes along the route given the connection of the Tabilban 'missing link' and promoting through traffic along the route.
C	Option C models show a significant reduction in volumes to a level generally consistent with the capacity of a Residential Collector due to effectively removing the east-west connection and forcing traffic to use the state controlled network.

Network Link Delays

The network link delays were extracted from the models and shown graphically for each option through colour coding (refer **Appendix D**). The colour coding is relative to the delay in the network and gives an indication of where delays and congestion are concentrated.

Delays are concentrated at signalised intersections at each end of the Tabilban-Ikkina route, and within the Burleigh Heads CBD area, particularly where West Burleigh Road intersects with Gold Coast Highway.

Of particular note is the Option C (removing the east-west Tabilban connection) models resulting in significant impacts to the state network with delays and queuing observed at the West Burleigh Road / Gold Coast Highway intersection which then blocks streets such as James Street and Burleigh Street. Option C has a significant impact on the broader network.

7. OPTIONS ASSESSMENT

7.1 Approach Overview

A rapid appraisal was undertaken to refine the short listed (filtered) options. The method considered the options modelling results with these results informing a two-stage process, including:

- Public Consultation
- Multi-criteria Analysis (MCA).

7.2 Public Consultation

Three (3) community information sessions were held at the Tallebudgera Creek Recreation Centre. It is understood that over 200 people attended in total. The material included a community feedback survey / form prepared by Council to seek feedback and to:

- Better understand the opinion from the local community regarding the extent of the issues raised in the petition provided to Council in 2021
- Obtain feedback on the overarching options and their benefits and disbenefits.

There was a total of 362 respondents of which approximately 94% identified themselves as local Koala Park residents. The survey results were grouped into two (2) categories including:

- Traffic outcome priorities
- Support of traffic management outcomes.

Responses were scored (see **Appendix D**) and the results ranked and listed in order of preference. Key outcomes are summarised in Table 7.1 and Table 7.2.

Table 7.1: Traffic Outcome Priorities: Results

Traffic Outcome	Score	Priority
Improving road safety	1,303	1
Preserving the local environment and Koala population	1,301	2
Reducing traffic volume	1,280	3
Reducing traffic speed	1,221	4
Prioritising local traffic	1,178	5
Upgrading the active transport network (pathways) in the local area	991	6
Maintaining the connection for local traffic between West Burleigh and Palm Beach	627	7
Prioritising through traffic	357	8

Table 7.2: Support of Traffic Management Outcomes: Results

Traffic Management Option	Score	Priority	% 'Do Not Support'
Installing roundabouts and/or intersection treatments to prioritise local traffic and discourage through traffic	934	1	3%
Providing a fauna crossing to preserve the local environment including the Burleigh Ridge Koala population	837	2	8%
Installing traffic management devices such as speed humps and chicanes to reduce speed and discourage through traffic	807	3	8%
Provide a high quality active transport pathway between Tabilban West and East	583	4	32%
Remove existing traffic calming devices to improve through traffic efficiency	519	5	36%
Making Koel Street one-way northbound to stop through traffic	179	6	76%

Of the 362 respondents, 358 provided a 1-3 ranking preference of the three (3) overarching options taken to consultation. The results are included in Table 7.3 in order of preference.

Table 7.3: Overarching Option Preference

Overarching Option	Percentage Preference
Option A: 'Minor Network Improvements'	32%
Option B: 'Promote Through Traffic'	17%
Option C: 'Local Traffic Only'	51%

The results indicate that:

- 51% of respondent's have a preference for removing an east-west link (Option C)
- 49% of respondent's have a preference for maintaining an east-west link (Options A and B).

This indicates that the community has no clear consensus on maintaining or removing the east west link, noting that 94% of respondents identified as 'locals'.

Although 51% of residents favoured Option C, the modelling showed that Option C effectively just 'moves the problem' elsewhere in the network. It results in significant impacts to the state network with delays and queuing observed at the West Burleigh Road / Gold Coast Highway intersection which then blocks streets such as James Street and Burleigh Street within Burleigh Village. Option C has a significant impact on the broader network which are not considered tenable, acceptable or feasible to address.

Other anecdotal comments from the public included (paraphrased):

- *Several 'near misses' occur regularly along the corridor*
- *Heavy vehicles are restricted from travelling through the corridor however often use the Tabilban link regardless and become stuck at the Reserve Street / Ocean Parade intersection at times*
- *The Reserve Street / Ocean Parade intersection is a key safety issue*
- *The volume of traffic on the corridor is a safety issue for parents whose children can no longer play safely in the area*
- *Traffic planning for this region must offer real solutions to ensure the safety of the koalas and the maintenance and enhancement of their territory*
- *Connecting the 'missing link' of Tabilban Street with Reserve Street closed will put a stop to the crashes and near misses along Reserve Street and Ocean Parade, including for pedestrians*
- *Multiple properties will benefit from connecting the 'missing link' by reducing through traffic on Ocean Parade and Reserve Street*
- *The traffic in our small street has become unmanageable, to the point where we are now unable to safely get in and out of our driveway from 7:30-8:30am each morning and 3:00-5:30 evenings and on most weekends - all day*
- *The increase to this situation when the light rail is operating because it will again bring more people to the area*
- *Maps are directing people to use the small streets as a shortcut which is not suitable*
- *Pedestrian access across West Burleigh Road to Stocklands is not safe and should be improved.*

7.3 Multi-Criteria Analysis (MCA)

TMR's *Smarter Solutions – Multi-criteria Assessment (MCA) Tool* was used to assist in determining a preferred option from the seven (7) short listed options. A set of selected criteria was adopted which is outlined in detail in **Appendix D** and summarised below:

- Economic data (implementation costs)
- Traffic performance and integration (road user safety, network connectivity, network-wide operating conditions, active transport – cyclists/pedestrians)
- Social factors (impact on property owners)
- Environmental impact (flora and fauna, noise and air quality)
- Construction and constructability (community disruption, engineering / constructability).

Each criterion was ranked by order of importance based on a neutral perspective considering Council objectives, traffic assessment, community consultation and feedback and the broader network including state authorities.

Each option was given a score ranging from 1-5, with 1 being the least favourable score (e.g. greatest level of impact or greatest order of cost), 5 being the most favourable (e.g. lowest comparative level of impact or lowest order of cost), and 3 being little or no change / impact from the Base.

The detailed MCA results are included in **Appendix D**.

7.4 Preferred Option

The MCA results show **Option A3** as the overall preferred option.

This option was found to best align with the function and intent of the network, and the community consultation feedback. It was found to provide the preferred solution given it:

- Achieves the intended function of the road network
- Maintains an east-west connection
- Results in a balanced level of traffic demand between the local and state networks
- Better manages speeds and improves road user safety
- Preserves the local environment and minimises environmental impact
- Provides active transport improvements and connections.

Multiple treatments (sub-options) were possible at different locations along the route in Option A3. The proposed treatments, including sub-option treatments at specific locations underwent further testing in a detailed appraisal process and were assessed using Aimsun microsimulation modelling and SIDRA Intersection modelling for specific intersection treatments.

Each sub-option treatment was found to generally operate within acceptable performance levels for the relevant intersection control type with no significant performance issues arising. With exception only to a signalised configuration of the Ocean Parade / Reserve Street intersection. The signals showed long queues back up Reserve Street from the intersection, essentially reaching to the crest of the hill. This queue length may increase the risk of nose-to-tail crashes. This queue would block a number of existing resident driveways; one of the key issues raised during community consultation.

Given these issues, the Ocean Parade / Reserve Street intersection was not recommended for signalisation.

The recommended treatment options at each location along the route based on traffic modelling, operational performance, traffic management and consultation findings are listed in Table 7.4.

Table 7.4: Option A3 Recommended Sub-Option Treatments

Location	Recommended Treatment
Tabilban Street / West Burleigh Road	Signalised pedestrian crossing on southern leg
Tabilban Street / Wairoo Street	Improved T-intersection alignment (chicane)
Ocean Parade / Reserve Street	Small roundabout treatment
Tabilban Street / Pindari Avenue	Roundabout treatment
Tabilban Street / Ikkina Road	Improved T-intersection alignment
Gold Coast Highway / Ikkina Road	Signal improvements for left turns into Ikkina Rd

An indicative snapshot of each sub-option treatment (as tested in SIDRA Intersection software) is shown in Figure 7.1.

7.5 Concept Design Development

Concept design drawings were prepared for the Tabilban-Ikkina route Option A3, including all sub-option treatments at the relevant locations to determine the construction feasibility for each measure. The concept designs have allowed for preliminary cost estimates to be completed by Council which informed the MCA inputs and outcomes.

The concept design drawings and cost estimates are detailed in **Appendix D**.

A key element to the overall concept design is the delineation of traffic lanes along the route using edge lines. This treatment assists in clearly identifying to motorists the trafficable paths along the route given the very wide pavement widths, particularly along Tabilban Street (west) and Bunyip Street. This treatment also ensures that the alignment of the vehicle path is 'tighter' by reducing 'curve-cutting' and hence reducing average traffic speeds.

7.6 Additional Considerations

A number of additional issues were raised for consideration throughout the consultation process. Some of these included:

- Travel route software / applications (e.g. Google Maps) currently identify the Tabilban-Ikkina route as the fastest route for some destinations, which may be contributing to more unfamiliar drivers choosing this route
- Traffic exiting Bunyip Street are using the Police Vehicle Only access across the West Burleigh Road median to turn right out and avoid traffic delays along Tabilban Street.

It is therefore recommended that the preferred option also consider:

- Liaising directly with representatives of (for example) Google Maps to determine whether a change to the street categorisation can be implemented so that the route is not included in Google's option calculation processes
- Liaising with the Burleigh Heads Police Station representatives to determine whether the current Police Vehicle Only median access is used by their staff and whether there is any scope to close this access, or to modify it to restrict the general public from using the facility.

In addition, further investigation and consideration should be undertaken for additional Local Area Traffic Management (LATM) treatments throughout Bunyip Street and Koel Street, including a speed limit review along Bunyip Street to consider 40km/h posted speeds commensurate with the surrounding speeds and LATM on Tabliban Street.

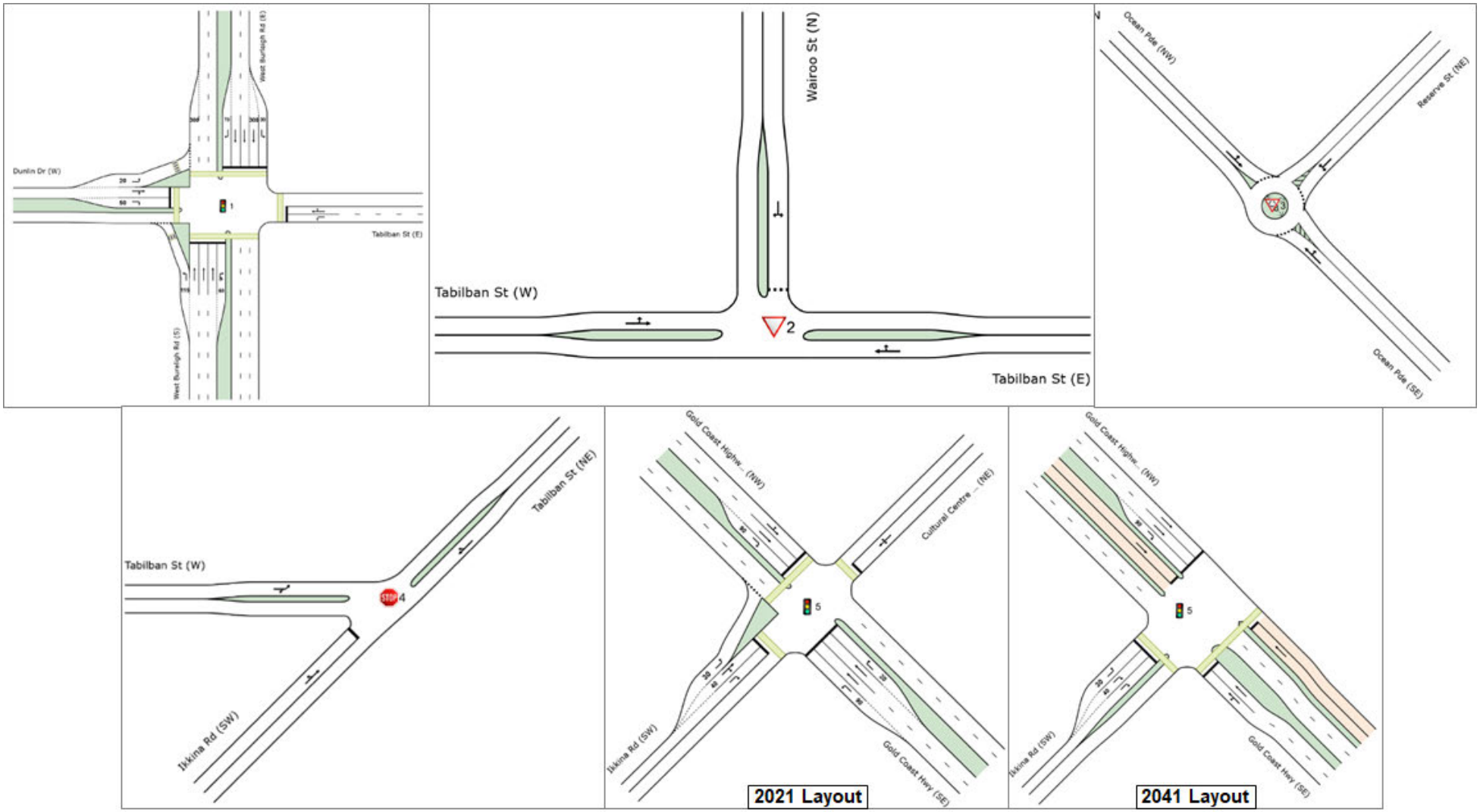


Figure 7.1: Option A3: Preferred Sub-Option Treatments – SIDRA Intersection Configurations

8. KEY FINDINGS AND RECOMMENDATIONS

8.1 Key Findings

Key findings are summarised below:

- The primary function of Tabilban Street-Ikkina Road was identified as a *Major Collector* with environmental capacity of <10,000 veh/day
- Traffic surveys identified the route as carrying 9,088 veh/day with over 70% of peak period trips travelling between the Gold Coast Highway and West Burleigh Road (westbound and eastbound) via the Tabilban-Ikkina route instead of the state network
- Travel time surveys revealed the Tabilban-Ikkina route is only marginally faster than travelling via the state route, however avoids slower moving traffic and up to six signalised intersections
- The independent Road Safety Audit identified 42 issues along the corridor prioritised by risk level with potential remedial measures suggested
- A local area transport model was developed which included a calibrated/validated base (2021) model and future year base models (2024, 2026, 2041) which revealed traffic volumes in the study area (averaged across both peaks and compared to the 2021 base):
  - Increase by 4.4% in the 2024 scenario
  - Reduce by 14.6% in the 2026 scenario
  - Reduce by 4.9% in the 2041 scenario
- The *Australian Transport Assessment and Planning* (ATAP) guidelines were used as the framework for options development and assessment which included:
  - Developing an Options Long List (Initial Options)
  - Stage 1: Strategic Merit Test (Filtered Options)
  - Stage 2: Rapid Appraisal (Final Options)
  - Stage 3: Detailed Appraisal (Preferred Option)
- Three (3) overarching option strategies were developed through options scoping. They were:
  - Option A: 'Do Minimum' including minor network improvements to the existing arrangement
  - Option B: 'Promote Through Route' via construction of Tabilban Street 'missing link'
  - Option C: 'Local Traffic Only' which removes/closes the east-west connection of Tabilban Street
- An options long list of 14 options were developed and seven (7) of them were short-listed for detailed options assessment
- The Options Assessment involved options modelling, public consultation and a multi-criteria analysis which considered economic data, traffic performance, social/amenity factors, environmental impacts, constructability and construction costs
- Concept design drawings were prepared for the shortlisted options allowing cost estimates to be prepared which informed the MCA

8.2 Recommendations

The key recommendations from the assessment were:

- Option A3 is the preferred overarching option for the Tabilban-Ikkina route
- The recommended treatment options within the preferred Option A3 are:
  - Tabilban St / W Burleigh Rd: signalised pedestrian crossing on southern leg
  - Tabilban St / Wairoo St: improved T-intersection alignment
  - Ocean Pde / Reserve St: small roundabout treatment
  - Tabilban St / Pindari Ave: roundabout treatment
  - Tabilban St / Ikkina Rd: improved T-intersection alignment
  - Gold Coast Hwy / Ikkina Rd: signal improvements for left turns into Ikkina Rd

- The preferred option should be considered and optimised further in detailed design
- Council should also:
  - Liaise with Google Maps to remove the Tabilban-Ikkina route as a route option within its calculations
  - Liaise with Burleigh Heads Police Station representatives to determine whether the existing Police Vehicle Only median access can be removed / modified to stop the general public from using the access
  - Additional Local Area Traffic Management (LATM) treatments throughout Bunyip Street and Koel Street, including a speed limit review along Bunyip Street to consider 40km/h posted speeds commensurate with the surrounding speeds and LATM on Tabliban Street

Appendix A: Existing Conditions Road Safety Audit Report

Koala Park Traffic Management Study

Existing Conditions Road Safety Audit

City of Gold Coast Council

14th October 2021

Gold Coast
Suite 26, 58 Riverwalk Avenue
Robina QLD 4226
P: (07) 5562 5377

Brisbane
Level 2, 428 Upper Edward Street
Spring Hill QLD 4000
P: (07) 3831 4442

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

W: www.bitziosconsulting.com.au

E: admin@bitziosconsulting.com.au

Document Issue History

Report File Name	Prepared	Reviewed	Issued	Date	Issued to
P5288.001R Koala Park Traffic Management Study RSA Report	[redacted]	[redacted]	[redacted]	14/10/2021	Jake Matuzic, sent via: JMATUZIC@goldcoast.qld.gov.au

CONTENTS

Tables

Figures

Appendices

1. INTRODUCTION

1.1 Background

Bitzios Consulting (Bitzios) was commissioned by City of Gold Coast (Council) to undertake an Existing Conditions Road Safety Audit (RSA) of the Tabilban Street / Ikkina Road corridor.

The RSA forms part of Bitzios' engagement to undertake the Koala Park Traffic Management Study which will focus on the development of options for the corridor for future consideration. The RSA will identify the key existing safety issues through the corridor and potential remedial actions, and likely assist in the development of feasible engineering options to be considered as part of Options Development for the overarching project.

This report summarises the findings of the RSA. The subject corridor included Tabilban Street, Ikkina Road, Koel Street, and Bunyip Street in Burleigh Heads. The subject corridor is shown in Figure 1.1.

Source: Nearmap

Figure 1.1: Corridor Location

1.2 Scope of Audit

The scope of the RSA included reviewing the Tabilban Street / Ikkina Road corridor including Koel Street and Bunyip Street, the West Burleigh Road / Tabilban Street intersection, and the Gold Coast Highway / Ikkina Road intersection.

Specifically, the following items were reviewed from an operational road safety perspective:

- Signs and pavement markings
- Roadside objects and hazards
- Road alignment (horizontal and vertical) and cross-section
- Provision for special road users including pedestrians and cyclists and potential conflict points.

This RSA details a list of safety issues identified during the site visit.

2. ROAD SAFETY AUDIT PROCESS

2.1 Definitions

The RSA was undertaken in accordance with the procedure set out in Austroads '*Guide to Road Safety Part 6: Managing Road Safety Audits (2019)*' (Austroads Part 6) and '*Guide to Road Safety Part 6A: Implementing Road Safety Audits (2019)*' (Austroads Part 6A).

Austroads Part 6 defines a road safety audit as:

"a formal, robust technical assessment of road safety risks associated with road transport projects and are completed by independent and qualified audit teams, by applying Safe System principles, considering the safety of all road users"

The essential elements of this definition are:

- A formal process and not an informal check
- An independent process
- Carried out by someone with appropriate experience and training
- Restricted to road safety issues.

The objectives of a road safety audit are:

- To identify potential safety problems for road users and others affected by a road project
- To ensure that measures to eliminate or reduce the problems are considered fully.

The benefits of a road safety audit are:

- The risks of crash occurrence are reduced
- The severity of crashes can be reduced
- Road safety is given greater prominence in the minds of the road designers, traffic engineers and road funders
- The need for costly remedial work is reduced
- The total cost of a project to the community, including crashes, disruption and trauma, is reduced.

The aim of a road safety audit is:

"to identify any existing deficiencies of design, layout and road furniture which are not consistent with the road's function and use. There should be a consistency of standards such that the road users' perception of local conditions assists safety behaviour."

2.2 Methodology

The RSA was carried out as per the procedures set out in the Austroads *Guide to Road Safety Audit* (2019). Items audited as part of this RSA included (but were not limited to) the following:

- Road alignment (horizontal and vertical) and cross-section
- Sign and pavement markings
- Provision for special road users including pedestrians and cyclists and potential conflict points
- Roadside objects and hazards.

2.3 Audit Team

The RSA was undertaken by the following team members:

- Manoj Munankami – Accredited Senior Road Safety Auditor (Lead Auditor)
- Luke Johnston – Accredited Senior Road Safety Auditor (Reviewer)
- Bodie Campbell – Traffic Engineer and Transport Planner.

Importantly, the audit team was entirely independent of the team undertaking tasks on the broader Koala Park Traffic Management Study.

2.4 Information Sources

Data sources for the road safety audit included:

- Australian Standards publications
- Austroads Guide to Road Design publications
- Austroads Guide to Road Safety publications.

2.5 Inception Meeting

An inception meeting was held prior to the site inspection on 9th September 2021 between the RSA team and the Project Manager (Luke Darragh, Bitzios Consulting) on behalf of Council. Key considerations outlined in the brief with respect to road safety were discussed.

2.6 Prioritisation of Safety Issues

Safety issues identified during the audit have been prioritised based on the likely level of risk, in accordance with the process outlined in Austroads Part 6 and 6A.

To determine the level of risk, each item was reviewed to determine how often the problem will likely lead to a crash (frequency) and what the likely severity of the resulting crash type would be.

Table 2.1 and Table 2.2 provide the definitions used to indicate the frequency and severity levels.

Table 2.1: Definitions of Frequency

Frequency	Definition
Frequent	Once or more per week
Probable	Once or more per year (but less than once per week)
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Table 2.2: Definitions of Severity

Severity	Definition
Catastrophic	Likely Multiple Deaths
Serious	Likely Death or Serious Injury
Minor	Likely Minor Injury
Limited	Likely Trivial Injury or Property Damage Only

Following assignment of the frequency and severity levels associated with each safety issue, the resulting risk level was determined based on the adopted risk matrix as summarised in Table 2.3.

Table 2.3: Adopted Risk Matrix (Frequency vs. Severity)

Risk Matrix		Frequency			
		Improbable	Occasional	Probable	Frequent
Severity	Catastrophic	High	Intolerable	Intolerable	Intolerable
	Serious	Medium	High	Intolerable	Intolerable
	Minor	Low	Medium	High	Intolerable
	Limited	Low	Low	Medium	High

Table 2.4 below provides a suggested treatment approach for each risk level.

Table 2.4: Suggest Treatment Approach

Risk	Definition
Intolerable	Must be corrected
High	Should be corrected or the risk significantly reduced, even if the treatment cost is high
Medium	Should be corrected or the risk significantly reduced, if the treatment cost is moderate but not too high
Low	Should be corrected or the risk reduced if the treatment cost is low

3. AUDIT FINDINGS

3.1 Review of Traffic Data

Council provided the following traffic survey data for the study area:

- Automatic Tube Count (ATC) undertaken by Austraffic at 68 Tabilban Street from 9th October 2019 to 15 October 2019
- ATC undertaken by Austraffic at 36 Tabilban Street from 20th June 2020 to 26th June 2020
- ATC undertaken by Austraffic at 8 Reserve Street from 20th June 2020 to 26th June 2020
- ATC undertaken by Austraffic at 18 Bunyip Street from 29th October 2020 to 4th November 2020
- ATC undertaken by Austraffic on Tabilban Street between Reserve Road and Pandari Avenue from 19th April 2021 and 25th April 2021.

Based on our review of the supplied traffic data, the following observations are noted:

- In 2021, Tabilban Street carried an average of 7,854 vehicles per day (veh/d) with 94.6% being light vehicles
- In 2020, Bunyip Street carried an average of 2,522veh/d with 91.8% being light vehicles.

The above highlights there is a clear 'rat-run' between West Burleigh Road and Gold Coast Highway via Tabilban Street, Reserve Street, and Ikkina Road as well as Koel Street and Bunyip Street.

A copy of the supplied traffic data is included in **Appendix A**.

3.2 Crash Data Analysis

Council provided a crash detail report of the subject corridor prepared by the Department of Transport and Main Roads (TMR). For crashes to qualify as valid, they must meet at least one of the following criteria:

- The crash occurred on a public road
- A person was killed or injured
- At least one vehicle was towed away
- The value of damage to property other than vehicles was greater than $2,500.

The crash history was based on validated crash data from reported crashes that have occurred along the corridor from 9th November 2010 to 23rd December 2020, with the most recent 5 year period from 2nd January 2016 to 23rd December 2020.

During the 10 year period, a total of 35 crashes were reported along the corridor, with 23 of these reported crashes occurring in the most recent 5 year period. With the majority of crashes occurring in the most recent 5 years, this was the focus for the crash analysis consistent with typical procedures.

Crash data maps for the 5 year and 10 year periods, along with the DCA code definitions, are provided in **Appendix B** by severity and by crash type (DCA Code).

One (1) fatal crash occurred within the study are in January 2016 on West Burleigh Road in the vicinity of the intersection with Bunyip Street. This fatality was a crash involving a pedestrian (DCA Code 003) in which the pedestrian was hit by a southbound vehicle in the traffic lane closest to the median while attempting to cross the road. Traffic conditions were busy with light rain falling shortly before the incident.

Based on our review of the supplied crash data, the following summarised observations were noted:

- A total of 23 crashes were reported along the study corridor in the 5 year period
- 4 crashes resulted in hospitalisation and 13 resulted in medical treatment
- 6 crashes were categorised as DCA 301 (vehicles in the same lane)
- 3 crashes were categorised as DCA 202 (through and right from opposing directions)
- 2 crashes were categorised as DCA 104 (playing, working, lying or standing on carriageway).

3.2.1 Intersection Crashes

Of the 23 reported crashes during the study period, 15 crashes (65%) were recorded at intersections along the corridor. The complete intersection crash matrix is provided in Table 3.1.

Table 3.1: Crash Matrix - Intersections

DCA	Year					Severity				Total
	2020	2019	2018	2017	2016	Fatal	Hospitalisation	Medical Treatment	Minor Injury	
Tabilban Steet / Wairoo Street										
101					1		1			**1**
Dunlin Drive / West Burleigh Road / Tabilban Street / Burleigh Connection Road										
104					1			1		**1**
202					1			1		**1**
301				1				1		**1**
303		1						1		**1**
305			1					1		**1**
Tweed Street / Burrabee Street / Gold Coast Highway										
202					1			1		**1**
301		1	2	1			1	1	2	**4**
307			1				1			**1**
805				1					1	**1**
Beelyu Street / Djerral Avenue / Ikkina Road / Tweed Street										
301	1								1	**1**
302	1							1		**1**
Total	**2**	**2**	**4**	**3**	**4**	**-**	**3**	**8**	**4**	**15**

3.2.2 Mid-block Crashes

Of the 23 reported crashes during the study period, 8 crashes (35%) were recorded midblock along the corridor. The complete midblock crash matrix is provided in Table 3.2.

Table 3.2: Crash Matrix – Midblock

DCA	Year					Severity				Total
	2020	2019	2018	2017	2016	Fatal	Hospitalisation	Medical Treatment	Minor Injury	
Tabilban Steet										
308		1						1		**1**
401	1								1	**1**
604					1			1		**1**
805		1					1			**1**
Ikkina Road										
104					1			1		**1**
West Burleigh Road										
003					1	1				**1**
202				1				1		**1**
Reserve Road / Tabilban Street										
201					1			1		**1**
Total	**1**	**2**	**-**	**1**	**4**	**1**	**1**	**5**	**1**	**8**

3.2.3 Pedestrian / Cyclist Crashes

Of the 23 reported crashes during the study period, 2 cyclist crashes (9%%) were recorded along the corridor. A cyclist crash occurred in January 2016 along Tabilban Street in which the side door of a parked vehicle was opened, causing a passing cyclist to clip the door and fall off their bicycle. A second cyclist crash occurred in January 2016 on Ikkina Road in which a cyclist has fallen and a vehicle following has missed the fallen cyclist but collided with the fallen bicycle.

The one pedestrian crash that occurred within the study area resulted in a fatality as detailed above.

3.2.4 Crash Lighting

Of the 23 crashes recorded, 6 crashes occurred at night, 2 crashes occurred at dawn/dusk with the remaining 15 crashes occurring during the day. It should be noted that all 6 crashes at night occurred in lighted areas. Furthermore, 2 of the daylight crashes including the fatal crash were recorded as raining.

3.2.5 Crash Clusters

Segments of the study corridor were identified with an increased occurrence of crashes in relation to the rest of the corridor and/or grouping of similar crash types within close vicinity. Two (2) clusters of crashes have been recorded at intersections along the corridor including the following:

- Dunlin Drive / West Burleigh Road intersection
- Gold Coast Highway / Ikkina Road intersection.

Of the 23 crashes recorded from the study corridor, 7 crashes occurred within vicinity to the Dunlin Drive / West Burleigh Road intersection including 4 vehicles from one direction, 1 vehicle from opposing direction, 1 intersection crash and 1 pedestrian crash.

A total of 9 crashes occurred within the vicinity of the Gold Coast Highway / Ikkina Road intersection including 7 vehicles from one direction, 1 non-collision (on curve) and 1 vehicle from opposing direction type crashes.

Based on a review of the data, crashes are largely concentrated at the major intersections at either end of the corridor with the predominant crash type being vehicles from same direction. Crashes along the Tabliban-Ikkina Road corridor appeared to be somewhat spread out (and again focussed at intersections) which are likely contributed to by motorists using the corridor as a 'rat-run' / through route, as evidenced from the traffic survey data review.

A copy of the crash data maps is included in **Appendix B**.

3.3 Site Inspection Observations

A day and night time inspection was carried out on 9th September 2021 as part of the RSA.

During the site inspection, the following key points were noted:

- The weather was fine
- High traffic demands were observed along West Burleigh Road and Gold Coast Highway
- Medium traffic demands were observed along Tabilban Street and Ikkina Road
- Limited pedestrian and cyclist demands were observed along Tabilban Street, Ikkina Road, Koel Street and Bunyip Street.

3.4 Identified Safety Issues & Possible Remedial Actions

Table 3.1 summarises potential safety issues that were identified during our site audit and our desktop review of the study area, as well as possible remedial actions for consideration.

A summary of key audit findings is provided below:

- Pavement surface along the corridor is generally damaged and worn
- Traffic control devices (e.g. signs, linemarking) are damaged, worn or absent, particularly at intersections
- Footpaths are narrow along some sections (e.g. Reserve Street) and obstructed by the presence of vegetation and power poles.

The location of each potential safety issue is illustrated on an aerial photo included at **Appendix C**.

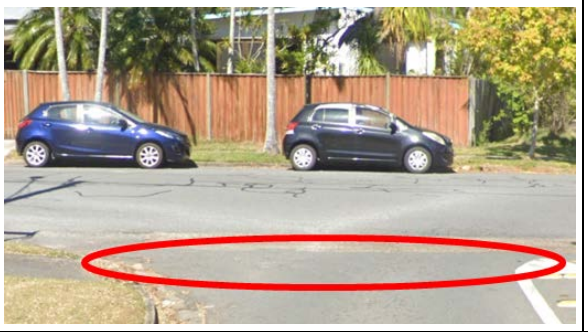
Table 3.3: Road Safety Issues & Potential Remedial Action

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
1	Tactical Ground Surface Indicators (TGSIs) are absent on the kerb ramps at the West Burleigh Road / Tabilban Street intersection. These are required for directional guidance for people with vision-impairment. This may result in pedestrian emerging type crashes.	Improbable x Catastrophic = **High**		Install TGSIs at the intersection to alert vision-impaired pedestrians through the crossing.
2	The narrow Keep Left (R2-3-Q02_3) sign on Tabilban Street in the eastbound direction is deformed/damaged. This reduces the visibility and effectiveness of the sign especially in low light conditions. This may result in head-on type crashes.	Improbable x Serious = **Medium**		Install a new narrow Keep Left (R2-3-Q02_3) sign.
3	The kerbs on the central traffic island along Tabilban Street are discoloured and barely visible especially in low light conditions. This may result in mounts traffic island or head-on type crashes.	Occasional x Minor = **Medium**		Repaint the kerbs on the traffic island kerbs, such that these are readily visible and/or install raised retroreflective pavement markers (RRPMs) for improved visibility.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
4	The 40km/h pavement marking provided along eastbound direction on Tabilban Street is faded. This reduces visibility of the pavement marking and effectiveness of identifying the low-speed road environment. This may result in motorists exceeding speed limits along the corridor.	Improbable x Serious = **Medium**		Repaint the 40km/h threshold treatment / pavement marking.
5	Driveways present along the northern side of Tabilban Street are steep and raised over the gutter onto the carriageway. As a result, culverts are located within the carriageway creating a physical hazard for road users. This also discourages vehicles from stopping before crossing the pedestrian path and entering the roadway. This may result in leaving driveway, pedestrian on driveway, and reversing in traffic type crashes.	Improbable x Serious = **Medium**	 	Regrade the driveways such that culverts can be removed and property accesses can be cut out of standard kerb and channel gutters.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
7	A pedestrian rail fence provided near 93 Tabilban Street, is located within the clear zone. This poses a road spear hazard to eastbound vehicles.	Improbable x Serious = **Medium**		Remove the existing pedestrian rail fence and install a new pedestrian fence without horizontal rails.
8	During the site visit, vegetation overgrown onto the footpath was observed near 87 Tabilban Street. This reduces the usable width of the footpath and obscures the edge of the footpath. This may result in pedestrians stepping off the path or collision with an opposing pedestrian/cyclist.	Improbable x Minor = **Low**		Clear the overgrown vegetation and keep the footpath clear of any obstruction.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
9	The footpath on Tabilban Street, opposite Koel Street is narrow, bounded by street trees, retaining walls, pedestrian rails and overhanging vegetation. This reduces the usable width of the path and obscures the edge of the footpath. This may result in cyclists colliding with the tree, pedestrian rail or retaining wall.	Improbable x Minor = **Low**		Maintain the vegetation and remove the tree in proximity to the footpath.
10	The Keep Left (R2-3) sign along eastbound Tabilban Street at Koel Street intersection, is deformed/damaged. This reduces the visibility and effectiveness of the sign. This may result in head-on type crashes.	Occasional x Minor = **Medium**		Replace the damaged sign with a new one.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
11	The traffic island kerbs on Tabilban Street at Koel Street are discoloured and are barely visible especially in low light conditions. This may result in mounts traffic island or head-on type crashes.	Occasional x Serious = **High**		Repaint the kerbs on the traffic island kerbs, such that these are readily visible and/or install raised retroreflective pavement markers (RRPMs) for improved visibility.
12	The give way line marking on Bunyip Street approach to West Burleigh Road is faded. This reduces the visibility and effectiveness of the line marking This may result in vehicles from adjacent approaches type crashes.	Improbable x Serious = **Medium**		Repaint the give way line marking.
13	“Give Way” (R1-2) sign and line marking are absent on the Koel Street approach to Bunyip Street to indicate priority at the intersection. This reduces the legibility of priority at the intersection. This may result in vehicles from adjacent approaches type crashes.	Frequent x Serious = **Intolerable**		Install “Give Way” sign and line marking on Koel Street approach to the intersection.
14	“Give Way” (R1-2) sign and line marking are absent on the Koel Street approach to Tabilban Street to indicate priority at the intersection. This reduces the legibility of priority at the intersection. This may result in vehicles from adjacent approaches type crashes.	Frequent x Serious = **Intolerable**		Install “Give Way” sign and line marking on Koel Street approach to the intersection.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
15	During the site visit, vegetation overgrown onto the footpath was observed near 60 Tabilban Street. This reduces the usable width of the footpath and obscures the edge of the footpath. This may result in pedestrians stepping off the path or collision with an opposing pedestrian/cyclist.	Improbable x Minor = **Low**		Clear the overgrown vegetation and keep the footpath clear of any obstruction.
16	The Right Turn warning (W1-1[R]) sign and Advisory Speed sign along eastbound Tabilban Street are dirty and non-reflective. This reduces the visibility and effectiveness of the signs. This may result in off carriageway and off right bend into object type crashes.	Frequent x Serious = **Intolerable**		Replace the non-reflective signs with new signs.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
17	The edge line marking on the outside of the sharp bend along Tabilban Street at Ocean Parade intersection, is faded and barely visible on approach to due to the superelevation. Motorists are not able to identify the edge line while travelling along the sharp curve. This may result in off carriageway and off right bend into object type crashes.	Probable x Serious = **Intolerable**		Repaint the edge line marking and install RRPMs.
18	Some vehicles were observed to be parked on the outside of the turn at Tabilban Street / Ocean Parade intersection. These vehicles are parked too close to the carriageway and the run-off space for errant vehicles are reduced. This may result in parked and left off carriageway into object type crashes	Improbable x Serious = **Medium**		Restrict parking within immediate proximity to the carriageway, especially along the outside of the turn. This can be achieved through the installation of yellow edge line marking and sign posting.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
19	The traffic island kerbs on Tabilban Street at Ocean Parade intersection, are dark and are barely visible especially in low light conditions. This may result in mounts traffic island or head-on type crashes.	Occasional x Serious = **High**		Repaint the kerbs on the traffic island kerbs, such that these are readily visible and/or install raised retroreflective pavement markers (RRPMs) for improved visibility.
20	The footpath on the inside of the sharp curve along westbound Tabilban Street at Ocean Parade intersection, is very steep. Visibility around the corner is limited and cyclists will be approaching the corner at high speed due to steep gradient. This may result in cyclists colliding with opposing pedestrians or cyclists, or cyclists running off the path, onto the carriageway.	Occasional x Catastrophic = **Intolerable**		Maintain the vegetation on the inside of the corner, investigate provision of pedestrian fence along the sharp bend.
21	Vegetation covers the Curve Warning (W1-3[L]) sign along westbound Ocean Parade, approaching Tabilban Street intersection. This reduces the visibility of the sign and awareness of the sharp curve. This may result in off carriageway, off left bend into object, and mounts traffic island type crashes.	Probable x Serious = **Intolerable**		Trim the vegetation covering the sign, such that it is readily visible to motorists.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
22	A large tree overhangs the roadway and appears to be leaning towards the carriageway along eastbound Ocean Parade. This reduces the visibility around the curve and is located within the clear zone. Further, high vehicles travelling close to the kerb may strike it. This may result in off left bend into object type crashes.	Probable x Serious = **Intolerable**		Remove the tree to protect vehicles from striking it.
23	During the site visit, vehicles were observed parked on the outside of the sharp curve along westbound Ocean Parade. This reduces the width of the travel lane along the sharp bend and might force vehicles to encroach into opposing lane. This may result in head-on or off-path on-straight type crashes.	Probable x Serious = **Intolerable**		Restrict parking along the sharp bend. This can be achieved by installing yellow edge line marking and parking / stopping restriction signs at the location.
24	The traffic island kerbs along Ocean Parade at Reserve Street intersection, are dark and are barely visible especially in low light conditions. Some traces of tire tracks from vehicle driving over the kerb was also observed. This may result in mounts traffic island or head-on type crashes.	Probable x Serious = **Intolerable**		Repaint the kerbs on the traffic island kerbs, such that these are readily visible and/or install raised retroreflective pavement markers (RRPMs) for improved visibility. Also, check swept paths for the vehicles navigating through the traffic calming area and provide appropriate reduced advisory speed if required.

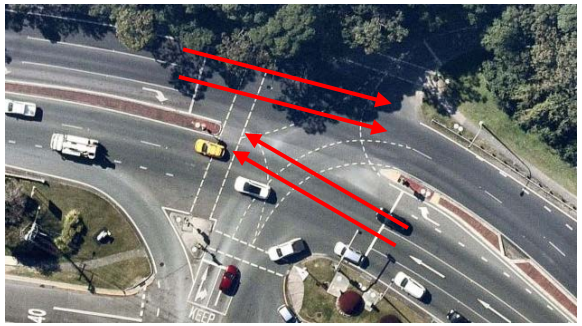
Item	Issue	Risk	Site Illustration	Potential Remedial Actions
25	Dead vegetation partially covers the footpath fronting 2 Reserve Street. This reduces the usable width of the footpath and obscures the edge of the footpath. This may result in pedestrians stepping off the path or collision with an opposing pedestrian/cyclist.	Improbable x Minor = **Low**		Clear the debris over the footpath and keep the footpath clear of any obstruction.
26	The footpath fronting 2 Reserve Street is approximately 900mm wide with a light pole located within the footpath. This reduces the space for cyclists and pedestrians to use the footpath. Furthermore, the footpath terminates at the Reserve Street / Ocean Parade intersection where kerb ramps are absent. This effectively obstructs the path for accessible users and may result in cyclists colliding with the pole or an opposing pedestrian/cyclist.	Improbable x Minor = **Low**		Widen the footpath around the pole. Alternatively, investigate alternate active transport route for users.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
27	The footpath fronting 6 Reserve Street is approximately 900mm wide and a light pole is located within the footpath. This reduces the space for cyclists and pedestrians to use the footpath and directs pedestrians to the carriageway. This effectively obstructs the path for accessible users and may result in pedestrian walking with traffic type crashes or, cyclists colliding with the pole or an opposing pedestrian/cyclist.	Improbable x Serious = **Medium**		Widen the footpath around the pole. Alternatively, investigate alternate active transport route for users.
28	A guardrail is provided along southbound Reserve Street. However, this does not protect vehicles from the steep fall adjacent to the carriageway. Further, fishtail type end treatment has been provided as end treatment of the guardrail. This may result in left off carriageway into object type crashes.	Improbable x Catastrophic = **High**		Extend the guardrail and install suitable end treatment.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
29	The footpath fronting 12 Reserve Street is approximately 900mm wide and a light pole is located within the footpath. This reduces the space for cyclists and pedestrians to use the footpath and directs pedestrians to the carriageway. This effectively obstructs the path for accessible users and may result in pedestrian walking with traffic type crashes or, cyclists colliding with the pole or an opposing pedestrian/cyclist.	Improbable x Minor = **Low**		Widen the footpath around the pole. Alternatively, investigate alternate active transport route for users.
30	Chevron Alignment Markers (CAMs) have been provided along westbound direction at the sharp curve at Reserve Street / Tabilban Street intersection. These are also required for vehicles travelling in northbound direction, for proper delineation of the turn. This may result in off carriageway right bend type crashes.	Probable x Serious = **Intolerable**		Install CAMs in the southbound direction.
31	Vegetation partially covers the Koala warning (W5-47) sign along westbound Tabilban Street. This reduces the visibility of the sign and awareness of wildlife in the area.	Improbable x Minor = **Low**		Trim the vegetation covering the sign, such that it is readily visible to motorists.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
32	The yellow edge line markings are absent on either side of Tabilban Street along the steep gradient. Parking / stopping restriction signs are also absent as such there is no restriction on motorists stopping along the roadside. This may result in parked car run away type crashes.	Improbable x Catastrophic = **High**		Extend the yellow edge line marking and install parking / stopping restriction signs to prohibit parking at the location.
33	The Tabilban Street / Ikkina Road intersection provides a straight alignment from Ikkina Street to Tabilban Street with no advance warning of an intersection on Ikkina Road. This reduces the awareness and legibility of the intersection. This may result in vehicles from adjacent approaches type crashes.	Occasional x Serious = **High**		Install “Intersection on Curve” or “Stop Ahead” sign on Ikkina Road approach to the intersection.
34	The line marking on Ikkina Street at Ikkina Street / Tabilban Street intersection is set back at a significant distance from the intersection. The major movement at the intersection is along the curve and the line markings and medians are required to denote priority and major movement at the intersection. This is inconsistent with similar types of intersections and reduces familiarity and legibility of the intersection. This may result in vehicles from adjacent approaches type crashes.	Occasional x Serious = **High**		Update the line markings and alignment at the intersection as per the figure below. 

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
35	The pavement condition throughout the corridor is poor with significant cracking and rutting observed at various locations. This reduces the coefficient of friction of the road and can affect steering of vehicles via 'tramlining'. This may result in a number of different crash types	Frequent x Minor = **Intolerable**		Repair or resurface the road pavement along the corridor.
36	The "Road Closed to Trucks and Trailers" sign provided along westbound Ikkina Road is faded. This reduces the visibility and effectiveness of the sign.	Improbable x Minor = **Low**		Install a new signage identifying any vehicle dimension limits (e.g. mass, length and width, etc.).
37	A "Give Way" (R1-2) sign is absent at Beelyu Street / Ikkina Road intersection. This is required to denote priority at the intersection. This may result in vehicles from adjacent approaches type crashes.	Improbable x Serious = **Medium**		Install a "Give Way" sign on Beelyu Street approach to the intersection.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
38	The Gold Coast Highway approaches are along the curve at its intersection with Ikkina Road. Through vehicles on the approaches are not pointed / aligned to appropriate exit lanes in both directions. Further, in westbound direction three exit lanes are provided with two approach lanes. This could confuse motorists and might not end up in correct lanes while navigating through the intersection. This may result in side swipe type crashes.	Probable x Serious = **Intolerable**		Provide Non-Reflective Pavement Markers through the intersection to direct the through traffic along Gold Coast Highway to appropriate lanes through the intersection and consider removing the additional exit lane on the westbound exit.
39	The “Keep Left” (R2-3) sign on Gold Coast Highway in the westbound direction is located at a distant from median nose. These are to be provided close to the median nose for directing traffic in appropriate lane. This may result in head-on type crashes.	Improbable x Catastrophic = **High**		Relocate the “Keep Left” sign closer to the median nose.
40	Tactical Ground Surface Indicators (TGSIs) are absent on the kerb ramps at the Gold Coast Highway / Ikkina Road intersection. These are required for directional guidance for people with vision-impairment. This may result in pedestrian emerging type crashes.	Improbable x Catastrophic = **High**		Install TGSIs at the intersection to alert vision- impaired pedestrian through the crossing.

Item	Issue	Risk	Site Illustration	Potential Remedial Actions
41	The turn lines indicating the dual right-turn from Ikkina Road to Gold Coast Highway are approximately 3.2m apart. The width appears inadequate to separate turning vehicles travelling side by side and may result in one vehicle encroaching into the path of the adjacent vehicle. This may result in side swipe type crashes.	Probable x Serious = **Intolerable**		Investigate if the width provided by the turn lanes is adequate for the turning vehicles by swept path assessment. If required update the line markings to provide adequate width.
42	The “Keep Left” (R2-3) sign on Gold Coast Highway in the eastbound direction is located at a distant from median nose. These are to be provided close to the median nose for directing traffic in appropriate lane. This may result in head-on type crashes.	Improbable x Catastrophic = **High**		Relocate the “Keep Left” sign closer to the median nose.

4. CONCLUDING STATEMENT

This Road Safety Audit was carried out generally in accordance with the procedures set out in Austroads Part 6 and 6A. The audit considered physical features at the study intersections and within the study area that may affect road user safety and sought to identify potential safety hazards. However, it is important to note that no guarantee is made that every deficiency has been identified. Furthermore, if all the possible remedial measures identified in this report were to be implemented, there is no guarantee that the road would be 'safe'. Rather, it is expected that these measures would only improve safety.

[redacted]

[redacted]

Bitzios Consulting
Traffic Engineer and Transport Planner
Accredited Senior Road Safety Auditor

[redacted]

[redacted]

Bitzios Consulting
Senior Traffic Engineer and Transport Planner
Accredited Senior Road Safety Auditor

[redacted]

[redacted]

Bitzios Consulting
Traffic Engineer and Transport Planner

Appendix A: Traffic Survey Data

SEVEN DAY AUTOMATIC VEHICLE CLASSIFICATION AND SPEED SURVEY
SUMMARY OF RESULTS - Two Way

Client: *Gold Coast City Council*
Survey Location: *Tabilban Street, Burleigh Waters, adjacent to no.68 (40kmh)*
Survey Period: *Wednesday,9 October 2019 to Tuesday,15 October 2019*
Speed Limit: *40*
ATS Reference: *16044 Z.217-5*
GCCC Reference: *Z.217 Site 5*
Notes:

TRAFFIC VOLUME / CLASSIFICATION DATA

DAY	DAILY TRAFFIC BY ARX CLASSES														
	Total	1		2	3	4	5	6	7	8	9	10	11	12	13 unclassified
		Cycle	MC												
Wednesday, October 09, 2019	**6896**	17	49	6387	60	353	13	7	4	4	0	1	0	1	13
Thursday, October 10, 2019	**6742**	24	33	6229	57	361	16	8	9	2	0	2	0	1	17
Friday, October 11, 2019	**7041**	16	45	6575	61	323	5	5	6	4	0	1	0	0	33
Saturday, October 12, 2019	**5000**	5	10	4767	22	179	10	3	2	2	0	0	0	0	24
Sunday, October 13, 2019	**4957**	13	43	4686	33	174	3	2	1	0	1	1	0	0	14
Monday, October 14, 2019	**6140**	18	36	5749	56	257	10	8	3	2	1	0	0	0	14
Tuesday, October 15, 2019	**6358**	19	43	5944	45	277	9	14	3	2	0	1	1	0	10
Weekly Averages	**6162**	16	37	5762	48	275	9	7	4	2	0	1	0	0	
% of Vehicles by Class	**100.0%**	0.3%	0.6%	93.5%	0.8%	4.5%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Total Weekly Volume	**43134**	112	259	40337	334	1924	66	47	28	16	2	6	1	2	125

SPEED DATA

DAY/DATE	DAILY								AM PEAK HOUR								PM PEAK HOUR								
	Vol (vpd)	Vol within 15Kph Pace	Avg Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed	AM Peak Hour Starting	Vol (vph)	Vol within 15Kph Pace	Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed	PM Peak Hour Starting	Vol (vph)	Vol within 15Kph Pace	Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed
Wednesday, October 09, 2019	6896	5366	32	3393	49.2%	40	46	84.8	8:00AM	576	467	32	334	58.0%	40.3	48.0	63.2	5:00PM	678	580	30	318	46.9%	37.5	43.5	62.0
Thursday, October 10, 2019	6742	5562	32	3371	50.0%	40	46	82.4	8:00AM	545	457	33	329	60.4%	40.6	46.2	62.0	4:00PM	641	548	33	280	43.7%	39.4	45.6	72.2
Friday, October 11, 2019	7041	5499	33	3317	47.1%	40	46	86.4	8:00AM	548	431	32	300	54.7%	39.9	46.3	65.2	4:00PM	679	559	32	308	45.4%	38.2	44.1	59.0
Saturday, October 12, 2019	5000	5695	32	2720	54.4%	40	47	71.6	11:00AM	555	448	34	317	57.1%	41.1	47.3	59.8	12:00PM	521	445	34	279	53.6%	40.5	46.8	57.9
Sunday, October 13, 2019	4957	4108	33	2463	49.7%	41	46	80.4	11:00AM	500	433	32	200	40.0%	38.5	44.7	61.4	12:00PM	516	427	32	227	44.0%	38.7	44.2	61.7
Monday, October 14, 2019	6140	3968	32	3051	49.7%	40	47	79.4	8:00AM	517	417	33	330	63.8%	41.7	48.6	63.0	4:00PM	615	515	32	295	48.0%	38.9	45.6	57.8
Tuesday, October 15, 2019	6358	4911	33	3140	49.4%	40	48	80.3	8:00AM	570	456	34	346	60.7%	40.9	47.2	63.9	4:00PM	612	484	32	300	49.0%	38.9	46.8	63.5
Weekly Averages	**6162**	5016	32	3065	49.9%	40.0	46.6																			
Total Weekly Volume	**43134**	35109		21455	49.7%																					

SEVEN DAY AUTOMATIC VEHICLE CLASSIFICATION AND SPEED SURVEY
SUMMARY OF RESULTS - Two Way

Client: *Gold Coast City Council*
Survey Location: *Tabilban Street, Burleigh Heads, opposite no.36 (40kmh)*
Survey Period: *Saturday,20 June 2020 to Friday,26 June 2020*
Speed Limit: *40*
ATS Reference: *16724 Z.342-1*
GCCC Reference: *Z.342 Site 1*
Notes: **Survey undertaken during the COVID19 pandemic**

TRAFFIC VOLUME / CLASSIFICATION DATA

DAY	DAILY TRAFFIC BY ARX CLASSES														
	Total	1		2	3	4	5	6	7	8	9	10	11	12	13 unclassified
		Cycle	MC												
Saturday, June 20, 2020	**5407**	7	32	5164	32	158	2	5	6	1	0	0	0	0	3
Sunday, June 21, 2020	**4786**	10	43	4560	29	135	1	6	0	0	2	0	0	0	1
Monday, June 22, 2020	**6332**	12	45	6005	48	198	5	8	6	4	0	1	0	0	3
Tuesday, June 23, 2020	**6689**	9	51	6312	45	259	3	2	3	3	0	1	0	1	6
Wednesday, June 24, 2020	**6848**	8	46	6499	50	222	6	11	2	3	0	1	0	0	7
Thursday, June 25, 2020	**7065**	9	61	6690	48	237	6	8	3	0	1	2	0	0	1
Friday, June 26, 2020	**6857**	10	39	6505	46	232	7	13	3	0	0	2	0	0	5
Weekly Averages	**6283**	9	45	5962	43	206	4	8	3	2	0	1	0	0	
% of Vehicles by Class	**100.0%**	0.1%	0.7%	94.9%	0.7%	3.3%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Total Weekly Volume	**43984**	65	317	41735	298	1441	30	53	23	11	3	7	0	1	26

SPEED DATA

DAY/DATE	DAILY								AM PEAK HOUR								PM PEAK HOUR								
	Vol (vpd)	Vol within 15Kph Pace	Avg Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed	AM Peak Hour Starting	Vol (vph)	Vol within 15Kph Pace	Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed	PM Peak Hour Starting	Vol (vph)	Vol within 15Kph Pace	Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed
Saturday, June 20, 2020	5407	5209	33	2848	52.7%	40	48	72.3	11:00AM	665	498	31	314	47.2%	39.3	46.6	64.4	12:00PM	506	397	32	265	52.4%	40.7	46.1	66.5
Sunday, June 21, 2020	4786	3999	33	2686	56.1%	40	48	76.9	11:00AM	524	397	34	301	57.4%	41.0	48.9	62.9	12:00PM	556	431	32	267	48.0%	39.8	46.6	76.9
Monday, June 22, 2020	6332	3520	33	3608	57.0%	41	49	68.4	8:00AM	629	480	32	310	49.3%	39.2	45.7	62.2	3:00PM	593	497	34	353	59.5%	41.2	47.8	59.1
Tuesday, June 23, 2020	6689	4841	33	3729	55.7%	41	47	80.2	8:00AM	663	511	32	343	51.7%	39.6	46.4	66.4	3:00PM	629	515	34	347	55.2%	40.8	46.4	80.2
Wednesday, June 24, 2020	6848	5101	33	3670	53.6%	41	48	81.7	8:00AM	647	504	31	340	52.6%	39.2	47.0	60.8	3:00PM	685	552	33	429	62.6%	40.2	46.3	72.1
Thursday, June 25, 2020	7065	5174	33	3799	53.8%	40	48	70.7	8:00AM	683	508	31	326	47.7%	38.2	45.4	59.1	3:00PM	688	530	32	390	56.7%	39.7	46.7	63.2
Friday, June 26, 2020	6857	5352	33	3749	54.7%	40	48	76.5	8:00AM	619	470	32	323	52.2%	39.7	46.2	62.3	3:00PM	614	504	33	392	63.8%	40.7	46.6	61.4
Weekly Averages	**6283**	4742	33	3441	54.8%	40.4	47.8																			
Total Weekly Volume	**43984**	33196		24089	54.8%																					

SEVEN DAY AUTOMATIC VEHICLE CLASSIFICATION AND SPEED SURVEY
SUMMARY OF RESULTS - Two Way

Client: *Gold Coast City Council*
Survey Location: *Reserve Street, Burleigh Heads, opposite no.8 (40kmh)*
Survey Period: *Saturday,20 June 2020 to Friday,26 June 2020*
Speed Limit: *40*
ATS Reference: *16724 Z.342-2*
GCCC Reference: *Z.342 Site 2*
Notes: **Survey undertaken during the COVID19 pandemic**

TRAFFIC VOLUME / CLASSIFICATION DATA

DAY	DAILY TRAFFIC BY ARX CLASSES														
	Total	1		2	3	4	5	6	7	8	9	10	11	12	13 unclassified
		Cycle	MC												
Saturday, June 20, 2020	**5392**	0	31	5144	34	162	13	4	3	0	0	1	0	0	1
Sunday, June 21, 2020	**4770**	8	39	4575	21	119	2	3	2	1	0	0	0	0	2
Monday, June 22, 2020	**6288**	12	36	5934	47	228	18	5	3	5	0	0	0	0	2
Tuesday, June 23, 2020	**6645**	14	37	6237	46	271	20	8	4	5	0	2	0	1	4
Wednesday, June 24, 2020	**6791**	12	46	6328	48	257	86	5	4	3	0	2	0	0	3
Thursday, June 25, 2020	**7021**	10	59	6623	41	251	31	1	0	0	2	2	1	0	3
Friday, June 26, 2020	**6876**	8	39	6490	40	264	25	5	3	1	0	1	0	0	5
Weekly Averages	**6255**	9	41	5904	40	222	28	4	3	2	0	1	0	0	
% of Vehicles by Class	**100.0%**	0.1%	0.7%	94.4%	0.6%	3.5%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Weekly Volume	**43783**	64	287	41331	277	1552	195	31	19	15	2	8	1	1	20

SPEED DATA

DAY/DATE	DAILY								AM PEAK HOUR								PM PEAK HOUR								
	Vol (vpd)	Vol within 15Kph Pace	Avg Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed	AM Peak Hour Starting	Vol (vph)	Vol within 15Kph Pace	Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed	PM Peak Hour Starting	Vol (vph)	Vol within 15Kph Pace	Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed
Saturday, June 20, 2020	5392	5976	25	327	6.1%	32	37	59.6	11:00AM	657	576	23	22	3.3%	31.0	36.7	49.3	12:00PM	511	483	26	24	4.7%	33.3	37.6	51.7
Sunday, June 21, 2020	4770	4908	25	284	6.0%	33	37	67.3	11:00AM	522	488	25	22	4.2%	33.3	37.7	55.9	12:00PM	562	518	25	22	3.9%	32.6	37.9	52.5
Monday, June 22, 2020	6288	4349	25	350	5.6%	33	37	68.5	8:00AM	592	435	22	14	2.4%	28.0	35.7	51.8	3:00PM	576	514	24	23	4.0%	32.1	38.0	48.5
Tuesday, June 23, 2020	6645	5596	25	385	5.8%	33	38	185.9	8:00AM	633	503	22	25	3.9%	28.9	35.1	47.4	3:00PM	624	578	25	27	4.3%	32.1	36.4	43.7
Wednesday, June 24, 2020	6791	5883	25	359	5.3%	33	37	63.2	8:00AM	609	502	22	25	4.1%	29.0	35.4	45.2	4:00PM	669	611	24	18	2.7%	32.1	36.4	63.2
Thursday, June 25, 2020	7021	5902	24	438	6.2%	32	38	62.0	8:00AM	666	480	22	19	2.9%	28.1	35.4	48.3	3:00PM	669	607	24	41	6.1%	32.0	36.2	59.0
Friday, June 26, 2020	6876	6162	25	419	6.1%	33	37	62.1	8:00AM	588	455	23	24	4.1%	29.3	36.9	45.0	3:00PM	616	572	24	21	3.4%	32.9	36.0	48.5
Weekly Averages	**6255**	5539	25	366	5.9%	32.6	37.5																			
Total Weekly Volume	**43783**	38776		2562	5.9%																					

SEVEN DAY AUTOMATIC VEHICLE CLASSIFICATION AND SPEED SURVEY
SUMMARY OF RESULTS - Two Way

Client: *Gold Coast City Council*
Survey Location: *Bunyip Street, Burleigh Heads, opposite no.18 (50kmh)*
Survey Period: *Thursday,29 October 2020 to Wednesday,4 November 2020*
Speed Limit: *50*
ATS Reference: *17144 Z.424-1*
GCCC Reference: *Z.424 Site 1*
Notes: **Survey undertaken during the COVID19 pandemic**

TRAFFIC VOLUME / CLASSIFICATION DATA

DAY	DAILY TRAFFIC BY ARX CLASSES														
	Total	1		2	3	4	5	6	7	8	9	10	11	12	13 unclassified
		Cycle	MC												
Thursday, October 29, 2020	**3156**	6	24	2893	21	199	6	3	2	2	0	0	0	0	1
Friday, October 30, 2020	**3086**	10	31	2828	33	163	10	4	2	4	0	1	0	0	0
Saturday, October 31, 2020	**2084**	2	21	1945	18	90	5	1	1	1	0	0	0	0	1
Sunday, November 01, 2020	**1863**	9	23	1729	13	81	1	2	3	1	0	1	0	0	0
Monday, November 02, 2020	**2948**	10	29	2705	26	164	7	0	5	1	0	1	0	0	0
Tuesday, November 03, 2020	**2939**	12	17	2674	27	188	10	5	6	0	0	0	0	0	2
Wednesday, November 04, 2020	**3156**	6	40	2881	22	192	7	1	5	0	0	2	0	0	4
Weekly Averages	**2747**	8	26	2522	23	154	7	2	3	1	0	1	0	0	
% of Vehicles by Class	**100.0%**	0.3%	1.0%	91.8%	0.8%	5.6%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Weekly Volume	**19232**	55	185	17655	160	1077	46	16	24	9	0	5	0	0	8

SPEED DATA

DAY/DATE	DAILY								AM PEAK HOUR								PM PEAK HOUR								
	Vol (vpd)	Vol within 15Kph Pace	Avg Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed	AM Peak Hour Starting	Vol (vph)	Vol within 15Kph Pace	Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed	PM Peak Hour Starting	Vol (vph)	Vol within 15Kph Pace	Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed
Thursday, October 29, 2020	3156	2377	40	1136	36.0%	47	55	78.3	8:00AM	437	327	39	125	28.6%	45.0	52.5	76.3	3:00PM	248	193	40	91	36.7%	46.6	54.6	70.5
Friday, October 30, 2020	3086	2502	40	1119	36.3%	47	55	86.6	8:00AM	366	294	38	91	24.9%	45.1	52.8	61.3	3:00PM	252	192	40	105	41.7%	48.3	55.6	86.6
Saturday, October 31, 2020	2084	2396	41	790	37.9%	47	55	79.2	10:00AM	252	200	38	75	29.8%	47.0	53.2	72.4	12:00PM	197	160	42	84	42.6%	48.2	54.6	67.7
Sunday, November 01, 2020	1863	1606	40	693	37.2%	48	54	102.0	11:00AM	179	139	39	78	43.6%	46.6	53.2	67.0	12:00PM	170	142	41	59	34.7%	47.7	53.6	69.3
Monday, November 02, 2020	2948	1445	40	1043	35.4%	48	54	80.0	8:00AM	388	255	40	93	24.0%	41.4	52.5	64.8	3:00PM	232	192	39	75	32.3%	47.4	53.3	75.6
Tuesday, November 03, 2020	2939	2327	40	977	33.2%	47	55	89.4	8:00AM	416	348	38	109	26.2%	45.8	51.2	69.6	3:00PM	214	175	40	73	34.1%	47.3	53.4	74.4
Wednesday, November 04, 2020	3156	2304	40	1037	32.9%	46	53	82.6	8:00AM	410	239	39	79	19.3%	37.2	51.7	70.2	3:00PM	264	217	39	93	35.2%	47.8	53.1	79.2
Weekly Averages	**2747**	2137	40	971	35.5%	47.2	54.5																			
Total Weekly Volume	**19232**	14957		6795	35.3%																					

SEVEN DAY AUTOMATIC VEHICLE CLASSIFICATION AND SPEED SURVEY
SUMMARY OF RESULTS - Two Way

Client: *Gold Coast City Council*
Survey Location: *Tabilban Street, Burleigh Heads, between Reserve Road and Pindari Avenue (40kmh)*
Survey Period: *Monday,19 April 2021 to Sunday,25 April 2021*
Speed Limit: *40*
ATS Reference: *17692 Z.502-8*
GCCC Reference: *Z.502 Site 17692 Z.502-8*
Notes:

TRAFFIC VOLUME / CLASSIFICATION DATA

DAY	DAILY TRAFFIC BY ARX CLASSES														
	Total	1		2	3	4	5	6	7	8	9	10	11	12	13 unclassified
		Cycle	MC												
Monday, April 19, 2021	**8863**	11	61	8222	58	466	16	11	16	2	0	0	0	0	7
Tuesday, April 20, 2021	**8874**	9	66	8206	55	476	20	20	17	3	0	2	0	0	9
Wednesday, April 21, 2021	**9158**	20	59	8513	69	434	22	14	14	3	2	8	0	0	9
Thursday, April 22, 2021	**8882**	5	54	8502	73	199	22	20	6	0	0	1	0	0	5
Friday, April 23, 2021	**9661**	6	87	9267	79	175	25	8	6	4	1	3	0	0	8
Saturday, April 24, 2021	**7167**	7	42	6943	54	95	13	9	1	0	0	3	0	0	0
Sunday, April 25, 2021	**5489**	2	45	5328	17	80	5	9	2	1	0	0	0	0	3
Weekly Averages	**8299**	9	59	7854	58	275	18	13	9	2	0	2	0	0	
% of Vehicles by Class	**100.0%**	0.1%	0.7%	94.6%	0.7%	3.3%	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Total Weekly Volume	**58094**	60	414	54981	405	1925	123	91	62	13	3	17	0	0	41

SPEED DATA

DAY/DATE	DAILY								AM PEAK HOUR								PM PEAK HOUR								
	Vol (vpd)	Vol within 15Kph Pace	Avg Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed	AM Peak Hour Starting	Vol (vph)	Vol within 15Kph Pace	Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed	PM Peak Hour Starting	Vol (vph)	Vol within 15Kph Pace	Start Pace	Vol > Limit	% > Limit	Avg Spd	85th% Speed	Max Speed
Monday, April 19, 2021	8863	6668	34	5116	57.7%	41	48	72.4	8:00AM	827	608	30	478	57.8%	39.2	46.4	63.1	3:00PM	822	651	33	537	65.3%	40.9	47.0	69.4
Tuesday, April 20, 2021	8874	6400	33	4910	55.3%	40	48	75.4	8:00AM	925	521	29	327	35.4%	33.4	43.9	59.8	3:00PM	783	596	33	495	63.2%	40.5	47.5	72.1
Wednesday, April 21, 2021	9158	6237	32	4416	48.2%	38	47	94.4	8:00AM	887	594	31	415	46.8%	36.3	44.8	70.7	3:00PM	888	677	31	417	47.0%	38.8	45.7	64.8
Thursday, April 22, 2021	8882	6801	32	4479	50.4%	40	47	77.1	8:00AM	874	614	29	312	35.7%	36.7	44.3	57.0	4:00PM	855	694	32	460	53.8%	39.9	46.1	65.6
Friday, April 23, 2021	9661	7378	33	5242	54.3%	40	47	73.4	8:00AM	773	553	30	453	58.6%	38.4	46.0	70.9	4:00PM	942	751	33	541	57.4%	41.0	47.5	62.9
Saturday, April 24, 2021	7167	5435	33	4085	57.0%	41	48	75.7	10:00AM	742	569	33	467	62.9%	40.4	47.0	63.6	12:00PM	728	561	33	436	59.9%	41.3	47.8	74.5
Sunday, April 25, 2021	5489	4006	33	3045	55.5%	41	48	143.5	9:00AM	704	514	32	425	60.4%	38.4	45.5	143.5	12:00PM	532	409	33	310	58.3%	41.1	47.8	66.3
Weekly Averages	**8299**	6132	33	4470	54.1%	40.0	47.4																			
Total Weekly Volume	**58094**	42925		31293	53.9%																					

Appendix B: Crash Data

N

WEST BURLEIGH RD

80

TWEED ST

2

GOLD COAST HWY

IKKINA RD

BEELYU ST

Burleigh Heads

Keith St

Eagle Ave

Burleigh St

Laneway

James St

Stephens St

Acanthus Ave

West Burleigh Rd

West St

Park Ave

Stanley St

Connor St

Lower East St

Upper East St

Ewart St

Era Ave

Hill Ave

View St

George St

Mount St

George St W

George St

The Esplanade

Brake St

short St

Albert St

Tweed St

George St E

Cotton St

Hayle St

Spence St

Judia St

Pegga Rd

Rudd St

Burleigh Head National Park

Burleigh Ridge Park

Dunlin Dr

Page Pde

Woolworths Stockland Burleigh Heads

Wairoo St

Tabilban St

Bunyip St

Banjo St

Koel St

Matilda St

Reserve St

Djerral Ave

Tawarri Cres

Guyra Ave

Elanora Dr

Pairroo Ave

Ikkina Rd

Bullimah Ave

Awoonga Ave

Pindari Ave

Timbertop Mead

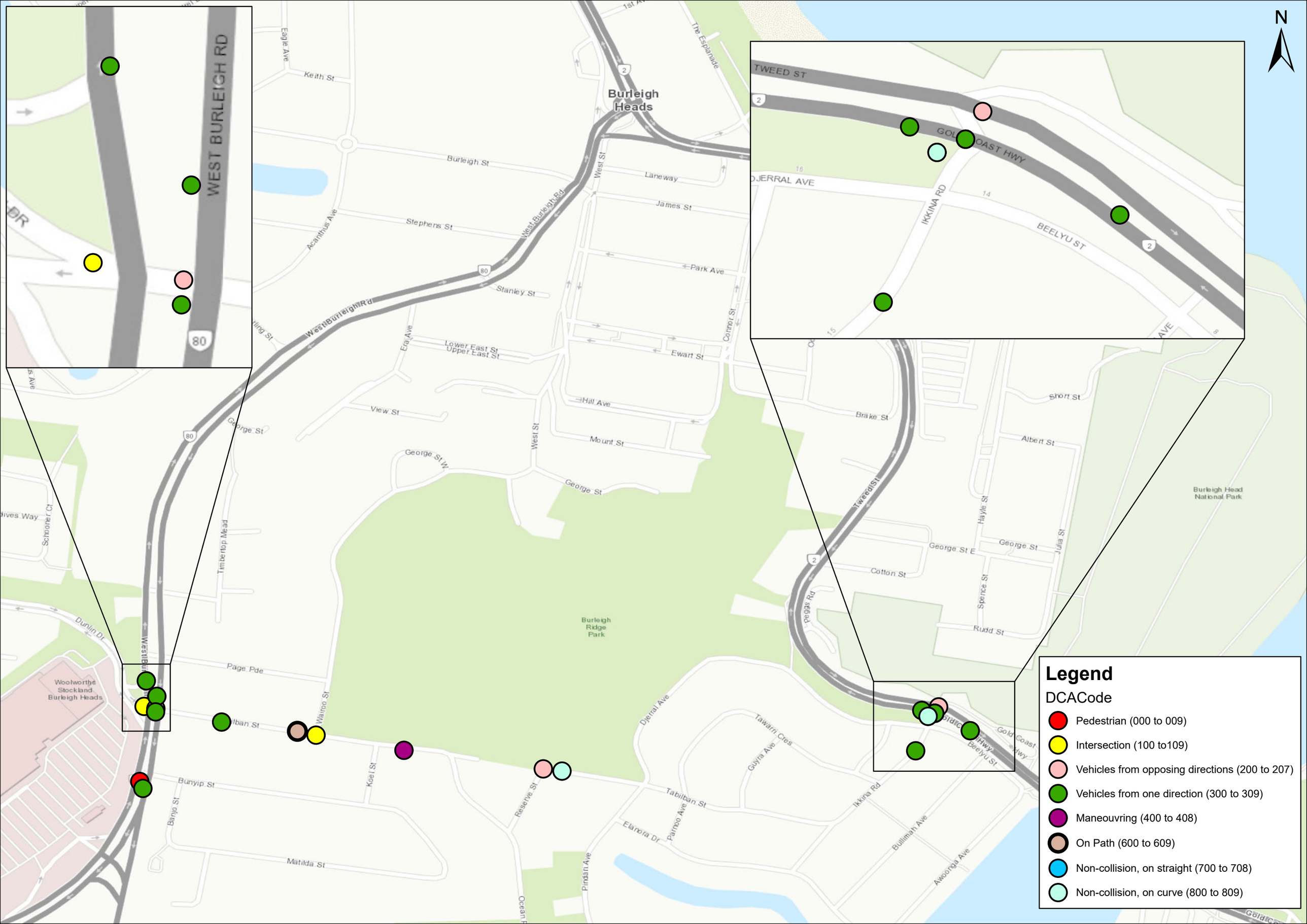
Schooner Ct

Legend

Crash Data - 5 Year

Severity

- Fatal
- Hospitalisation
- Medical treatment
- Minor injury


N
WEST BURLEIGH RD
80
TWEED ST
2
GOLD COAST HWY
OJERRAL AVE
IKKINA RD
BEELYU ST
14
16
15
Burleigh Heads
Burleigh St
Laneway
James St
Park Ave
Stanley St
Ewart St
Hill Ave
Mount St
West St
Connor St
Lower East St
Upper East St
Era Ave
Stephens St
Acanthus Ave
Eagle Ave
Keith St
The Esplanade
George St
George St W
View St
Page Pde
Bunyip St
Matilda St
Dunlin Dr
Schooner Ct
Timbertop Mead
Banjo St
Koel St
Warroo St
Reserve St
Burleigh Ridge Park
Woolworths Stockland Burleigh Heads
Djerral Ave
Tawarri Cres
Guyra Ave
Tabilban St
Elanora Dr
Pindari Ave
Pandoo Ave
Ikkina Rd
Bullimah Ave
Awoonga Ave
Brake St
Short St
Albert St
Tweed St
George St E
Cotton St
Hayle St
Spence St
Julia St
Peggs Rd
Rudd St
Burleigh Head National Park
Legend
DCACode
Pedestrian (000 to 009)
Intersection (100 to109)
Vehicles from opposing directions (200 to 207)
Vehicles from one direction (300 to 309)
Maneouvring (400 to 408)
On Path (600 to 609)
Non-collision, on straight (700 to 708)
Non-collision, on curve (800 to 809)

N

Burleigh Heads

WEST BURLEIGH RD

TWEED ST

GOLD COAST HWY

OJERRAL AVE

IKKINA RD

BEELYU ST

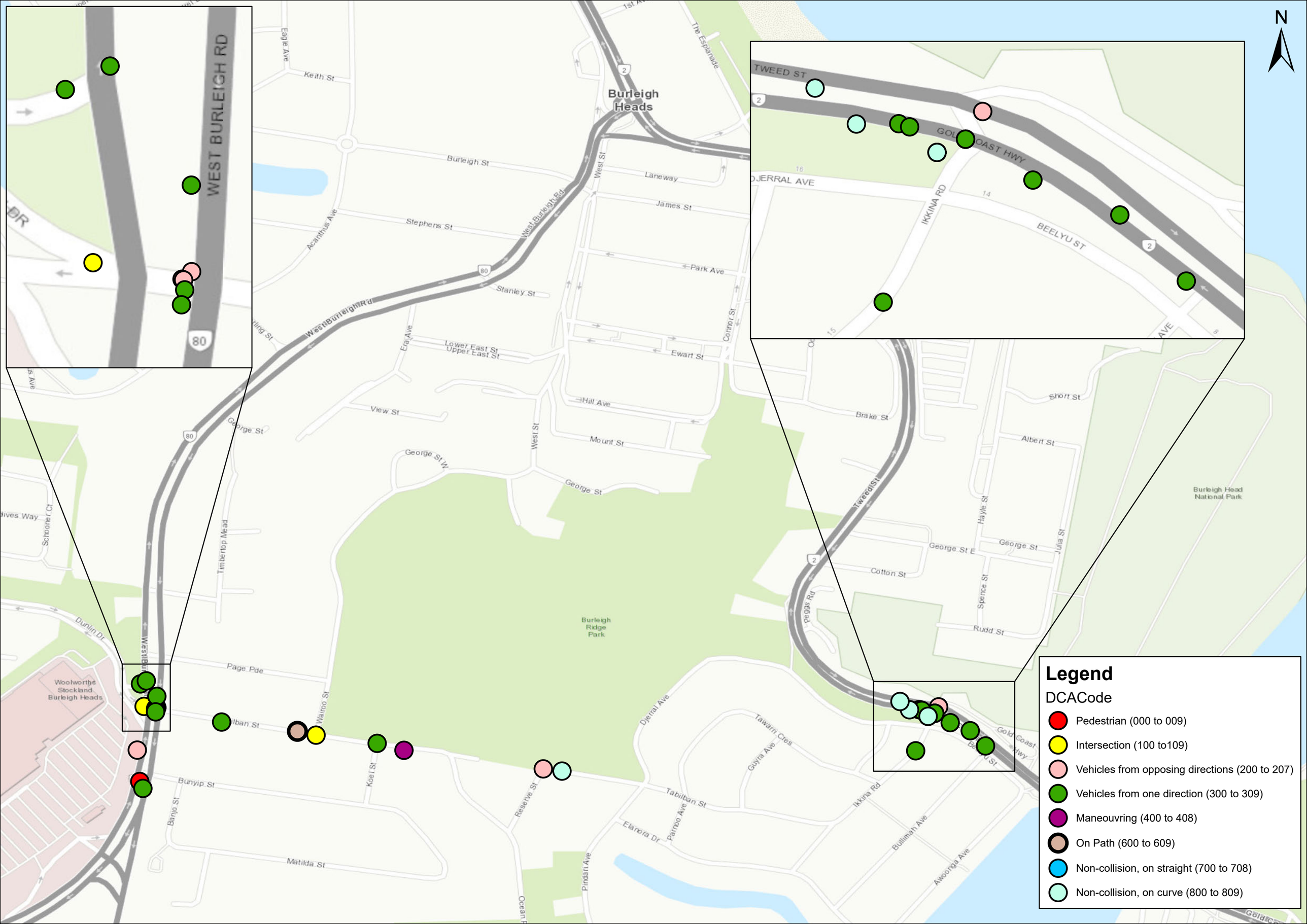
Eagle Ave
Keith St
Burleigh St
Laneway
James St
Stephens St
Acanthus Ave
West Burleigh Rd
West St
Park Ave
Stanley St
Connor St
Lower East St
Upper East St
Era Ave
Ewart St
Hill Ave
View St
George St
Mount St
George St W
George St
Brake St
short St
Albert St
Tweed St
Hayle St
Julia St
George St E
Cotton St
Spence St
Rudd St
Pegas Rd
Burleigh Head National Park
Burleigh Ridge Park
Schooner Ct
Timbertop Mead
Dunlin Dr
Page Pde
Woolworths Stockland Burleigh Heads
Tabilban St
Wairoo St
Koel St
Bunyip St
Banjo St
Matilda St
Reserve St
Djerral Ave
Tawarri Cres
Guyra Ave
Elanora Dr
Pairroo Ave
Ikkina Rd
Bullimah Ave
Awoonga Ave
Pindari Ave
Ocean
Gold Coast Hwy

Legend

Crash Data - 10 Year

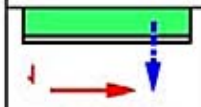
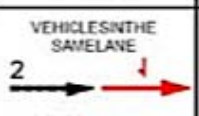
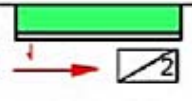
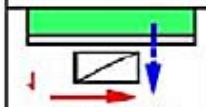
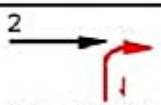
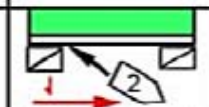
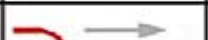
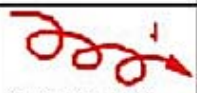
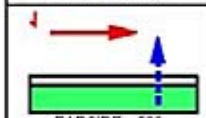
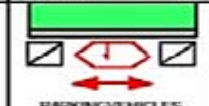
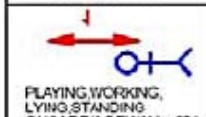
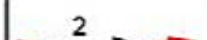
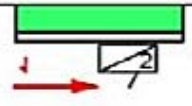
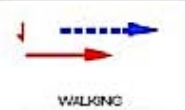
Severity

- Fatal
- Hospitalisation
- Medical treatment
- Minor injury


N
WEST BURLEIGH RD
TWEED ST
GOLD COAST HWY
IKKINA RD
BEELYU ST
Burleigh Heads
West Burleigh Rd
Burleigh St
Laneway
James St
Stephens St
Park Ave
Stanley St
Lower East St
Upper East St
Ewart St
Hill Ave
View St
Mount St
George St
George St W
Eagle Ave
Keith St
Acanthus Ave
Era Ave
West St
Connor St
Brake St
Short St
Albert St
Burleigh Head National Park
Hayle St
Julia St
George St E
Cotton St
Spence St
Rudd St
Peggs Rd
Tweed St
Timbertop Mead
Schooner Ct
Dunlin Dr
Page Pde
Woolworths Stockland Burleigh Heads
Bunyip St
Banjo St
Matilda St
Koel St
Wairoo St
Reserve St
Burleigh Ridge Park
Djerral Ave
Tawarri Cres
Guyra Ave
Tabilban St
Elanora Dr
Pairroo Ave
Ikkina Rd
Bullimah Ave
Awoonga Ave
Pindari Ave
Ocean
Legend
DCACode
Pedestrian (000 to 009)
Intersection (100 to109)
Vehicles from opposing directions (200 to 207)
Vehicles from one direction (300 to 309)
Maneouvring (400 to 408)
On Path (600 to 609)
Non-collision, on straight (700 to 708)
Non-collision, on curve (800 to 809)

DEFINITIONS FOR CODING ACCIDENTS

NOTE :- **1 = Key vehicle direction.** ie; The direction in which the key vehicle was travelling as it approached the crash location.

	00..	10..	20..	30..	40..	50..	60..	70..	80..	90..
	PEDESTRIAN onfootorintoy/pram	INTERSECTION vehiclesfrom adjacentapproaches	VEHICLES from opposingdirections	VEHICLES from onedirection	MANOEUVRING	OVERTAKING	ONPATH	OFFPATH ONSTRAIGHT	OFFPATH ONCURVE	PASSENGERS& MISCELLANEOUS
1	 NEARSIDE 001	 THRU-THRU 101	 HEAD-ON 201	 VEHICLESINTHE SAMELANE REAREND 301	 LEAVINGPARKING 401	 HEAD-ON 501	 PARKED 601	 OFFCARRIAGEWAY TOLEFT 701	 OFFCARRIAGEWAY RIGHTBEND 801	 FELLIN/FROM VEHICLE 901
2	 EMERGING 002	 RIGHT-THRU 102	 THRU-RIGHT 202	 LEFTREAR 302	 PARKING 402	 OUTOFCONTROL 502	 DOUBLEPARKED 602	 OFFCARRIAGEWAY TORIGHT 702	 OFFCARRIAGEWAY LEFTBEND 802	
3	 FARSIDE 003	 LEFT-THRU 103	 RIGHT-LEFT 203	 RIGHTREAR 303	 PARKINGVEHICLES ONLY 403	 PULLINGOUT 503		 LEFTOFFCARRIAGEWAY INTOOBJECT 703	 OFFRIGHTBEND INTOOBJECT 803	 STRUCKTRAIN 903
4	 PLAYING,WORKING, LYING,STANDING ONCARRIAGEWAY 004	 THRU-RIGHT 104	 RIGHT-RIGHT 204	 U TURN 304	 REVERSINGIN TRAFFIC 404	 CUTTINGIN 504	 CARDOOR 604	 RIGHTOFFCARRIAGEWAY INTOOBJECT 704	 OFFLEFTBEND INTOOBJECT 804	 STRUCKRAILWAY X-INGFURNITURE 904
5	 WALKING WITHTRAFFIC 005	 RIGHT-RIGHT 105	THRU-LEFT 205	VEHICLESIN PARALLELLANES LANESIDESWIPE 305	REVERSINGINTO FIXEDOBJECT 405	PULLINGOUT REAREND 505	PERMANENT OBSTRUCTION 605	OUTOFCONTROL ONCARRIAGEWAY 705	OUTOFCONTROL ONCARRIAGEWAY 805	HITANIMALOFF CARRIAGEWAY 905
6	FACINGTRAFFIC 006	LEFT-RIGHT 106	LEFT-LEFT 206	LANECHANGERIGHT 306	LEAVINGDRIVEWAY 406	OVERTAKING RIGHTTURN 506	TEMPORARY ROADWORKS 606	LEFTTURN 706	LEFTTURN 806	PARKEDCAR RAMWAY 906
7	DRIVEWAY 007	THRU-LEFT 107	UTURN 207	LANECHANGELEFT 307	FROMLOADINGBAY 407		TEMPORARYOBJECT ONCARRIAGEWAY 607	RIGHTTURN 707	RIGHTTURN 807	VEHICLEMOVEMENTS NOTKNOWN 907
8	ONFOOTWAY 008	RIGHT-LEFT 108		RIGHTTURNSIDESWIPE308	FROMFOOTWAY 408		ACCIDENTOR BROKENDOWN 608	MOUNTS TRAFFICISLAND 708	MOUNTS TRAFFICISLAND 808	
9	STRUCKWHILEBOARDING ORALIGHTING 009	LEFT-LEFT 109		LEFTTURNSIDESWIPE309			ANIMAL 609			
0	OTHER 000	OTHER 100	OTHER 200	PULLINGOUT 310	OTHER 400	OTHER 500	LOADHITS VEHICLE 610	OTHER 700	OTHER 800	OTHER 900

Appendix C: Issues Map

Date: 07/10/2021	**Map Name:** Issue Identification Map
Project No: P5288	**Project Name:** Koala Park Traffic Management Study

BITZIOS consulting
traffic engineering • transport planning

Appendix B: Base Model Calibration & Validation Report

Koala Park Traffic Management Study

Base Model Calibration and Validation Report

City of Gold Coast

24 February 2022

Gold Coast
Suite 26, 58 Riverwalk Avenue
Robina QLD 4226
P: (07) 5562 5377

Brisbane
Level 2, 428 Upper Edward Street
Spring Hill QLD 4000
P: (07) 3831 4442

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

W: www.bitziosconsulting.com.au

E: admin@bitziosconsulting.com.au

Document Issue History

Report File Name	Prepared	Reviewed	Issued	Date	Issued to
P5288.001R Koala Park Traffic Study_Base Model Calibration_Validation	[redacted]	[redacted]	[redacted]	22/12/2021	Jake Matuzic JMATUZIC@goldcoast.qld.gov.au
P5288.002R Koala Park Traffic Study_Base Model Calibration_Validation	[redacted]	[redacted]	[redacted]	24/02/2022	Jake Matuzic JMATUZIC@goldcoast.qld.gov.au

CONTENTS

Tables

Figures

Appendices

1. INTRODUCTION

1.1 Overview

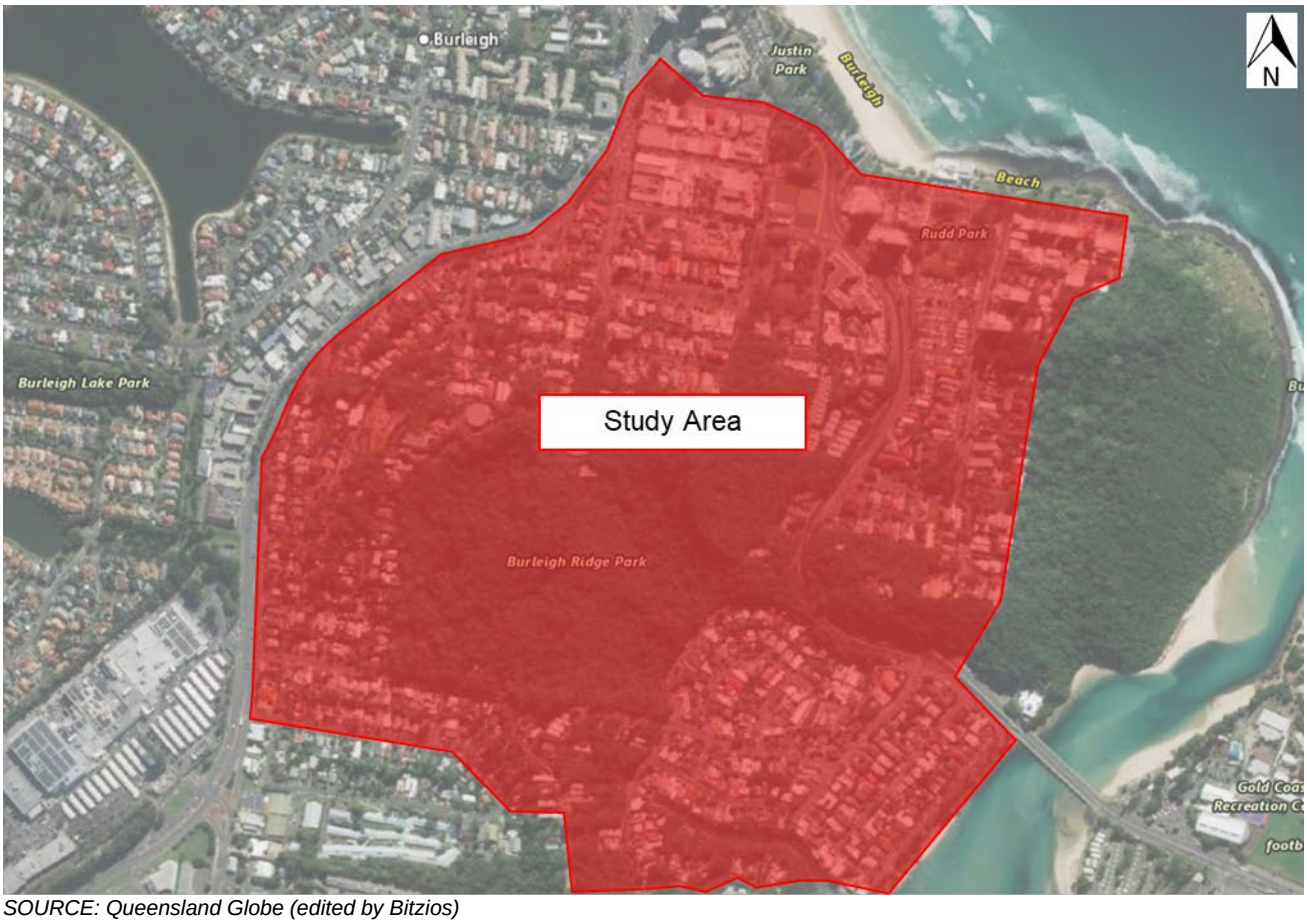
This traffic modelling report has been prepared to document the outcomes of the 2021 Base Aimsun model calibration and validation undertaken as part of the Koala Park Traffic Management Study commissioned by City of Gold Coast Council (Council).

Council commissioned Bitzios Consulting to complete the study including the development of an Aimsun microsimulation traffic model to inform investigations into the Burleigh Heads / Koala Park area, with a key focus on the Tabilban Street / Ikkina Road corridor. The corridor services the local residential catchments, however is also experiencing increased through traffic who use the route as a 'rat-run' to avoid the Gold Coast Highway-West Burleigh Road corridors.

The Aimsun modelling commissioned will facilitate detailed forecasts of medium and long-term traffic movements within the study area allowing for options testing of potential solutions for traffic operational issues currently experienced in the Koala Park precinct, focusing primarily on the Tabilban Street / Ikkina Road corridor.

1.2 Study Area

The study area is bounded by Tabilban Street (south), W Burleigh Road (west), Gold Coast Highway (north), Julia Street (east) in Burleigh Heads as shown in Figure 1.1.



SOURCE: Queensland Globe (edited by Bitzios)

Figure 1.1: Study Area

1.3 Purpose of Assessment

The purpose of this report is to document the 2021 Base Aimsun model calibration and validation process and findings. The key outcomes of the base model development are to:

- Develop a 2021 traffic model of the Burleigh Heads / Koala Park area representing current traffic demand and key elements of traffic flow including:
  - Congestion and delays on key road links and critical intersections in the area
  - Estimation of traffic flows and distribution to/from various land uses through the study area road network
  - Accurate representation of driver route choice, focusing primarily on the proportion of drivers choosing to use the 'rat-run' route through Tabilban Street
- Prepare a base model that is reactive to road network and traffic demand updates and can therefore be used for options testing at interim and ultimate future years with updated route choices based on factors such as:
  - Change in traffic demands associated with future stages of the Gold Coast Light Rail
  - Change in driver decisions based on future infrastructure changes influencing capacity of road links and intersections within the network
  - Modified driver behaviour stemming from potential infrastructure works on the Tabilban Street / Ikkina Road corridor.

1.4 Traffic Data Sources

Traffic data used to develop the Aimsun model was compiled from a number of sources including:

- Intersection traffic counts
- 24hr automatic count data (tube counts)
- Origin-Destination (OD) data
- Travel time data
- Traffic signal data.

It is important to note that traffic data collected / supplied for use in model development were undertaken at different times / dates with historical traffic count data used at some locations. While South-East Queensland was not in lockdown at the time of the surveys, it is further noted that traffic numbers may also be somewhat influenced by travel demand impacts associated with the Covid-19 pandemic.

This forms part of the limitations of the model development which is discussed further herein.

1.4.1 Intersection Traffic Counts / Tube Counts

Intersection traffic counts were undertaken at nine (9) sites, including:

- Six (6) signalised intersections
- Three (3) priority-controlled intersections.

The intersection count locations are shown in Figure 1.2 below.

Source: Queensland Globe (edited by Bitzios)

Figure 1.2: Intersection Traffic Count Locations

Details of each of the surveyed intersection are outlined in Table 1.1.

Table 1.1: Intersection Traffic Count Locations

ID	Intersection	Type	Survey Date
101	West Burleigh Road / Tabilban Street / Dunlin Drive	Signals	27 / 07 / 2021
102	West Burleigh Road / James Street / Burleigh Street	Signals	12 / 02 / 2020
103	Gold Coast Highway / West Burleigh Road	Signals	12 / 02 / 2020
104	Gold Coast Highway / The Esplanade / Connor Street	Signals	12 / 02 / 2020
105	Gold Coast Highway / Goodwin Terrace	Signals	12 / 02 / 2020
106	Gold Coast Highway / Ikkina Road	Signals	27 / 07 / 2021
107	Elanora Drive / Ikkina Road / Elanora Drive	Priority	23 / 06 / 2020
108	Ocean Parade / Reserve Street / Ocean Parade	Priority	24 / 11 / 2020
109	West Burleigh Road / Bunyip Street	Priority	27 / 07 / 2021

Detailed traffic survey data is provided at **Appendix A**. From the above, it is important to note that the intersection survey periods vary by site.

Balancing between the 2020 and 2021 surveys was not undertaken due to the number of intersections and zones between the survey locations. Network diagrams detailing surveyed volumes are provided at **Appendix B**.

1.4.2 Signal Data

Traffic signal data for 2021 of each signalised intersection within the study area was supplied by the Department of Transport and Main Roads (TMR) as summarised in Table 1.2.

Table 1.2: Traffic Signal Cycle Times

ID	Intersection	Cycle Time	
		AM Peak	PM Peak
101	West Burleigh Road / Tabilban Street / Dunlin Drive	140 seconds	140 seconds
103	Gold Coast Highway / West Burleigh Road		
104	Gold Coast Highway / The Esplanade / Connor Street		
105	Gold Coast Highway / Goodwin Terrace		
106	Gold Coast Highway / Ikkina Road		

Peak signal plans for Site 102 were absent from data provided, however the modelled signal phasing was still matched to the signal design plan and minimum greens as per the time settings provided.

Signal design plans used to develop the model are provided in **Appendix E**.

1.4.3 Origin–Destination (OD) Data

OD surveys were undertaken at key locations within the study area at the following peak periods:

- Tuesday 27/07/2021 AM Peak: 06:00 – 09:00am
- Tuesday 27/07/2021 PM Peak: 03:00 – 06:00pm.

Origin / destination stations surveyed are illustrated in Figure 1.3.

Source: Matrix (AUQLD1451 Koala Park OD - AM - 20Min Report)

Figure 1.3: OD Data Routes

Surveyed OD matrices are provided at **Appendix C**.

1.4.4 Travel Time Observations

Travel times were recorded on three (3) key routes within the study area at the following peak periods:

- Thursday 22/07/2021 AM Peak: 06:00 – 09:00am
- Thursday 22/07/2021 PM Peak: 03:00 – 06:00pm.

A minimum of 16 runs of travel time data were recorded for each of the routes in each direction of travel over the peak periods.

The travel routes surveyed are illustrated in Figure 1.4.

Detailed travel time survey data is provided at **Appendix D**.

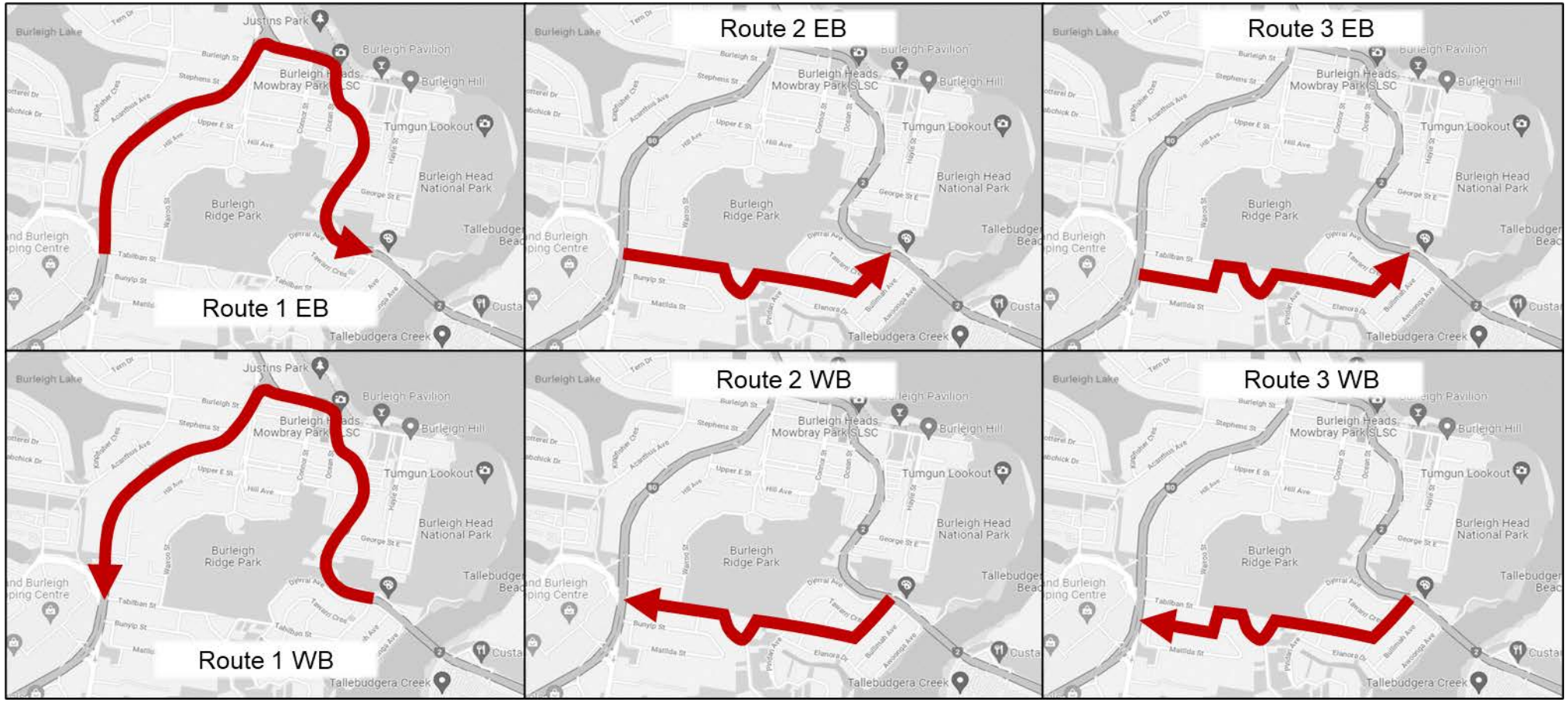


Figure 1.4: **Travel Time Survey Routes**

2. 2021 BASE MODEL DEVELOPMENT

2.1 Modelling Platform

The base model network was developed in Aimsun Next 20.0.1 modelling software.

The calibrated and validated 2021 base year traffic models will be used to develop future year traffic models for 2031 (interim design horizon) and 2041 (ultimate design horizon).

2.2 Time Period

The base models were developed at 15-minute intervals for typical 2021 weekday AM / PM peak periods as follows:

- Weekday AM Base model peak period – 07:00 to 09:00am
- Weekday PM Base model peak period – 04:00 to 06:00pm

The models include a 30 minute 'warm up' period prior to the peak period using the scenario demand.

2.3 Assignment Type

The microsimulation models have been developed using a *Dynamic User Equilibrium* (DUE) assignment using the *Weighted Method of Successive Averages* (MSA) method.

The MSA procedure reassigns traffic flows among the available paths in an iterative procedure until the convergence criteria are met. Path assignment files which record the paths taken by all vehicles are produced and then incorporated in the simulation replications.

2.4 Vehicle Types

Vehicle types / classes used in the models are generally based on the default Aimsun template vehicles classes that were split into 'Cars' and 'Trucks' with separate demands. Table 2.1 details the changes to the length distribution properties and speed acceptance parameters for each vehicle class.

Table 2.1: Vehicle Properties

Vehicle / Class	Mean		Minimum		Maximum	
	Length (m)	Speed Acceptance	Length (m)	Speed Acceptance	Length (m)	Speed Acceptance
1 Car	4.0m	1.10	3.5m	0.90	4.5m	1.30
2 Truck	8.0m	1.05	6.0m	1.00	10.0m	1.10

2.5 Pedestrian and Cyclists

Pedestrians and cyclists have not been included in the model.

However, where applicable, the traffic signals include late starts for some movements to replicate pedestrian crossing influences on traffic delays.

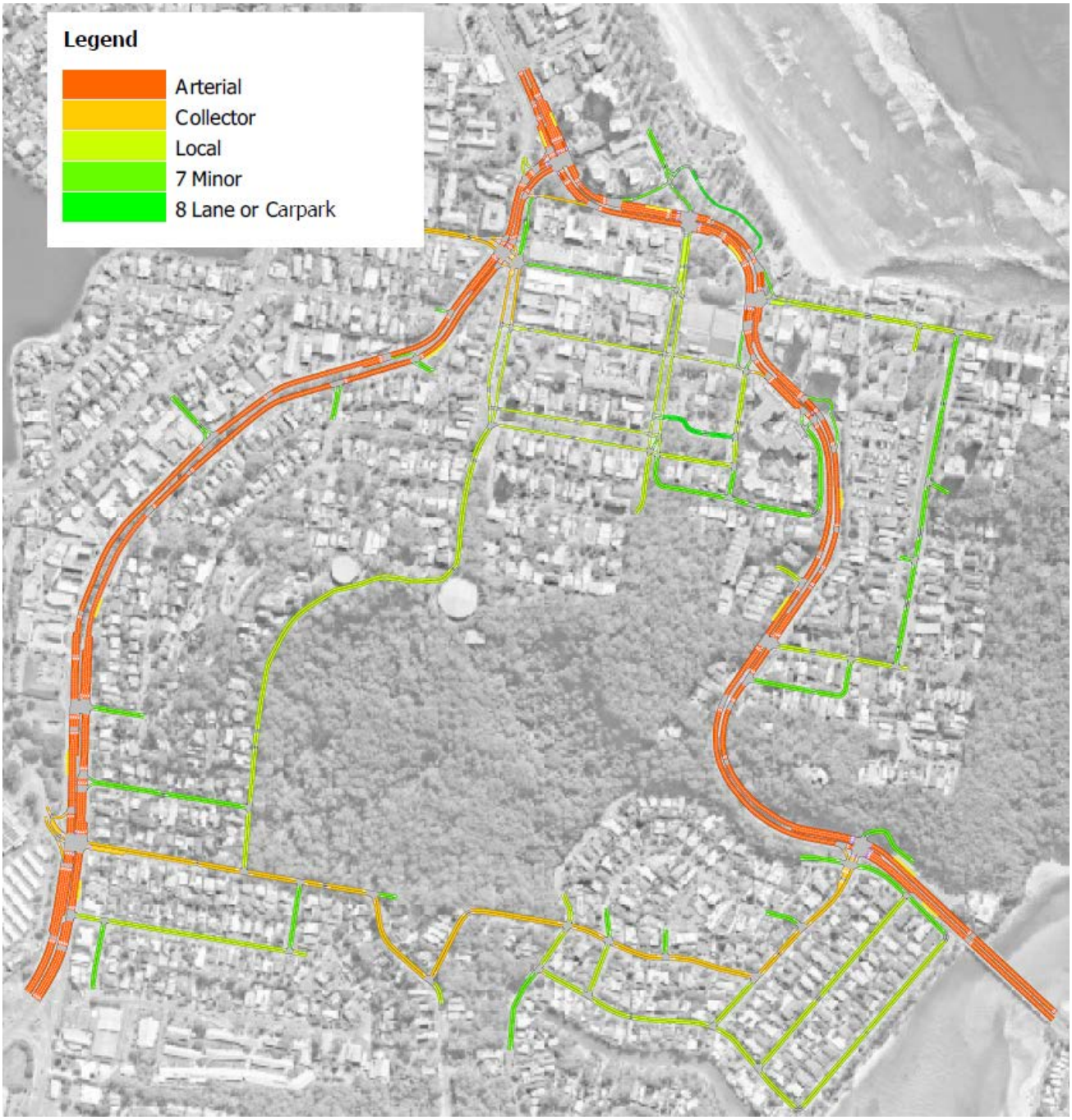
2.6 Road Types

The road types and default parameters in the models are detailed in Table 2.2. The section speeds have been adjusted from the default speeds based on the posted speed limits that were understood to be in-place at the time of the most-recent traffic data collection (July 2021).

Table 2.2: Road Types

Name	Default Capacity (per Lane)	Default Speed	Example
Arterial	1,500 PCUs/h	70km/h	Gold Coast Highway (South of Ikkina Road)
Collector	1,000 PCUs/h	50km/h	Dunlin Drive
Local	700 PCUs/h	50km/h	Bunyip Street
Minor	375 PCUs/h	40km/h	Cotton Street
Lane or Car Park	200 PCUs/h	20km/h	Alex Black Car Park

Figure 2.1 shows the above road types within the study area.



SOURCE: Background image taken from Nearmap

Figure 2.1: Base Model Road Types

2.7 Public Transport Services

Table 2.3 summarises the public transport service included in the base model. Bus route frequencies were adopted based on the most recent timetables prior to the impacts of Covid-19, such as the temporary cancellation of Route 777 during the 2021 traffic data collection periods above.

Table 2.3: Bus Services

Route ID	Route Detail
700	Tweed Heads – Broadbeach via Burleigh Heads
753	Broadbeach – Burleigh Heads via Robina, Varsity Lakes
754	Broadbeach – Burleigh Heads via Mermaid Waters
756	Broadbeach – West Burleigh via Miami
757	Reedy Creek – Burleigh Heads via Varsity Lakes
764	Burleigh Heads – Currumbin Creek via The Pines
765	The Pines – Robina via Burleigh Heads
777	Airport – Broadbeach South via Burleigh Heads

SOURCE: TransLink

A bus stop dwell time of 30 seconds, with a 10 second deviation, has been assumed at all bus stops within the model.

2.8 Traffic Profiles

The modelled demands were developed using 15-minute profiles based on key surveyed intersections. Figure 2.2 and Figure 2.3 show the traffic profiles for each modelled period.

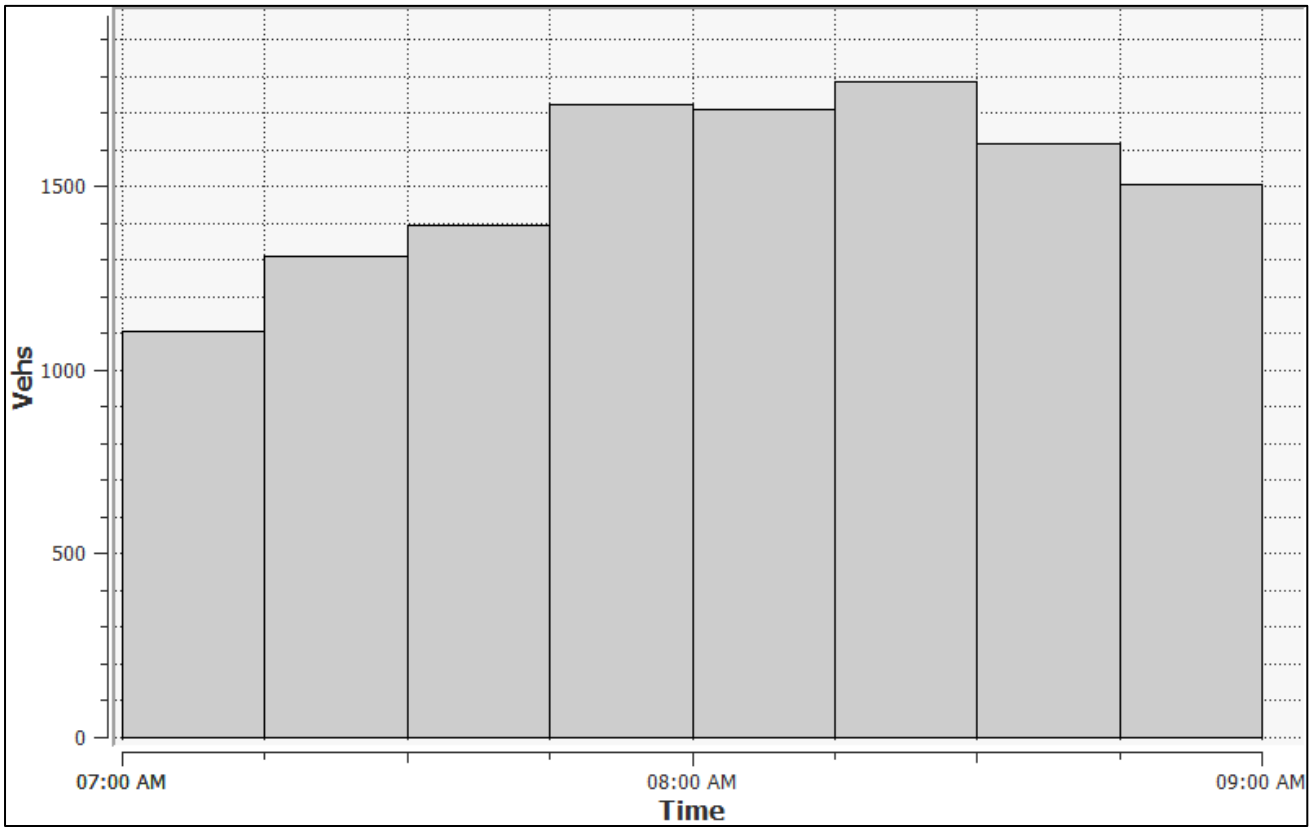


Figure 2.2: AM Traffic Demand Profile – All Vehicles

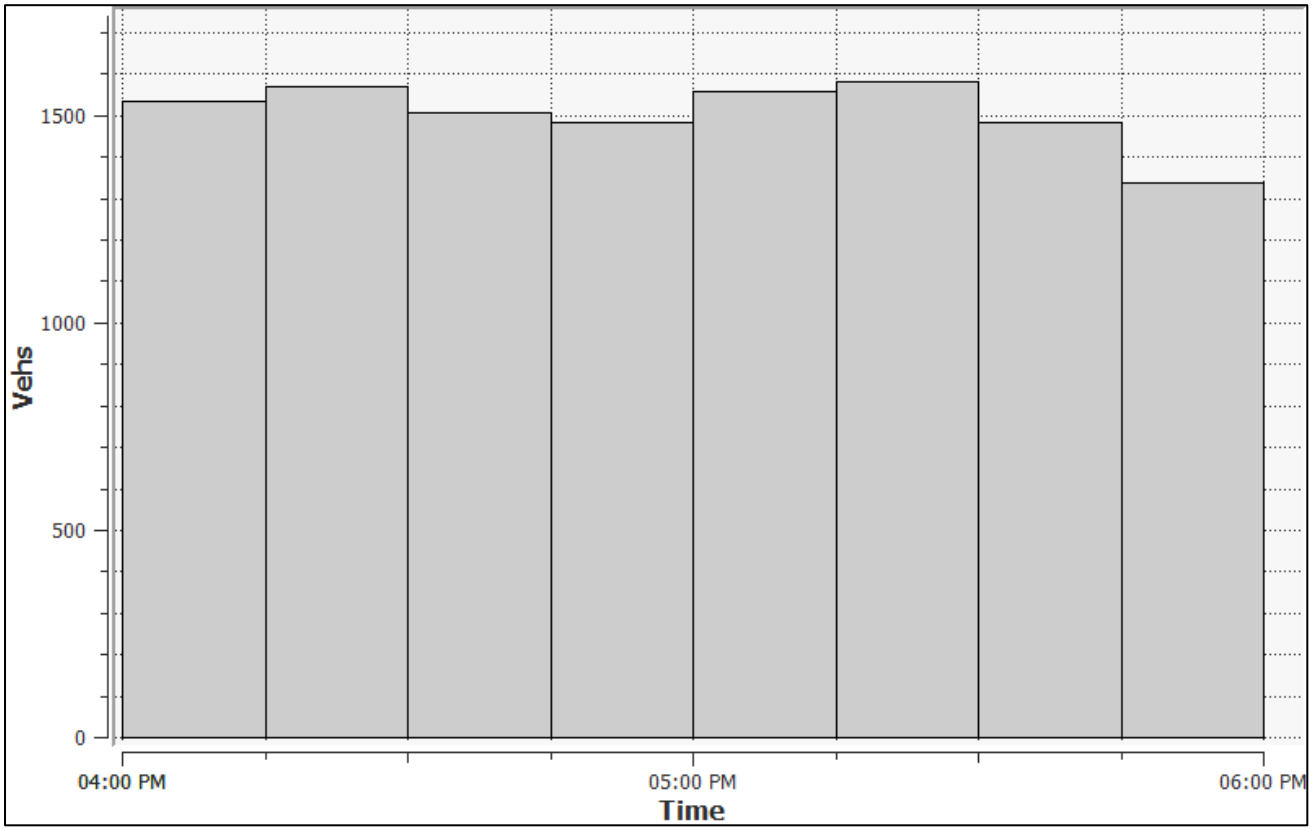


Figure 2.3: PM Traffic Demand Profile – All Vehicles

2.9 Aimsun Zones

The Aimsun zoning system has been adopted to reflect the strategic model zones within the study area such that the GCSTM-MM (EMME) OD cordon matrices can provide a prior matrix for model development. Additional zone connectors were subsequently added to the Aimsun model to provide more detailed loading of development trips on the road network in the microsimulation model.

The Aimsun network with zone centroids and connectors is illustrated in Figure 2.4 with zone details provided in Table 2.4. This network and zoning system was provided to Council for a high-level review who were comfortable with the zoning / network approach.

Table 2.4: Aimsun Zone Details

Aimsun Zone	Name	Aimsun Zone	Name
Internal			
1107	Bullimah Avenue Residential	1115	Burleigh Beach Tourist Park
1108	Tawarri Crescent Residential	1116	Burleigh Pavilion & Hill
1109	Ocean Parade Residential	1117	Nathan Street Apartments
1110	Timbertop Mead Residential	1118	Julia Street Residential
1111	Bunyip Street Residential	1119	Cotton Street Residential
1112	Burleigh Ridge Park	1120	Swell Resort & Surrounds
1113	West Burleigh Road Mixed-Use	1121	Burleigh Heads Town Centre
1114	Water Tower Residential		
External			
1101	The Esplanade	1104	West Burleigh Road
1102	Gold Coast Highway North	1105	Dunlin Drive
1103	Burleigh Street	1106	Gold Coast Highway South

Figure 2.4: Base Model Network with Zone Connectors

2.10 Demand Development

2.10.1 Development Process

The process for developing the Aimsun model demands were as follows:

- The GCSTM-MM v2.2 was used for prior matrix development with a demand profile applied to the 2-hour strategic model cordon volumes as above, to provide 15-minute cordon matrices
- Demand matrices were manually modified where substantial differences from traffic survey data were observed, as discussed further in Section 2.10.2 below
- Static OD adjustment experiments, limited to a maximum elasticity of 0.25, were run for these modified 15-minute cordon matrices for minor refinements
- The static adjustment output matrices formed the final traffic demands for the DUE traffic assignment.

2.10.2 Manual Modifications

Noting the relative coarseness of the GCSTM-MM (EMME) model, manual modification of traffic demands to / from some zones were required to achieve prior matrices that reflected current conditions as surveyed. These updates included:

- Modified external traffic demands to match count data where available
- Modified demand to/from external connections 1101, 1103 and 1105 noting that the GCSTM-MM (EMME) cordon boundary did not include volumes from strategic model zone connections loaded directly into intersections in the study area (refer Figure 2.5 for example)
- Updated Burleigh Heads Town Centre traffic demands (Zone 1121) noting that the strategic model has limited ability to accurately represent the wide variety of land uses within the precinct.

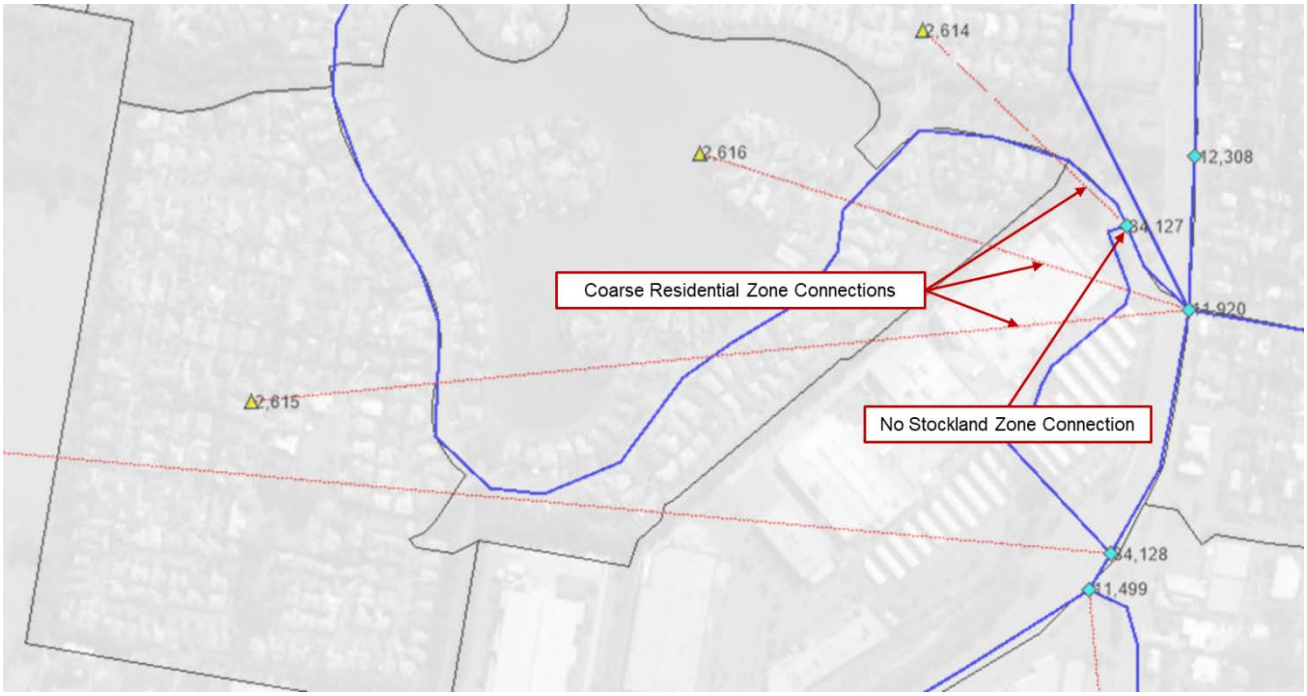


Figure 2.5: Example Strategic Model Connection Inaccuracy

3. 2020 BASE MODEL CALIBRATION

3.1 Overview

A combination of 2020 and 2021 survey data has been used in the calibration of the model, and as a result, there are limitations to modelling. It should also be noted that the 2020 surveys were collected during rainy conditions. The 2020 and 2021 traffic counts have not been balanced due to the number of intersections and zones between the survey locations. As a result, calibration has focused on the 2021 counts at the West Burleigh Road / Tabilban Street / Dunlin Drive intersection and the Gold Coast Highway / Ikkina Road intersection, at each end of the 'rat-run' route.

Furthermore, the 2021 OD surveys have also been a key focus of the calibration to ensure the proportions of traffic using the 'rat-run' route are appropriately replicated in the model.

3.2 Calibration Criteria

The models have been calibrated to the observed vehicle movement data sourced from the intersection turn counts. Model calibration was based on the *RMS Traffic Modelling Guidelines* and includes three (3) target criteria as follows:

- A minimum of 85% of turn volumes with a GEH < 5
- No volumes with a GEH > 10 (without justification)
- A minimum R-squared value of 0.9 for turning volumes.

3.3 Turn Count Calibration - GEH Statistics

The Geoffrey E. Havers (GEH) Statistic is an industry standard measure of variance between the observed count and modelled count, expressed by the following:

$$GEH = \sqrt{\frac{2(M-C)^2}{M+C}}$$

Where, "M" is the modelled traffic volume and "C" is the observed traffic volume.

The use of the GEH calculation is an industry accepted approach to measure the quality of the model. The model was calibrated to the observed vehicle movement data.

3.4 Calibration Results

The GEH statistics for the weekday AM / PM models in relation to the above criteria are summarised in Table 3.1 and detailed calculations for each movement are shown in **Appendix F**.

Table 3.1: Turning Movement Results – 2021 Weekday AM / PM Base Models

	Weekday AM Peak		Weekday PM Peak	
GEH	0700-0800	0800-0900	1600-1700	1700-1800
GEH > 10	0%	0%	0%	0%
GEH >5, <=10	9.5%	14.9%	8.1%	10.8%
GEH <=5	90.5%	85.1%	91.9%	89.2%

As shown in the table above, all peak hour models show that more than 85% of turn volumes have a GEH statistic below 5.0 and no volumes have a GEH statistic greater than 10.0.

As a result, this meets the calibration criteria, and the model demand is considered suitable for use.

3.5 Turn Count Calibration - R² Value

The plot of the modelled vs. observed traffic flows are shown in Figure 3.1 to Figure 3.4 for the weekday AM / PM peaks. The R² value and the best fit linear trend line are also provided.

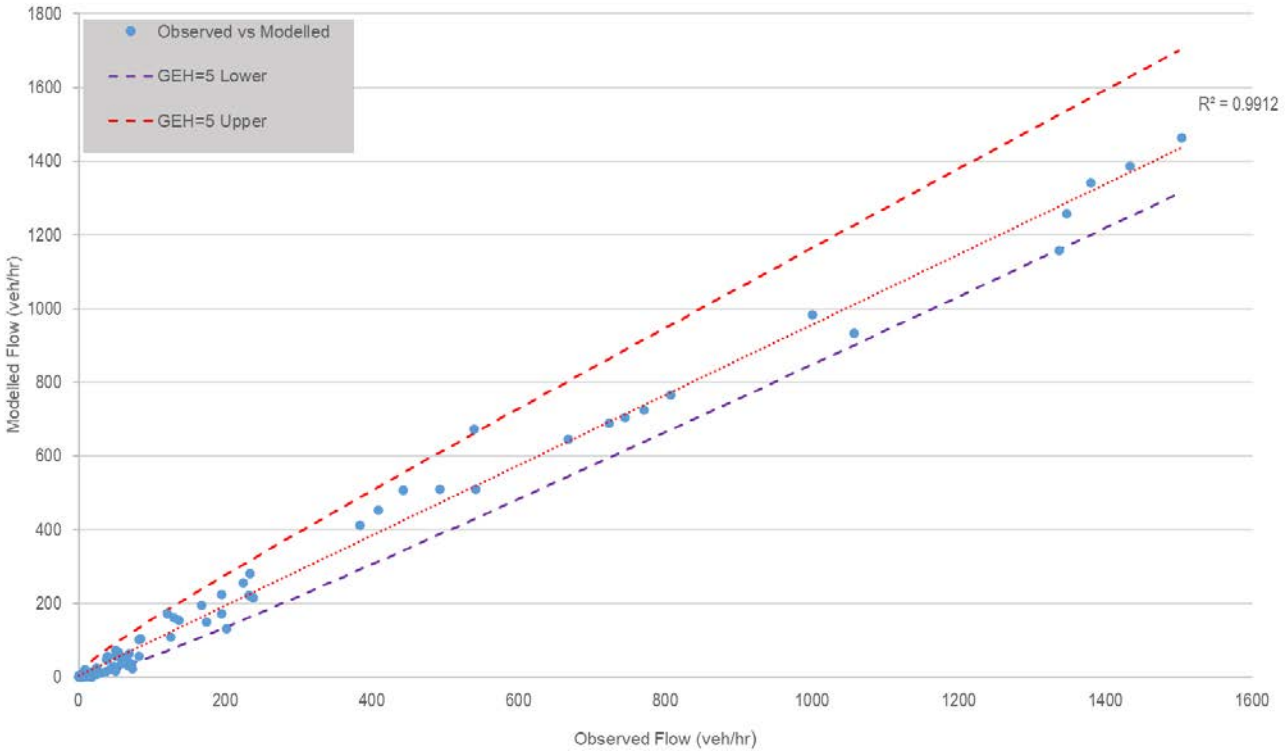


Figure 3.1: AM Observed vs Modelled Volumes Regression (0700-0800)

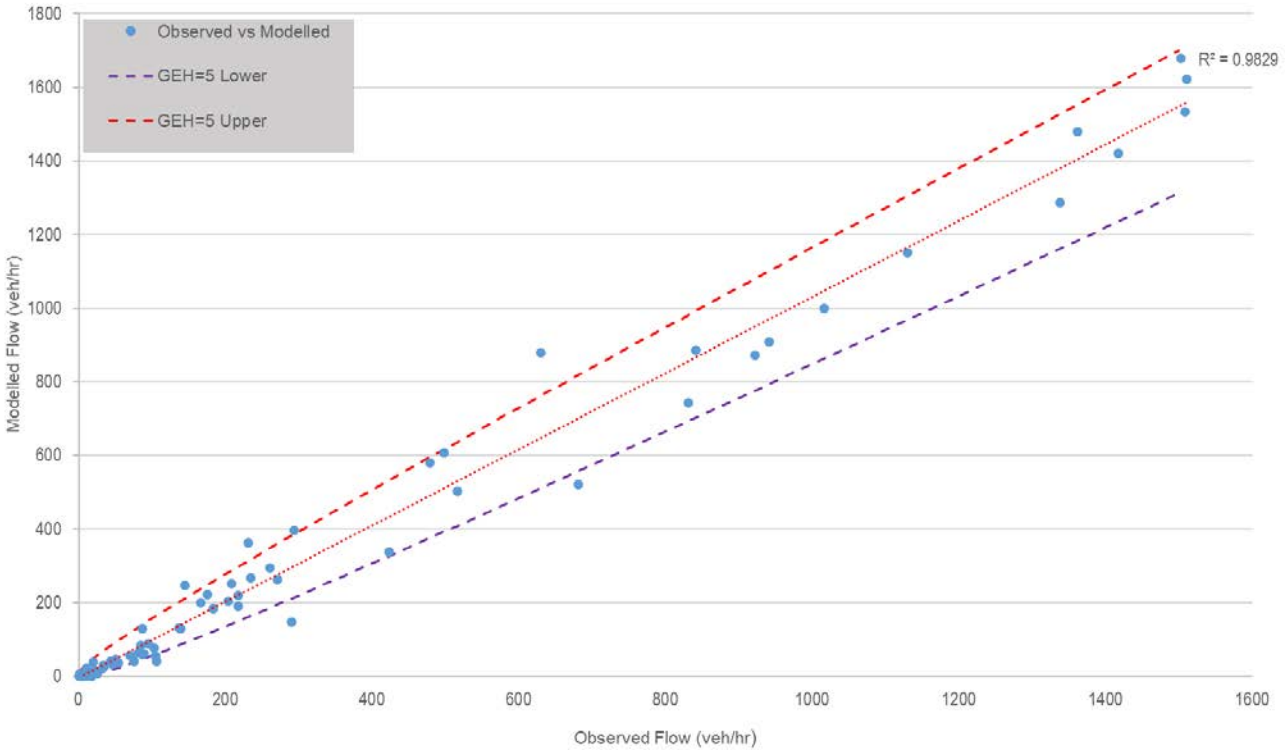


Figure 3.2: AM Observed vs Modelled Volumes Regression (0800-0900)

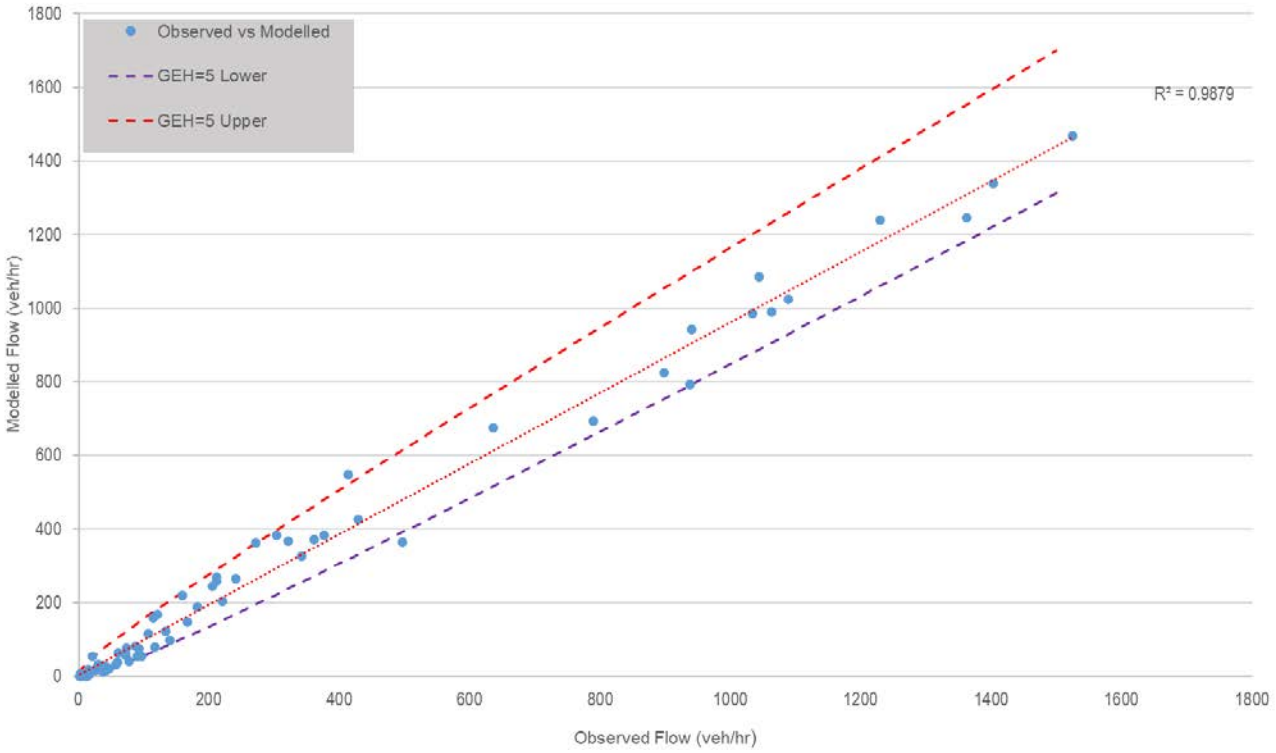


Figure 3.3: PM Observed vs Modelled Volumes Regression (1600-1700)

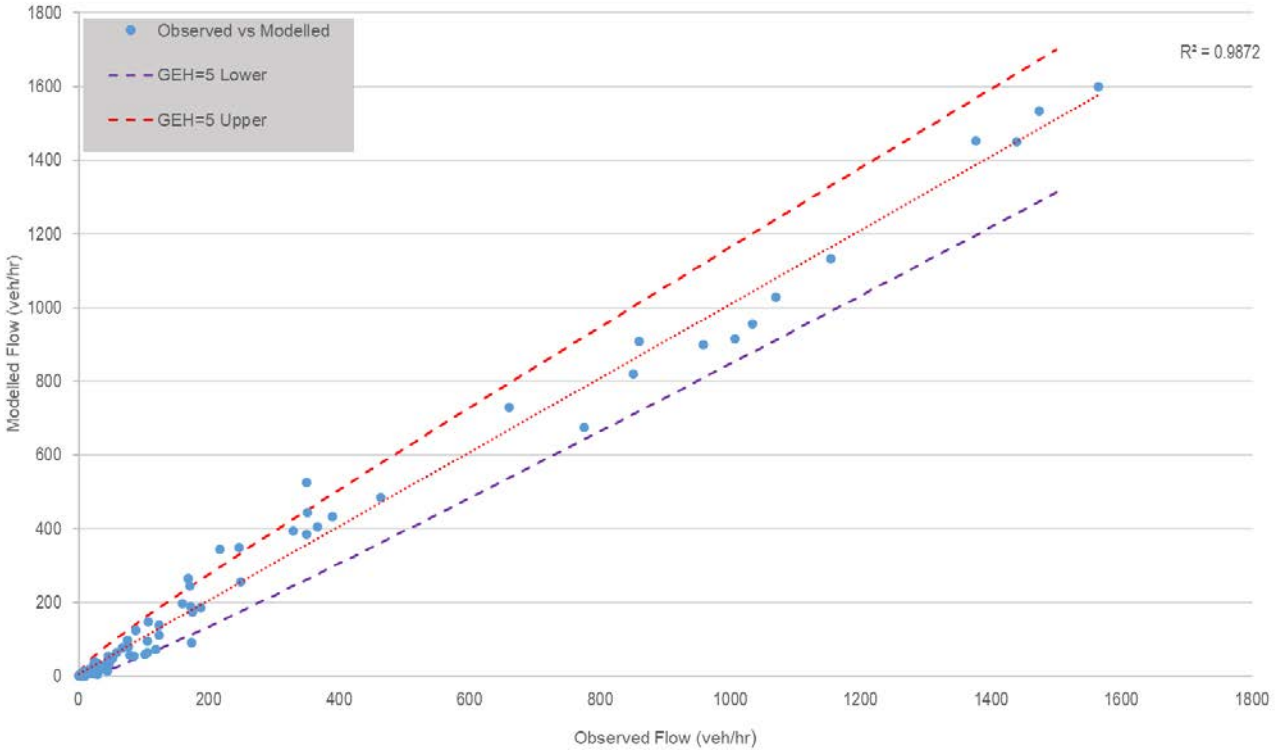


Figure 3.4: PM Observed vs Modelled Volumes Regression (1700-1800)

As shown, the R^2 values in all time periods are greater than 0.98, comfortably exceeding the minimum calibration criterion of 0.9.

3.6 OD Calibration

A comparison of the surveyed OD data and the modelled route choice for key paths is illustrated in Figure 3.5 to Figure 3.8.

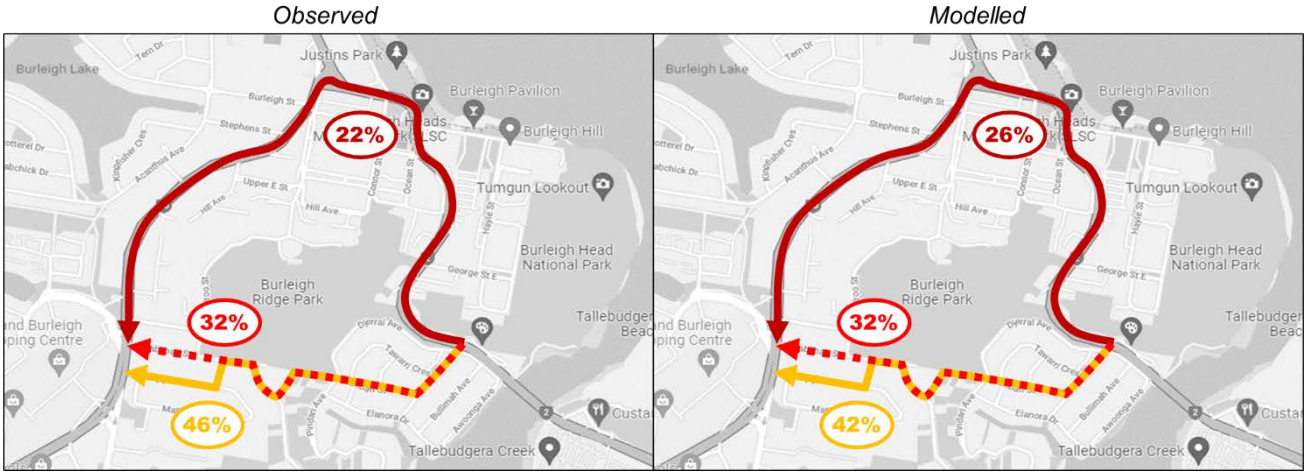


Figure 3.5: AM Peak Westbound OD Comparison

Figure 3.6: AM Peak Eastbound OD Comparison

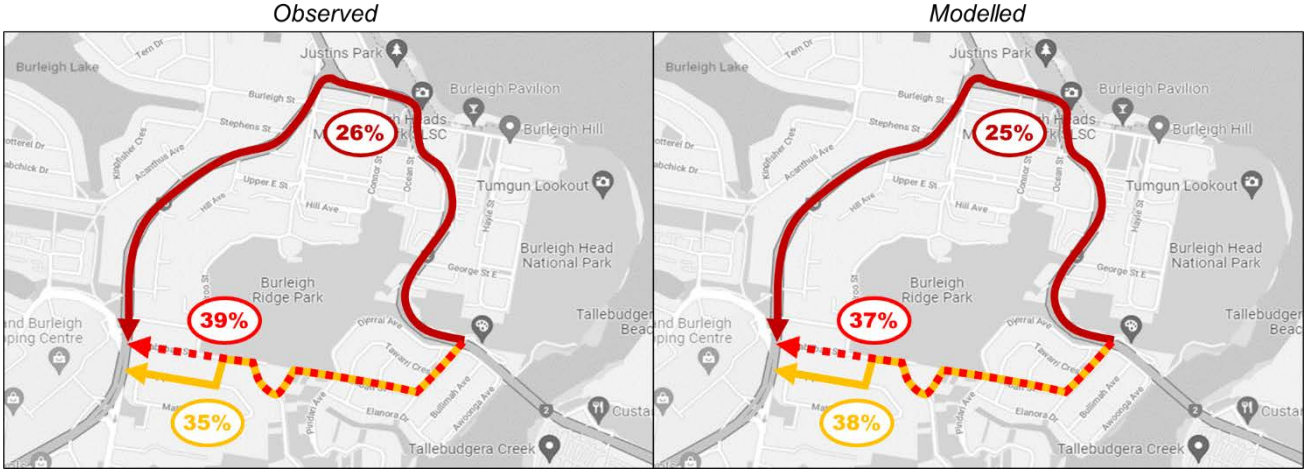


Figure 3.7: PM Peak Westbound OD Comparison

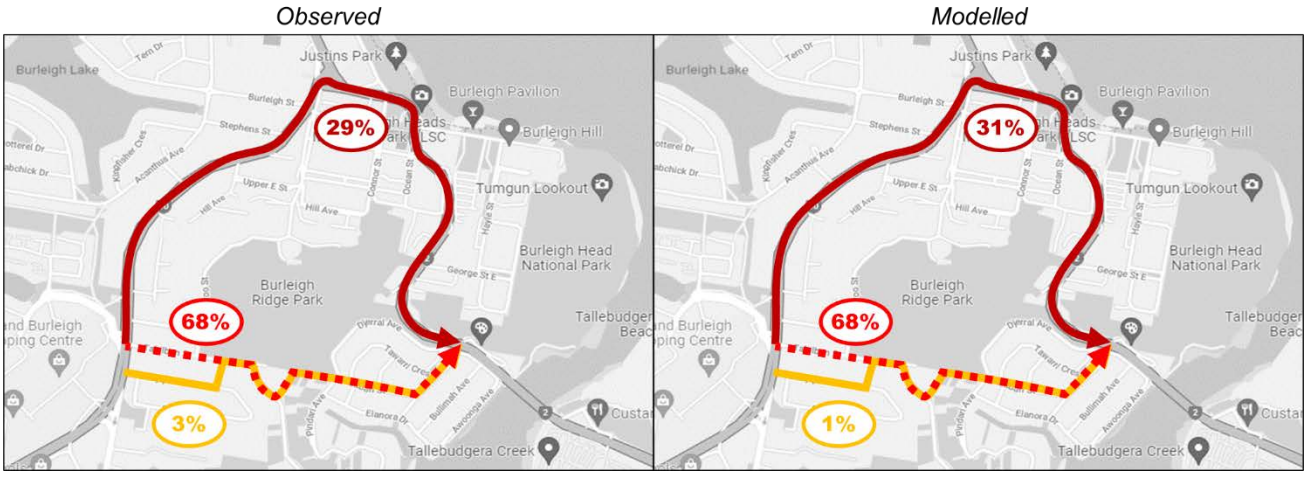


Figure 3.8: PM Peak Eastbound OD Comparison

As shown, the modelled route choice is similar to the OD survey data. The above graphical comparison is tabulated in Table 3.2.

Table 3.2: OD Data Route Choice Comparison – Observed vs. Modelled

Route		Peak	Observed (%)	Modelled (%)	Difference (%)
Westbound Direction					
Route 1	West Burleigh Road-Gold Coast Highway	AM	22%	26%	+4%
		PM	26%	25%	-1%
Route 2	Tabilban Street-Ikkina Road	AM	32%	32%	-
		PM	39%	37%	-2%
Route 3	Ikkina Road-Tabilban Street-Bunyip Street	AM	46%	42%	-4%
		PM	35%	38%	+3%
Eastbound Direction					
Route 1	West Burleigh Road-Gold Coast Highway	AM	30%	28%	-2%
		PM	29%	31%	+2%
Route 2	Tabilban Street-Ikkina Road	AM	69%	71%	+2%
		PM	68%	68%	-
Route 3	Ikkina Road-Tabilban Street-Bunyip Street	AM	1%	1%	-
		PM	3%	1%	-2%

The OD route choice comparisons demonstrate that the model closely represents the observed route choice, with no more than ±4% difference overall, and ±2% for the direct Tabilban Street-Ikkina Road route (i.e. Route 2).

Critically, in all modelled scenarios, there is clear driver route choice occurring regarding the use of the Tabilban Street / Ikkina Road 'rat-run' as opposed to use of West Burleigh Road / Gold Coast Highway.

Route choice was controlled with the use of costs added to key turning movements. Importantly, the addition of these costs still allows for the route choice to be reactive to road network or traffic demand changes.

3.7 Model Stability Testing

3.7.1 Stability Testing

Model stability between runs / seeds is particularly important in microsimulation models. Model stability is able to be demonstrated using a variety of network performance measures. Cumulative travel time across all vehicles (using Vehicle Hours Travelled – VHT) has been adopted as the key metric to demonstrate model stability.

The model cumulative travel time outputs for the five model seeds runs are presented in Figure 3.9 and Figure 3.10.

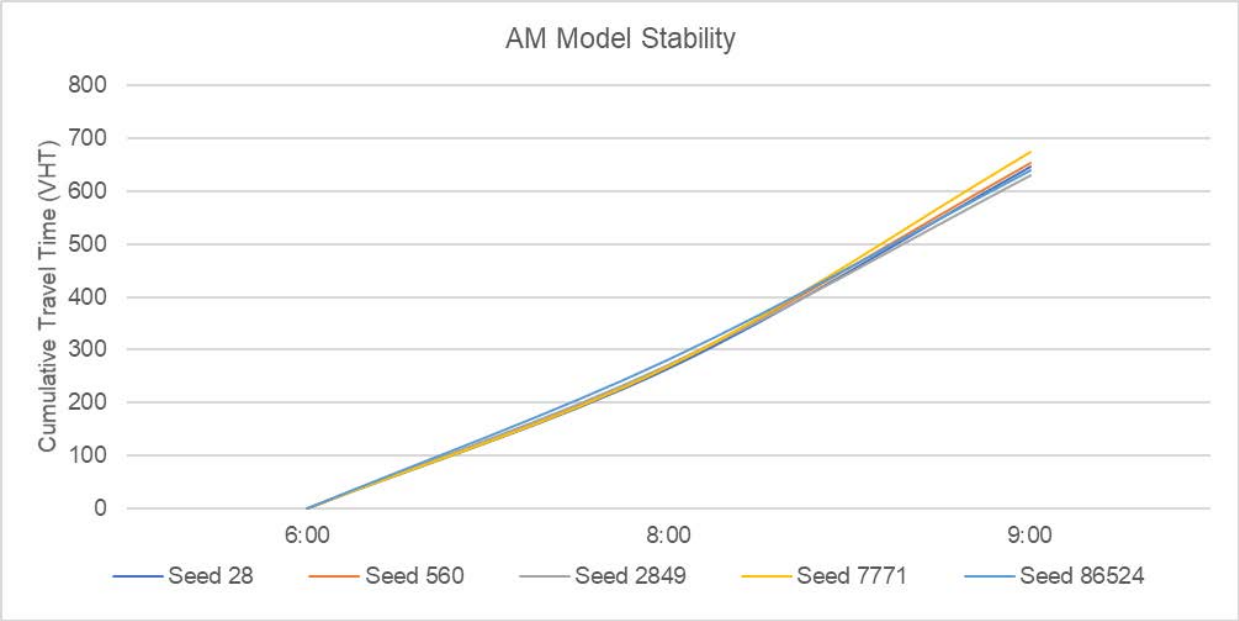


Figure 3.9: AM Peak Vehicle Hours Travelled

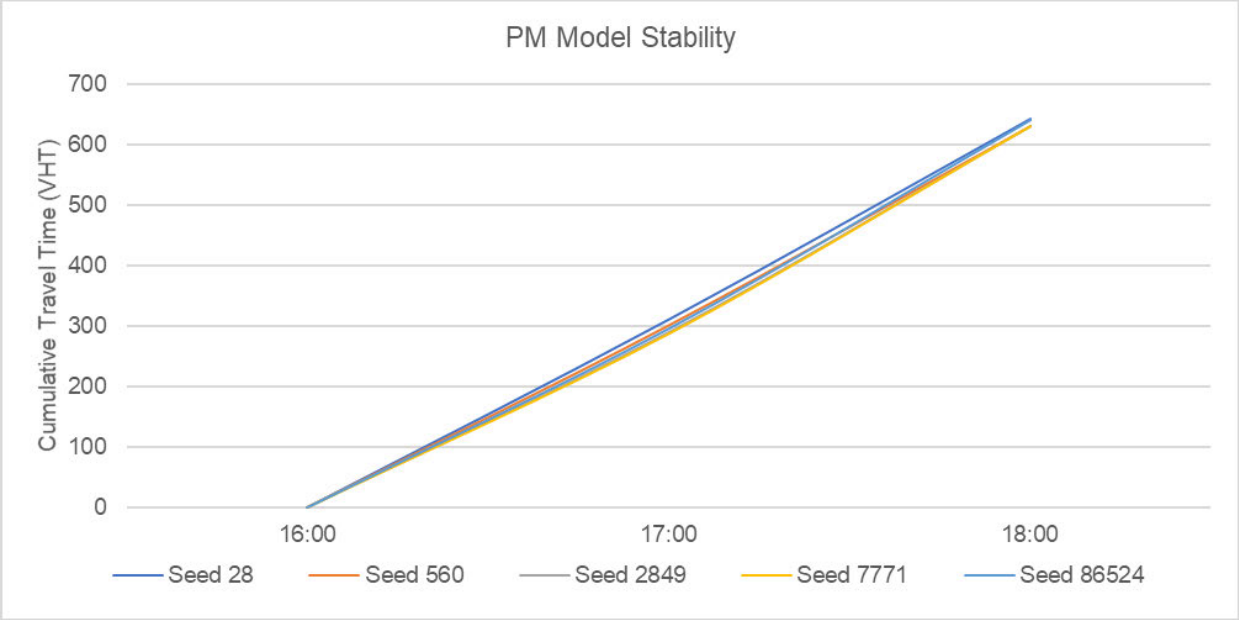


Figure 3.10: PM Peak Vehicle Hours Travelled

As shown, the model results across multiple seed values are generally consistent and the models are considered to be stable.

3.7.2 Median Seed

The median seed for each weekday peak period has been identified based on the VHT of each seed run. The weekday AM / PM peak median seeds were as follows:

- **AM Peak**: Seed 28
- **PM Peak**: Seed 2849

All calibration and validation outputs reported are drawn from the median seed run and the same seed value will be adopted in future year model runs.

4. 2020 BASE MODEL VALIDATION

4.1 Travel Time Validation

A comparison between the observed and modelled travel times was undertaken for the travel routes as shown previously in Section 1.4.4. The comparison of observed and modelled travel times is detailed in Table 4.1.

Note, eastbound traffic volumes on Route 3 are too low in observed and modelled scenarios to provide an effective travel time comparison and as such, eastbound Route 3 data is excluded.

Table 4.1: Travel Time Comparison Summary

Route	Distance	Direction	Observed Time (mm:ss)		Modelled Time (mm:ss)		Difference (mm:ss)	
AM Peak								
			7-8am	**8-9am**	**7-8am**	**8-9am**	**7-8am**	**8-9am**
Route 1	2.6km	Eastbound	05:11	05:15	04:25	04:22	00:46	00:53
		Westbound	05:20	05:30	04:07	04:35	01:13	00:55
Route 2	1.35km	Eastbound	02:54	03:03	02:54	02:47	00:00	00:16
		Westbound	03:26	04:27	03:38	04:01	00:12	00:26
Route 3	1.4km	Westbound	03:18	04:48	02:44	04:00	00:34	00:48
PM Peak								
			4-5pm	**5-6pm**	**4-5pm**	**5-6pm**	**4-5pm**	**5-6pm**
Route 1	2.6km	Eastbound	05:03	05:11	04:28	04:38	00:35	00:33
		Westbound	04:40	04:17	03:52	03:58	00:48	00:19
Route 2	1.35km	Eastbound	04:11	03:46	02:58	02:46	01:13	01:00
		Westbound	03:11	03:22	03:14	03:26	00:03	00:04
Route 3	1.4km	Westbound	03:21	03:06	02:30	02:34	00:51	00:32

As shown, the majority of modelled travel times are within one minute of the observed travel times, with key deviations described below:

- **Route 1: Westbound (7-8am)**: The modelled travel times are lower than observed, however it should be noted that there was a high variance in the survey travel times (ranging from 4:09 to 6:32). It should also be reiterated that the travel times were surveyed in 2021, however the majority of intersections along Route 1 are calibrated to 2020 survey data
- **Route 2: Eastbound (4-5pm and 5-6pm)**: The modelled travel times are lower than the observed, however it should again be noted that there was a high variance in the survey travel times, ranging from 2:49 to 5:55 (4-5pm) and 2:38 to 6:04 (5-6pm).

Although there are some discrepancies between the modelled and observed travel times, overall modelled route choice across these routes is well replicated in the model, as shown in the OD comparison (see Section 3.6). As a result, the model is still considered suitably validated.

Cumulative time vs. distance graphs for the travel time routes in the weekday AM / PM peaks are also provided in Figure 4.1 to Figure 4.20.

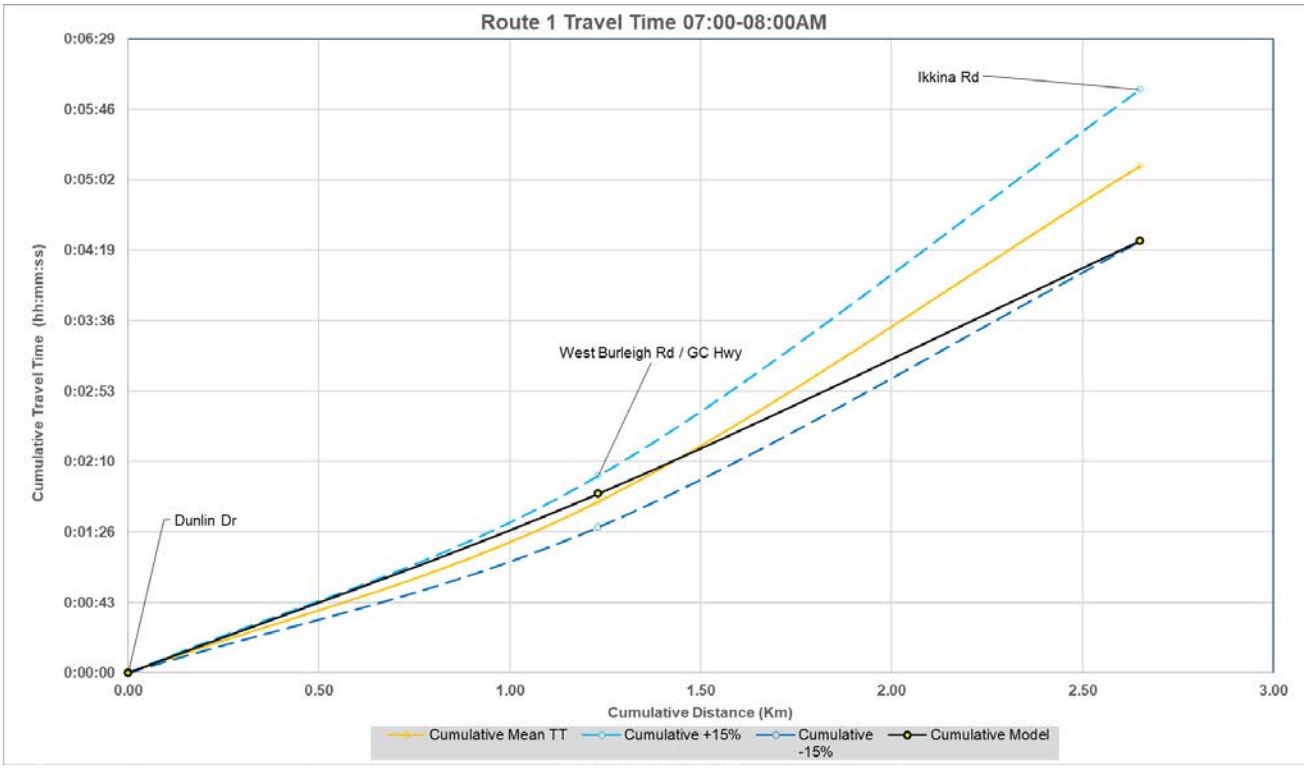


Figure 4.1: Route 1 Travel Time 07:00-08:00 Eastbound

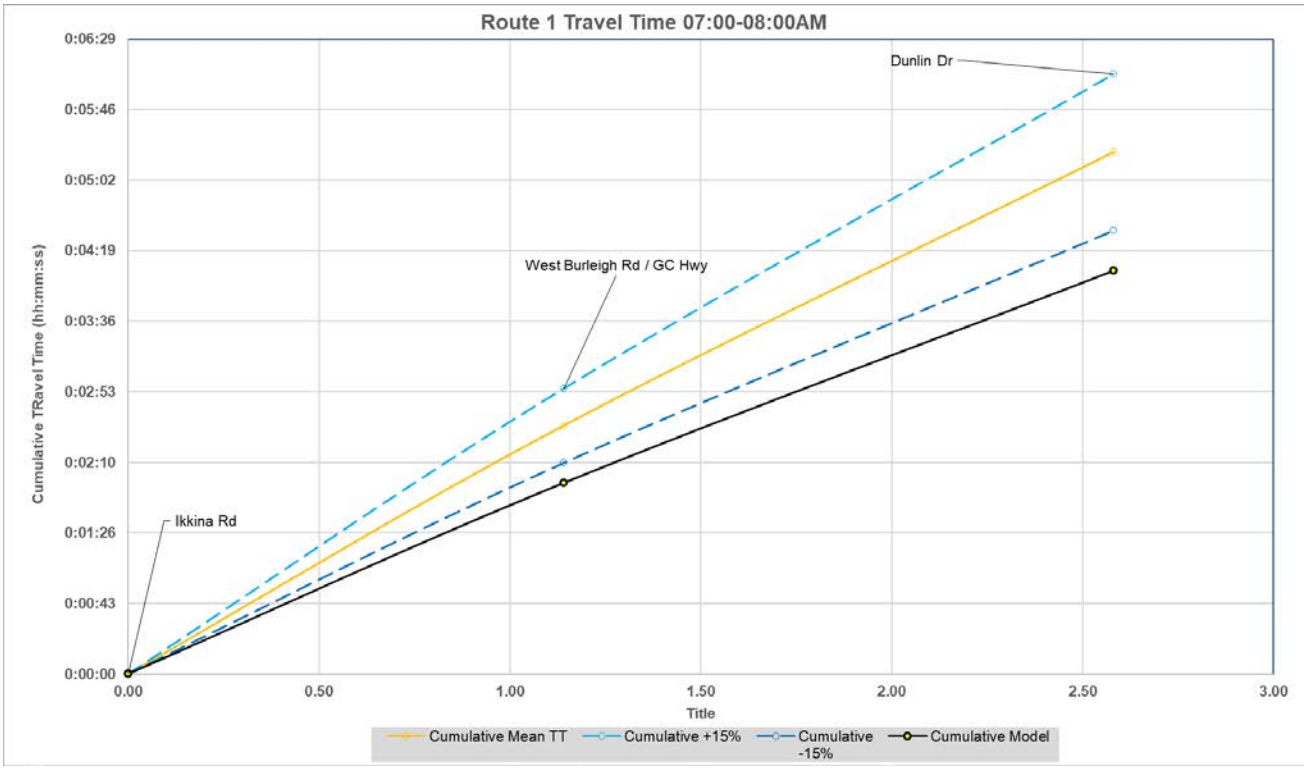


Figure 4.2: Route 1 Travel Time 07:00-08:00 Westbound

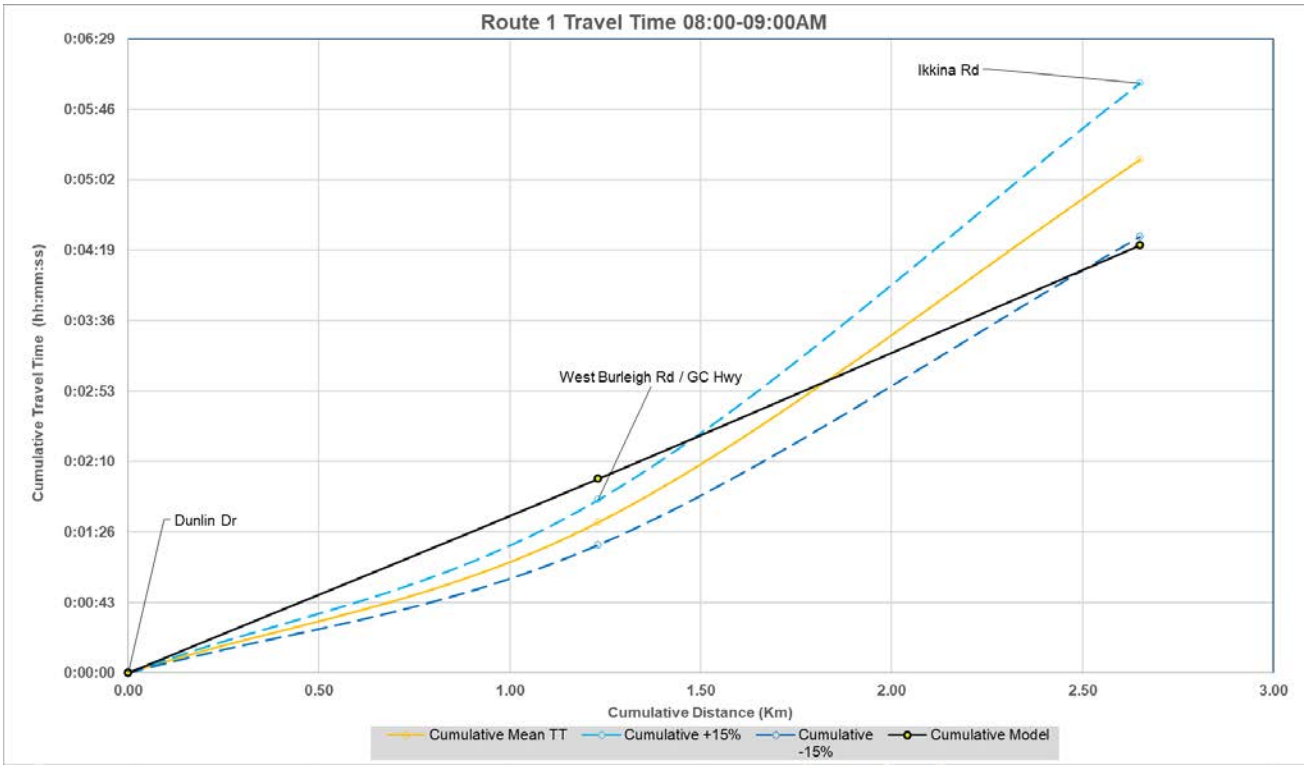


Figure 4.3: Route 1 Travel Time 08:00-09:00 Eastbound

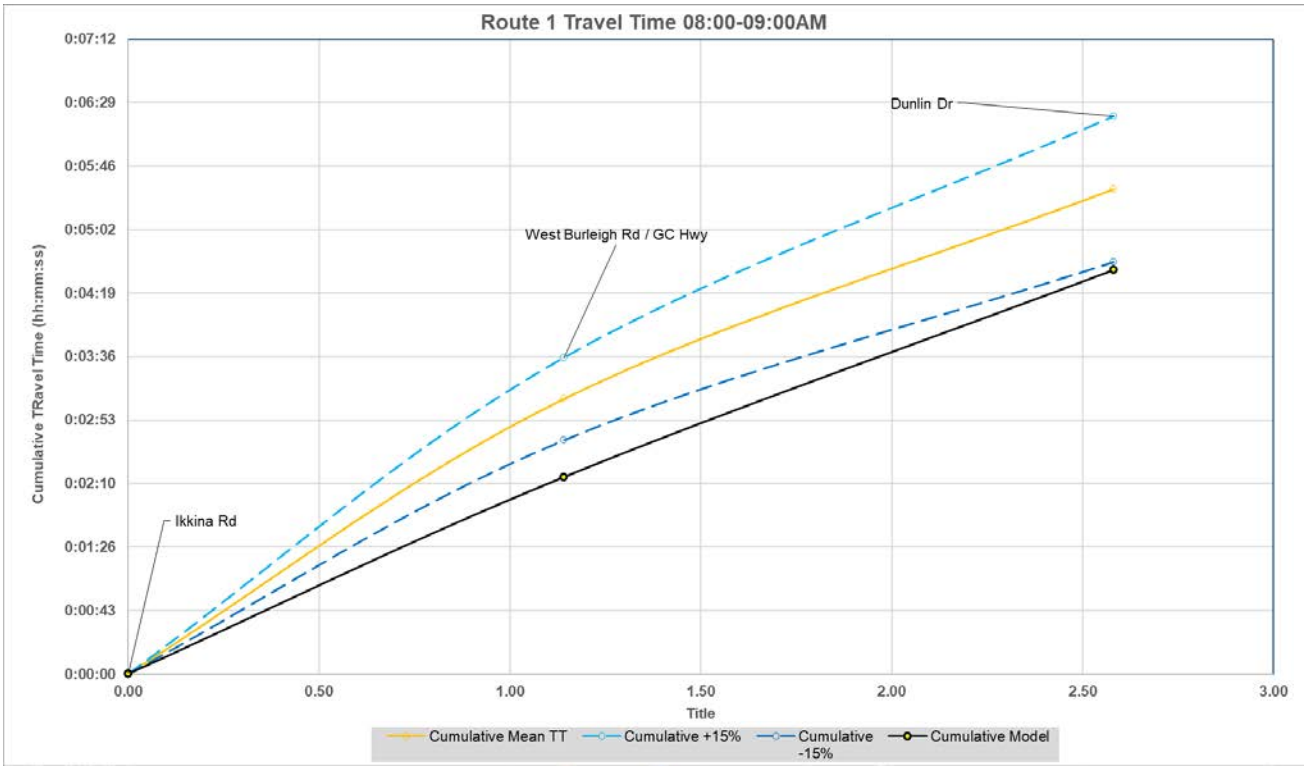


Figure 4.4: Route 1 Travel Time 08:00-09:00 Westbound

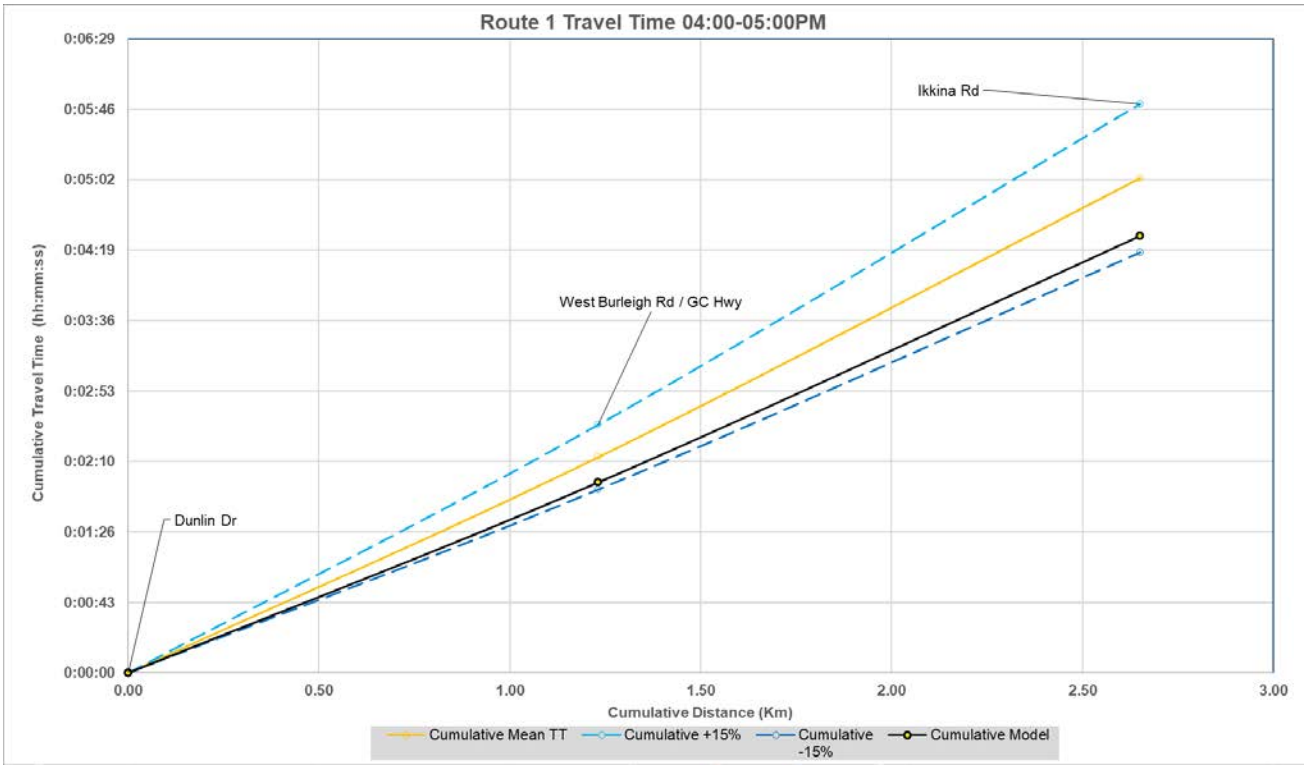


Figure 4.5: **Route 1 Travel Time 16:00-17:00 Eastbound**

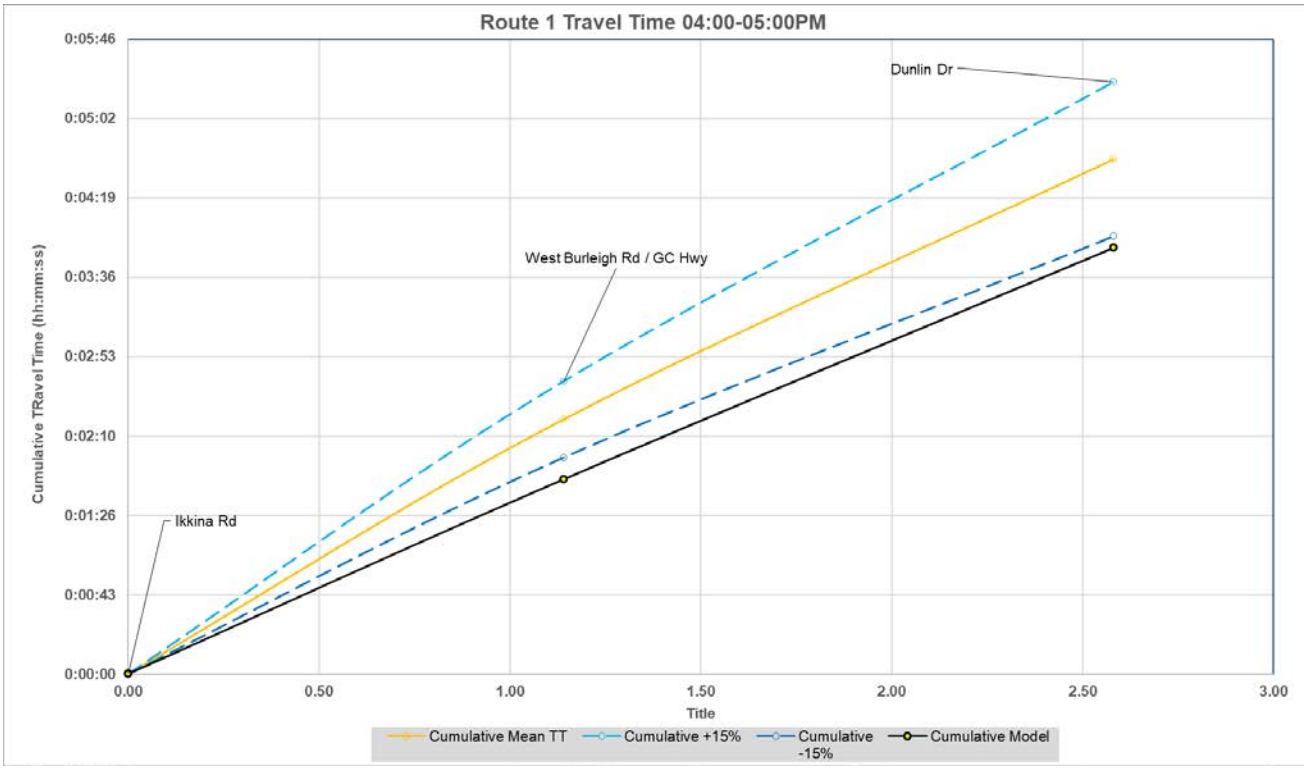


Figure 4.6: **Route 1 Travel Time 16:00-17:00 Westbound**

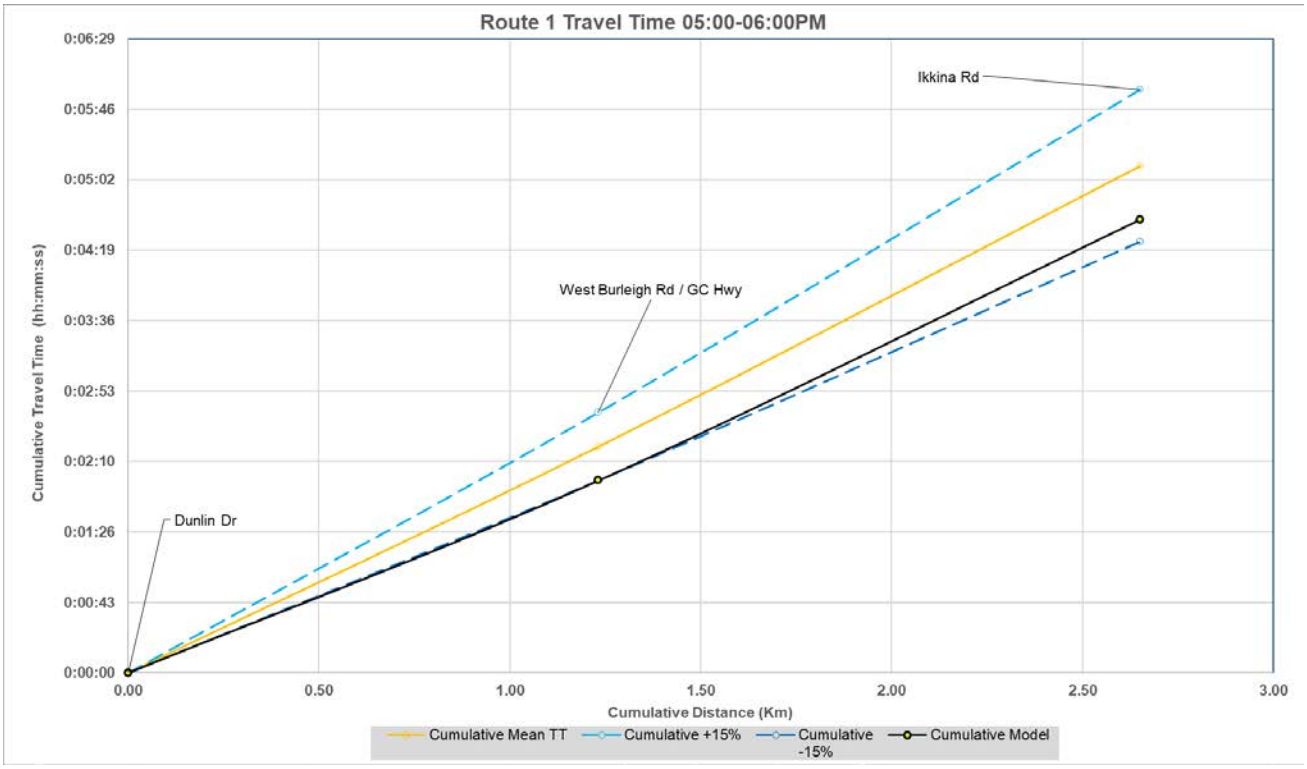


Figure 4.7: **Route 1 Travel Time 17:00-18:00 Eastbound**

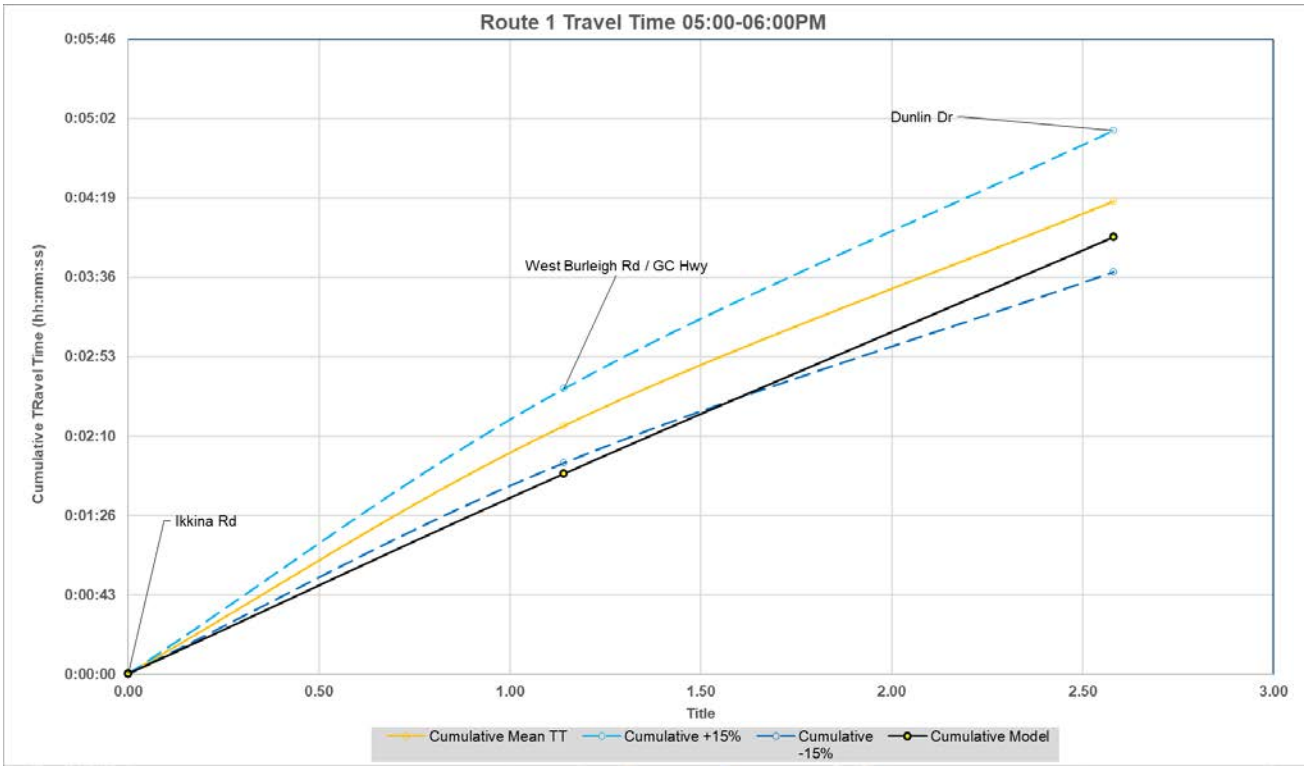


Figure 4.8: **Route 1 Travel Time 17:00-18:00 Westbound**

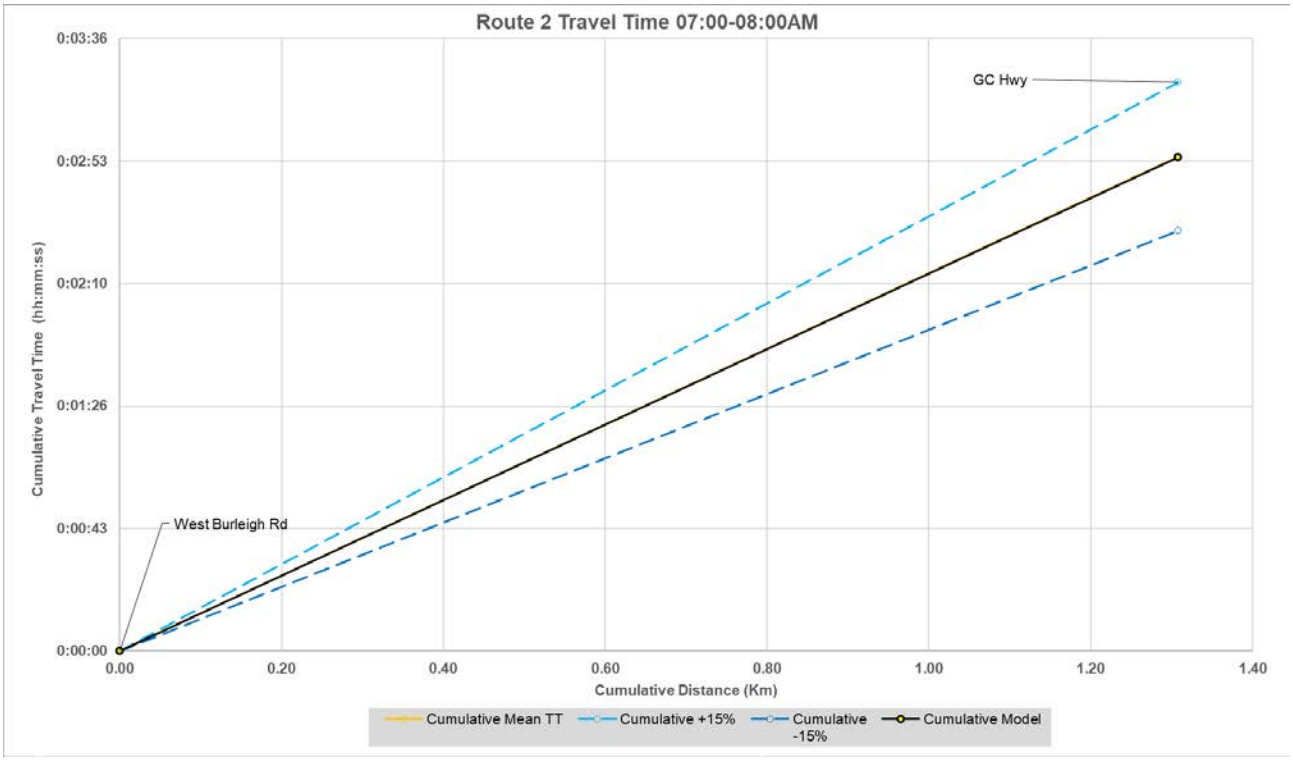


Figure 4.9: Route 2 Travel Time 07:00-08:00 Eastbound

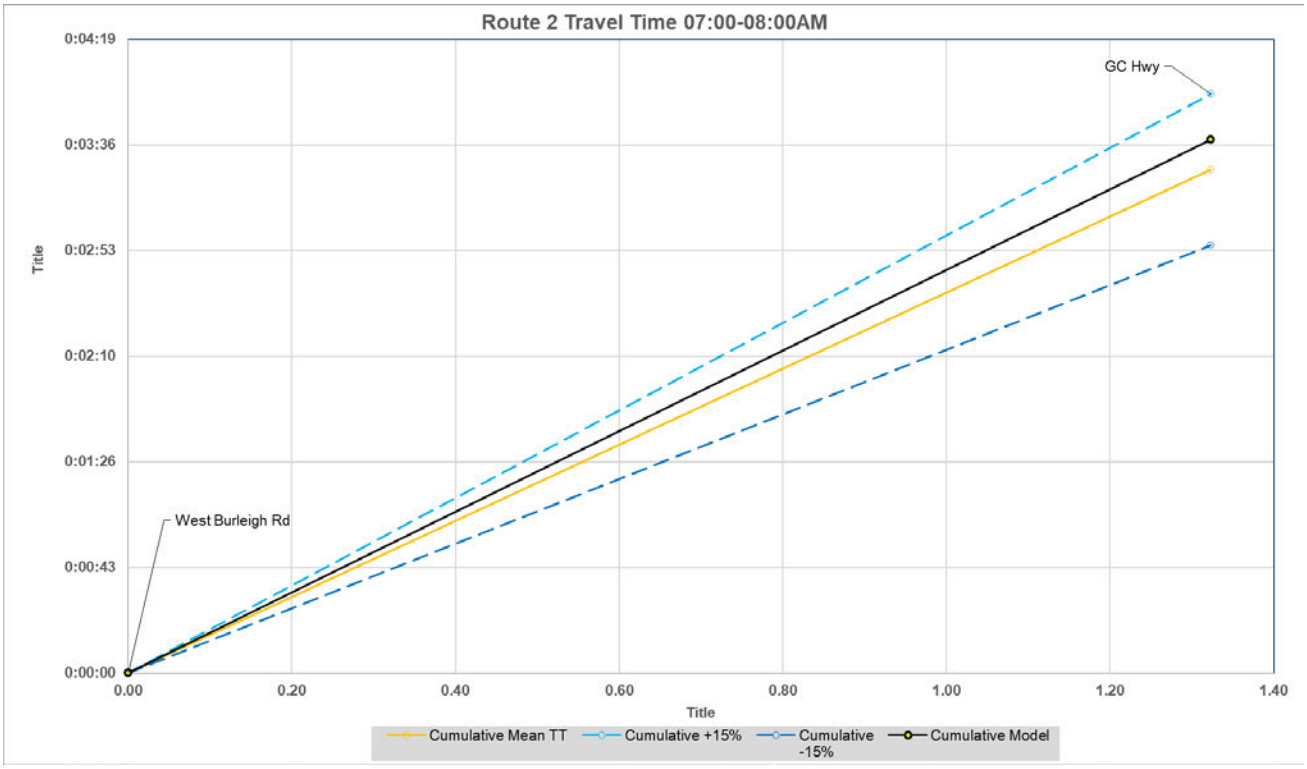


Figure 4.10: Route 2 Travel Time 07:00-08:00 Westbound

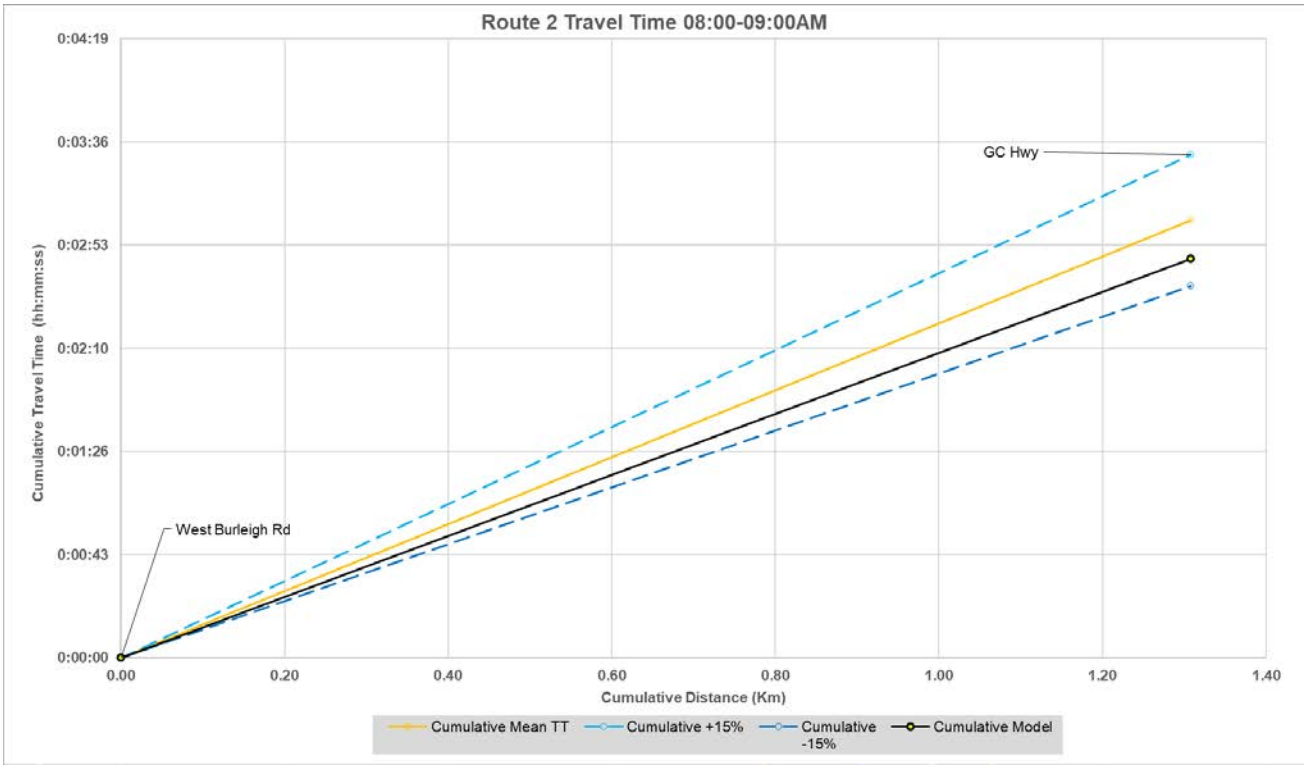


Figure 4.11: Route 2 Travel Time 08:00-09:00 Eastbound

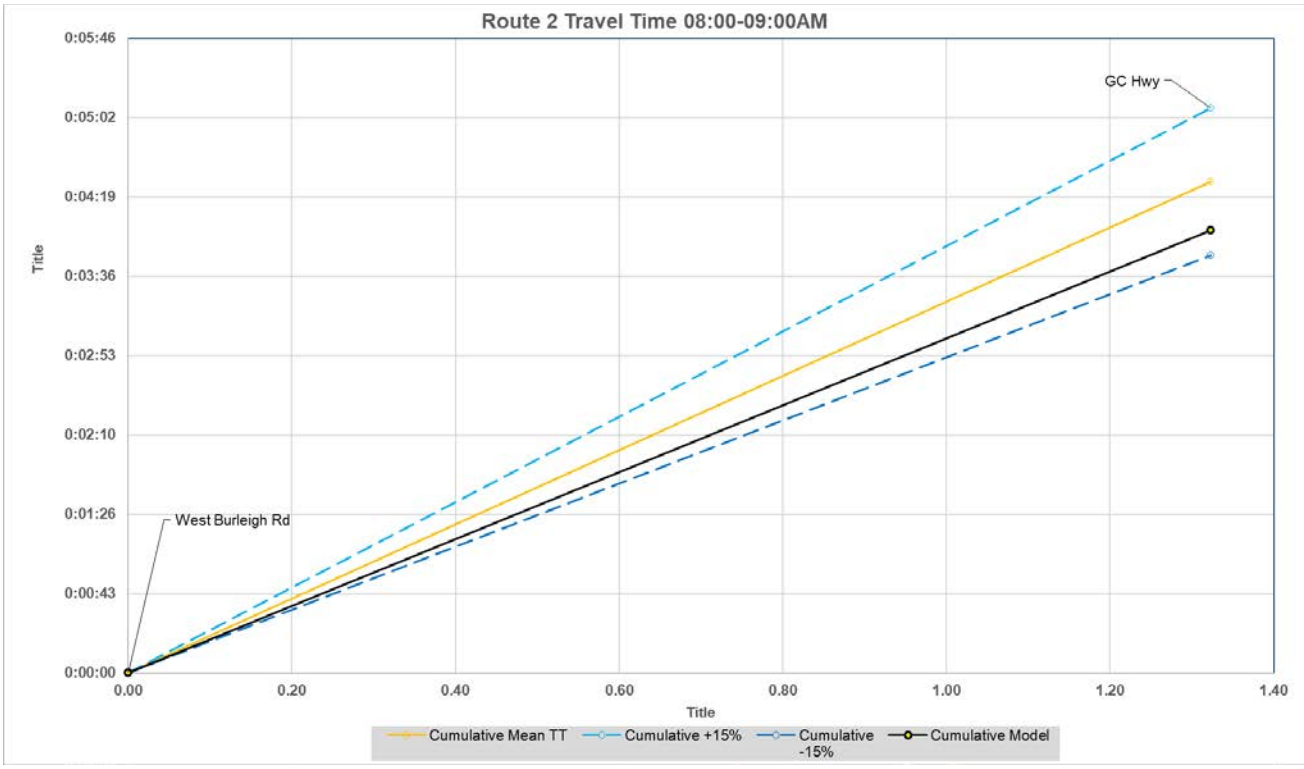


Figure 4.12: Route 2 Travel Time 08:00-09:00 Westbound

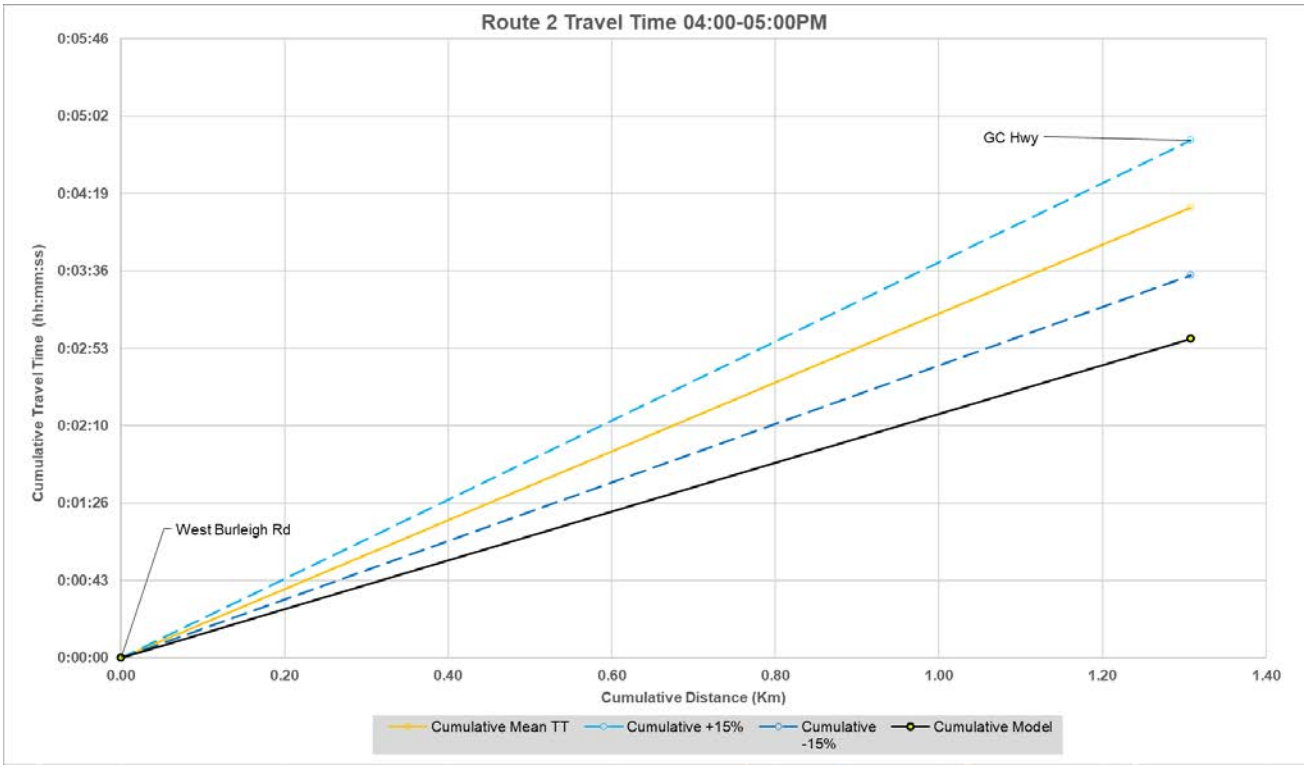


Figure 4.13: Route 2 Travel Time 16:00-17:00 Eastbound

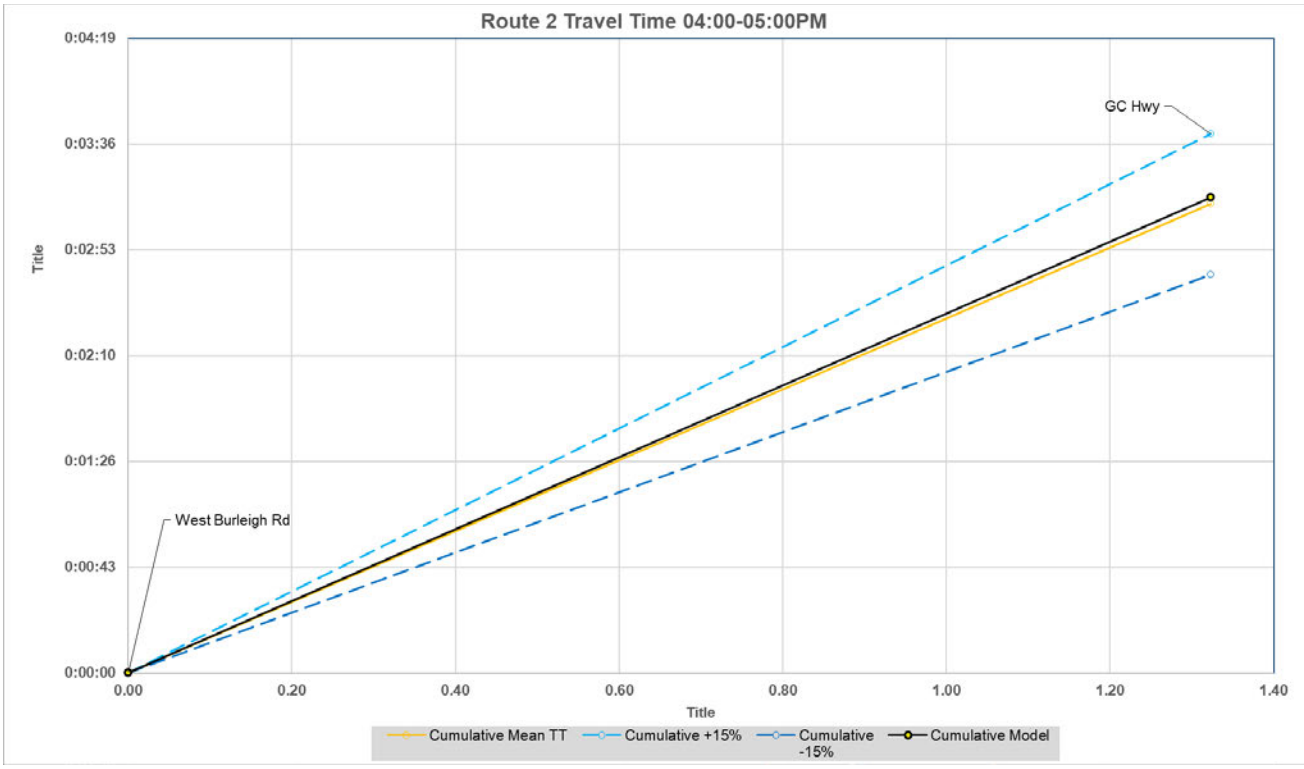


Figure 4.14: Route 2 Travel Time 16:00-17:00 Westbound

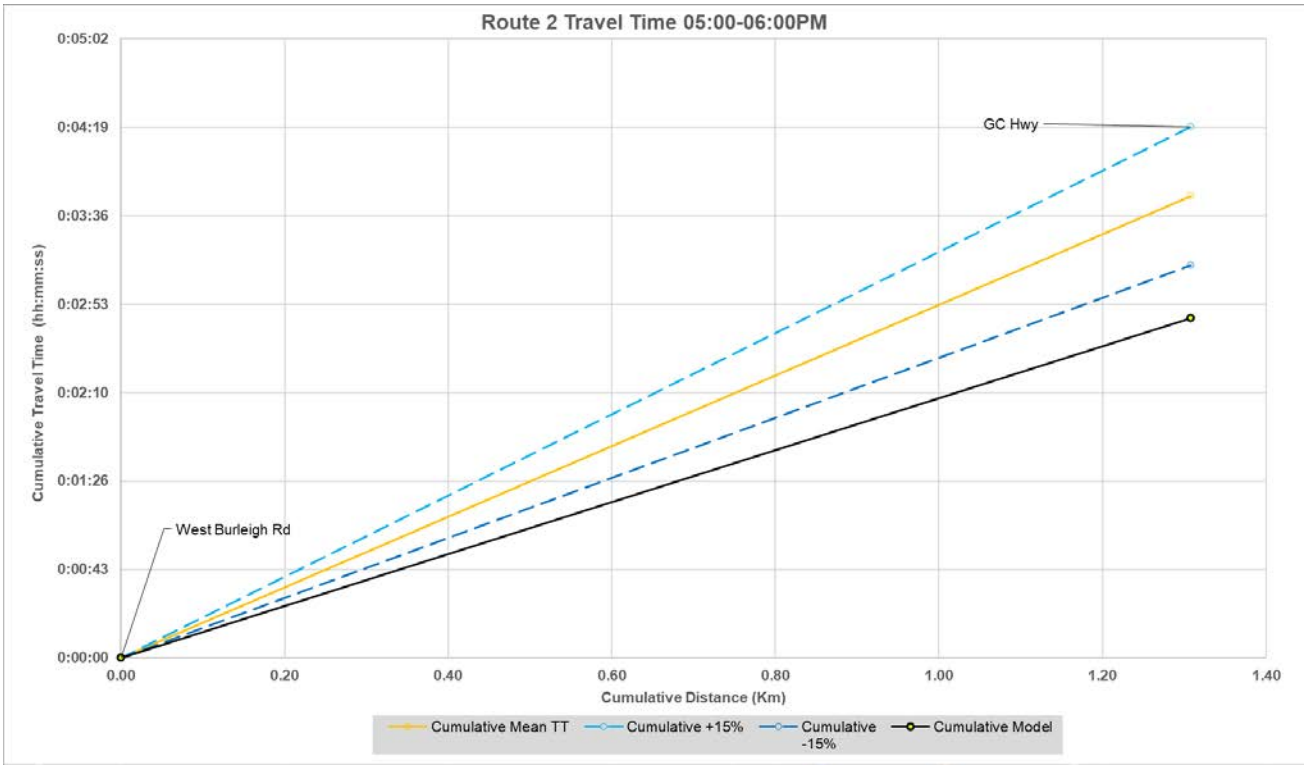


Figure 4.15: Route 2 Travel Time 17:00-18:00 Eastbound

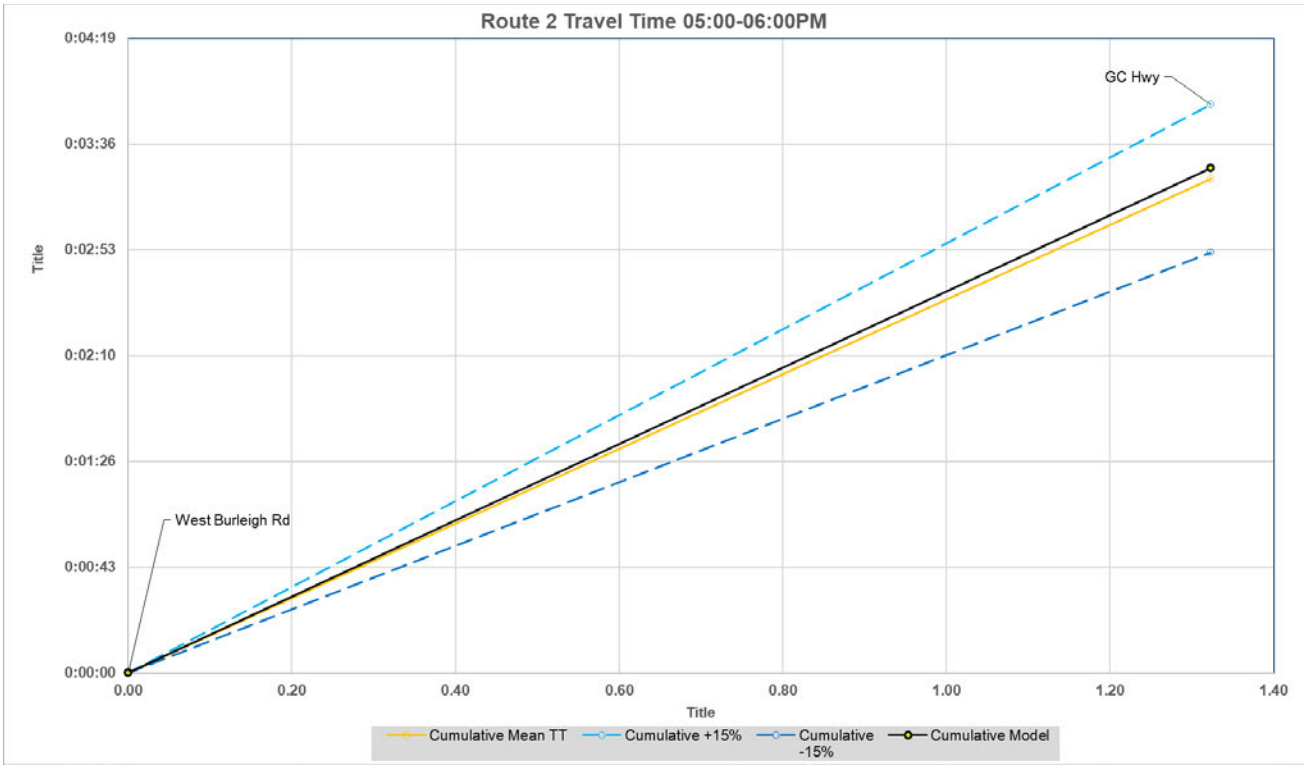


Figure 4.16: Route 2 Travel Time 17:00-18:00 Westbound

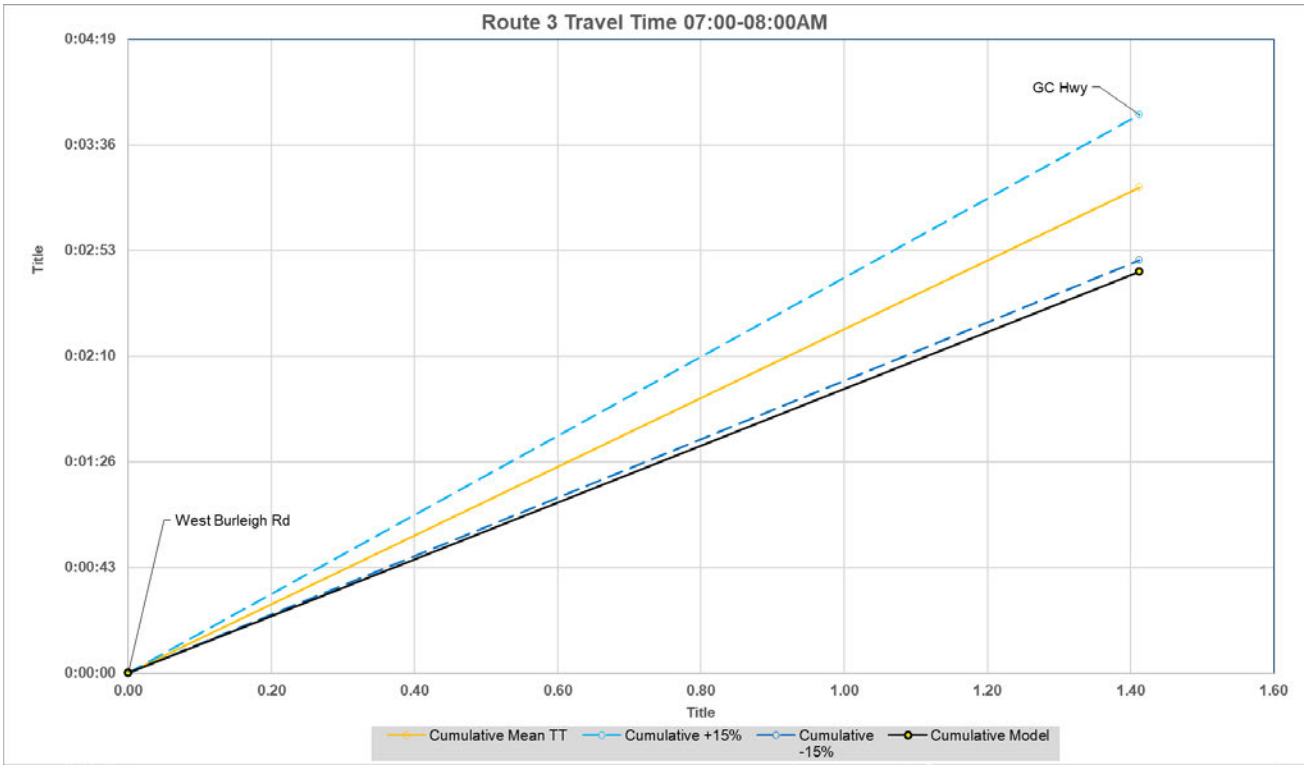


Figure 4.17: Route 3 Travel Time 07:00-08:00 Westbound

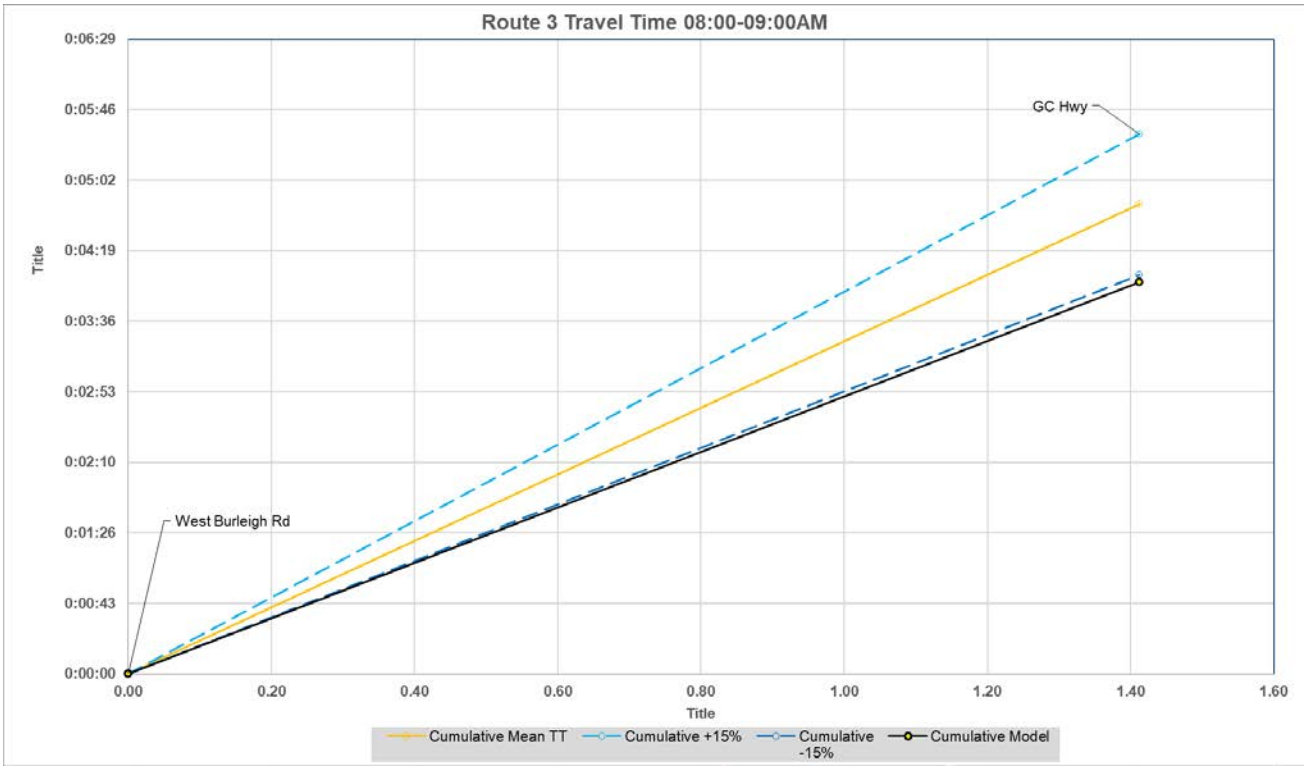


Figure 4.18: Route 3 Travel Time 08:00-09:00 Westbound

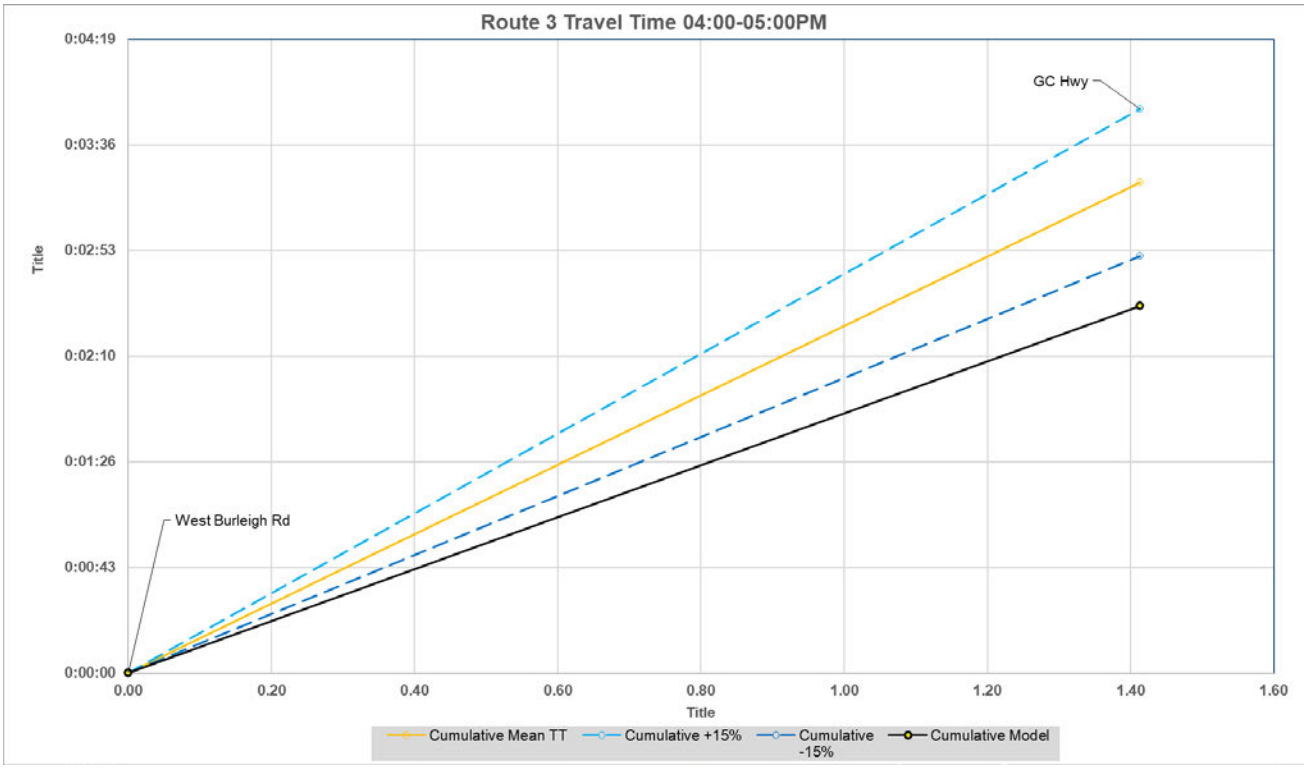


Figure 4.19: Route 3 Travel Time 16:00-17:00 Westbound

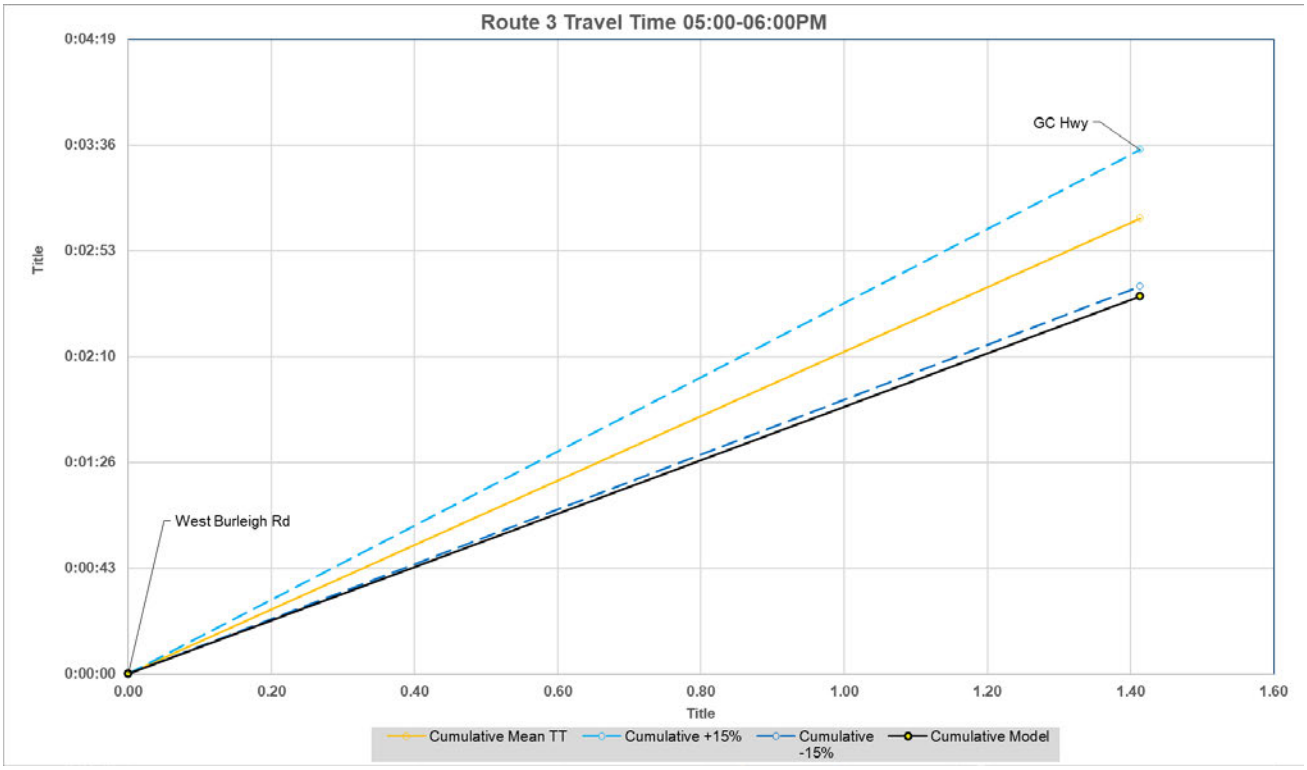


Figure 4.20: Route 3 Travel Time 17:00-18:00 Westbound

5. LIMITATIONS

It is important to note that traffic data collected / supplied for use in model development were undertaken at different times / dates. While South-East Queensland was not in lockdown at the time of the surveys, it is further noted that traffic numbers may also be somewhat influenced by travel demand impacts associated with the Covid-19 pandemic.

In summary, certain data and base model limitations exist through the development of the 2021 Aimsun Base model. The varied survey periods for the intersection data limited the quantity of 2021 traffic counts available and did not allow for traffic flow balancing for surveyed intersections. These limitations are also noted previously in Section 3.1.

Current traffic flows through the study area may be influenced by non-typical factors such as:

- Impacts of the Covid-19 pandemic
- Temporary changes in travel behaviours as a result of current Pacific Motorway (M1) roadworks (potentially resulting in motorists avoiding the M1 and using the study area road network).

Regardless, the above implications are not considered to impact the validity or purpose of the model and the 2021 Aimsun Base Model is considered fit for the purpose of future forecasting and the options testing of interim and ultimate scenarios for the Tabilban Street / Ikkina Road 'rat-run' route.

6. CONCLUDING STATEMENT

In summary, the 2021 Base Aimsun model for the weekday AM / PM peak is deemed to be:

- Suitably calibrated to available count data based on GEH findings
- Suitably representative of current route choice determined by OD survey data
- Suitably validated with travel time data considering the limitations and range of surveyed times.

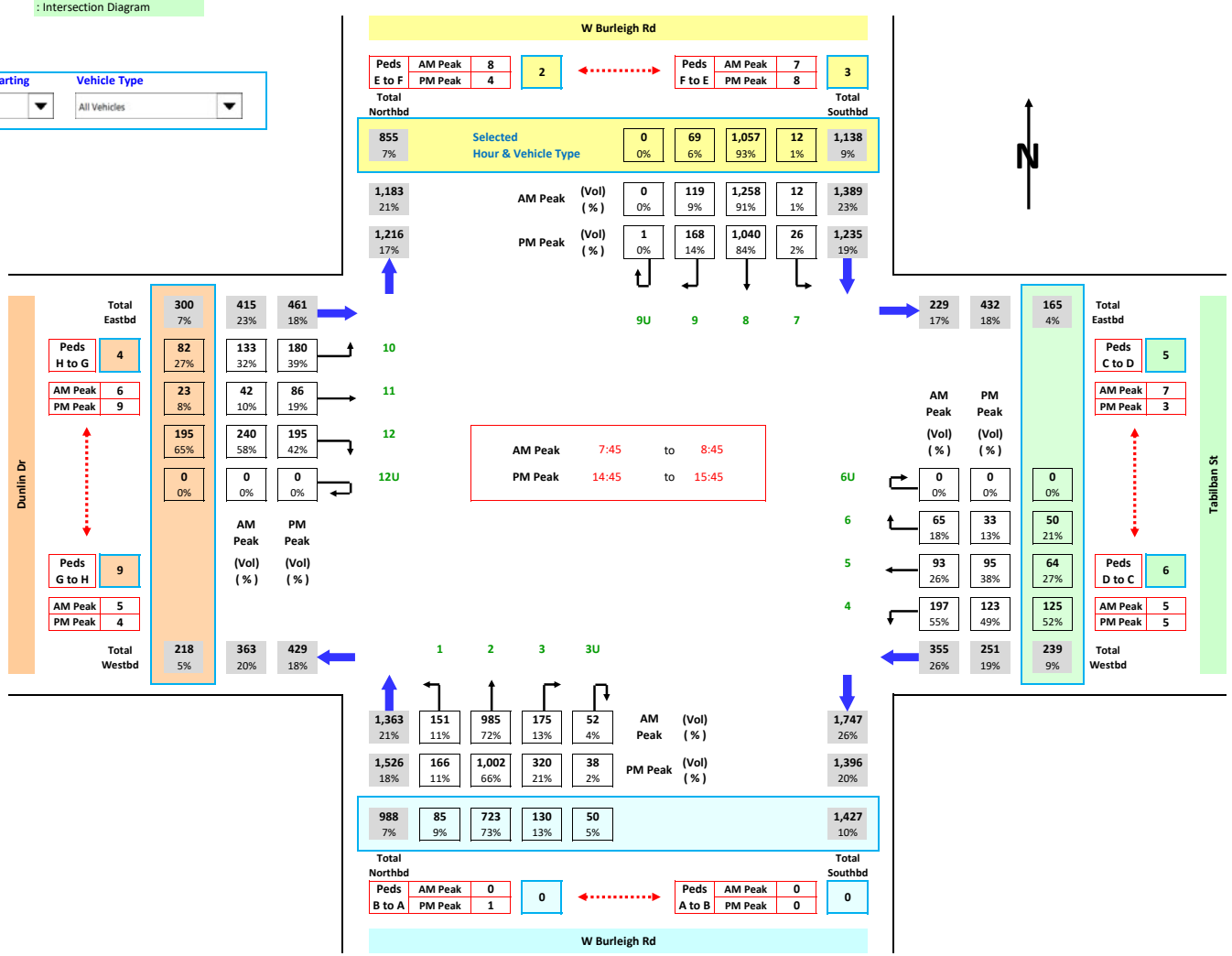
The 2021 model is therefore considered fit-for-purpose and can facilitate the development of future year models and options testing of interim and ultimate scenarios.

Appendix A: Intersection Survey Data

Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 2. W Burleigh Rd / Tabilban St / Dunlin Dr

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

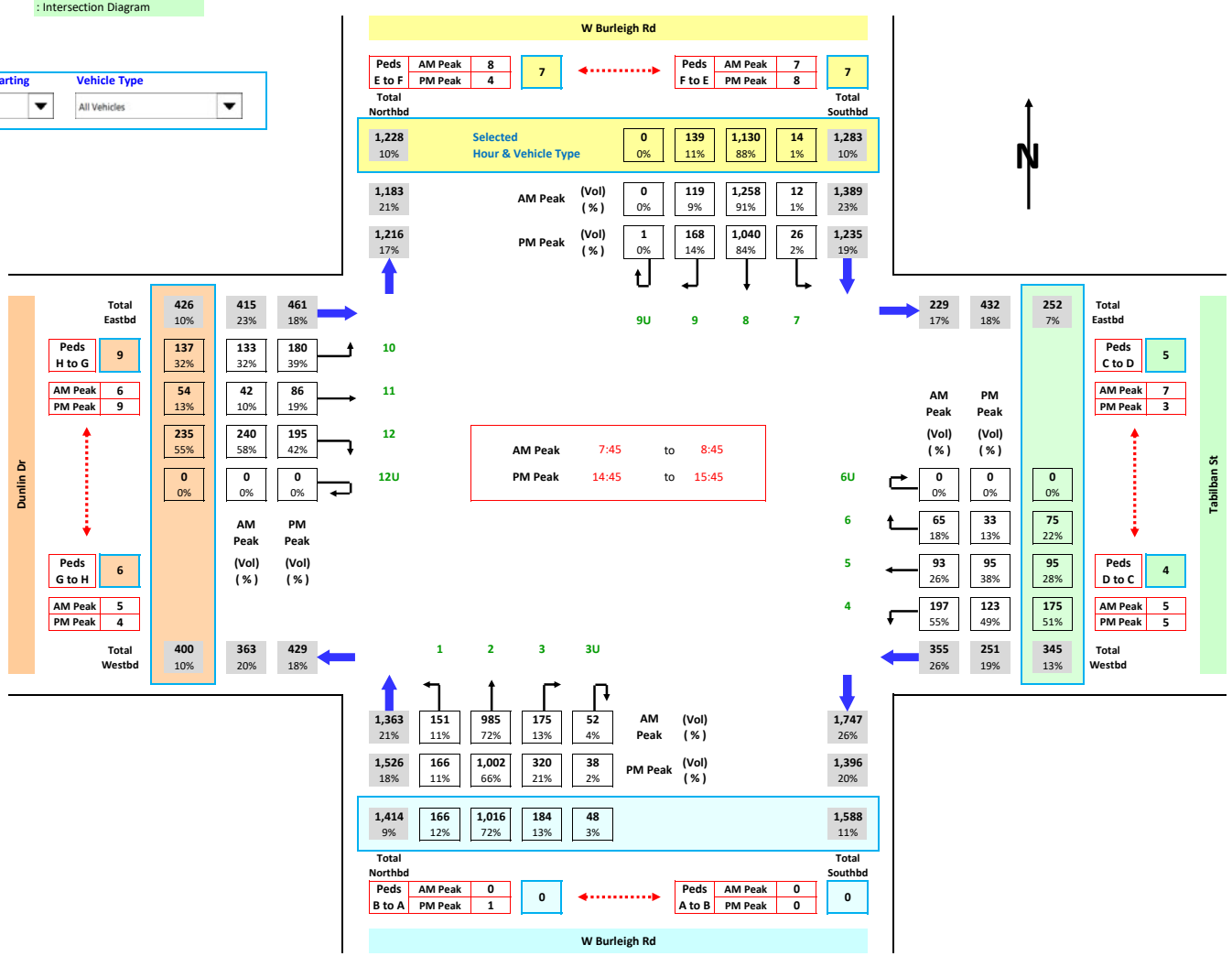
Hour Starting 7:00 **Vehicle Type** All Vehicles



Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 2. W Burleigh Rd / Tabilban St / Dunlin Dr

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

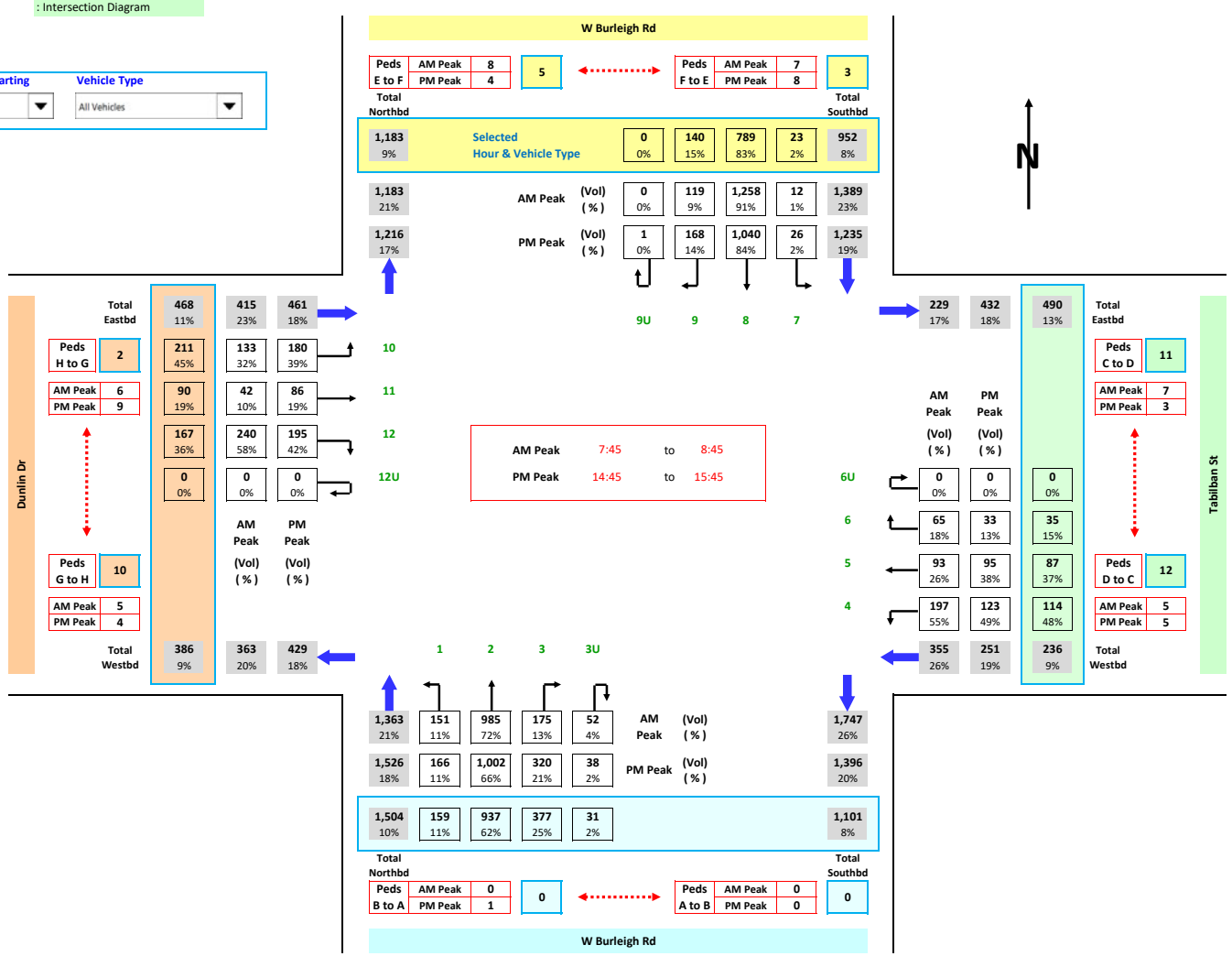
Hour Starting	Vehicle Type
8:00	All Vehicles



Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 2. W Burleigh Rd / Tabilban St / Dunlin Dr

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

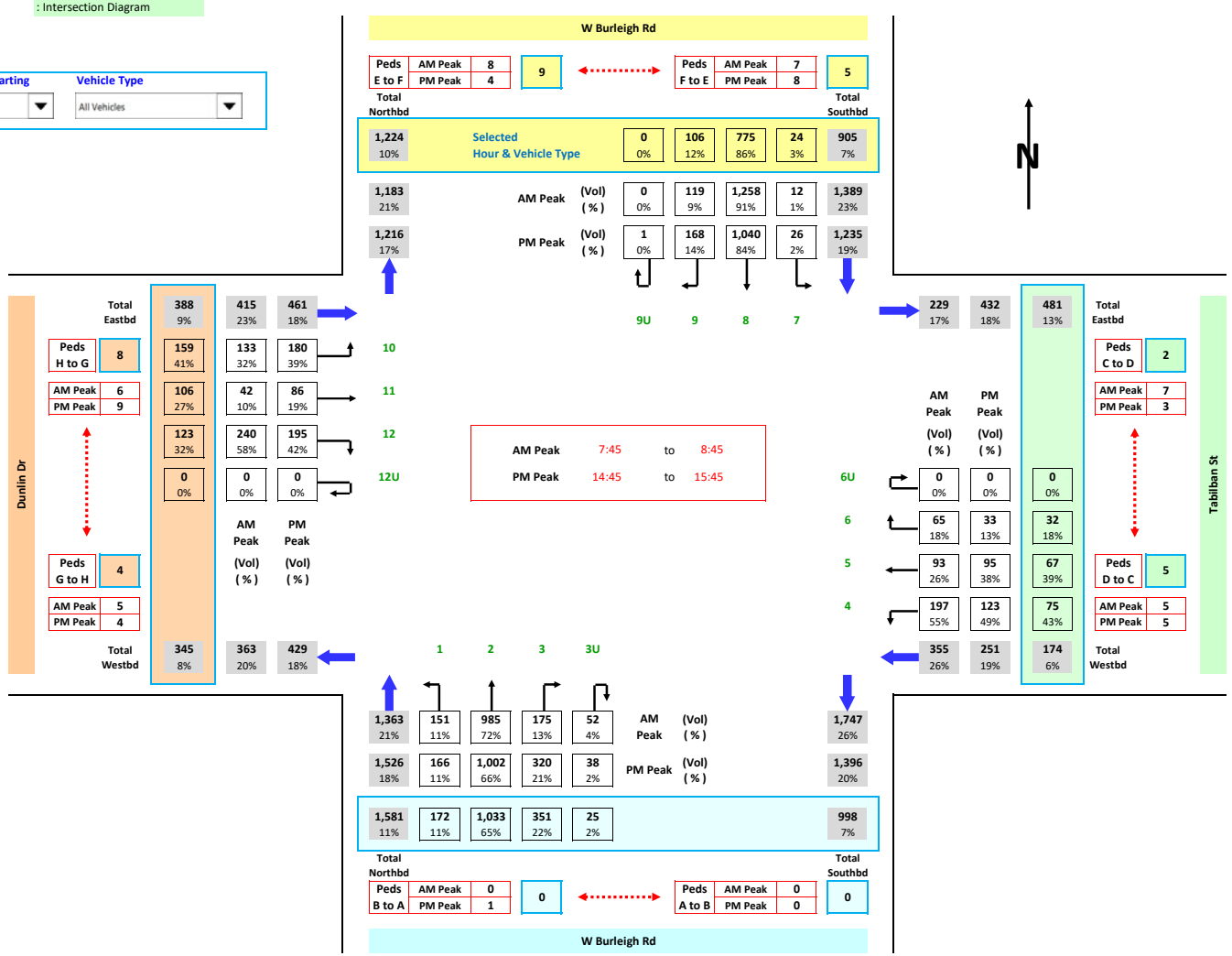
Hour Starting 16:00 **Vehicle Type** All Vehicles



Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 2. W Burleigh Rd / Tabilban St / Dunlin Dr

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

Hour Starting 17:00 **Vehicle Type** All Vehicles

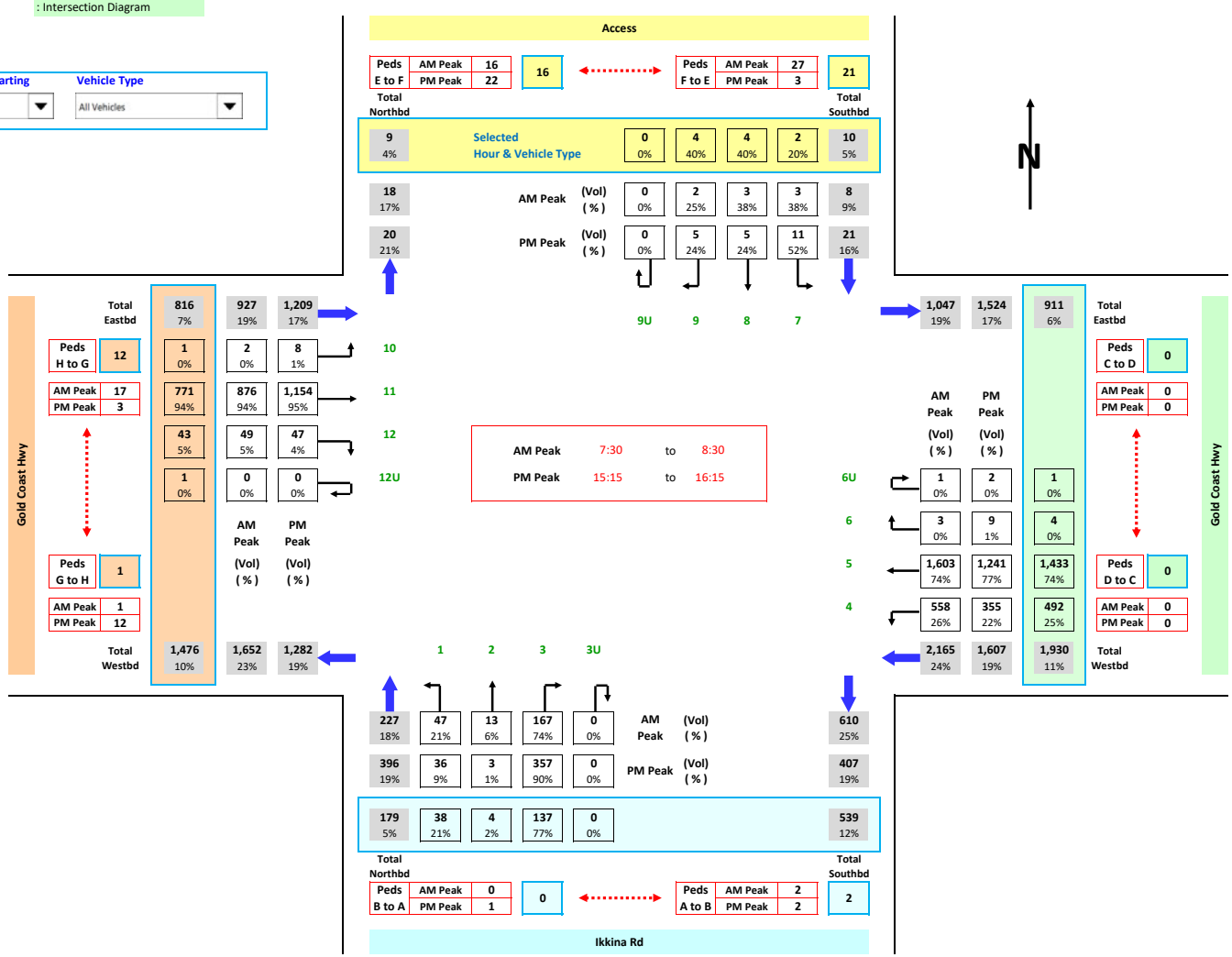


Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 1. Ikkina Rd / Gold Coast Hwy

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting	Vehicle Type
7:00	All Vehicles

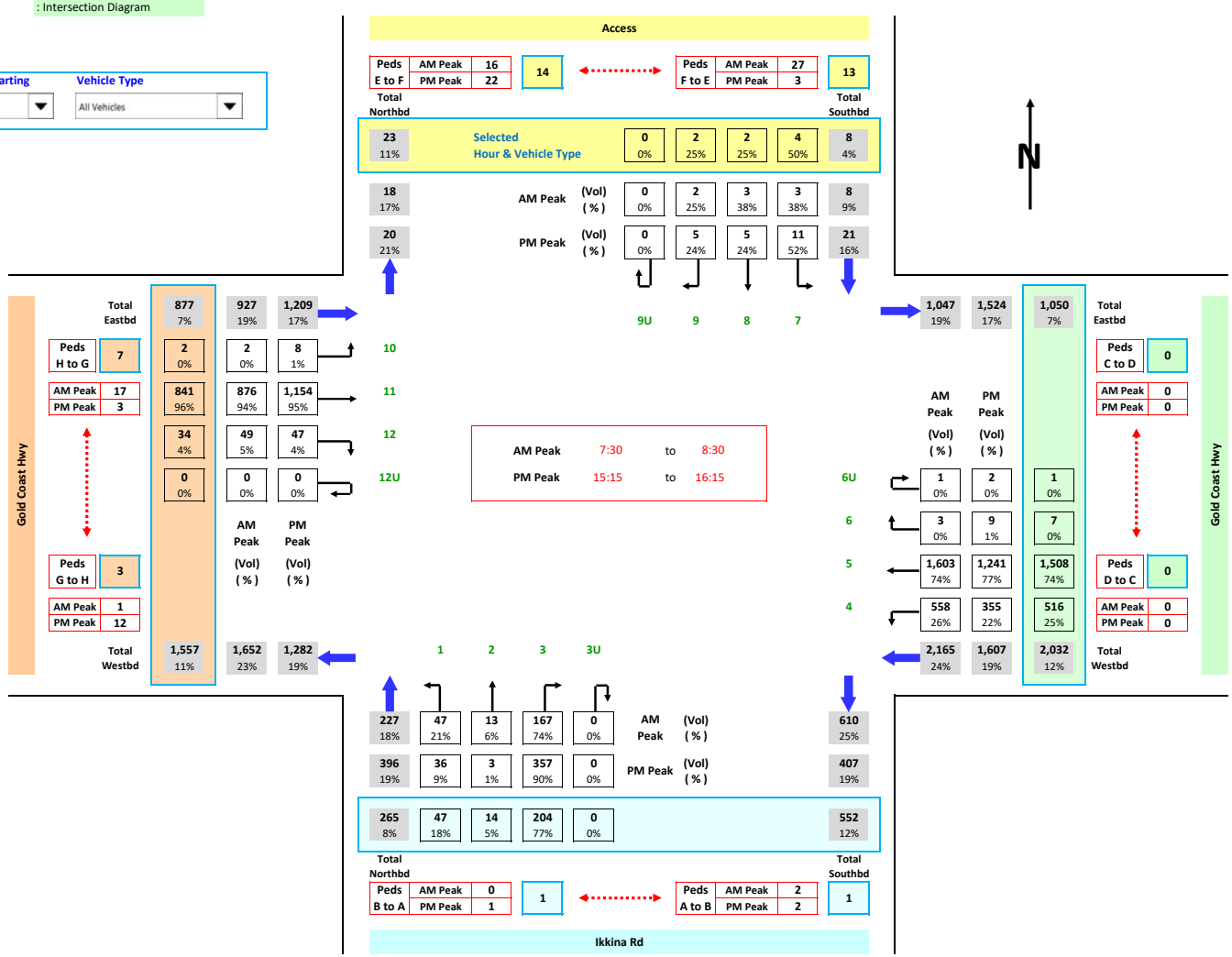


Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 1. Ikkina Rd / Gold Coast Hwy

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

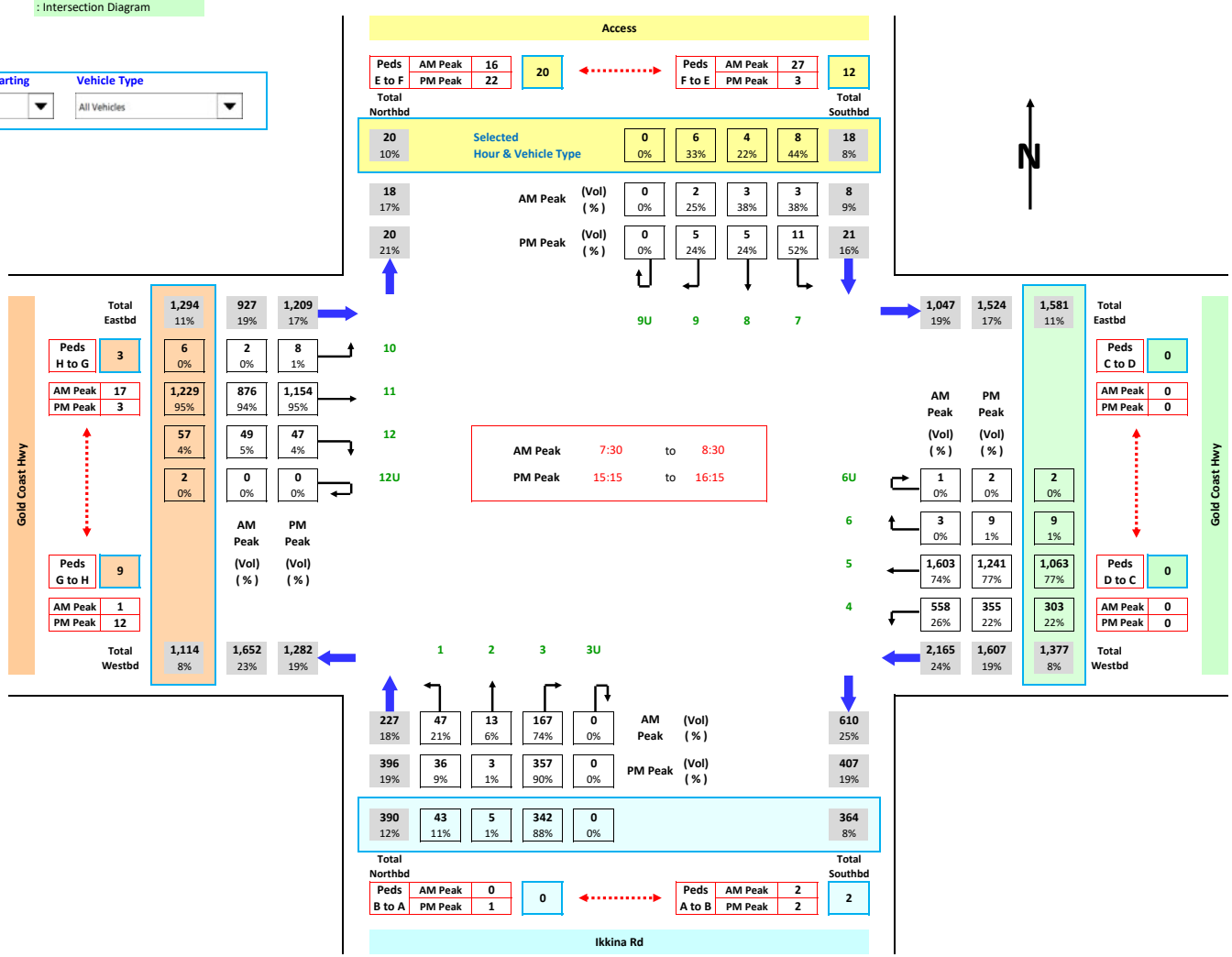
Hour Starting 8:00 **Vehicle Type** All Vehicles



Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 1. Ikkina Rd / Gold Coast Hwy

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

Hour Starting	Vehicle Type
16:00	All Vehicles

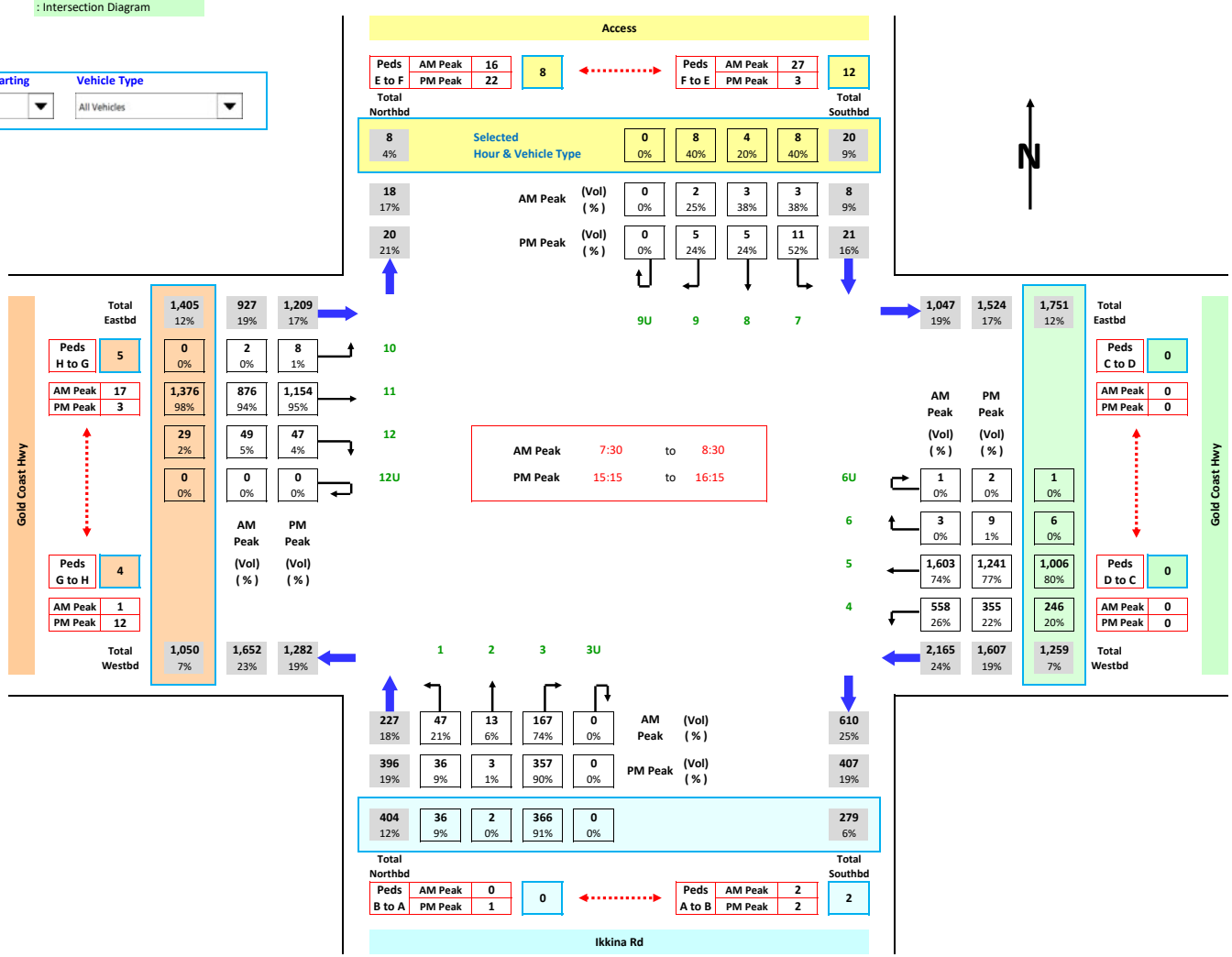


Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 1. Ikkina Rd / Gold Coast Hwy

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

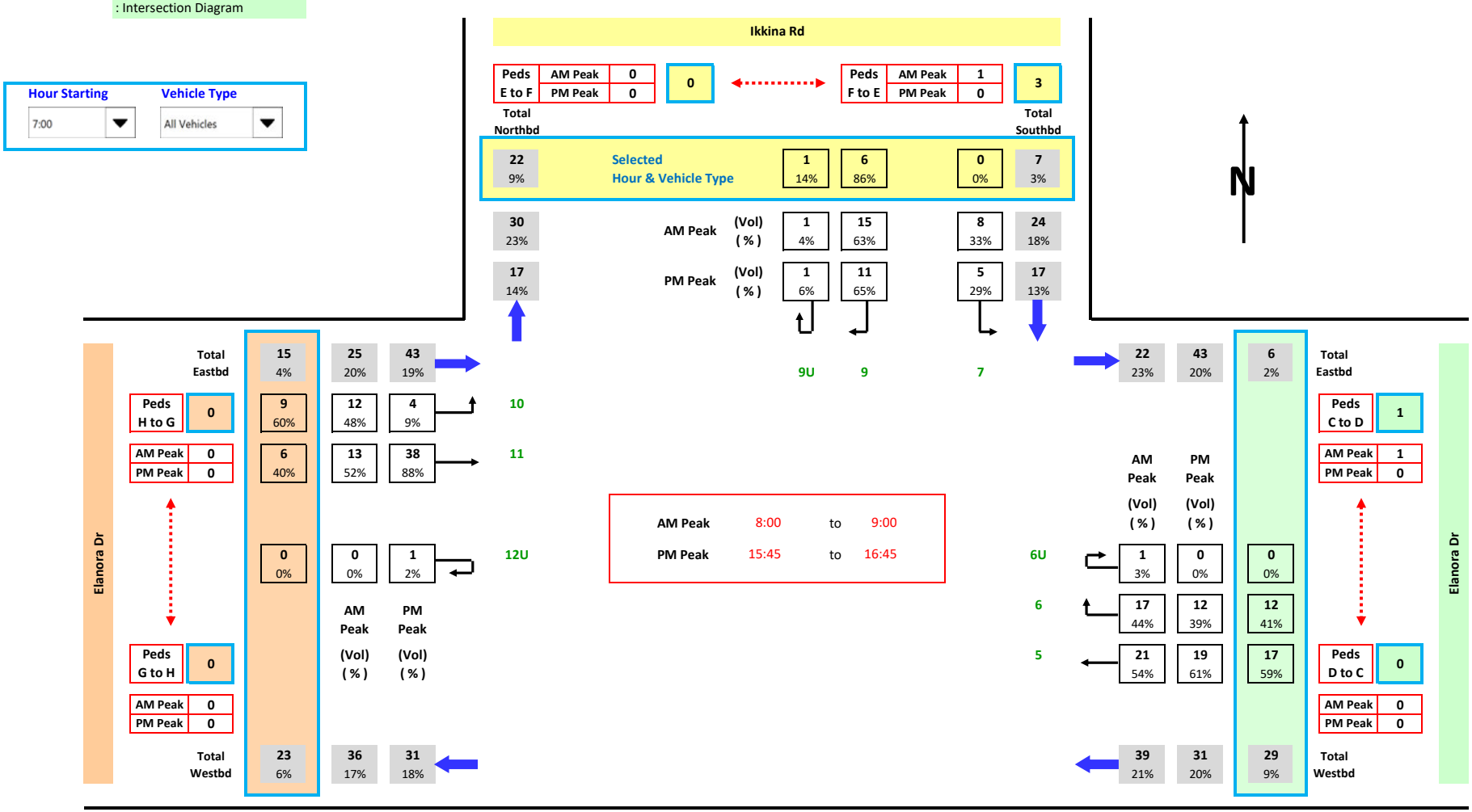
Hour Starting	Vehicle Type
17:00	All Vehicles



Job No. : Q2694 Note: Counts undertaken during COVID-19 Pandemic
Client : GCCC
Suburb : M.175 Burleigh Heads
Location : 1. Elanora Dr / Ikkina Rd

Day/Date : Tue, 23rd Jun 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

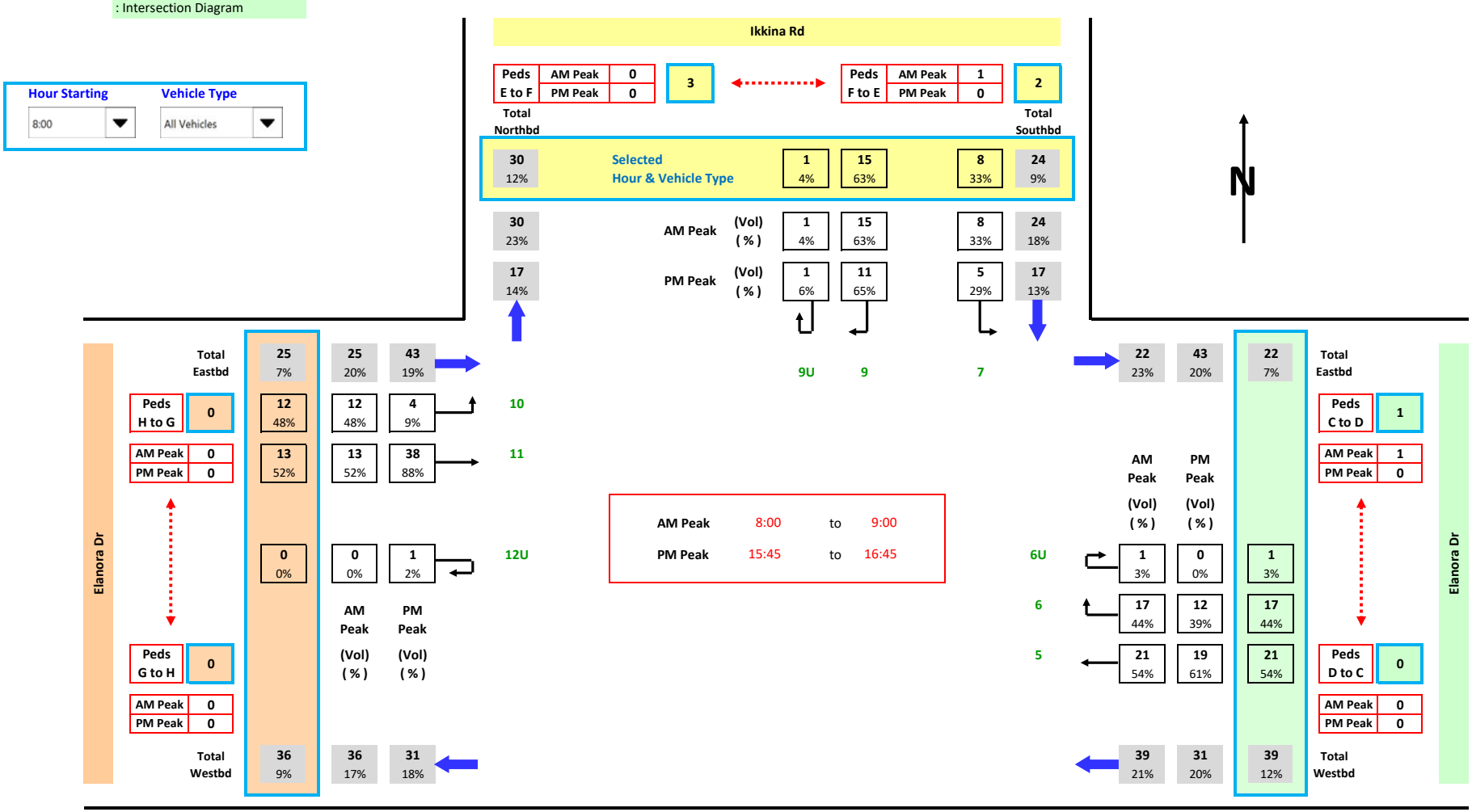
MATRIX Traffic and Transport Data



Job No. : Q2694 Note: Counts undertaken during COVID-19 Pandemic
Client : GCCC
Suburb : M.175 Burleigh Heads
Location : 1. Elanora Dr / Ikkina Rd

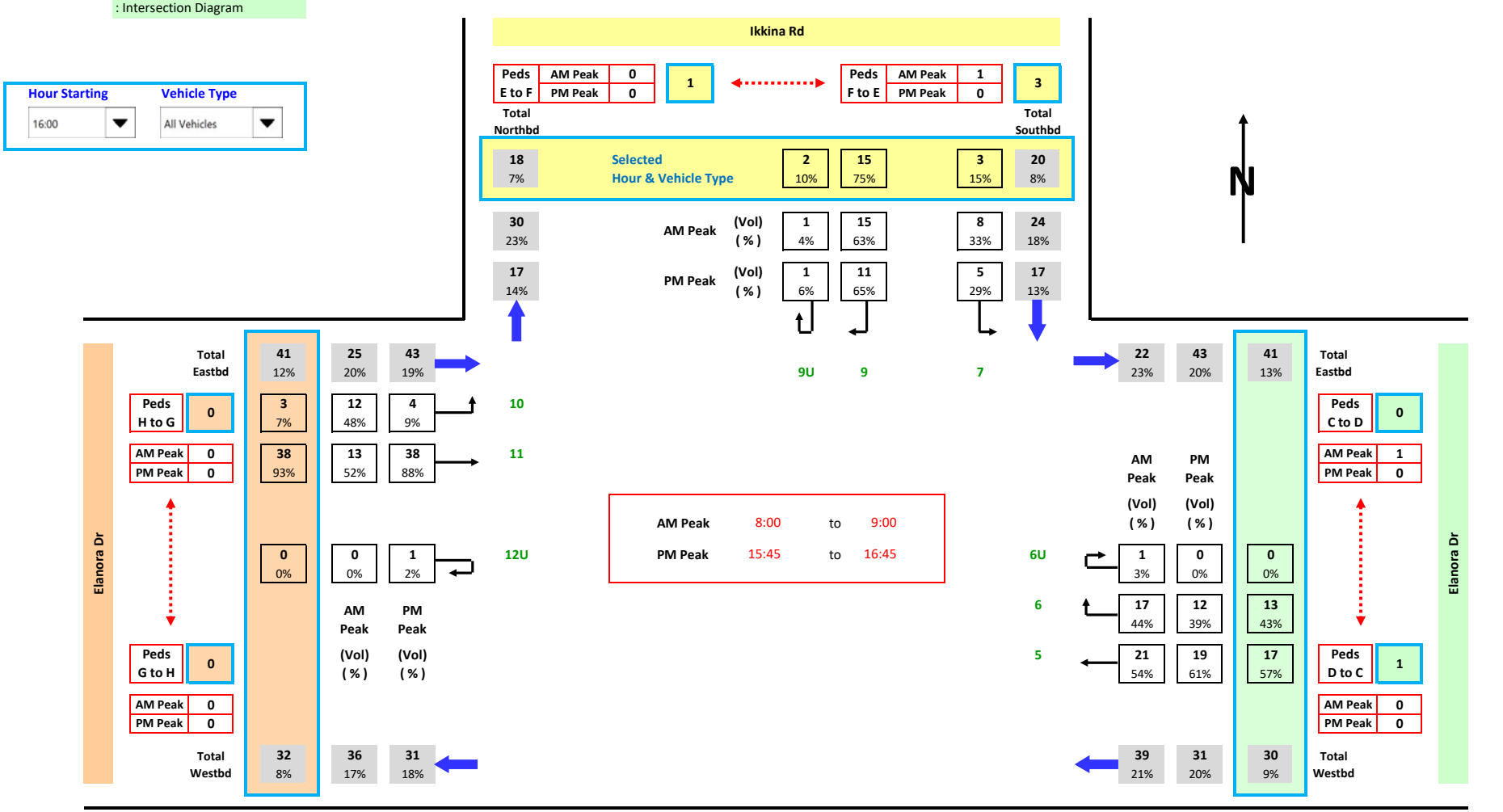
Day/Date : Tue, 23rd Jun 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data



Job No. : Q2694 Note: Counts undertaken during COVID-19 Pandemic
Client : GCCC
Suburb : M.175 Burleigh Heads
Location : 1. Elanora Dr / Ikkina Rd

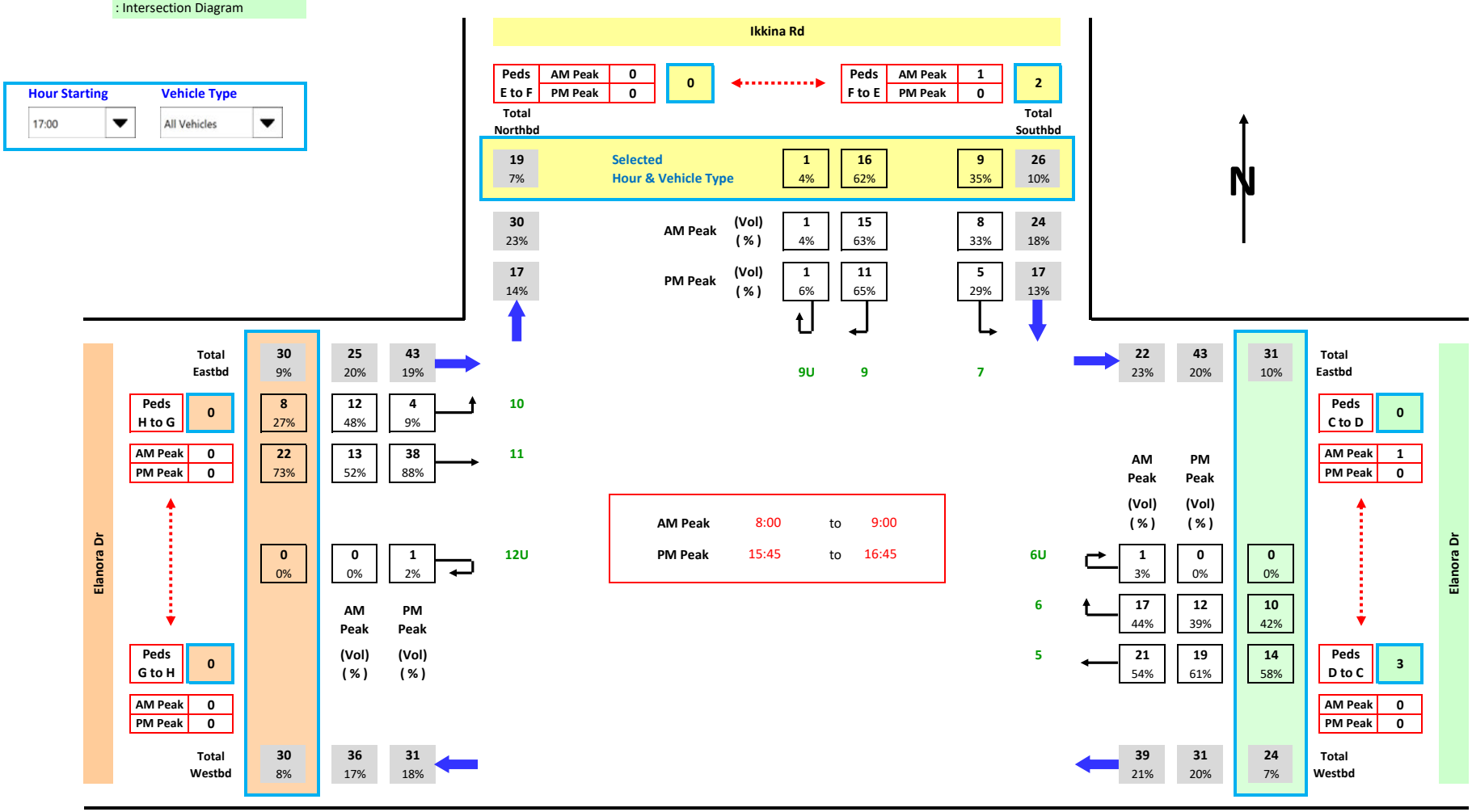
Day/Date : Tue, 23rd Jun 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Job No. : Q2694 Note: Counts undertaken during COVID-19 Pandemic
Client : GCCC
Suburb : M.175 Burleigh Heads
Location : 1. Elanora Dr / Ikkina Rd

Day/Date : Tue, 23rd Jun 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

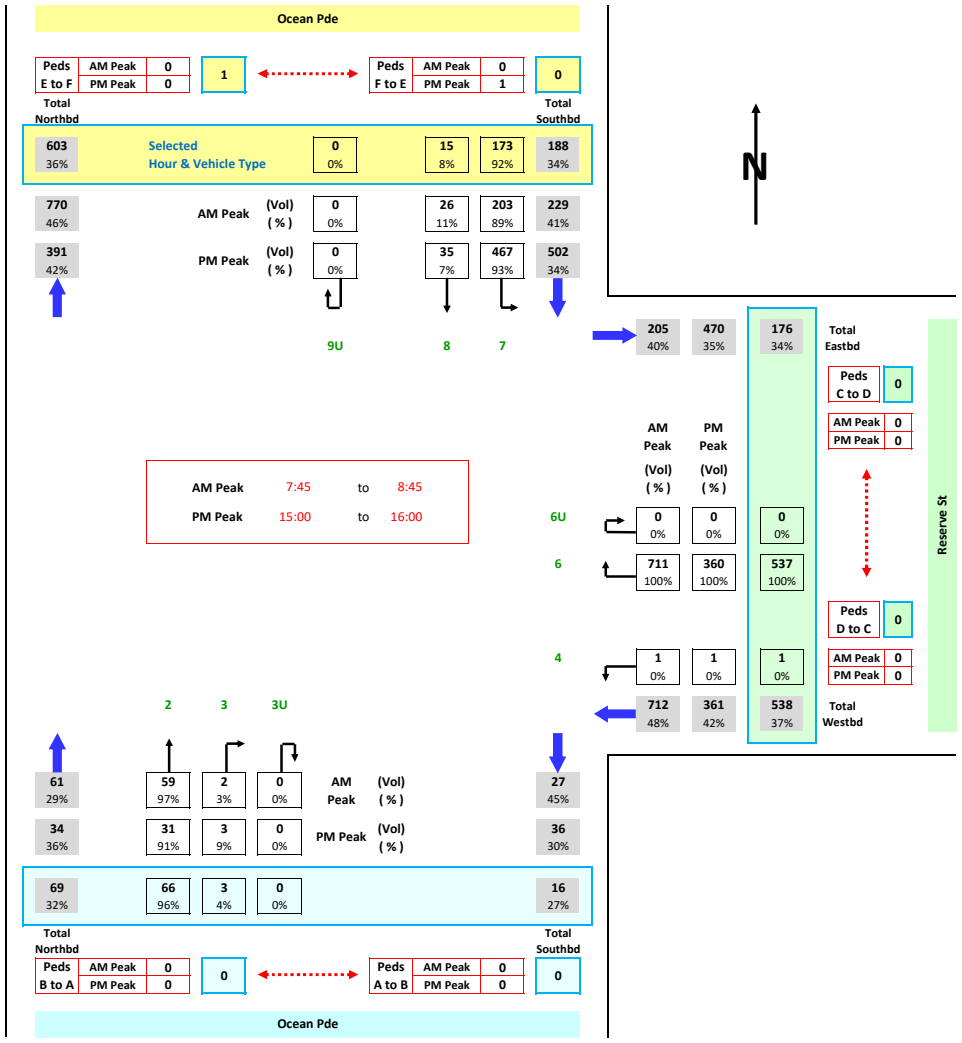
MATRIX Traffic and Transport Data



Job No. : Q2851
Client : GCCC
Suburb : M.230 Burleigh Heads
Location : 1. Ocean Pde / Reserve St

Day/Date : Tues, 24th Nov 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

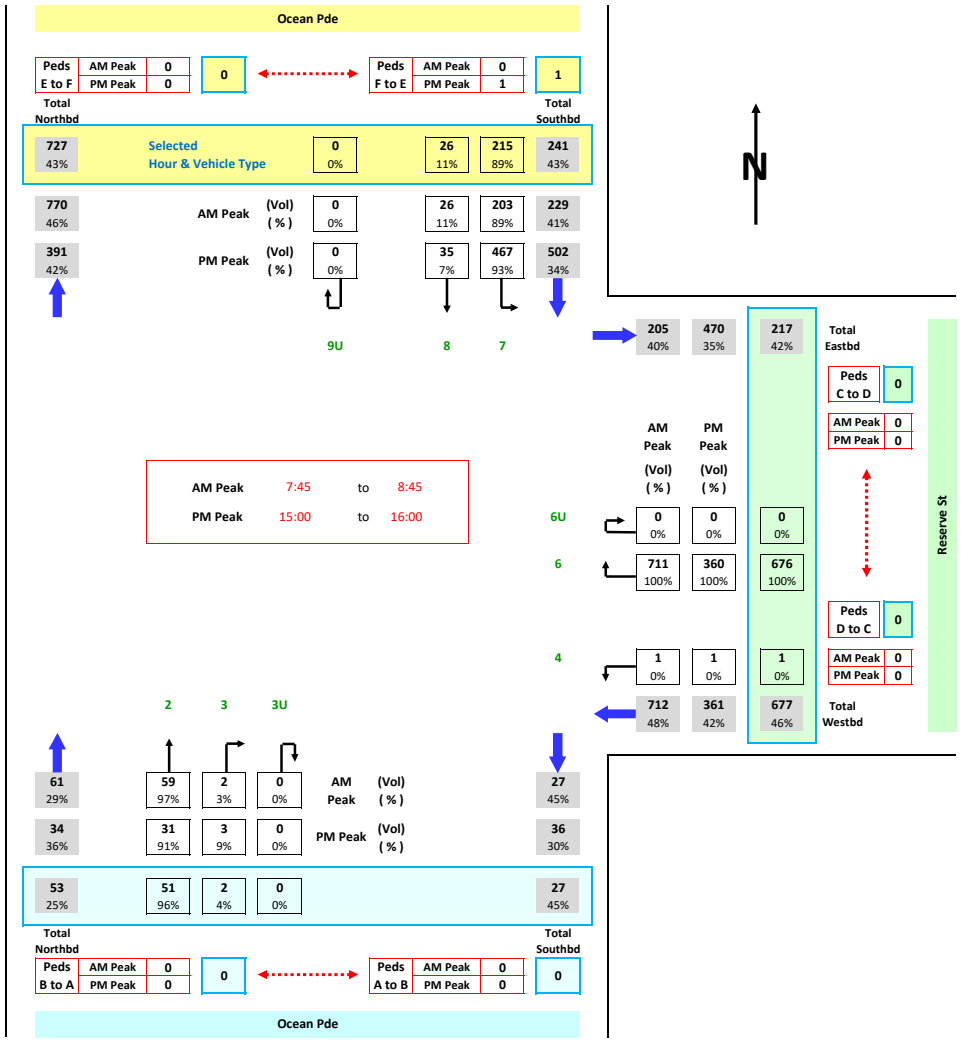
Hour Starting	Vehicle Type
7:00	All Vehicles



Job No. : Q2851
Client : GCCC
Suburb : M.230 Burleigh Heads
Location : 1. Ocean Pde / Reserve St

Day/Date : Tues, 24th Nov 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

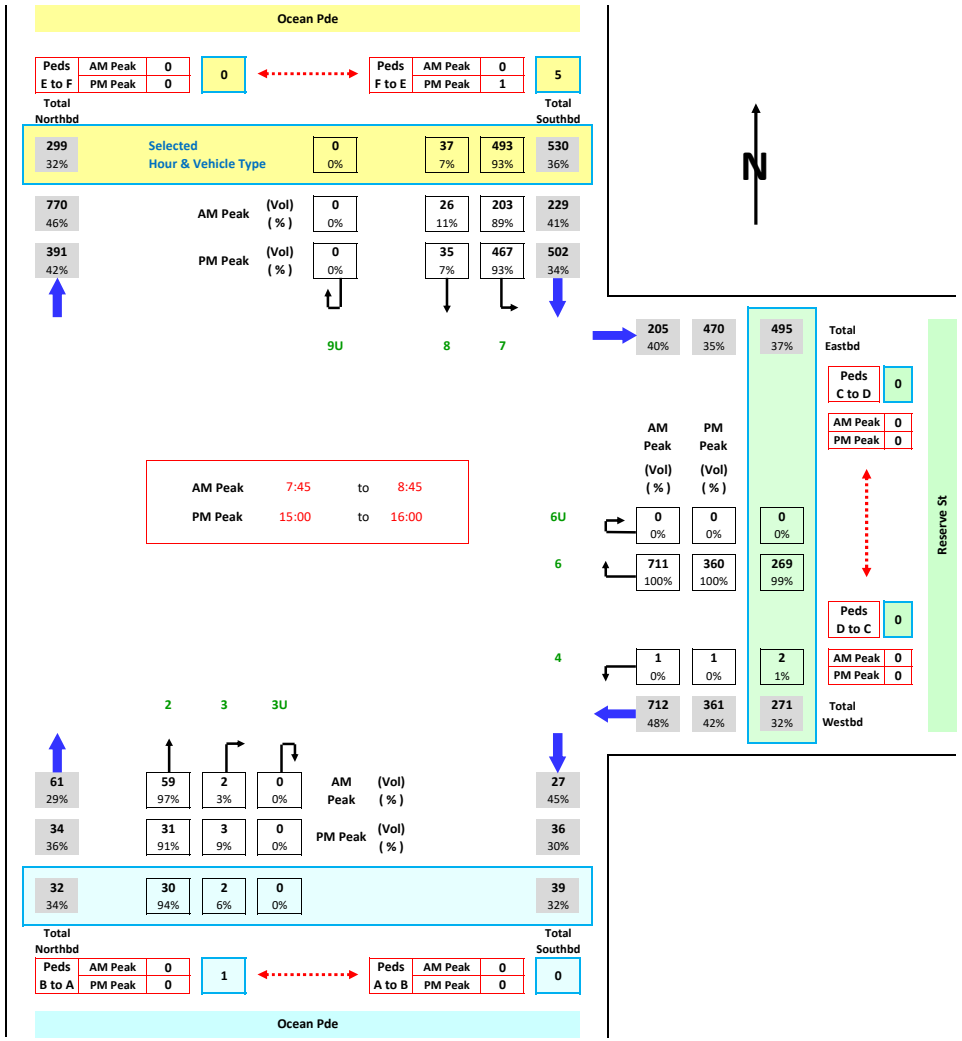
Hour Starting	Vehicle Type
8:00	All Vehicles



Job No. : Q2851
Client : GCCC
Suburb : M.230 Burleigh Heads
Location : 1. Ocean Pde / Reserve St

Day/Date : Tues, 24th Nov 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

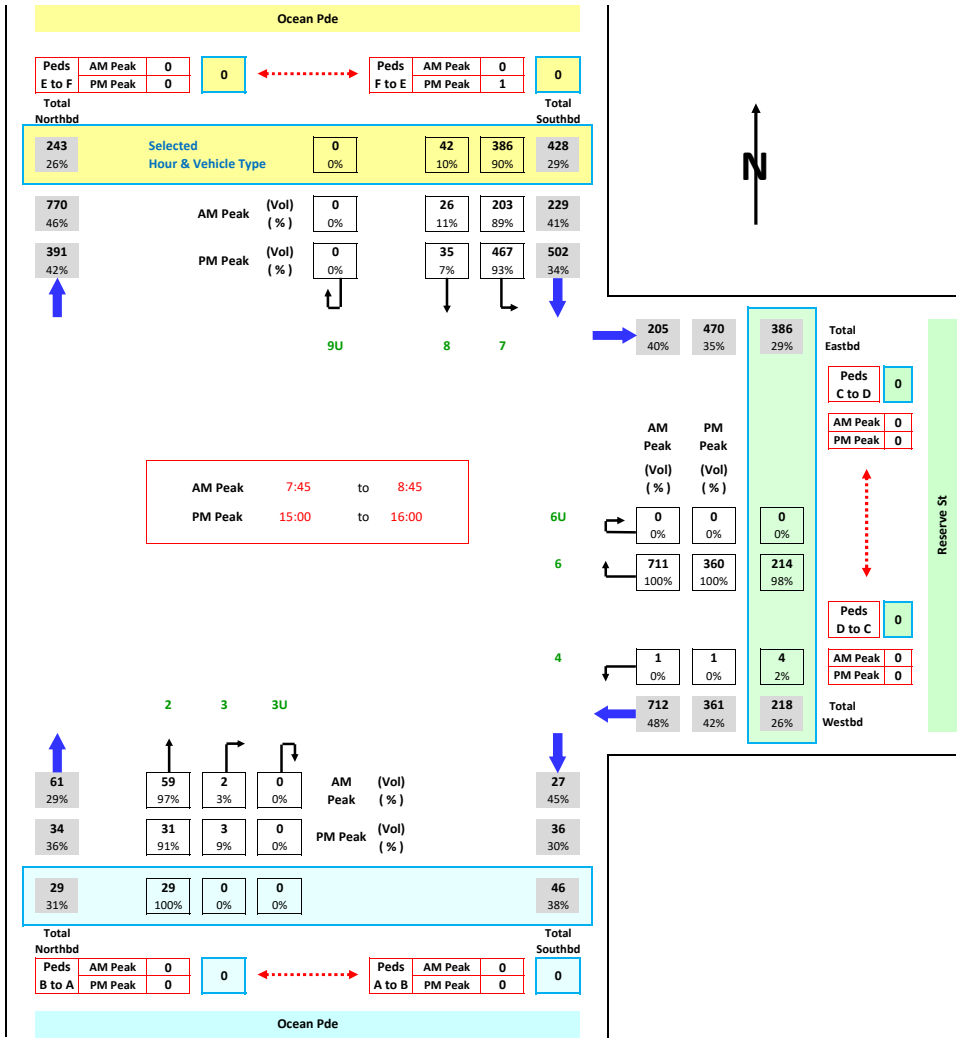
Hour Starting	Vehicle Type
16:00	All Vehicles



Job No. : Q2851
Client : GCCC
Suburb : M.230 Burleigh Heads
Location : 1. Ocean Pde / Reserve St

Day/Date : Tues, 24th Nov 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

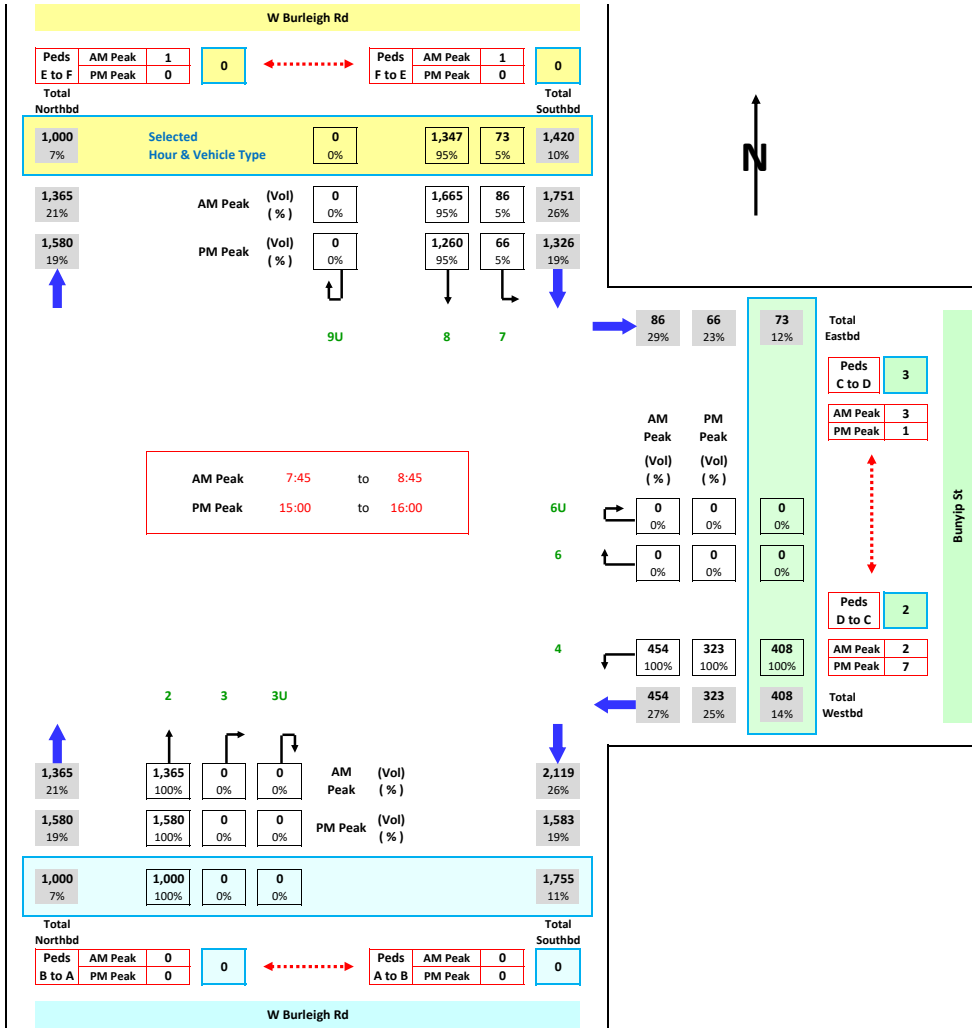
Hour Starting	Vehicle Type
17:00	All Vehicles



Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 3. W Burleigh Rd / Bunyip St

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

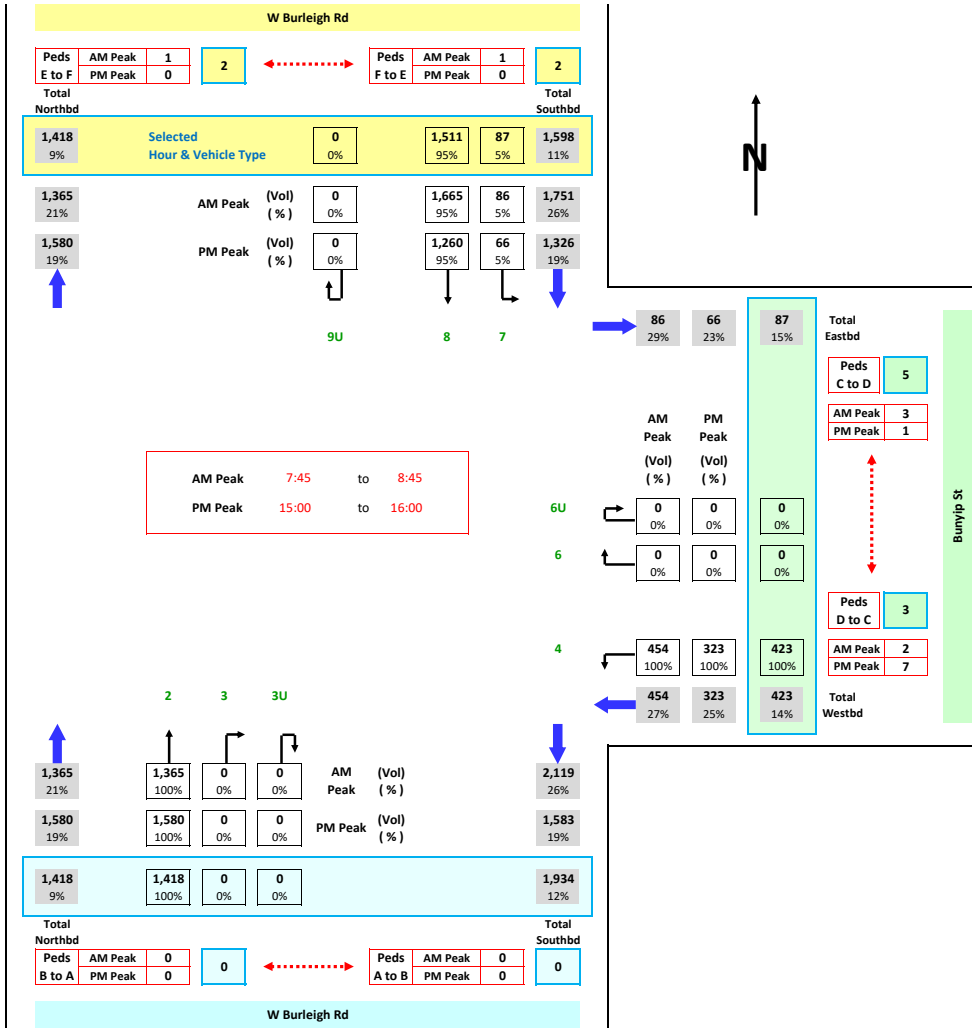
Hour Starting	Vehicle Type
7:00	All Vehicles



Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 3. W Burleigh Rd / Bunyip St

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

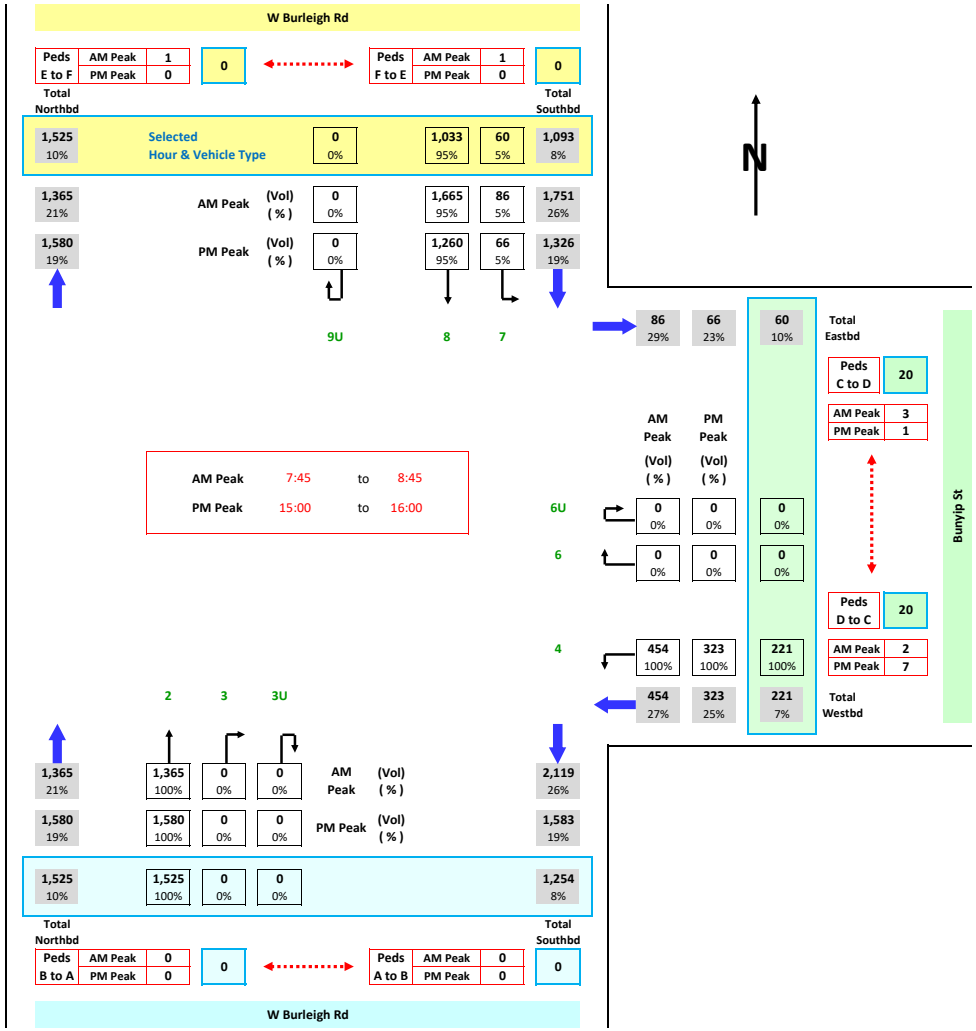
Hour Starting	Vehicle Type
8:00	All Vehicles



Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 3. W Burleigh Rd / Bunyip St

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

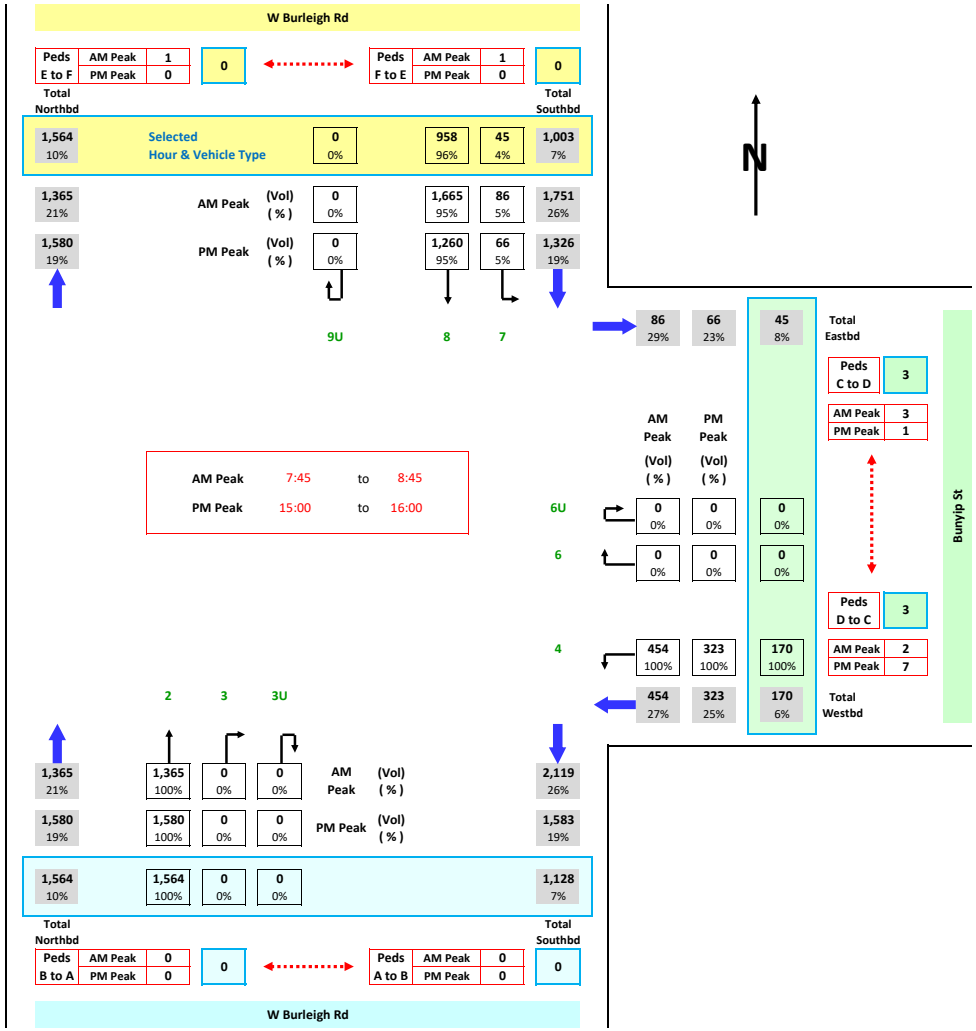
Hour Starting	Vehicle Type
16:00	All Vehicles



Job No. : AUQLD1451
Client : Gold Coast City Council
Suburb : M.271 Koala Park, Burleigh Heads
Location : 3. W Burleigh Rd / Bunyip St

Day/Date : Tue, 27th July 2021
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

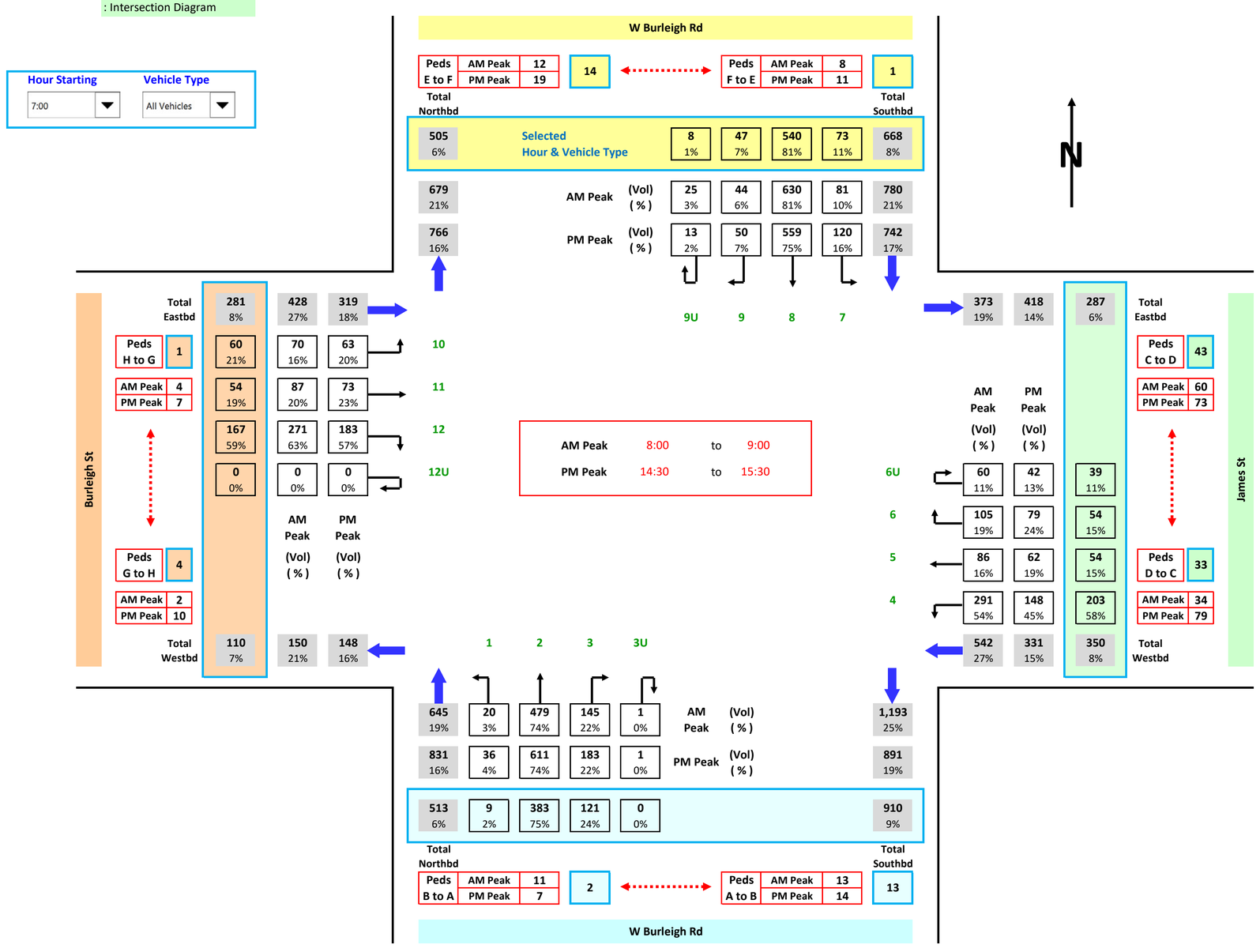
Hour Starting	Vehicle Type
17:00	All Vehicles



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 53. W Burleigh Rd / Burleigh St / James St

Day/Date : Wed, 12th Feb 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

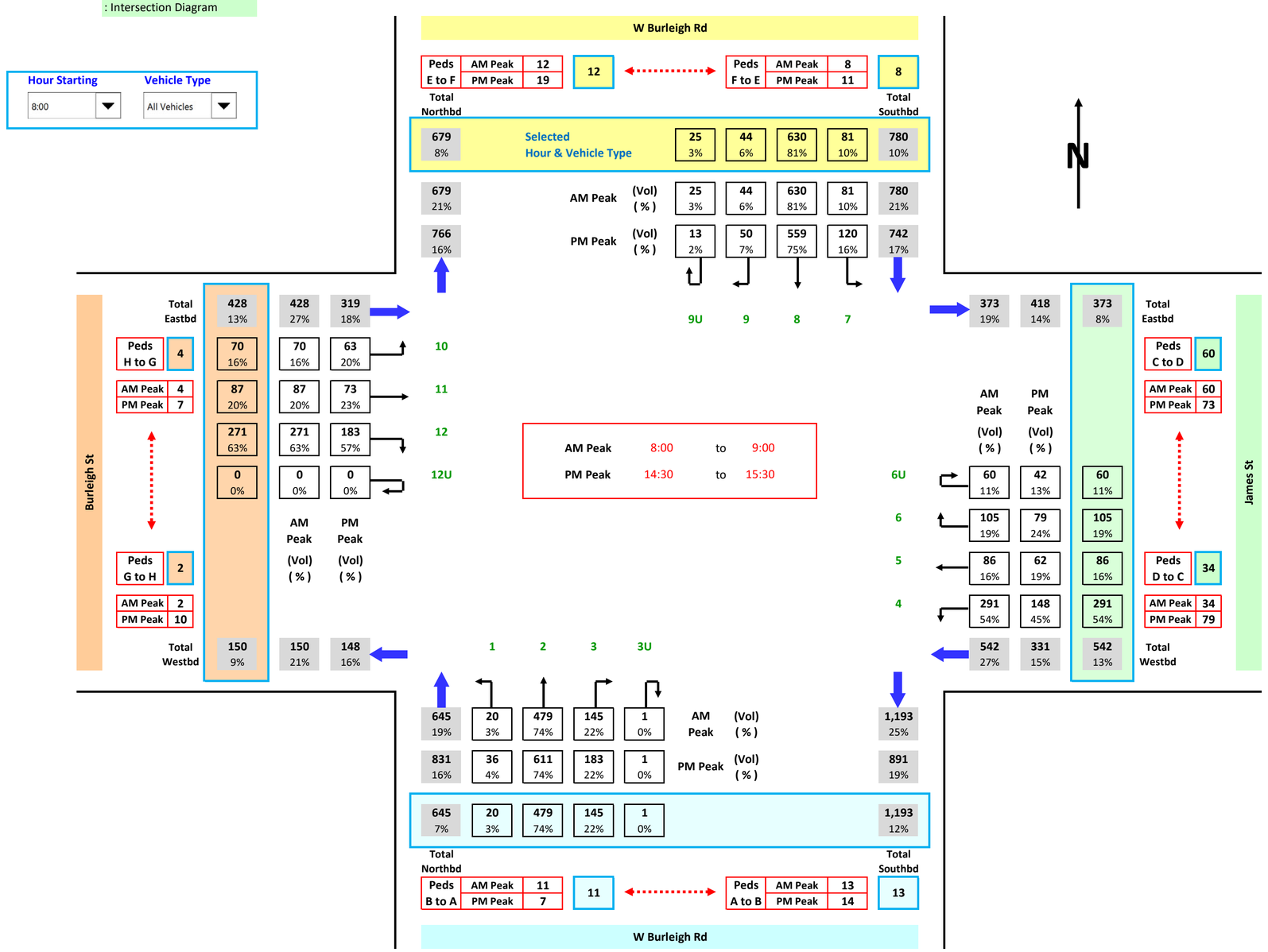
MATRIX Traffic and Transport Data



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 53. W Burleigh Rd / Burleigh St / James St

Day/Date : Wed, 12th Feb 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

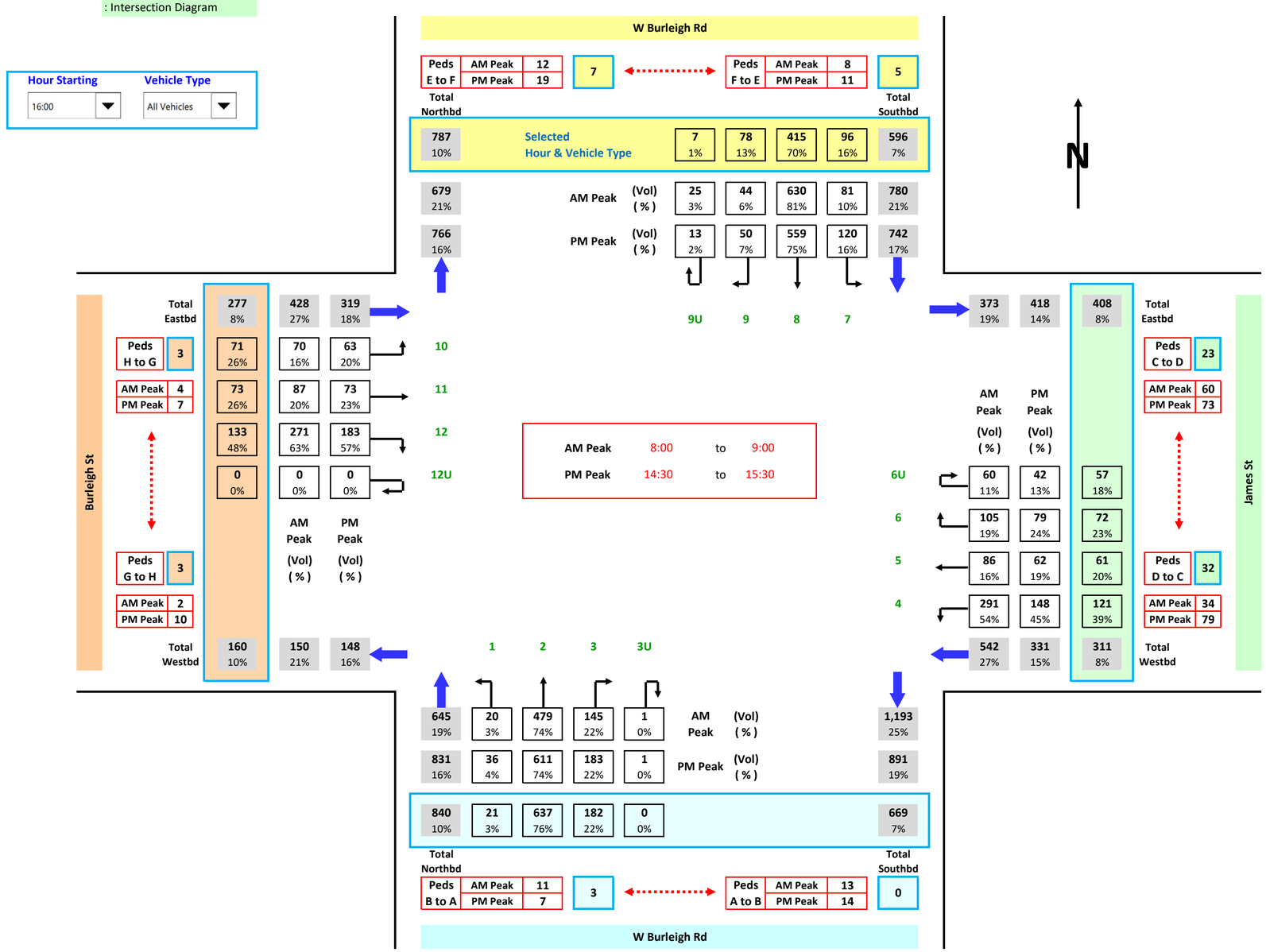
MATRIX Traffic and Transport Data



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 53. W Burleigh Rd / Burleigh St / James St

Day/Date : Wed, 12th Feb 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

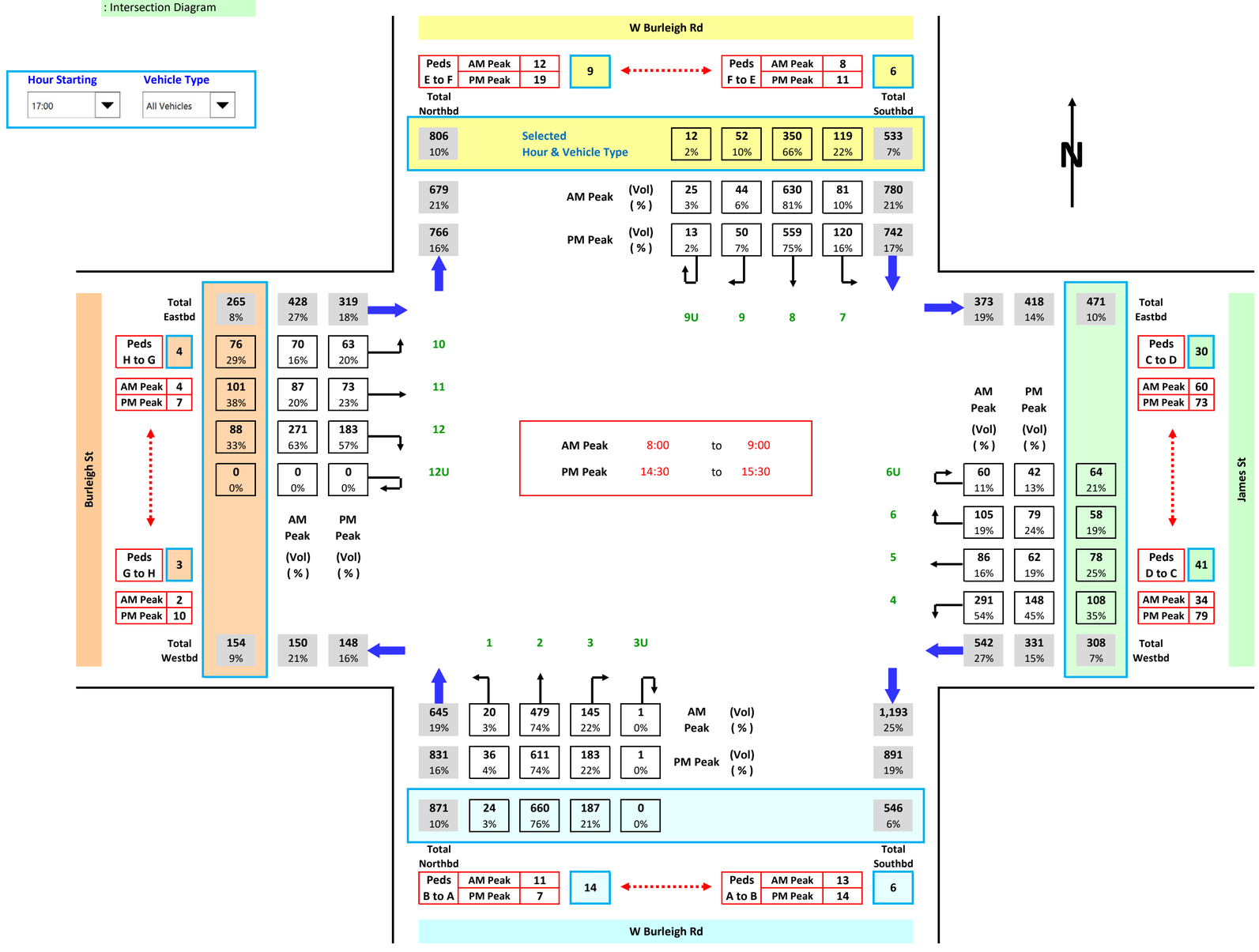
MATRIX Traffic and Transport Data



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 53. W Burleigh Rd / Burleigh St / James St

Day/Date : Wed, 12th Feb 2020
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

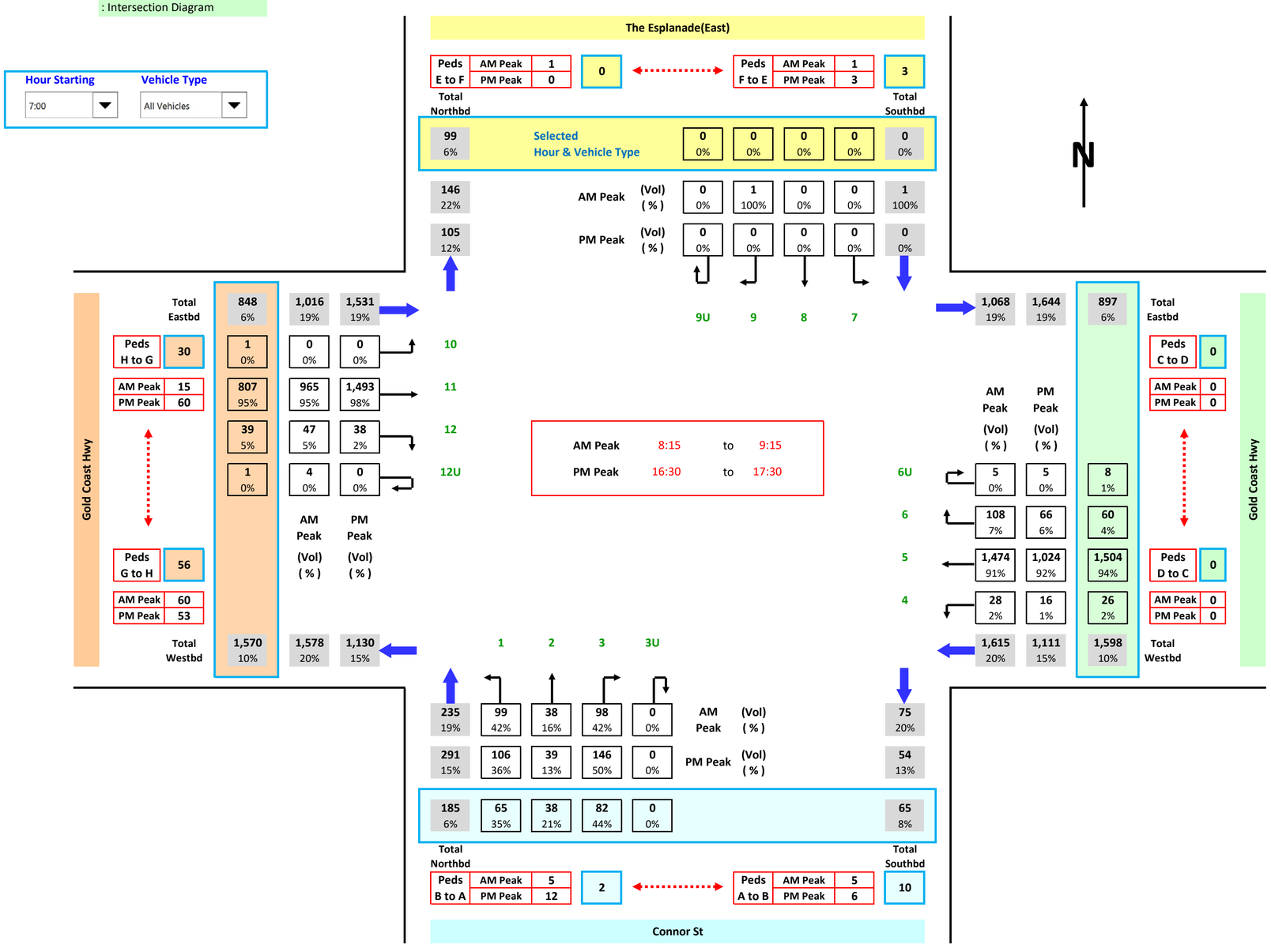
MATRIX Traffic and Transport Data



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 59A. Gold Coast Hwy / Connor St / The Esplanade(East)

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

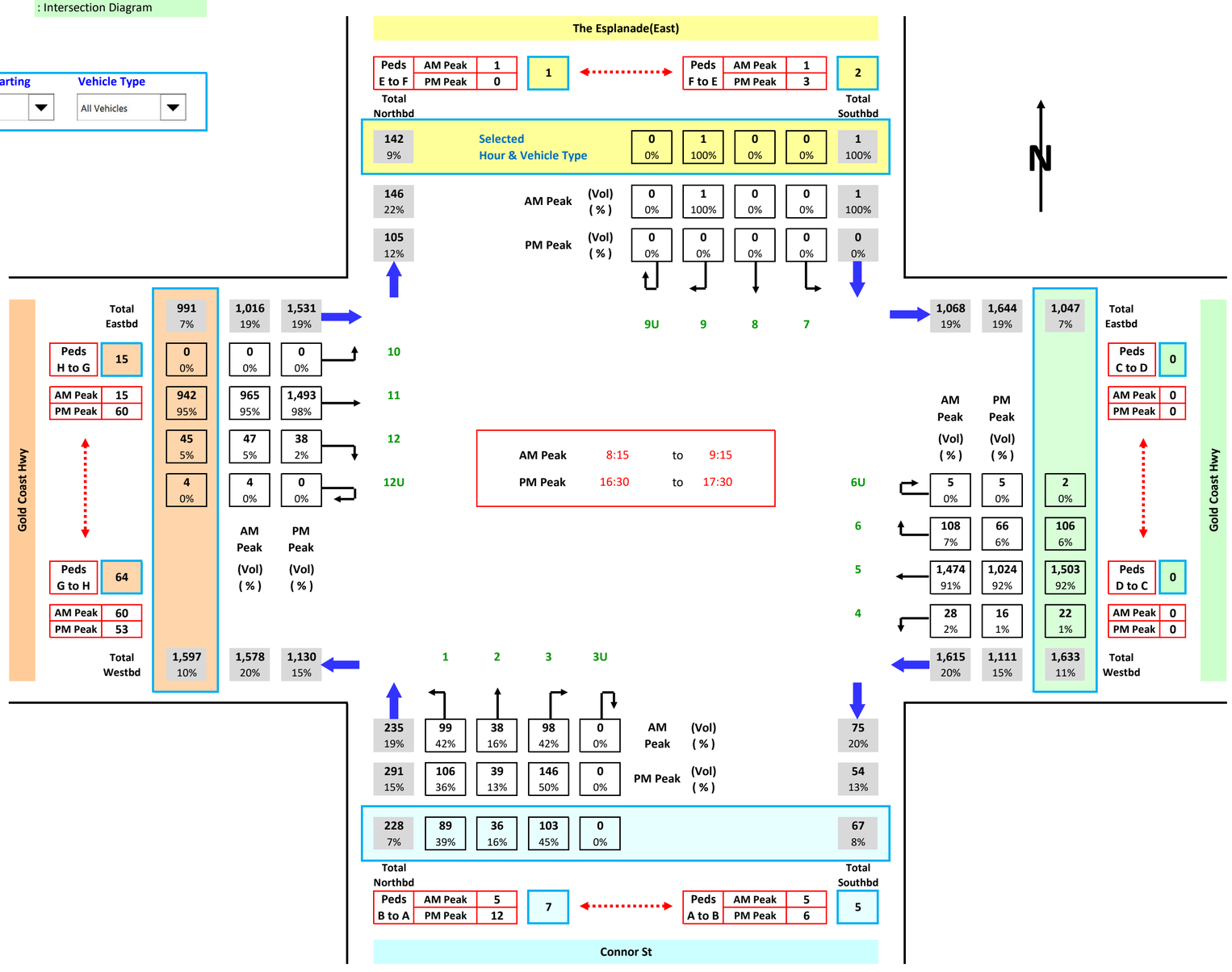


Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 59A. Gold Coast Hwy / Connor St / The Esplanade(East)

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting	Vehicle Type
8:00	All Vehicles

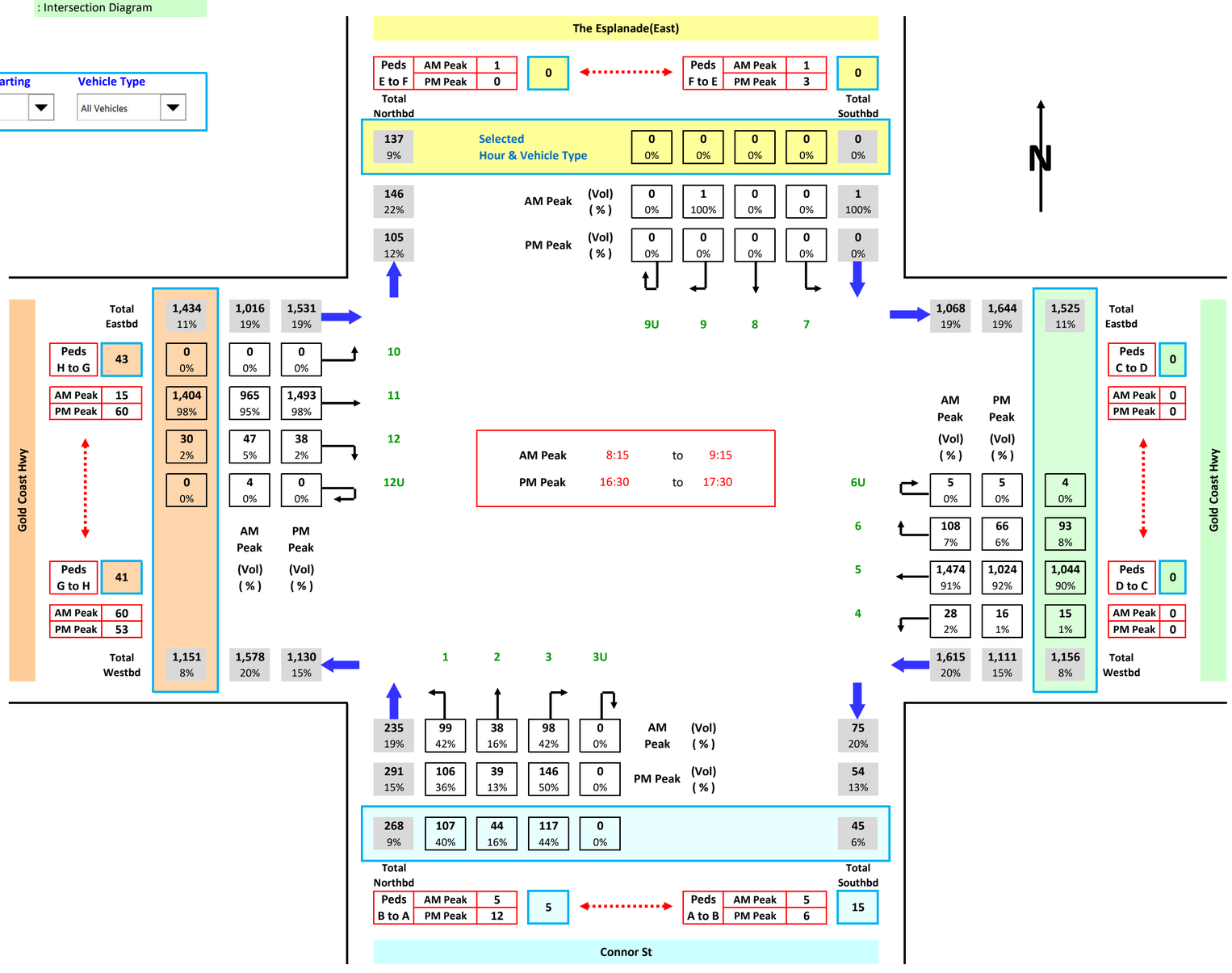


Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 59A. Gold Coast Hwy / Connor St / The Esplanade(East)

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

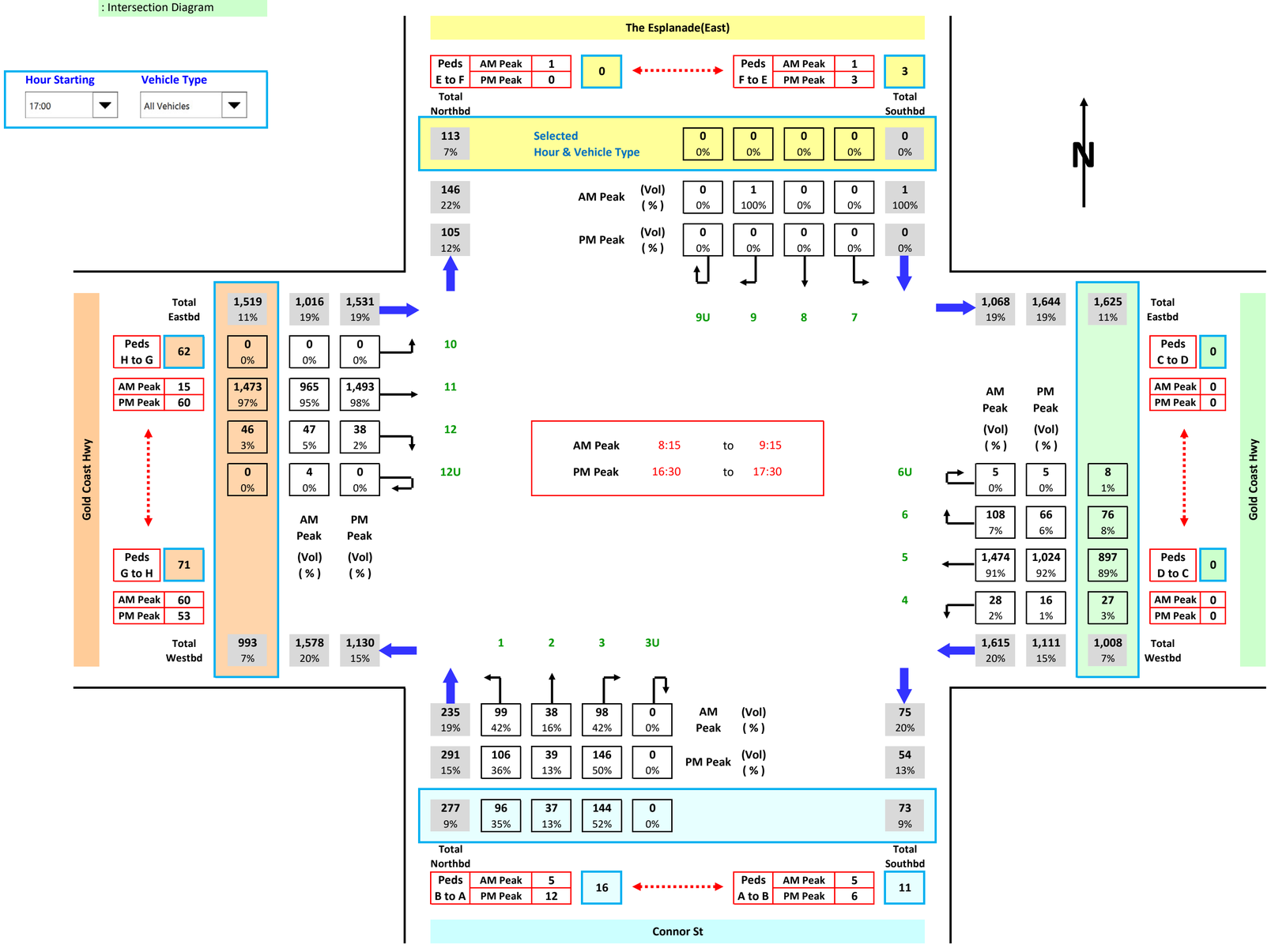
Hour Starting	Vehicle Type
16:00	All Vehicles



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 59A. Gold Coast Hwy / Connor St / The Esplanade(East)

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

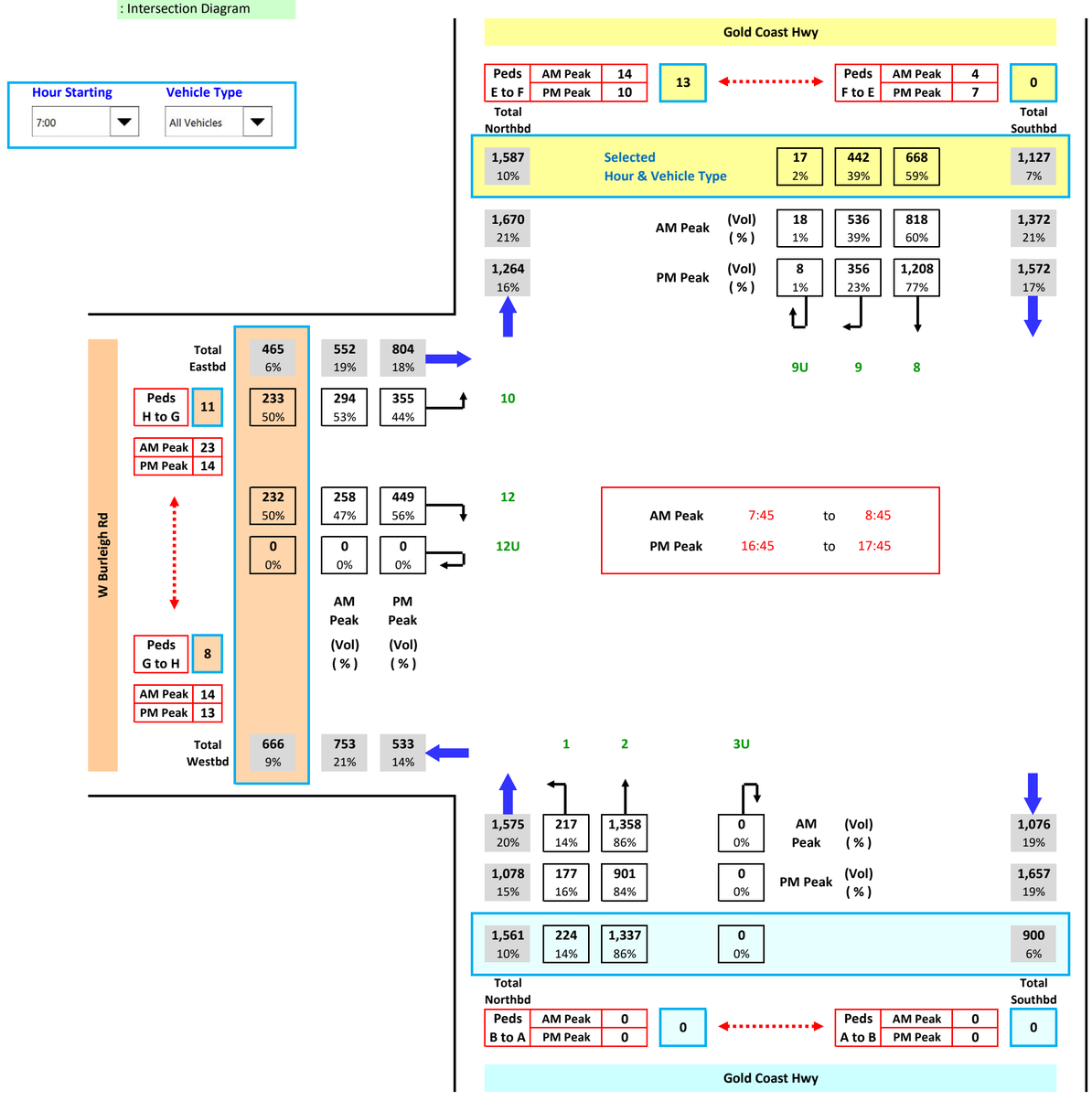
MATRIX Traffic and Transport Data



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 60A. Gold Coast Hwy / W Burleigh Rd

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

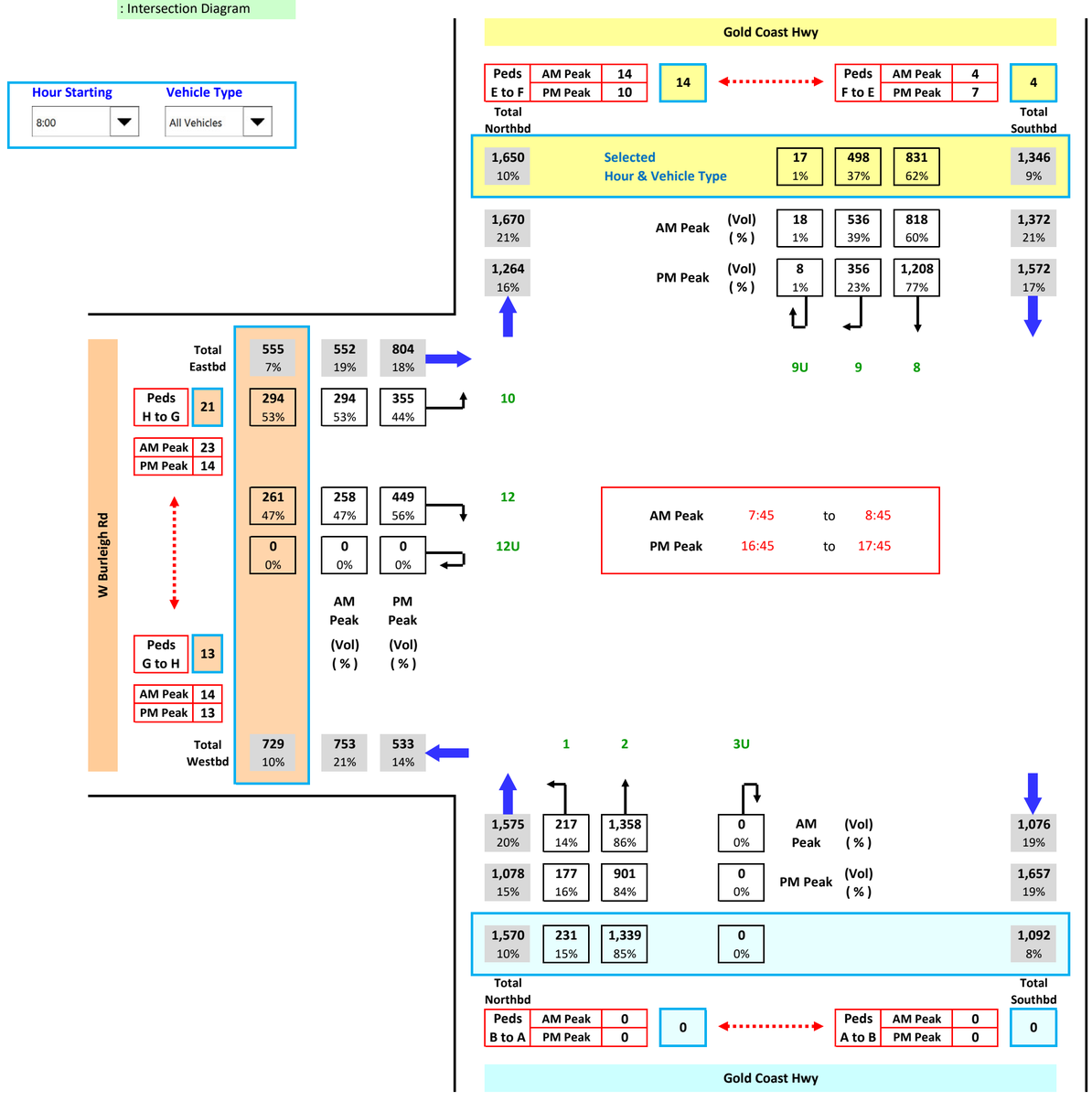
MATRIX Traffic and Transport Data



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 60A. Gold Coast Hwy / W Burleigh Rd

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

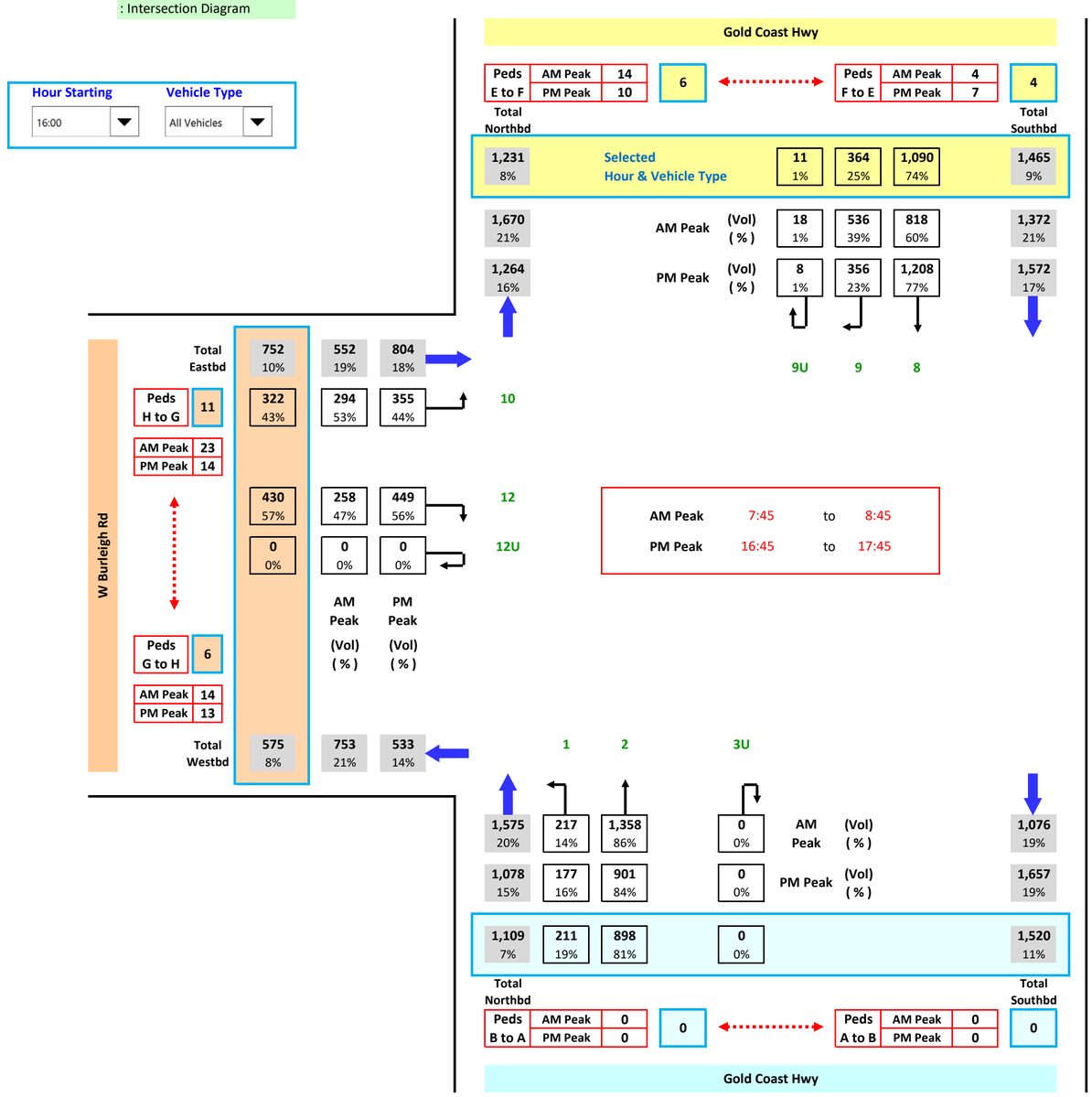
MATRIX Traffic and Transport Data



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 60A. Gold Coast Hwy / W Burleigh Rd

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

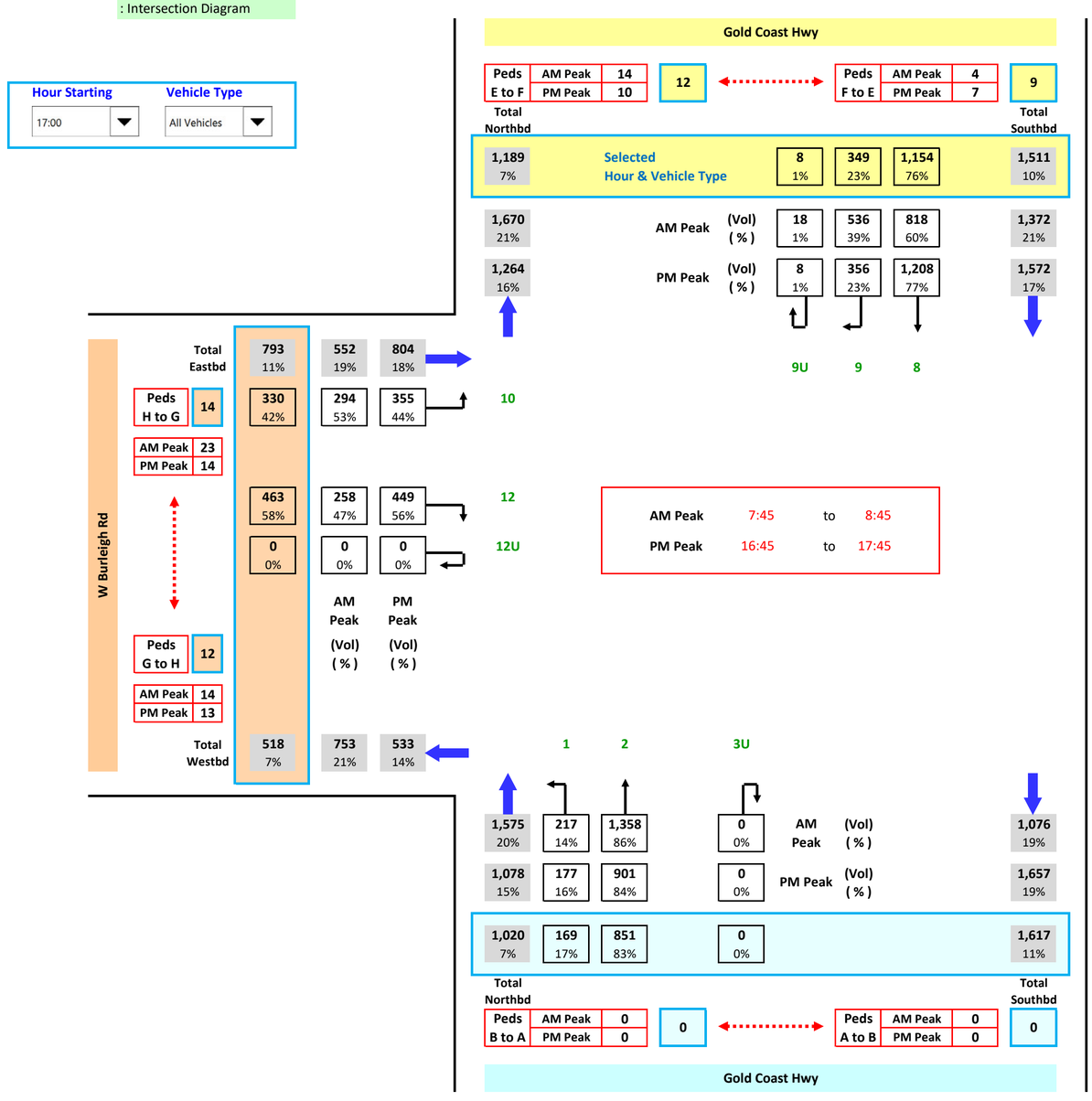
MATRIX Traffic and Transport Data



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 60A. Gold Coast Hwy / W Burleigh Rd

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

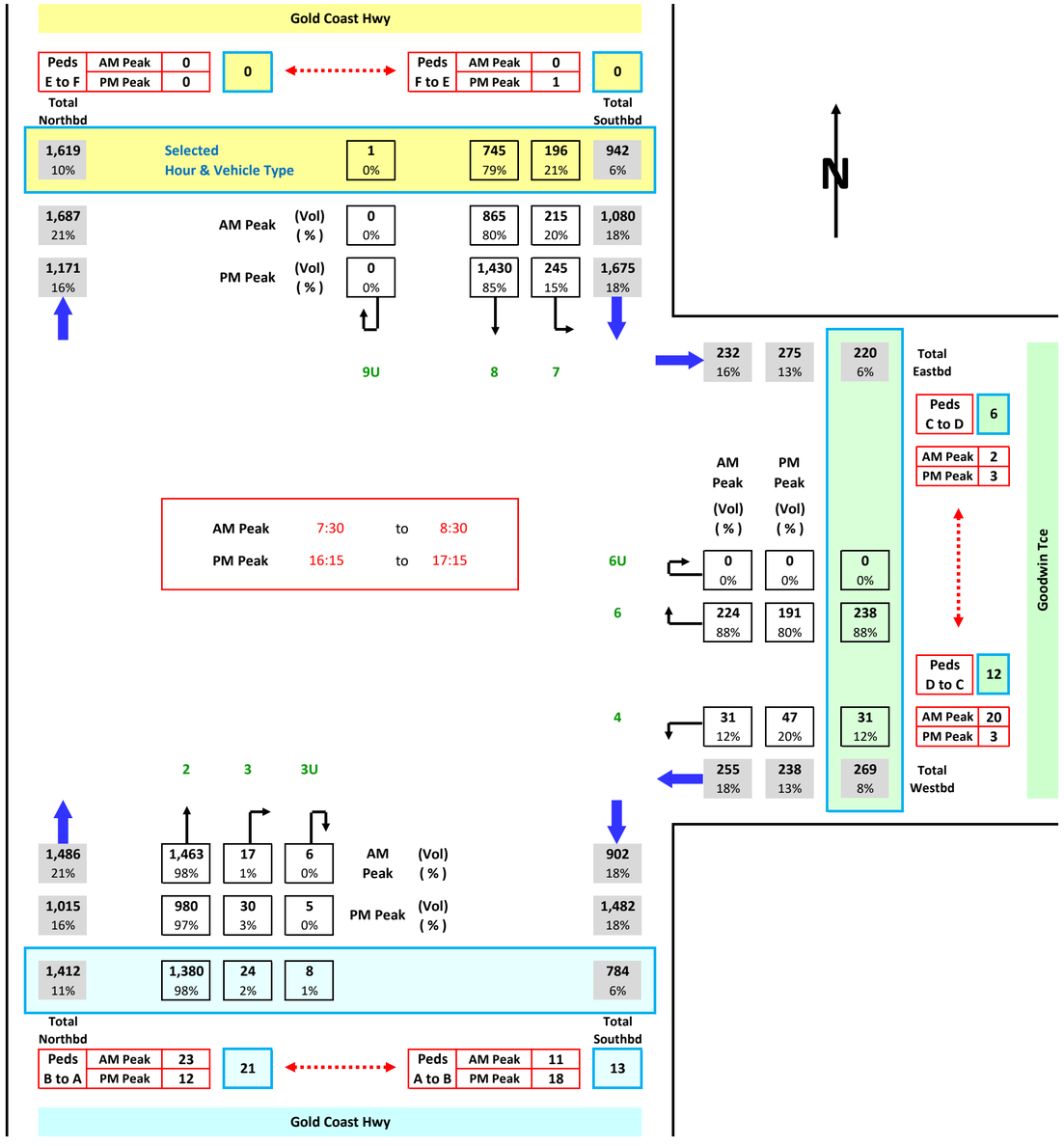


Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 61. Gold Coast Hwy / Goodwin Tce

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

Hour Starting	Vehicle Type
7:00	All Vehicles

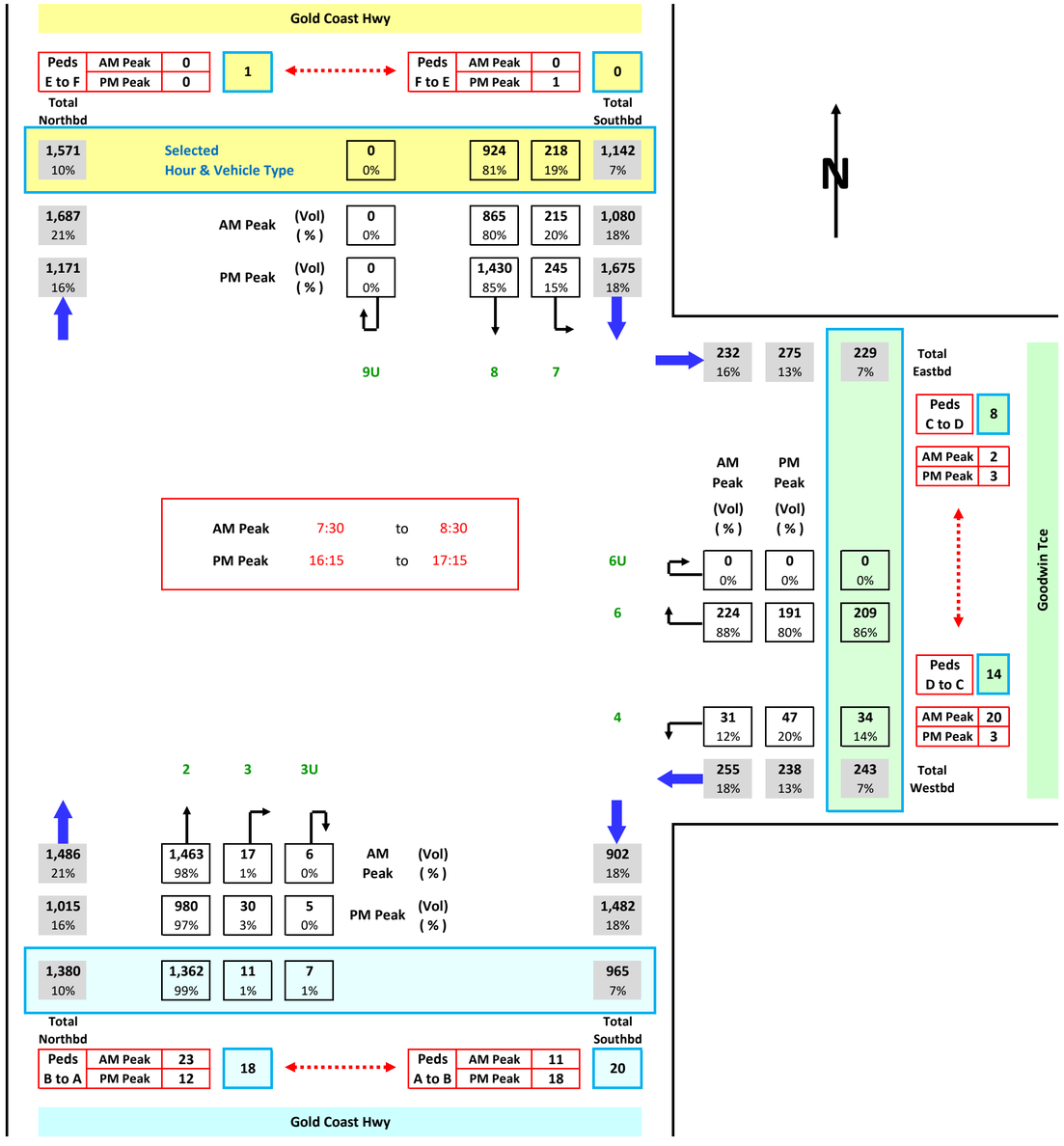
MATRIX Traffic and Transport Data



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 61. Gold Coast Hwy / Goodwin Tce

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

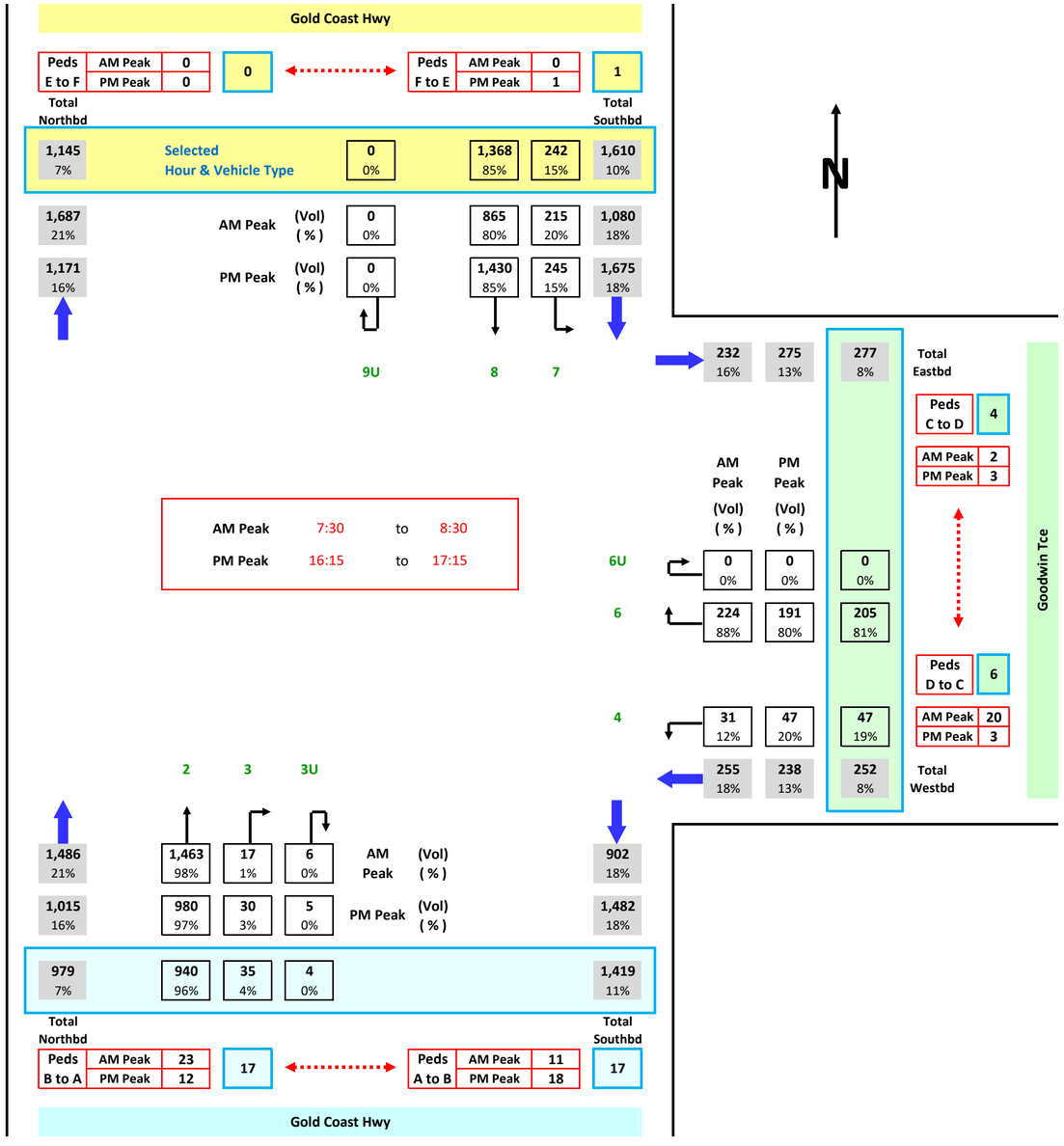
Hour Starting	Vehicle Type
8:00	All Vehicles



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 61. Gold Coast Hwy / Goodwin Tce

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

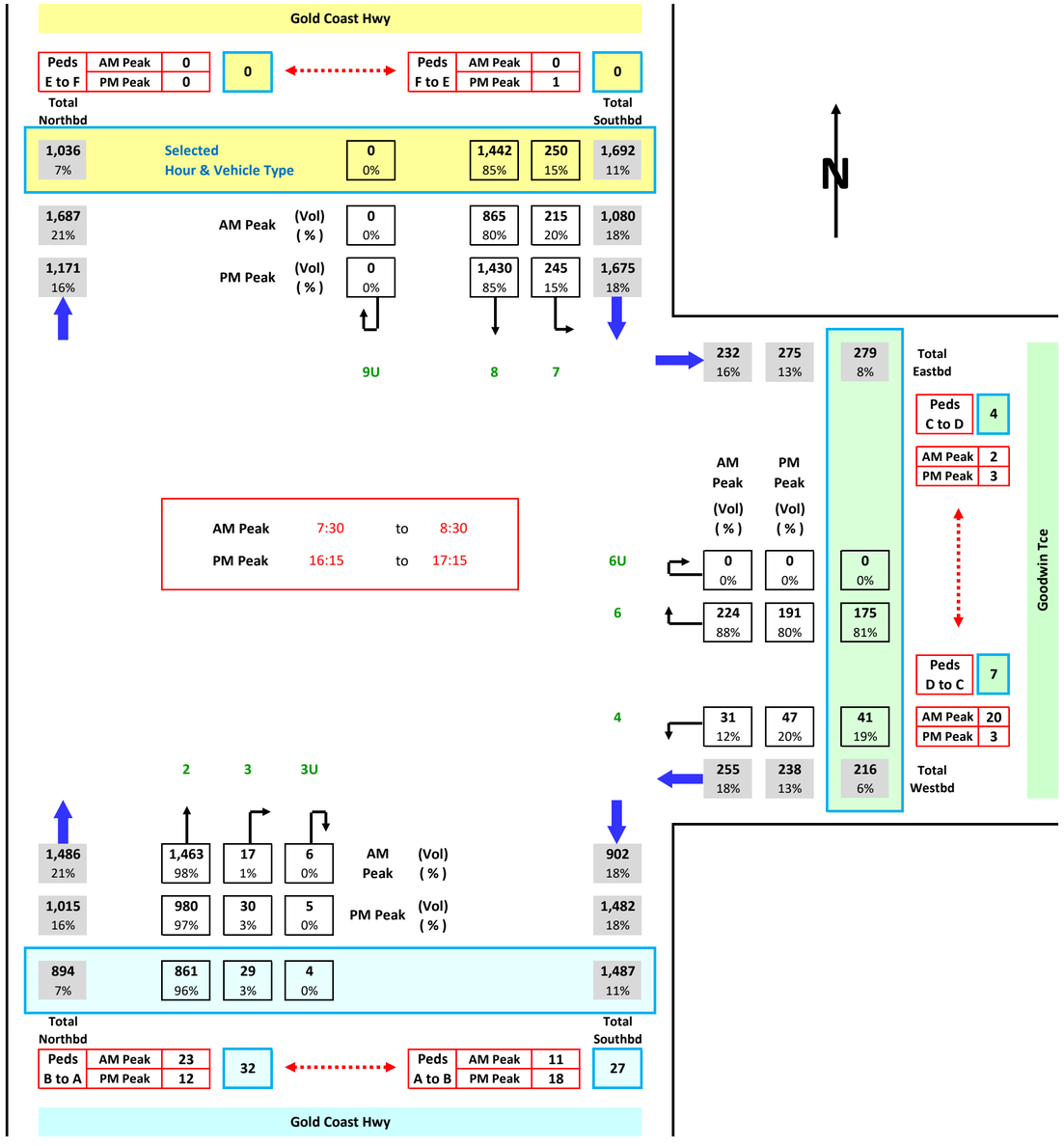
Hour Starting	Vehicle Type
16:00	All Vehicles



Job No. : M.143
Client : GCCC
Suburb : GCCC Light Rail 3A
Location : 61. Gold Coast Hwy / Goodwin Tce

Day/Date : Wed, 12th Feb 2020
Weather : Rainy
Description : Classified Intersection Count
: Intersection Diagram

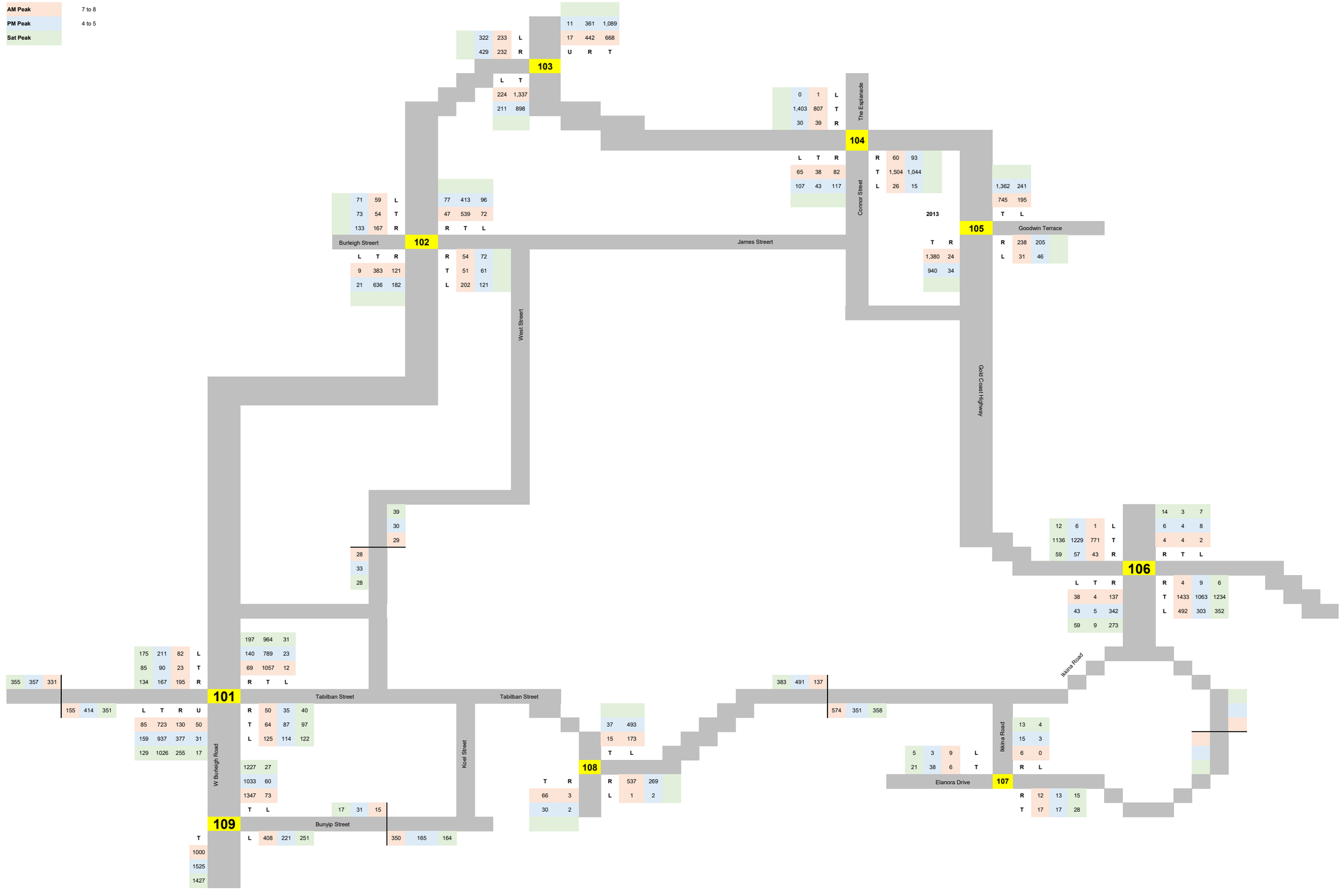
Hour Starting	Vehicle Type
17:00	All Vehicles



Appendix B: Network Diagrams

TOTAL (LV + HV)

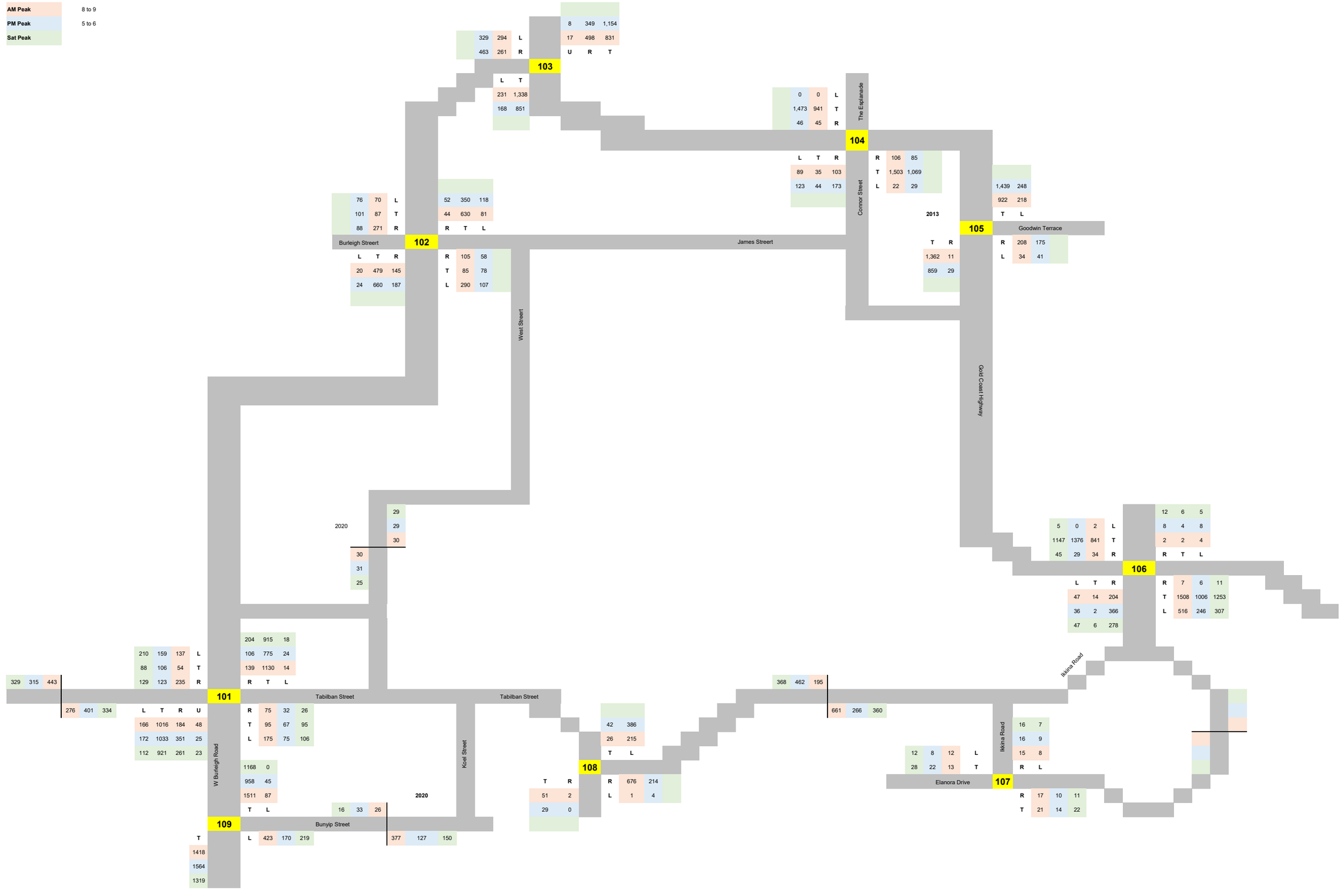
AM Peak	7 to 8
PM Peak	4 to 5
Sat Peak	



BITZIOS consulting	Project Name: Koala Park 2021 Base Model Calibration & Validation	Sheet Name: Surveyed Traffic Volumes Hr 1 of 2 in Peak	Date: 23/02/2022	Sheet Number: 1 of 2

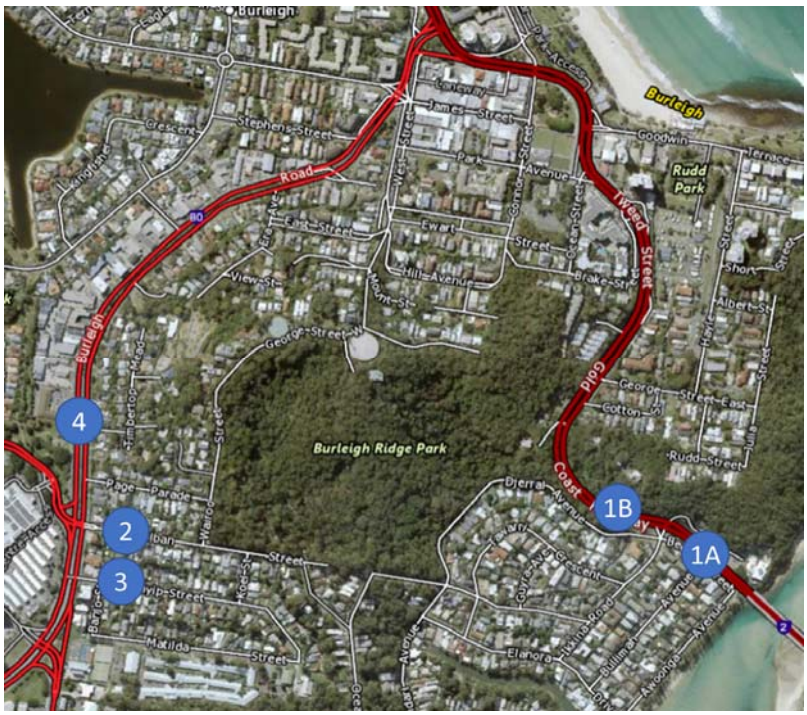
TOTAL (LV + HV)

AM Peak	8 to 9
PM Peak	5 to 6
Sat Peak	



BITZIOS consulting	Project Name: Koala Park 2021 Base Model Calibration & Validation	Sheet Name: Surveyed Traffic Volumes Hr 2 of 2 in Peak	Date: 23/02/2022	Sheet Number: 2 of 2

Appendix C: OD Survey Data



MATRIX
Traffic and Transport Data

AUQLD1451 Koala Park OD - AM

Date	27/07/2021		
Start Time	7:00:00 AM	**End Time**	8:00:00 AM
Match Time	20 Minutes		

O-D Matches - Classification 1 - Light

Time Period 7:00 8:00	Destination Station	1A SB	1B NB	2 WB	3 WB	4 SB
Origin Station	Volume	733	1875	227	410	1157
1A NB	1875			166	299	112
1B SB	733			9	19	
2 EB	162	127	21			
3 EB	69	3	0			
4 NB	778	49				

O-D Matches - Classification 2 - Heavy

Time Period 7:00 8:00	Destination Station	1A SB	1B NB	2W	3W	4S
Origin Station	Volume	51	57	2	2	23
1A NB	57			1	1	0
1B SB	51			0	0	
2E	2	2	0			
3E	2	0	0			
4N	46	9				

O-D Matches - Total Vehicles

Time Period 7:00 8:00	Destination Station	1A SB	1B NB	2W	3W	4S
Origin Station	Volume	784	1932	229	412	1180
1A NB	1932			167	300	112
1B SB	784			9	19	
2E	164	129	21			
3E	71	3	0			
4N	824	58				

AUQLD1451 Koala Park OD - AM

Date	27/07/2021		
Start Time	8:00:00 AM	**End Time**	9:00:00 AM
Match Time	20 Minutes		

O-D Matches - Classification 1 - Light

Time Period 8:00 9:00	Destination Station	1A SB	1B NB	2 WB	3 WB	4 SB
Origin Station	Volume	835	1951	339	416	1335
1A NB	1951			210	245	124
1B SB	835			7	13	
2 EB	214	194	27			
3 EB	83	3	0			
4 NB	1210	73				

O-D Matches - Classification 2 - Heavy

Time Period 8:00 9:00	Destination Station	1A SB	1B NB	2W	3W	4S
Origin Station	Volume	44	58	0	2	36
1A NB	58			0	0	17
1B SB	44			0	0	
2E	3	0	0			
3E	4	0	0			
4N	40	7				

O-D Matches - Total Vehicles

Time Period 8:00 9:00	Destination Station	1A SB	1B NB	2W	3W	4S
Origin Station	Volume	879	2009	339	418	1371
1A NB	2009			210	245	141
1B SB	879			7	13	
2E	217	194	27			
3E	87	3	0			
4N	1250	80				

AUQLD1451 Koala Park OD - PM

Date	27/07/2021		
Start Time	4:00:00 PM	**End Time**	5:00:00 PM
Match Time	20 Minutes		

O-D Matches - Classification 1 - Light

Time Period 16:00 17:00	Destination Station	1A SB	1B NB	2 WB	3 WB	4 SB
Origin Station	Volume	1272	1361	222	220	982
1A NB	1361			146	104	77
1B SB	1272			12	8	
2 EB	480	322	26			
3 EB	58	27	27			
4 NB	1314	153				

O-D Matches - Classification 2 - Heavy

Time Period 16:00 17:00	Destination Station	1A SB	1B NB	2 WB	3 WB	4 SB
Origin Station	Volume	26	28	1	0	21
1A NB	28			1	0	7
1B SB	26			0	0	
2 EB	2	1	0			
3 EB	0	0	0			
4 NB	16	3				

O-D Matches - Total Vehicles

Time Period 16:00 17:00	Destination Station	1A SB	1B NB	2 WB	3 WB	4 SB
Origin Station	Volume	1298		223	220	1003
1A NB	1389			147	104	84
1B SB	1298			12	8	
2 EB		323	26			
3 EB		27	27			
4 NB	1330	156				

AUQLD1451 Koala Park OD - PM

Date	27/07/2021		
Start Time	5:00:00 PM	**End Time**	6:00:00 PM
Match Time	20 Minutes		

O-D Matches - Classification 1 - Light

Time Period 17:00 18:00	Destination Station	1A SB	1B NB	2 WB	3 WB	4 SB
Origin Station	Volume	1413	1243	159	170	916
1A NB	1243			80	96	64
1B SB	1413			8	7	
2 EB	472	337	24			
3 EB	44	2	0			
4 NB	1321	117				

O-D Matches - Classification 2 - Heavy

Time Period 17:00 18:00	Destination Station	1A SB	1B NB	2 WB	3 WB	4 SB
Origin Station	Volume	21	24	1	0	18
1A NB	24			0	0	3
1B SB	21			0	0	
2 EB	2	1	0			
3 EB	1	0	0			
4 NB	9	4				

O-D Matches - Total Vehicles

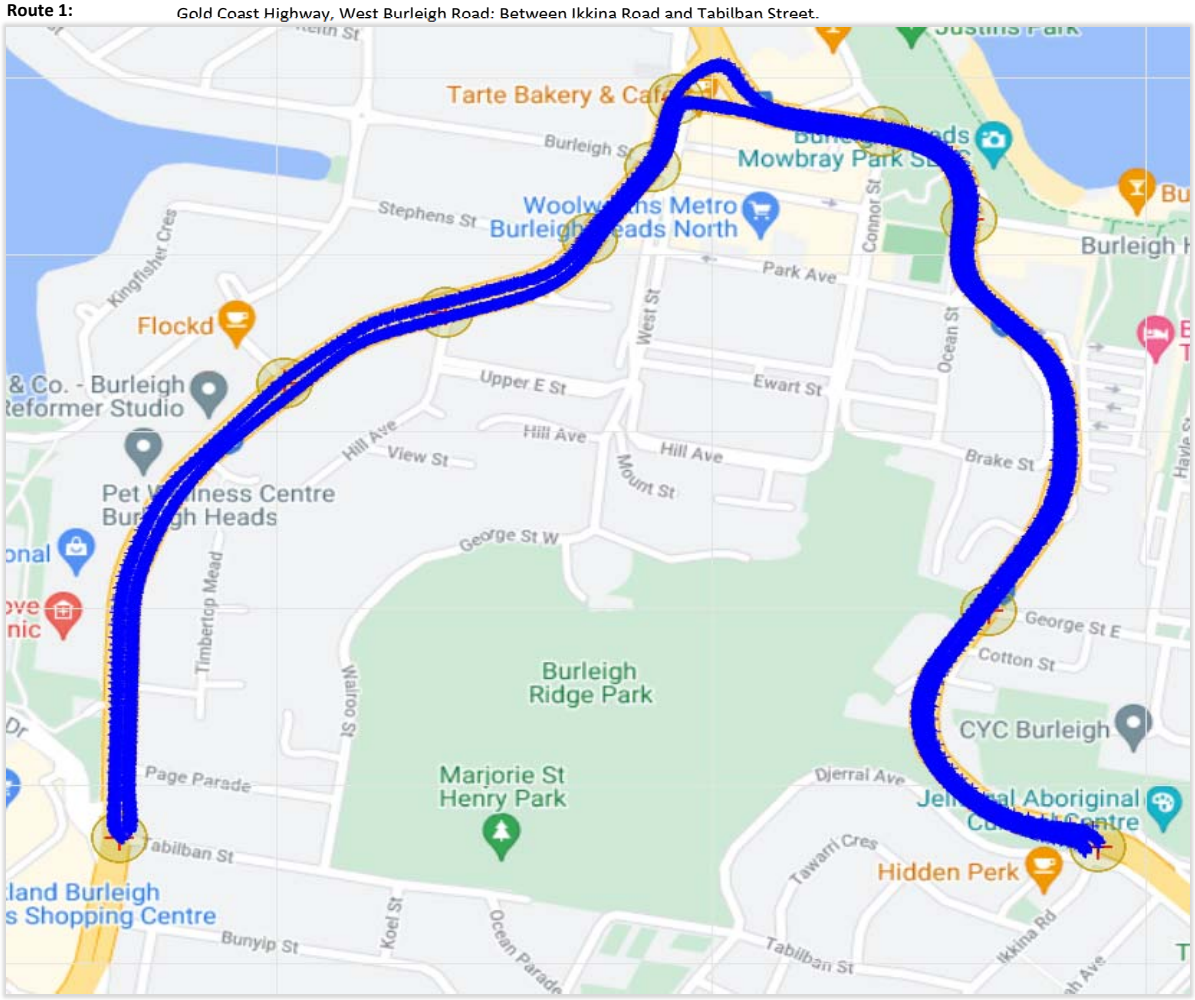
Time Period 17:00 18:00	Destination Station	1A SB	1B NB	2 WB	3 WB	4 SB
Origin Station	Volume	1434		160	170	934
1A NB	1267			80	96	67
1B SB	1434			8	7	
2 EB		338	24			
3 EB		2	0			
4 NB	1330	121				

Appendix D: Travel Time Survey Data

Client:	City of Gold Coast
Route Name:	Gold Coast Highway, West Burleigh Road
Route Range:	Between Ikkina Road and Tabilban Street
Survey Date:	Thursday, 22 July 2021

MATRIX Traffic and Transport Data

Route 1: Gold Coast Highway, West Burleigh Road: Between Ikkina Road and Tabilban Street.



Client:	City of Gold Coast
Route Name:	Gold Coast Highway, West Burleigh Road
Route Range:	Between Ikkina Road and Tabilban Street
Survey Date:	Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Eastbound

Directions
- (•) Eastbound
- ( ) Westbound

Survey Periods
AMPK
06:00 - 09:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	18	18	18	18
Average	0:05:19	2653.18	31.2	0:01:46
Median	0:05:20	2650.39	29.8	0:01:45
Minimum	0:03:27	2630.68	21.7	0:00:08
Maximum	0:07:20	2672.72	45.8	0:03:49
Standard Deviation	0:01:05	12.88	6.8	0:00:59

Threshold Speed for Delay: 5 km/h

Client:	City of Gold Coast
Route Name:	Gold Coast Highway, West Burleigh Road
Route Range:	Between Ikkina Road and Tabilban Street
Survey Date:	Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Westbound

Directions
- Eastbound
- Westbound

Survey Periods
AMPK
06:00 - 09:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	22	22	22	22
Average	0:05:09	2577.13	30.8	0:01:17
Median	0:05:06	2578.13	30.3	0:01:08
Minimum	0:03:34	2563.76	23	0:00:01
Maximum	0:06:44	2582.2	43	0:02:45
Standard Deviation	0:00:49	4.93	5	0:00:45

Threshold Speed for Delay: 5 km/h

Client:	City of Gold Coast
Route Name:	Gold Coast Highway, West Burleigh Road
Route Range:	Between Ikkina Road and Tabilban Street
Survey Date:	Thursday, 22 July 2021

Survey Period: 14:00 - 18:00
Direction: Eastbound

Directions
- (•) Eastbound
- ( ) Westbound

Survey Periods
PMPK
14:00 - 18:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	24	24	24	24
Average	0:05:35	2649.64	29.5	0:01:53
Median	0:05:34	2650.78	28.6	0:01:58
Minimum	0:03:33	2632.12	19.3	0:00:03
Maximum	0:08:16	2667.19	44.7	0:04:40
Standard Deviation	0:01:05	9.53	5.6	0:01:04

Threshold Speed for Delay: 5 km/h

Client:	City of Gold Coast
Route Name:	Gold Coast Highway, West Burleigh Road
Route Range:	Between Ikkina Road and Tabilban Street
Survey Date:	Thursday, 22 July 2021

Survey Period: 14:00 - 18:00
Direction: Westbound

Directions
- Eastbound
- Westbound

Survey Periods
PMPK
14:00 - 18:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	29	29	29	29
Average	0:04:38	2575.76	34.1	0:00:52
Median	0:04:30	2576.1	34.2	0:00:52
Minimum	0:03:43	2562.86	25.6	0:00:02
Maximum	0:06:03	2582.97	41.6	0:02:18
Standard Deviation	0:00:41	5.82	4.8	0:00:38

Threshold Speed for Delay: 5 km/h

Client: City of Gold Coast
Route Name: Gold Coast Highway, West Burleigh Road
Route Range: Between Ikkina Road and Tabilban Street
Survey Date: Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Eastbound

Eastbound
Westbound

Periods
AMPK
06:00 - 09:00

Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
AMPK_EB_01	22/07/2021	6:03:47	0:04:32	2650.54	35.1	0:00:59
AMPK_EB_02	22/07/2021	6:12:09	0:05:49	2663.89	27.5	0:02:11
AMPK_EB_03	22/07/2021	6:21:21	0:06:33	2668.55	24.4	0:02:44
AMPK_EB_04	22/07/2021	6:32:50	0:05:14	2662.34	30.5	0:01:39
AMPK_EB_05	22/07/2021	6:41:10	0:05:33	2646.17	28.6	0:01:58
AMPK_EB_06	22/07/2021	6:51:10	0:05:26	2639.01	29.1	0:01:51
AMPK_EB_07	22/07/2021	7:00:56	0:03:42	2643.27	42.9	0:00:10
AMPK_EB_08	22/07/2021	7:08:34	0:05:30	2670.85	29.1	0:02:03
AMPK_EB_09	22/07/2021	7:17:59	0:04:39	2650.24	34.2	0:01:20
AMPK_EB_10	22/07/2021	7:26:53	0:03:40	2646.47	43.3	0:00:21
AMPK_EB_11	22/07/2021	7:34:27	0:05:36	2630.68	28.2	0:02:02
AMPK_EB_12	22/07/2021	7:45:52	0:05:49	2644.94	27.3	0:02:08
AMPK_EB_13	22/07/2021	7:57:29	0:07:20	2648.57	21.7	0:03:49
AMPK_EB_14	22/07/2021	8:11:29	0:05:03	2665.9	31.5	0:01:34
AMPK_EB_15	22/07/2021	8:23:10	0:05:14	2660.4	30.4	0:01:39
AMPK_EB_16	22/07/2021	8:32:34	0:03:27	2632.54	45.8	0:00:08
AMPK_EB_17	22/07/2021	8:41:52	0:07:17	2660.15	21.9	0:03:28
AMPK_EB_18	22/07/2021	8:53:29	0:05:12	2672.72	30.8	0:01:37

Client: City of Gold Coast
Route Name: Gold Coast Highway, West Burleigh Road
Route Range: Between Ikkina Road and Tabilban Street
Survey Date: Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Westbound

Eastbound
Westbound

Periods
AMPK
06:00 - 09:00

Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
AMPK_WB_01	22/07/2021	6:00:26	0:05:19	2581.72	28.8	0:01:30
AMPK_WB_02	22/07/2021	6:08:40	0:04:42	2576.38	32.9	0:00:57
AMPK_WB_03	22/07/2021	6:16:29	0:04:49	2572.97	32	0:00:49
AMPK_WB_04	22/07/2021	6:24:14	0:04:41	2566.38	32.9	0:00:46
AMPK_WB_05	22/07/2021	6:32:16	0:03:34	2563.76	43	0:00:01
AMPK_WB_06	22/07/2021	6:39:02	0:05:26	2578.12	28.5	0:01:32
AMPK_WB_07	22/07/2021	6:47:24	0:04:23	2581.53	35.2	0:00:31
AMPK_WB_08	22/07/2021	6:54:44	0:04:44	2578.92	32.7	0:00:54
AMPK_WB_09	22/07/2021	7:02:18	0:04:09	2581.37	37.3	0:00:29
AMPK_WB_10	22/07/2021	7:09:23	0:04:46	2582.19	32.5	0:00:54
AMPK_WB_11	22/07/2021	7:17:05	0:05:39	2577.43	27.4	0:01:46
AMPK_WB_12	22/07/2021	7:25:37	0:04:41	2578.13	33	0:00:48
AMPK_WB_13	22/07/2021	7:33:23	0:05:10	2573.45	29.9	0:01:11
AMPK_WB_14	22/07/2021	7:41:25	0:05:30	2579.17	28.1	0:01:40
AMPK_WB_15	22/07/2021	7:49:52	0:06:10	2580.19	25.1	0:02:24
AMPK_WB_16	22/07/2021	7:59:05	0:06:32	2582.2	23.7	0:02:45
AMPK_WB_17	22/07/2021	8:08:43	0:05:56	2576.76	26	0:01:56
AMPK_WB_18	22/07/2021	8:17:56	0:06:08	2572.72	25.2	0:02:18
AMPK_WB_19	22/07/2021	8:27:22	0:05:07	2575.37	30.2	0:01:37
AMPK_WB_20	22/07/2021	8:35:13	0:05:06	2580.88	30.4	0:01:04
AMPK_WB_21	22/07/2021	8:42:59	0:06:44	2581.39	23	0:02:13
AMPK_WB_22	22/07/2021	8:52:20	0:03:59	2575.84	38.8	0:00:09

Client: City of Gold Coast
Route Name: Gold Coast Highway, West Burleigh Road
Route Range: Between Ikkina Road and Tabilban Street
Survey Date: Thursday, 22 July 2021

Survey Period: 14:00 - 18:00
Direction: Eastbound

Eastbound
Westbound

Periods
PMPK
14:00 - 18:00

Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
PMPK_EB_01	22/07/2021	14:04:42	0:06:30	2662.37	24.6	0:02:39
PMPK_EB_02	22/07/2021	14:14:01	0:04:58	2653.25	32.1	0:01:01
PMPK_EB_03	22/07/2021	14:23:18	0:05:31	2653.92	28.9	0:01:52
PMPK_EB_04	22/07/2021	14:32:48	0:06:01	2648.09	26.4	0:02:25
PMPK_EB_05	22/07/2021	14:44:12	0:06:42	2657.46	23.8	0:02:51
PMPK_EB_06	22/07/2021	14:55:02	0:05:52	2648.1	27.1	0:02:16
PMPK_EB_07	22/07/2021	15:06:58	0:03:33	2644.6	44.7	0:00:03
PMPK_EB_08	22/07/2021	15:16:20	0:07:20	2667.19	21.8	0:03:31
PMPK_EB_09	22/07/2021	15:30:13	0:05:47	2637.51	27.4	0:02:04
PMPK_EB_10	22/07/2021	15:41:54	0:06:55	2640.02	22.9	0:03:10
PMPK_EB_11	22/07/2021	15:52:45	0:08:16	2657.12	19.3	0:04:40
PMPK_EB_12	22/07/2021	16:04:26	0:04:24	2646.64	36.1	0:00:47
PMPK_EB_13	22/07/2021	16:13:36	0:04:51	2633.56	32.6	0:01:11
PMPK_EB_14	22/07/2021	16:23:10	0:04:34	2657.93	34.9	0:00:49
PMPK_EB_15	22/07/2021	16:32:16	0:04:39	2632.12	34	0:00:59
PMPK_EB_16	22/07/2021	16:41:44	0:05:53	2655.47	27.1	0:02:05
PMPK_EB_17	22/07/2021	16:50:57	0:06:00	2662.2	26.6	0:02:06
PMPK_EB_18	22/07/2021	17:00:21	0:04:42	2643.69	33.8	0:00:56
PMPK_EB_19	22/07/2021	17:09:49	0:04:46	2634.02	33.2	0:01:05
PMPK_EB_20	22/07/2021	17:18:53	0:04:41	2650.03	33.9	0:00:54
PMPK_EB_21	22/07/2021	17:28:14	0:05:36	2651.53	28.4	0:01:53
PMPK_EB_22	22/07/2021	17:37:34	0:04:43	2645.48	33.7	0:01:00
PMPK_EB_23	22/07/2021	17:47:32	0:06:18	2651.67	25.2	0:02:44
PMPK_EB_24	22/07/2021	17:59:35	0:05:30	2657.4	29	0:02:08

Client: City of Gold Coast
Route Name: Gold Coast Highway, West Burleigh Road
Route Range: Between Ikkina Road and Tabilban Street
Survey Date: Thursday, 22 July 2021

Survey Period: 14:00 - 18:00
Direction: Westbound

Eastbound
Westbound

Periods
PMPK
14:00 - 18:00

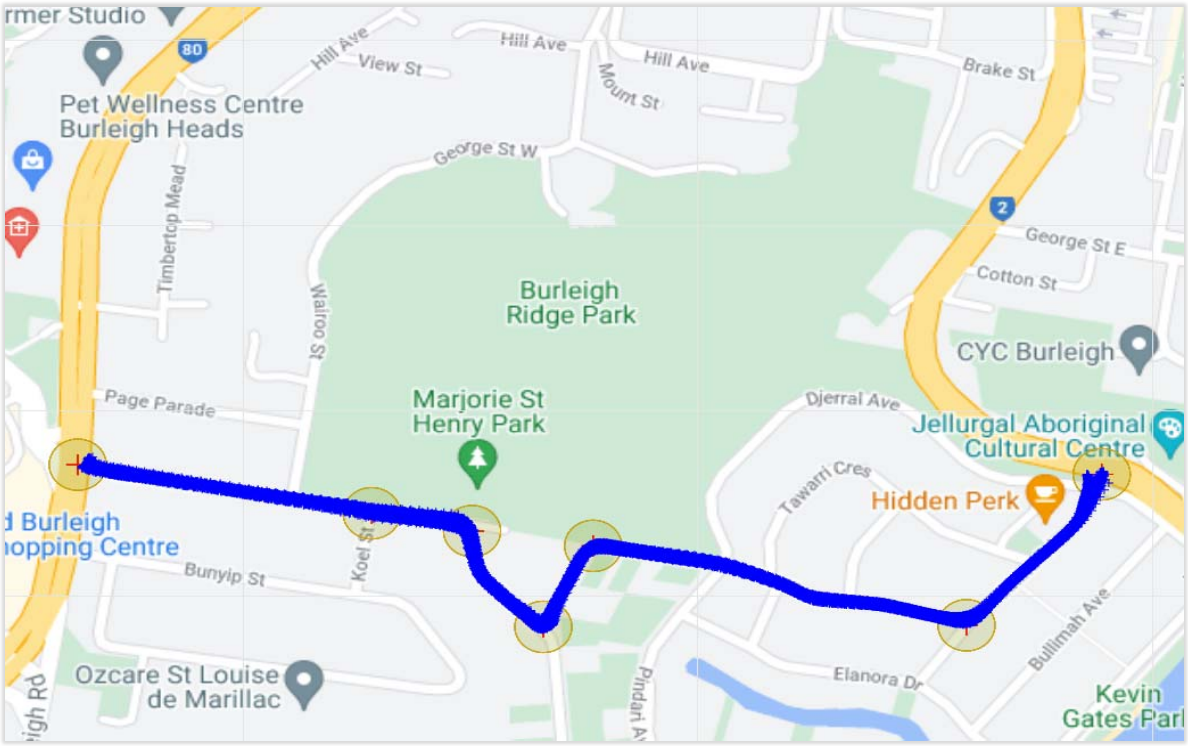
Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
PMPK_WB_01	22/07/2021	14:01:17	0:05:24	2573.7	28.6	0:01:52
PMPK_WB_02	22/07/2021	14:09:50	0:04:24	2578.97	35.2	0:00:55
PMPK_WB_03	22/07/2021	14:17:00	0:04:36	2581.42	33.7	0:00:57
PMPK_WB_04	22/07/2021	14:24:19	0:06:01	2581.17	25.7	0:02:18
PMPK_WB_05	22/07/2021	14:34:21	0:05:06	2575.51	30.3	0:01:14
PMPK_WB_06	22/07/2021	14:42:14	0:04:45	2579.24	32.6	0:00:55
PMPK_WB_07	22/07/2021	14:49:40	0:05:07	2565.16	30.1	0:01:27
PMPK_WB_08	22/07/2021	14:57:45	0:05:09	2582.37	30.1	0:01:03
PMPK_WB_09	22/07/2021	15:05:44	0:04:04	2576.1	38	0:00:19
PMPK_WB_10	22/07/2021	15:12:45	0:04:01	2568.84	38.4	0:00:18
PMPK_WB_11	22/07/2021	15:19:42	0:03:43	2579.52	41.6	0:00:02
PMPK_WB_12	22/07/2021	15:26:39	0:04:28	2576.1	34.6	0:00:52
PMPK_WB_13	22/07/2021	15:35:24	0:04:34	2573.03	33.8	0:00:49
PMPK_WB_14	22/07/2021	15:44:22	0:06:03	2579.06	25.6	0:01:46
PMPK_WB_15	22/07/2021	15:53:57	0:04:10	2581.91	37.2	0:00:20
PMPK_WB_16	22/07/2021	16:01:09	0:04:00	2581.26	38.7	0:00:10
PMPK_WB_17	22/07/2021	16:08:00	0:05:34	2582.97	27.8	0:01:46
PMPK_WB_18	22/07/2021	16:18:19	0:03:58	2563.84	38.8	0:00:13
PMPK_WB_19	22/07/2021	16:26:42	0:04:04	2574.33	38	0:00:26
PMPK_WB_20	22/07/2021	16:34:26	0:05:31	2575.89	28	0:01:37
PMPK_WB_21	22/07/2021	16:43:50	0:04:30	2567.83	34.2	0:00:57
PMPK_WB_22	22/07/2021	16:54:35	0:05:04	2571.71	30.5	0:01:23
PMPK_WB_23	22/07/2021	17:06:21	0:03:55	2575.89	39.5	0:00:16
PMPK_WB_24	22/07/2021	17:13:21	0:05:31	2579.19	28	0:01:29
PMPK_WB_25	22/07/2021	17:22:31	0:04:11	2582.46	37	0:00:14
PMPK_WB_26	22/07/2021	17:31:51	0:04:39	2571.18	33.2	0:00:39
PMPK_WB_27	22/07/2021	17:41:20	0:04:07	2581.43	37.6	0:00:22
PMPK_WB_28	22/07/2021	17:48:22	0:03:44	2574.01	41.4	0:00:09
PMPK_WB_29	22/07/2021	17:55:06	0:03:54	2562.86	39.4	0:00:06

Client:	City of Gold Coast
Route Name:	Ikkina Rd, Reserve St, Ocean Pde, and Tabilban St
Route Range:	Between Gold Coast Hwy and West Burleigh St
Survey Date:	Thursday, 22 July 2021

MATRIX Traffic and Transport Data

Route 2: Ikkina Rd. Reserve St. Ocean Pde. and Tabilban St: Between Gold Coast Hwy and West Burleigh St.



Client:	City of Gold Coast
Route Name:	Ikkina Rd, Reserve St, Ocean Pde, and Tabilban St
Route Range:	Between Gold Coast Hwy and West Burleigh St
Survey Date:	Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Eastbound

Directions
- (•) Eastbound
- ( ) Westbound

Survey Periods
AMPK
06:00 - 09:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	22	22	22	22
Average	0:02:56	1308.54	26.9	0:00:04
Median	0:02:54	1308.78	27.1	0:00:00
Minimum	0:02:35	1299.27	19.2	0:00:00
Maximum	0:04:08	1325.38	30.4	0:01:06
Standard Deviation	0:00:18	6.07	2.1	0:00:14

Threshold Speed for Delay: 5 km/h

Client:	City of Gold Coast
Route Name:	Ikkina Rd, Reserve St, Ocean Pde, and Tabilban St
Route Range:	Between Gold Coast Hwy and West Burleigh St
Survey Date:	Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Westbound

Directions
- Eastbound
- Westbound

Survey Periods
AMPK
06:00 - 09:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	18	18	18	18
Average	0:03:43	1323.49	22.6	0:00:51
Median	0:03:20	1325.71	23.9	0:00:28
Minimum	0:02:37	1307.26	12.1	0:00:02
Maximum	0:06:34	1331.51	30.4	0:02:43
Standard Deviation	0:00:59	7.57	5	0:00:48

Threshold Speed for Delay: 5 km/h

Client:	City of Gold Coast
Route Name:	Ikkina Rd, Reserve St, Ocean Pde, and Tabilban St
Route Range:	Between Gold Coast Hwy and West Burleigh St
Survey Date:	Thursday, 22 July 2021

Survey Period: 14:00 - 18:00
Direction: Eastbound

Directions
- (•) Eastbound
- ( ) Westbound

Survey Periods
PMPK
14:00 - 18:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	29	29	29	29
Average	0:03:27	1310.76	24.1	0:00:39
Median	0:03:02	1310.05	26.1	0:00:17
Minimum	0:02:38	1298.4	13	0:00:00
Maximum	0:06:04	1318.86	29.7	0:02:41
Standard Deviation	0:00:57	4.87	5.1	0:00:49

Threshold Speed for Delay: 5 km/h

Client:	City of Gold Coast
Route Name:	Ikkina Rd, Reserve St, Ocean Pde, and Tabilban St
Route Range:	Between Gold Coast Hwy and West Burleigh St
Survey Date:	Thursday, 22 July 2021

Survey Period: 14:00 - 18:00
Direction: Westbound

Directions
- Eastbound
- Westbound

Survey Periods
PMPK
14:00 - 18:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	24	24	24	24
Average	0:03:22	1322.33	24.3	0:00:37
Median	0:03:17	1324.45	24.4	0:00:30
Minimum	0:02:43	1305.07	15.2	0:00:01
Maximum	0:05:09	1336.82	29.2	0:02:14
Standard Deviation	0:00:37	9.39	3.9	0:00:35

Threshold Speed for Delay: 5 km/h

Client: City of Gold Coast
Route Name: Ikkina Rd, Reserve St, Ocean Pde, and Tabilban St
Route Range: Between Gold Coast Hwy and West Burleigh St
Survey Date: Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Eastbound

Eastbound
Westbound

Periods
AMPK
06:00 - 09:00

Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
AMPK_EB_01	22/07/2021	6:05:46	0:02:53	1310.67	27.3	0:00:00
AMPK_EB_02	22/07/2021	6:13:23	0:02:55	1315.47	27.1	0:00:00
AMPK_EB_03	22/07/2021	6:21:20	0:02:53	1307.73	27.2	0:00:00
AMPK_EB_04	22/07/2021	6:29:23	0:02:52	1307.92	27.4	0:00:00
AMPK_EB_05	22/07/2021	6:36:09	0:02:52	1299.27	27.2	0:00:00
AMPK_EB_06	22/07/2021	6:44:30	0:02:53	1306.23	27.2	0:00:00
AMPK_EB_07	22/07/2021	6:51:49	0:02:54	1300.68	26.9	0:00:00
AMPK_EB_08	22/07/2021	6:59:29	0:02:47	1303.62	28	0:00:00
AMPK_EB_09	22/07/2021	7:06:28	0:02:54	1300.33	26.9	0:00:00
AMPK_EB_10	22/07/2021	7:14:10	0:02:54	1309.73	27.1	0:00:00
AMPK_EB_11	22/07/2021	7:22:45	0:02:51	1306.76	27.5	0:00:00
AMPK_EB_12	22/07/2021	7:30:19	0:02:55	1308.69	26.9	0:00:00
AMPK_EB_13	22/07/2021	7:38:34	0:02:50	1302.59	27.6	0:00:00
AMPK_EB_14	22/07/2021	7:46:56	0:02:55	1309.42	26.9	0:00:02
AMPK_EB_15	22/07/2021	7:56:03	0:03:01	1312.16	26.1	0:00:00
AMPK_EB_16	22/07/2021	8:05:38	0:03:04	1310.74	25.6	0:00:00
AMPK_EB_17	22/07/2021	8:14:40	0:03:13	1313.62	24.5	0:00:16
AMPK_EB_18	22/07/2021	8:24:05	0:03:02	1316.41	26	0:00:08
AMPK_EB_19	22/07/2021	8:32:30	0:02:42	1308.87	29.1	0:00:00
AMPK_EB_20	22/07/2021	8:40:20	0:02:38	1301.84	29.7	0:00:00
AMPK_EB_21	22/07/2021	8:49:44	0:02:35	1309.68	30.4	0:00:00
AMPK_EB_22	22/07/2021	8:56:20	0:04:08	1325.38	19.2	0:01:06

Client: City of Gold Coast

Route Name: Ikkina Rd, Reserve St, Ocean Pde, and Tabilban St

Route Range: Between Gold Coast Hwy and West Burleigh St

Survey Date: Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Westbound

Eastbound
Westbound

Periods
AMPK
06:00 - 09:00

Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
AMPK_WB_01	22/07/2021	6:00:28	0:03:00	1307.32	26.1	0:00:03
AMPK_WB_02	22/07/2021	6:08:52	0:03:16	1330.01	24.4	0:00:25
AMPK_WB_03	22/07/2021	6:17:59	0:03:21	1329.07	23.8	0:00:23
AMPK_WB_04	22/07/2021	6:27:55	0:04:54	1331.09	16.3	0:02:05
AMPK_WB_05	22/07/2021	6:38:05	0:03:04	1329.02	26	0:00:16
AMPK_WB_06	22/07/2021	6:47:50	0:03:19	1325.49	24	0:00:31
AMPK_WB_07	22/07/2021	6:57:54	0:03:01	1319.09	26.2	0:00:12
AMPK_WB_08	22/07/2021	7:05:49	0:02:44	1317.76	28.9	0:00:03
AMPK_WB_09	22/07/2021	7:14:05	0:03:53	1324.72	20.5	0:01:09
AMPK_WB_10	22/07/2021	7:23:49	0:03:03	1327.09	26.1	0:00:23
AMPK_WB_11	22/07/2021	7:31:49	0:02:37	1325.93	30.4	0:00:02
AMPK_WB_12	22/07/2021	7:41:38	0:04:13	1331.51	18.9	0:01:32
AMPK_WB_13	22/07/2021	7:53:23	0:04:05	1323.56	19.4	0:01:12
AMPK_WB_14	22/07/2021	8:05:00	0:04:35	1314.79	17.2	0:01:29
AMPK_WB_15	22/07/2021	8:16:34	0:06:34	1326.43	12.1	0:02:43
AMPK_WB_16	22/07/2021	8:28:26	0:04:06	1331.18	19.4	0:01:27
AMPK_WB_17	22/07/2021	8:37:37	0:04:14	1321.5	18.7	0:01:21
AMPK_WB_18	22/07/2021	8:49:10	0:02:47	1307.26	28.2	0:00:04

Client: City of Gold Coast
Route Name: Ikkina Rd, Reserve St, Ocean Pde, and Tabilban St
Route Range: Between Gold Coast Hwy and West Burleigh St
Survey Date: Thursday, 22 July 2021

Survey Period: 14:00 - 18:00
Direction: Eastbound

Eastbound
Westbound

Periods
PMPK
14:00 - 18:00

Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
PMPK_EB_01	22/07/2021	14:06:55	0:02:54	1311.29	27.1	0:00:10
PMPK_EB_02	22/07/2021	14:14:15	0:02:44	1316.26	28.9	0:00:00
PMPK_EB_03	22/07/2021	14:21:37	0:02:41	1307.05	29.2	0:00:00
PMPK_EB_04	22/07/2021	14:30:21	0:03:59	1309.77	19.7	0:01:18
PMPK_EB_05	22/07/2021	14:39:28	0:02:45	1314.27	28.7	0:00:00
PMPK_EB_06	22/07/2021	14:47:00	0:02:39	1310.05	29.7	0:00:00
PMPK_EB_07	22/07/2021	14:55:05	0:02:39	1310.02	29.7	0:00:00
PMPK_EB_08	22/07/2021	15:02:55	0:02:48	1313.9	28.2	0:00:00
PMPK_EB_09	22/07/2021	15:09:49	0:02:43	1318.86	29.1	0:00:00
PMPK_EB_10	22/07/2021	15:16:47	0:02:54	1316.15	27.2	0:00:00
PMPK_EB_11	22/07/2021	15:23:26	0:03:02	1318.38	26.1	0:00:02
PMPK_EB_12	22/07/2021	15:31:08	0:04:15	1309.53	18.5	0:01:21
PMPK_EB_13	22/07/2021	15:39:59	0:04:22	1314.36	18.1	0:01:32
PMPK_EB_14	22/07/2021	15:50:26	0:03:30	1309.93	22.5	0:00:41
PMPK_EB_15	22/07/2021	15:58:08	0:03:00	1307.27	26.1	0:00:14
PMPK_EB_16	22/07/2021	16:05:10	0:02:49	1304.82	27.8	0:00:00
PMPK_EB_17	22/07/2021	16:13:35	0:04:17	1309.73	18.3	0:01:21
PMPK_EB_18	22/07/2021	16:23:02	0:03:39	1312.56	21.6	0:01:02
PMPK_EB_19	22/07/2021	16:30:47	0:03:17	1318.82	24.1	0:00:31
PMPK_EB_20	22/07/2021	16:39:58	0:03:18	1315.69	23.9	0:00:32
PMPK_EB_21	22/07/2021	16:48:39	0:05:55	1307.79	13.3	0:02:41
PMPK_EB_22	22/07/2021	17:00:16	0:06:04	1312.17	13	0:02:36
PMPK_EB_23	22/07/2021	17:10:17	0:03:03	1310.83	25.8	0:00:21
PMPK_EB_24	22/07/2021	17:18:53	0:03:37	1304.46	21.6	0:00:51
PMPK_EB_25	22/07/2021	17:26:43	0:05:07	1306.01	15.3	0:02:15
PMPK_EB_26	22/07/2021	17:37:35	0:03:44	1311.7	21.1	0:00:54
PMPK_EB_27	22/07/2021	17:45:28	0:02:53	1308.73	27.3	0:00:07
PMPK_EB_28	22/07/2021	17:52:07	0:02:58	1298.4	26.3	0:00:17
PMPK_EB_29	22/07/2021	17:59:38	0:02:38	1303.32	29.7	0:00:02

Client: City of Gold Coast
Route Name: Ikkina Rd, Reserve St, Ocean Pde, and Tabilban St
Route Range: Between Gold Coast Hwy and West Burleigh St
Survey Date: Thursday, 22 July 2021

Survey Period: 14:00 - 18:00
Direction: Westbound

Eastbound
Westbound

Periods
PMPK
14:00 - 18:00

Threshold Speed for Delay: 5 km/h

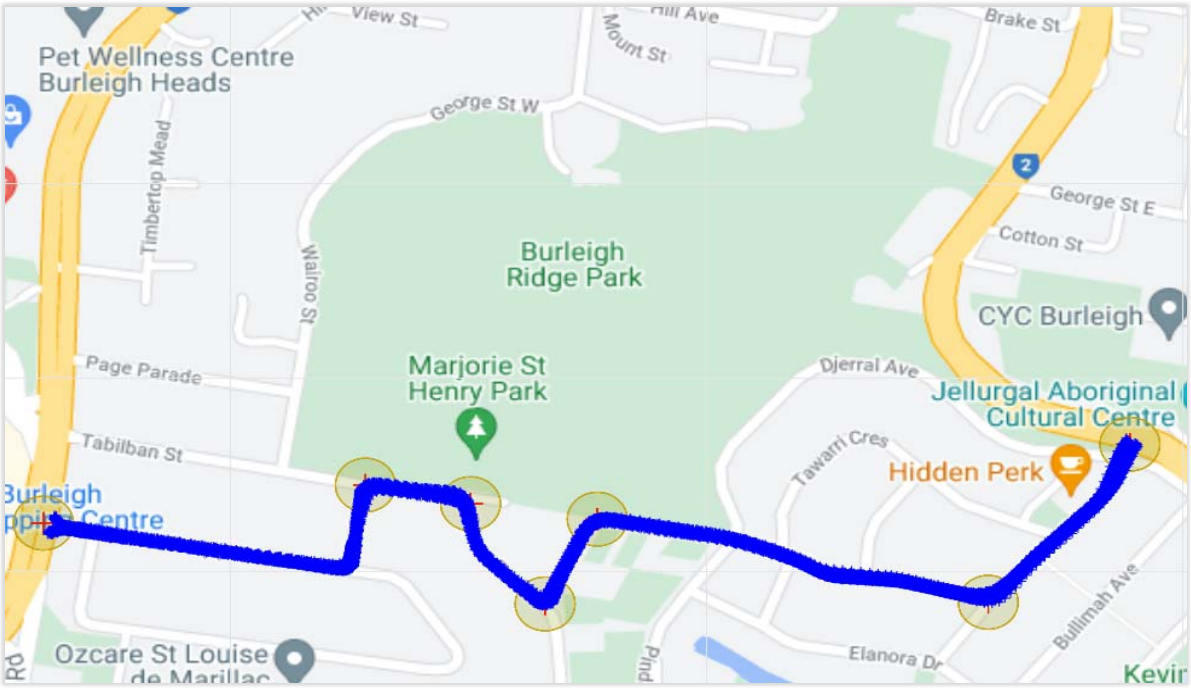
Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
PMPK_WB_01	22/07/2021	14:01:14	0:03:27	1325.76	23.1	0:00:48
PMPK_WB_02	22/07/2021	14:11:13	0:02:47	1326.75	28.6	0:00:01
PMPK_WB_03	22/07/2021	14:20:34	0:02:43	1324.35	29.2	0:00:02
PMPK_WB_04	22/07/2021	14:29:54	0:02:53	1321.81	27.5	0:00:08
PMPK_WB_05	22/07/2021	14:39:23	0:02:45	1310.23	28.6	0:00:06
PMPK_WB_06	22/07/2021	14:50:55	0:02:54	1314.78	27.2	0:00:18
PMPK_WB_07	22/07/2021	15:02:41	0:04:16	1326	18.6	0:01:30
PMPK_WB_08	22/07/2021	15:12:03	0:04:16	1329.62	18.7	0:01:34
PMPK_WB_09	22/07/2021	15:23:41	0:05:09	1305.07	15.2	0:02:14
PMPK_WB_10	22/07/2021	15:37:44	0:04:09	1327.68	19.2	0:01:21
PMPK_WB_11	22/07/2021	15:49:21	0:02:48	1315.36	28.2	0:00:04
PMPK_WB_12	22/07/2021	16:01:02	0:03:23	1336.82	23.7	0:00:32
PMPK_WB_13	22/07/2021	16:10:18	0:02:44	1308.7	28.7	0:00:06
PMPK_WB_14	22/07/2021	16:19:41	0:03:28	1323.2	22.9	0:00:38
PMPK_WB_15	22/07/2021	16:28:59	0:03:16	1333.05	24.5	0:00:18
PMPK_WB_16	22/07/2021	16:38:19	0:02:49	1306.69	27.8	0:00:06
PMPK_WB_17	22/07/2021	16:47:38	0:03:18	1334.79	24.3	0:00:35
PMPK_WB_18	22/07/2021	16:56:58	0:03:22	1335.03	23.8	0:00:32
PMPK_WB_19	22/07/2021	17:06:17	0:03:31	1327.36	22.6	0:00:44
PMPK_WB_20	22/07/2021	17:15:42	0:02:45	1310.01	28.6	0:00:06
PMPK_WB_21	22/07/2021	17:24:57	0:03:16	1330.58	24.4	0:00:29
PMPK_WB_22	22/07/2021	17:34:19	0:03:14	1319.98	24.5	0:00:27
PMPK_WB_23	22/07/2021	17:43:39	0:03:52	1324.54	20.5	0:01:05
PMPK_WB_24	22/07/2021	17:55:17	0:03:33	1317.78	22.3	0:01:03

Client:	City of Gold Coast
Route Name:	Ikkina Rd, Reserve St, Ocean Pde, Tabilban St, and Bunyip St
Route Range:	Between Gold Coast Hwy and West Burleigh St
Survey Date:	Thursday, 22 July 2021

MATRIX Traffic and Transport Data

Title | Route Summary | Runs Summary | Run Detail | Runs Graph | Speed Graph

Route 3: Ikkina Rd, Reserve St, Ocean Pde, Tabilban St, and Bunyip St: Between Gold Coast Hwy and West Burleigh St.



Client:	City of Gold Coast
Route Name:	Ikkina Rd, Reserve St, Ocean Pde, Tabilban St, and Bunyip St
Route Range:	Between Gold Coast Hwy and West Burleigh St
Survey Date:	Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Eastbound

Directions
- (•) Eastbound
- ( ) Westbound

Survey Periods
AMPK
06:00 - 09:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	16	16	16	16
Average	0:03:20	1403.99	25.5	0:00:25
Median	0:03:10	1404.39	26.6	0:00:20
Minimum	0:02:55	1399.37	21.1	0:00:02
Maximum	0:04:00	1410.15	28.6	0:01:01
Standard Deviation	0:00:21	2.91	2.5	0:00:20

Threshold Speed for Delay: 5 km/h

Client:	City of Gold Coast
Route Name:	Ikkina Rd, Reserve St, Ocean Pde, Tabilban St, and Bunyip St
Route Range:	Between Gold Coast Hwy and West Burleigh St
Survey Date:	Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Westbound

Directions
- Eastbound
- Westbound

Survey Periods
AMPK
06:00 - 09:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	16	16	16	16
Average	0:03:45	1411.93	23.6	0:00:34
Median	0:03:24	1411.79	24.9	0:00:20
Minimum	0:02:53	1404.98	11.7	0:00:04
Maximum	0:07:14	1423.74	29.4	0:03:01
Standard Deviation	0:01:03	4.77	4.3	0:00:44

Threshold Speed for Delay: 5 km/h

Client:	City of Gold Coast
Route Name:	Ikkina Rd, Reserve St, Ocean Pde, Tabilban St, and Bunyip St
Route Range:	Between Gold Coast Hwy and West Burleigh St
Survey Date:	Thursday, 22 July 2021

Survey Period: 14:00 - 18:00
Direction: Eastbound

Directions
- (•) Eastbound
- ( ) Westbound

Survey Periods
PMPK
14:00 - 18:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	18	18	18	18
Average	0:05:18	1403.68	16.7	0:02:02
Median	0:05:12	1403.95	16.2	0:01:56
Minimum	0:03:27	1394.14	11.1	0:00:18
Maximum	0:07:35	1410.33	24.4	0:04:04
Standard Deviation	0:01:11	4.3	3.9	0:01:03

Threshold Speed for Delay: 5 km/h

Client:	City of Gold Coast
Route Name:	Ikkina Rd, Reserve St, Ocean Pde, Tabilban St, and Bunyip St
Route Range:	Between Gold Coast Hwy and West Burleigh St
Survey Date:	Thursday, 22 July 2021

Survey Period: 14:00 - 18:00
Direction: Westbound

Directions
- Eastbound
- Westbound

Survey Periods
PMPK
14:00 - 18:00

Statistics	Travel Time	Distance (m)	Speed (km/h)	Delay
Number of Runs	18	18	18	18
Average	0:03:25	1412.85	24.9	0:00:18
Median	0:03:20	1413.51	25.5	0:00:11
Minimum	0:03:00	1404.04	20.5	0:00:04
Maximum	0:04:09	1420.28	28.1	0:00:49
Standard Deviation	0:00:19	4.71	2.2	0:00:15

Threshold Speed for Delay: 5 km/h

Client: City of Gold Coast
Route Name: Ikkina Rd, Reserve St, Ocean Pde, Tabilban St, and Bunyip St
Route Range: Between Gold Coast Hwy and West Burleigh St
Survey Date: Thursday, 22 July 2021

Survey Period: 06:00 - 09:00
Direction: Eastbound

Eastbound
Westbound

Periods
AMPK
06:00 - 09:00

Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
AMPK_EB_01	22/07/2021	6:04:49	0:03:47	1404.17	22.3	0:00:50
AMPK_EB_02	22/07/2021	6:13:57	0:02:55	1399.9	28.6	0:00:03
AMPK_EB_03	22/07/2021	6:24:39	0:03:00	1405.82	28.1	0:00:02
AMPK_EB_04	22/07/2021	6:34:05	0:03:28	1404.75	24.3	0:00:36
AMPK_EB_05	22/07/2021	6:45:45	0:03:47	1404.12	22.3	0:00:54
AMPK_EB_06	22/07/2021	6:57:30	0:04:00	1406.49	21.1	0:01:01
AMPK_EB_07	22/07/2021	7:10:00	0:03:30	1410.15	24.2	0:00:35
AMPK_EB_08	22/07/2021	7:21:40	0:03:51	1406.59	21.9	0:00:55
AMPK_EB_09	22/07/2021	7:33:29	0:03:06	1402.47	27.1	0:00:13
AMPK_EB_10	22/07/2021	7:45:02	0:03:11	1404.62	26.5	0:00:19
AMPK_EB_11	22/07/2021	7:56:47	0:03:08	1400.68	26.8	0:00:11
AMPK_EB_12	22/07/2021	8:08:30	0:03:03	1405.54	27.7	0:00:05
AMPK_EB_13	22/07/2021	8:22:32	0:03:07	1399.37	26.9	0:00:12
AMPK_EB_14	22/07/2021	8:34:07	0:03:09	1401.11	26.7	0:00:22
AMPK_EB_15	22/07/2021	8:45:46	0:03:12	1406.2	26.4	0:00:21
AMPK_EB_16	22/07/2021	8:57:32	0:03:04	1401.82	27.4	0:00:06

Route Range: Between Gold Coast Hwy and West Burleigh St

Survey Date: Thursday, 22 July 2021

MATRIX Traffic and Transport Data

Title | Route Summary | Runs Summary | Run Detail | Runs Graph | Speed Graph

Survey Period: 06:00 - 09:00
Direction: Westbound

ons
- Eastbound
- Westbound

Periods
AMPK
06:00 - 09:00

Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
AMPK_WB_01	22/07/2021	6:00:22	0:03:12	1408.76	26.4	0:00:05
AMPK_WB_02	22/07/2021	6:09:34	0:03:14	1406.83	26.1	0:00:08
AMPK_WB_03	22/07/2021	6:19:01	0:03:09	1405.02	26.6	0:00:07
AMPK_WB_04	22/07/2021	6:28:41	0:03:25	1412.64	24.8	0:00:17
AMPK_WB_05	22/07/2021	6:39:20	0:03:22	1413.4	25.2	0:00:11
AMPK_WB_06	22/07/2021	6:51:19	0:03:13	1415.38	26.4	0:00:16
AMPK_WB_07	22/07/2021	7:03:20	0:03:23	1404.98	24.9	0:00:22
AMPK_WB_08	22/07/2021	7:15:22	0:03:35	1409.02	23.6	0:00:26
AMPK_WB_09	22/07/2021	7:27:22	0:03:16	1414.64	26	0:00:12
AMPK_WB_10	22/07/2021	7:38:39	0:03:25	1409.7	24.8	0:00:27
AMPK_WB_11	22/07/2021	7:50:19	0:02:53	1410.94	29.4	0:00:04
AMPK_WB_12	22/07/2021	8:01:58	0:05:03	1423.74	16.9	0:01:19
AMPK_WB_13	22/07/2021	8:13:38	0:07:14	1416.19	11.7	0:03:01
AMPK_WB_14	22/07/2021	8:27:38	0:04:03	1413.91	20.9	0:00:48
AMPK_WB_15	22/07/2021	8:39:18	0:03:50	1415.01	22.1	0:00:36
AMPK_WB_16	22/07/2021	8:50:59	0:03:48	1410.77	22.3	0:00:46

Route Range: Between Gold Coast Hwy and West Burleigh St

Survey Date: Thursday, 22 July 2021

MATRIX Traffic and Transport Data

Title | Route Summary | Runs Summary | Run Detail | Runs Graph | Speed Graph

Survey Period: 14:00 - 18:00
Direction: Eastbound

ons
- (•) Eastbound
- ( ) Westbound

Periods
- PMPK
- 14:00 - 18:00

Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
PMPK_EB_01	22/07/2021	14:03:54	0:04:44	1396.38	17.7	0:01:48
PMPK_EB_02	22/07/2021	14:15:29	0:04:40	1408.76	18.1	0:01:39
PMPK_EB_03	22/07/2021	14:27:22	0:04:34	1406.46	18.5	0:00:59
PMPK_EB_04	22/07/2021	14:38:55	0:04:40	1407.47	18.1	0:01:39
PMPK_EB_05	22/07/2021	14:51:59	0:03:28	1408.38	24.4	0:00:22
PMPK_EB_06	22/07/2021	15:03:32	0:03:27	1405.69	24.4	0:00:18
PMPK_EB_07	22/07/2021	15:15:08	0:05:41	1400.52	14.8	0:02:39
PMPK_EB_08	22/07/2021	15:29:34	0:07:35	1402	11.1	0:04:04
PMPK_EB_09	22/07/2021	15:45:44	0:05:47	1401.38	14.5	0:02:04
PMPK_EB_10	22/07/2021	15:58:48	0:04:16	1405.58	19.8	0:01:11
PMPK_EB_11	22/07/2021	16:10:33	0:06:29	1410.33	13	0:03:02
PMPK_EB_12	22/07/2021	16:24:44	0:06:07	1394.14	13.7	0:02:42
PMPK_EB_13	22/07/2021	16:38:28	0:04:21	1404.42	19.4	0:01:10
PMPK_EB_14	22/07/2021	16:50:24	0:06:22	1403.29	13.2	0:02:53
PMPK_EB_15	22/07/2021	17:04:13	0:06:35	1402.99	12.8	0:02:44
PMPK_EB_16	22/07/2021	17:18:18	0:06:07	1406.14	13.8	0:02:50
PMPK_EB_17	22/07/2021	17:32:12	0:04:13	1403.48	20	0:01:20
PMPK_EB_18	22/07/2021	17:43:41	0:06:23	1398.83	13.1	0:03:15

Client: City of Gold Coast
Route Name: Ikkina Rd, Reserve St, Ocean Pde, Tabilban St, and Bunyip St
Route Range: Between Gold Coast Hwy and West Burleigh St
Survey Date: Thursday, 22 July 2021

MATRIX Traffic and Transport Data

Survey Period: 14:00 - 18:00
Direction: Westbound

Eastbound
Westbound

Periods
PMPK
14:00 - 18:00

Threshold Speed for Delay: 5 km/h

Run ID	Date	Start Time	Travel Time	Distance (m)	Speed (km/h)	Delay
PMPK_WB_01	22/07/2021	14:10:38	0:03:11	1415.48	26.7	0:00:12
PMPK_WB_02	22/07/2021	14:22:19	0:03:14	1413.98	26.2	0:00:12
PMPK_WB_03	22/07/2021	14:33:58	0:03:17	1412	25.8	0:00:11
PMPK_WB_04	22/07/2021	14:45:40	0:03:47	1408.1	22.3	0:00:34
PMPK_WB_05	22/07/2021	14:57:18	0:03:54	1419.7	21.8	0:00:49
PMPK_WB_06	22/07/2021	15:09:03	0:04:09	1420.28	20.5	0:00:48
PMPK_WB_07	22/07/2021	15:22:58	0:03:42	1415.33	23	0:00:25
PMPK_WB_08	22/07/2021	15:39:21	0:03:50	1415.75	22.2	0:00:42
PMPK_WB_09	22/07/2021	15:53:19	0:03:27	1407.62	24.5	0:00:08
PMPK_WB_10	22/07/2021	16:04:55	0:03:13	1404.7	26.2	0:00:10
PMPK_WB_11	22/07/2021	16:18:56	0:03:22	1410.09	25.1	0:00:06
PMPK_WB_12	22/07/2021	16:32:54	0:03:25	1413.42	24.8	0:00:15
PMPK_WB_13	22/07/2021	16:44:35	0:03:17	1411.9	25.8	0:00:09
PMPK_WB_14	22/07/2021	16:58:36	0:03:26	1410.53	24.6	0:00:11
PMPK_WB_15	22/07/2021	17:12:35	0:03:10	1413.6	26.8	0:00:06
PMPK_WB_16	22/07/2021	17:26:34	0:03:10	1416.55	26.8	0:00:11
PMPK_WB_17	22/07/2021	17:38:19	0:03:00	1404.04	28.1	0:00:08
PMPK_WB_18	22/07/2021	17:52:15	0:03:04	1418.25	27.7	0:00:04

Appendix E: Signal Design Plans

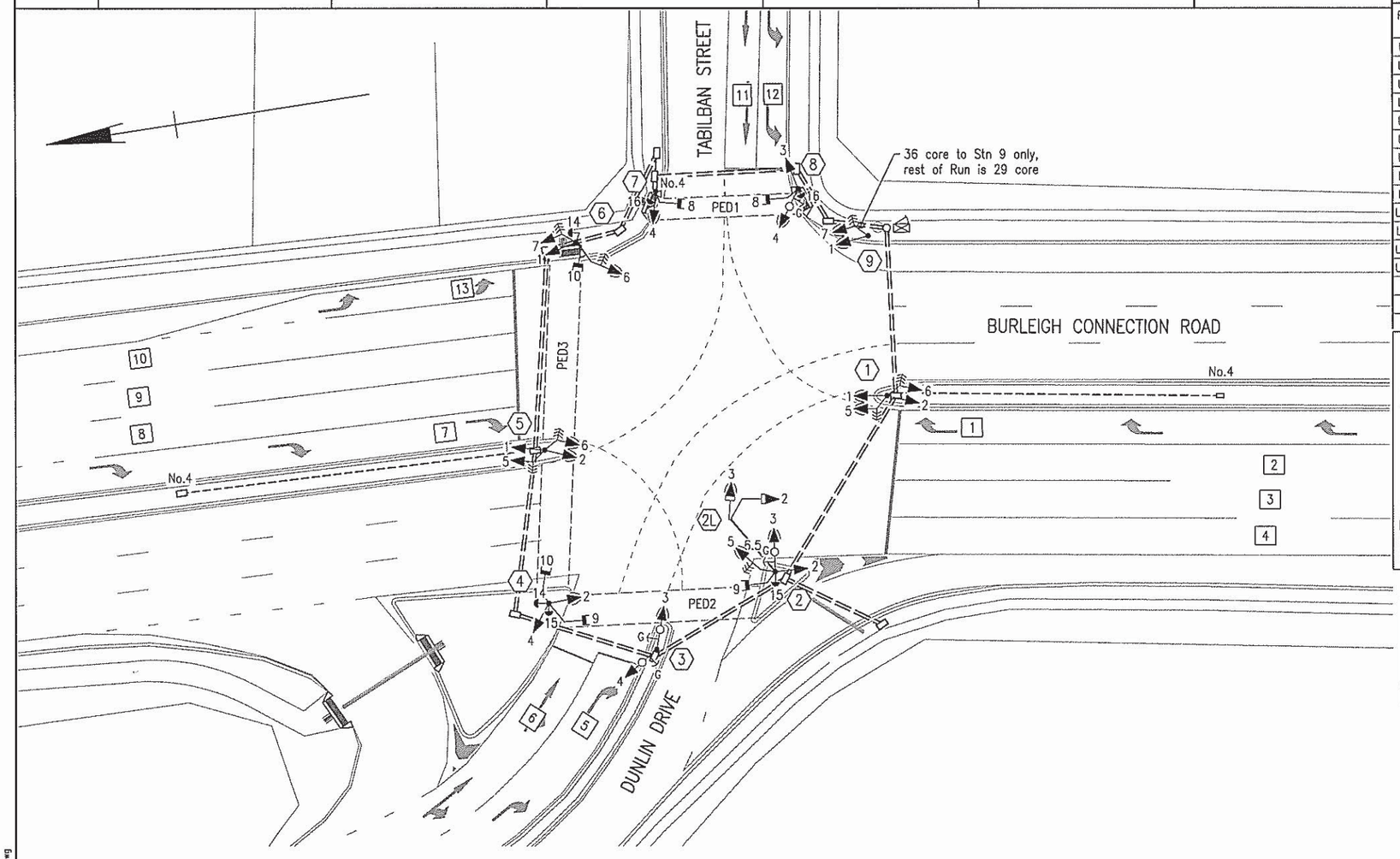
PHASE DIAGRAMS	A PHASE	B PHASE	C PHASE	D PHASE	E PHASE
SIGNAL GROUPS	1 | 2 | 8 | 9	2 | 6 | 9	4 | 10	3 | 7	1 | 5 | 8
VEHICLE/PED	VG1 | VG2 | PG1 | PG2	VG2 | VG6 | PG2	VG4 | PG3	VG3 | VG7	VG1 | VG5 | PG1
LOGICAL INPUT	8 9 10 13 | 2 3 4 | 16 | 15	2 3 4 | 1 | 15	5 6 | 14	12 13 | 13	8 9 10 | 7 | 16
CALL	X X X X | X X X | PED1 | PED2	X | PED2	X X	X X	X | PED1
EXTEND	X X X X | X X X	X	X X	X X	X
INCREMENT	X X X | X X X				
SPECIAL CONDITIONS	SG7 Red during PED 1 walk, else off				SG7 Red during PED 1 walk, else off

CONFLICT TABLE (X INDICATES CONFLICT)

VEHICLE GROUPS	1	2	3	4	5	6	7	8	9	10	11	12	PED GROUPS 1	2	3	4
1	\		X	X		X										X
2		\	X	X	X											X
3	X	X	\	X	X	X							X	X	X	
4	X	X	X	\	X	X	X						X	X		
5		X	X	X	\										X	X
6	X		X	X		\	X						X			
7				X		X	\						X		X	
8							\									
9								\								
10									\							
11										\						
12											\					
PED GROUPS 1			X	X		X	X						\			
2			X	X	X									\		
3	X	X	X		X		X								\	
4																\

DETECTOR TABLE

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	STOP LINE	6m
LOOP 2	P2	2	ADVANCE	35m
LOOP 3	P3	3	ADVANCE	35m
LOOP 4	P4	4	ADVANCE	35m
LOOP 5	P5	5	STOP LINE	6m
LOOP 6	P6	6	STOP LINE	6m
LOOP 7	P7	7	STOP LINE	6m
LOOP 8	P8	8	ADVANCE	35m
LOOP 9	Q9	9	ADVANCE	35m
LOOP 10	Q10	10	ADVANCE	35m
LOOP 11	Q11	11	STOP LINE	6m
LOOP 12	Q12	12	STOP LINE	6m
LOOP 13	Q13	13	STOP LINE	4m
EXT3	E7	14	Pb3–AUDIO	
EXT2	E6	15	Pb2–AUDIO	
EXT1	E5	16	Pb1–AUDIO	



LEGEND

***** UNLESS OTHERWISE STATED *****

- 2x100DIA HD ORANGE
- 1x50DIA HD ORANGE
- NO. 7 PIT
- SIGNAL POST LOCATION
- [3] DETECTOR LOOP
- (3) STATION/POST ID

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91. REFER TO TMR SD1436 FOR SYMBOL DETAILS

The works shown on this drawing are a factual representation of works constructed.

Name: A.Lynch

File No.: 517/00327 Date: 13.3.2019

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINAL TERMINALS	RUN 1 CONNECTS	RUN 1 CORES USED	RUN 2 FINAL TERMINALS	RUN 2 CONNECTS	RUN 2 CORES USED	RUN 3 FINAL TERMINALS	RUN 3 CONNECTS	RUN 3 CORES USED
1	RED	A5	1	1		1	1				
	YELLOW	A4	2	2		2	2				
	GREEN	A3	3	3		3	3				
2	RED	A8	4	4	4	4	4				
	YELLOW	A7	5	5	5	5	5				
	GREEN	A6	6	6	6	6	6				
3	RED	A11	7	7	7	7	7				
	YELLOW	A10	8	8	8	8	8				
	GREEN	A9	9	9	9	9	9				
4	RED	A14	10	10		10	10				
	YELLOW	A13	11	11		11	11				
	GREEN	A12	12	12		12	12				
5	RED	B5	13	13		13	13				
	YELLOW	B4	14	14		14	14				
	GREEN	B3	15	15		15	15				
6	RED	B8	16	16		16	16				
	YELLOW	B7	17	17		17	17				
	GREEN	B6	18	18		18	18				
7	RED	B11	RD	RD		19	19				
	YELLOW	B10	OG	OG		20	20				
	GREEN	B9	27	27		21	21				
8	RED DW	B14				22	22				
	PED1										
	GREEN W	B12				23	23				
9	RED DW	C5	19	19							
	PED2										
	GREEN W	C3	20	20							
10	RED DW	C8	21	21		24	24				
	PED3										
	GREEN W	C6	22	22		25	25				
	EXT3 DET 22	E7	25	25		P3	PU3				
	EXT2 DET 15	E6	26	26							
	EXT1 DET 16	E5				P1	PU1				
	240V	B2	23	23		A	RD				
	DET COMMON	E3	PR	GY		PR	GY				
	NEUTRAL	AT,91 C1,01	NL	BK	BK	NL	BK				
	SPARE CORES TO EARTH			24 P1–P4	1–3, 10–26, GY		26,27 P2,P4				
	CABLE SIZE			29+36	29		36				

CONTROLLER TYPE TYCO ECLIPSE EC1–62–16

NOTE

1. All lanterns are Light Emitting Diode (LED) type.

G	As Constructed		27.5.2019	
F	Loop numbering changed	D.Roesner 09350	19.2.2019	
E	Loop 13 added	D.Roesner 09350	07.2.2019	
D	PED safety modifications	D.Roesner 09350	17.1.2019	
C	As Constructed (Eclipse installed)	K.Anderson 16626	11.9.2017	MF.C
B	As Constructed	AJC 08751	14.05.2014	MF07.14B
A	Original Issue A3			MF12.13A
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES G:\NERD\ITS&E Asset Database\Burleigh Connection(Reedy Ck Rd)(102)\Traffic Signals\M5046Tabilban\Drawing\Current\M5046 633224_G.dwg

Associated Job Nos 160/102/1

Auxiliary Drg Nos

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
BURLEIGH CONNECTION ROAD
INTERSECTION WITH TABILBAN STREET

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
102/1	1.32	N/A	0.22	102/2

Through Chainage from Start of Gazettal 1.32km

TRAFFIC SIGNAL INSTALLATION OPERATIONS AND ELECTRICAL CONNECTION SHEET

Checked J.ONG

Designed B.JONES

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
ELECTRICAL	A.CAUSLEY	Original signed	8751	07.11.2013

Site Number M5046 Map60 C9

Queensland Government

Job No. R10/R003/410

Contract. No.

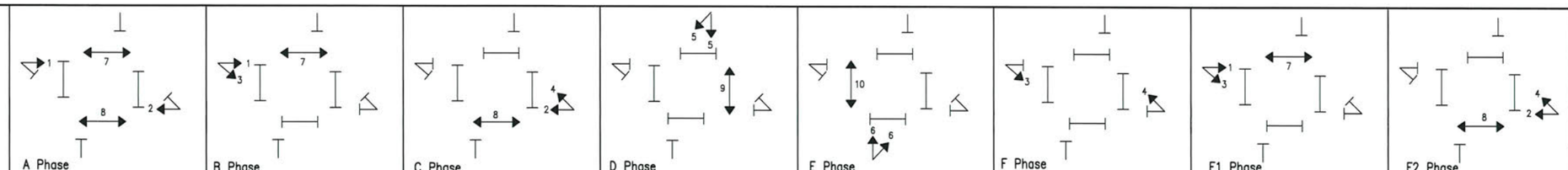
Drawing No. 633224 G

Series Number of

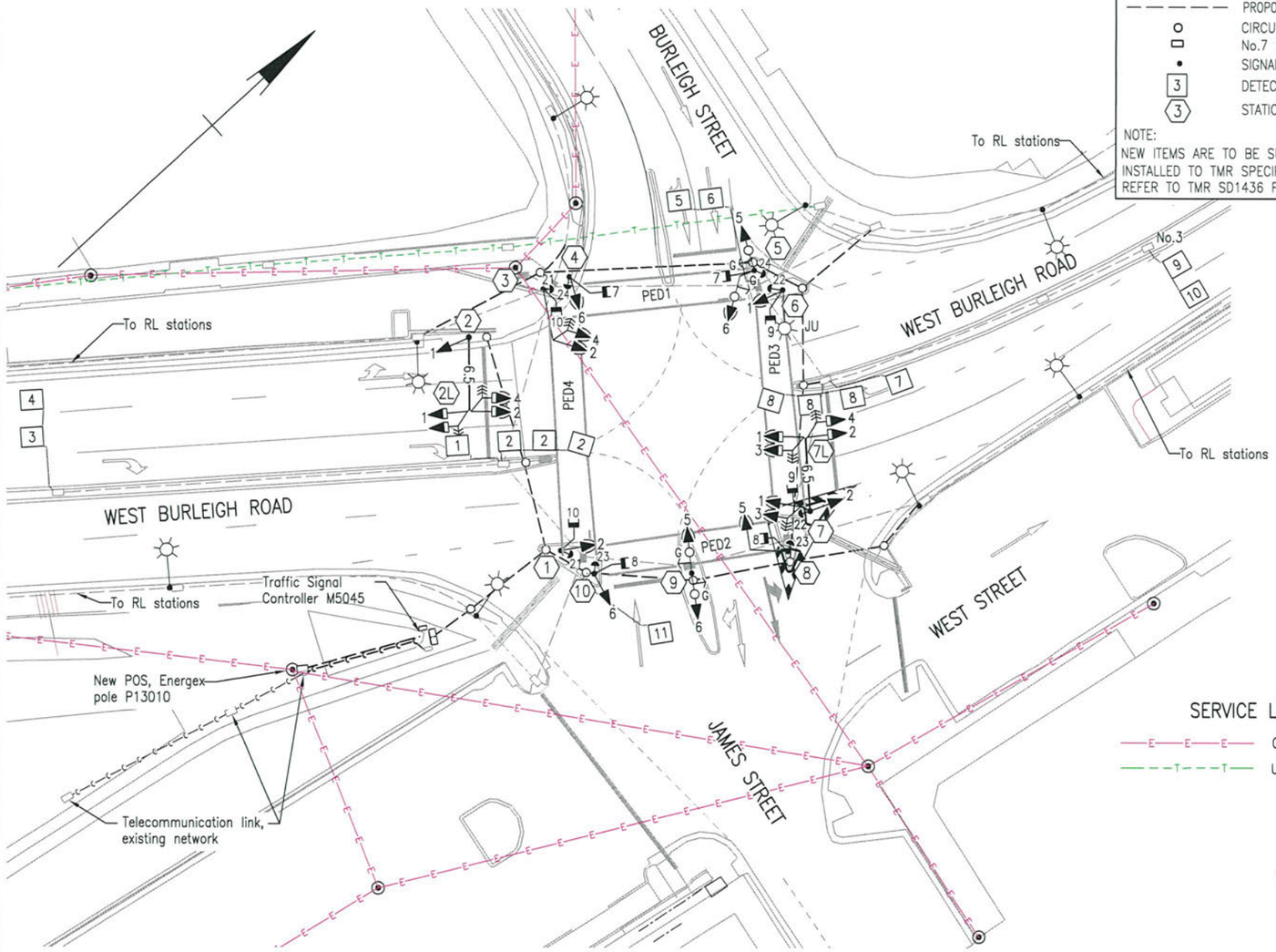
MRT_Detail (D6/13)

Last Modified :- May 27, 2019 – 2:10pm XREFS :- X_Image.dwg

PHASE DIAGRAMS



	A Phase						B Phase						C Phase						D Phase						E Phase						F Phase						F1 Phase						F2 Phase					
SIGNAL GROUPS	1		2		7	8	1	3	7				2	4	8				5	9					6	10					3	4					1	3	7				2	4	8			
VEHICLE/PED	Vg1		Vg2		Pg1	Pg2	Vg1		Vg3		Pg1		Vg2		Vg4		Pg2		Vg5		Pg3				Vg6		Pg4				Vg3		Vg4				Vg1		Vg3		Pg1		Vg2		Vg4		Pg2	
LOGICAL INPUT	2	4	9	10	24	23	3	4	1	2	24		9	10	7	8	23		5	6	22				11		21				1	2	7	8			3	4	1	2	24		9	10	7	8	23	
CALL	X	X	X	X	PED1	PED2			X		PED1				X		PED2		X	X	PED3				X		PED4				X		X						X		PED1				X		PED2	
EXTEND	X	X	X	X					X						X				X	X					X		X				X		X						X						X			
INCREMENT	X	X	X	X																																			X									
SPECIAL CONDITIONS	XSF allow filter SG3 Red during PED2 else off after t' secs, XSF allow filter SG4 Red during PED1 else off after t' secs						Introduce 'B' phase on 'Z' Neg Signal						Introduce 'C' phase on 'Z' Pos Signal																								loop 2 diode to loop 1						loop 8 diode to loop 7					



LEGEND

***** UNLESS OTHERWISE STATED *****

- PROPOSED AND EXISTING CONDUIT RUN
- CIRCULAR PIT
- No.7 PIT
- SIGNAL POST LOCATION
- [3] DETECTOR LOOP
- (3) STATION POST/ID

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91.
REFER TO TMR SD1436 FOR SYMBOL DETAILS

SERVICE LEGEND

- Overhead electrical cable
- Underground Telstra service

CONFLICT TABLE (X INDICATES CONFLICT)

VEHICLE GROUPS	1	2	3	4	5	6	7	8	9	10	11	12	PED GROUPS 1	2	3	4
1				X	X	X									X	X
2			X		X	X									X	X
3		X			X	X								X		X
4	X				X	X							X		X	
5	X	X	X	X		X							X	X		X
6	X	X	X	X	X								X	X	X	
7																
8																
9																
10																
11																
12																

PED GROUPS	1	2	3	4
1			X	X	X	
2		X		X	X	
3	X	X		X		X
4	X	X	X		X	

DETECTOR TABLE

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	STOP LINE	4m
LOOP 2	P2	2	NON-LOCK	—
LOOP 3	P3	3	ADVANCE	35m
LOOP 4	P4	4	ADVANCE	35m
LOOP 5	P5	5	STOP LINE	4m
LOOP 6	P6	6	STOP LINE	4m
LOOP 7	P7	7	STOP LINE	4m
LOOP 8	P8	8	NON-LOCK	—
LOOP 9	Q9	9	ADVANCE	35m
LOOP 10	Q10	10	ADVANCE	35m
LOOP 11	Q11	11	STOP LINE	4m
EXT4	E8	21	Pb4-AUDIO	
EXT3	E7	22	Pb3-AUDIO	
EXT2	E6	23	Pb2-AUDIO	
EXT1	E5	24	Pb1-AUDIO	

NOTE

1. This drawing has been compiled from As Constructed mark up's provided by electrical & civil contractor that haven't been verified. Certification is limited to interpretation of mark up's only.

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINAL TERMINALS	RUN 1 CORES USED			RUN 2 FINAL TERMINALS	RUN 2 CORES USED			RUN 3 FINAL TERMINALS	RUN 3 CORES USED		
			CONNECTS W 1 2 2 3 2L 4 5				CONNECTS W 10 7 9 8 7L 7 6				CONNECTS W			
1	RED	A5	1	1	1		1	1	1					
	YELLOW	A4	2	2	2		2	2	2					
	GREEN	A3	3	3	3		3	3	3					
2	RED	A8	4	4	4		4	4	4					
	YELLOW	A7	5	5	5		5	5	5					
	GREEN	A6	6	6	6		6	6	6					
3	RED	A11	7	7	7		7	7	7					
	YELLOW	A10	8	8	8		8	8	8					
	GREEN	A9	9	9	9		9	9	9					
4	RED	A14	10	10	10		10	10	10					
	YELLOW	A13	11	11	11		11	11	11					
	GREEN	A12	12	12	12		12	12	12					
5	RED	B5	13	13			13	13						
	YELLOW	B4	14	14			14	14						
	GREEN	B3	15	15			15	15						
6	RED	B8	16	16			16	16						
	YELLOW	B7	17	17			17	17						
	GREEN	B6	18	18			18	18						
7	RED DW	B11	19	19										
	PED1													
	GREEN W	B9	20	20										
8	RED DW	B14					19	19						
	PED2													
	GREEN W	B12					20	20						
9	RED DW	C5					21	21						
	PED3													
	GREEN W	C3					22	22						
10	RED DW	C8	21	21										
	PED4													
	GREEN W	C6	22	22										
	EXT4 DET 21	E8	P4	PU4										
	EXT3 DET 22	E7					P3	PU3						
	EXT2 DET 23	E6					P2	PU2						
	EXT1 DET 24	E5	P1	PU1										
	240V	A2	A	RD			A	RD						
	DET COMMON	E3	27	GY			27	GY						
	NEUTRAL	A1,B1 C1,D1	NL	BK			NL	BK	BK					
	SPARE CORES TO EARTH			23-27 OG	13-GY			23-27 OG	13-GY					
	CABLE SIZE			36	19			36	19					

CONTROLLER TYPE – TYCO ECLIPSE EC1-62-16

B	As Constructed	09350	17.10.16	
A	Original Issue A3			MF02.15A
	Revisions/Descriptions	Certification	Date	M'filed

CAD FILES: G:\NERD\ROAD PROJECTS\102\009 West Burleigh and James St M5045\ACAD M5045\Electrical\As Con\M5045_649301_649719.dwg

Associated Job Nos: –
Auxiliary Drg Nos: 649300
SURVEY DATA: Horiz. Grid; Height Origin; Survey Books

Scales: 0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
WEST BURLEIGH ROAD
INTERSECTION WITH JAMES ST AND BURLEIGH ST

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
102/1	0.112	0.40 km	1.30km	102/2

Through Chainage from 0.112km – 0.272km

Drawn: L.GIBSON
Checked: J.ONG
For scheme approval status refer Drg. No.(of)

TRAFFIC SIGNAL INSTALLATION OPERATIONS AND ELECTRICAL CONNECTION SHEET

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
Electrical	Andrew Causley	Original signed	08751	16-Jan-15

Queensland Government

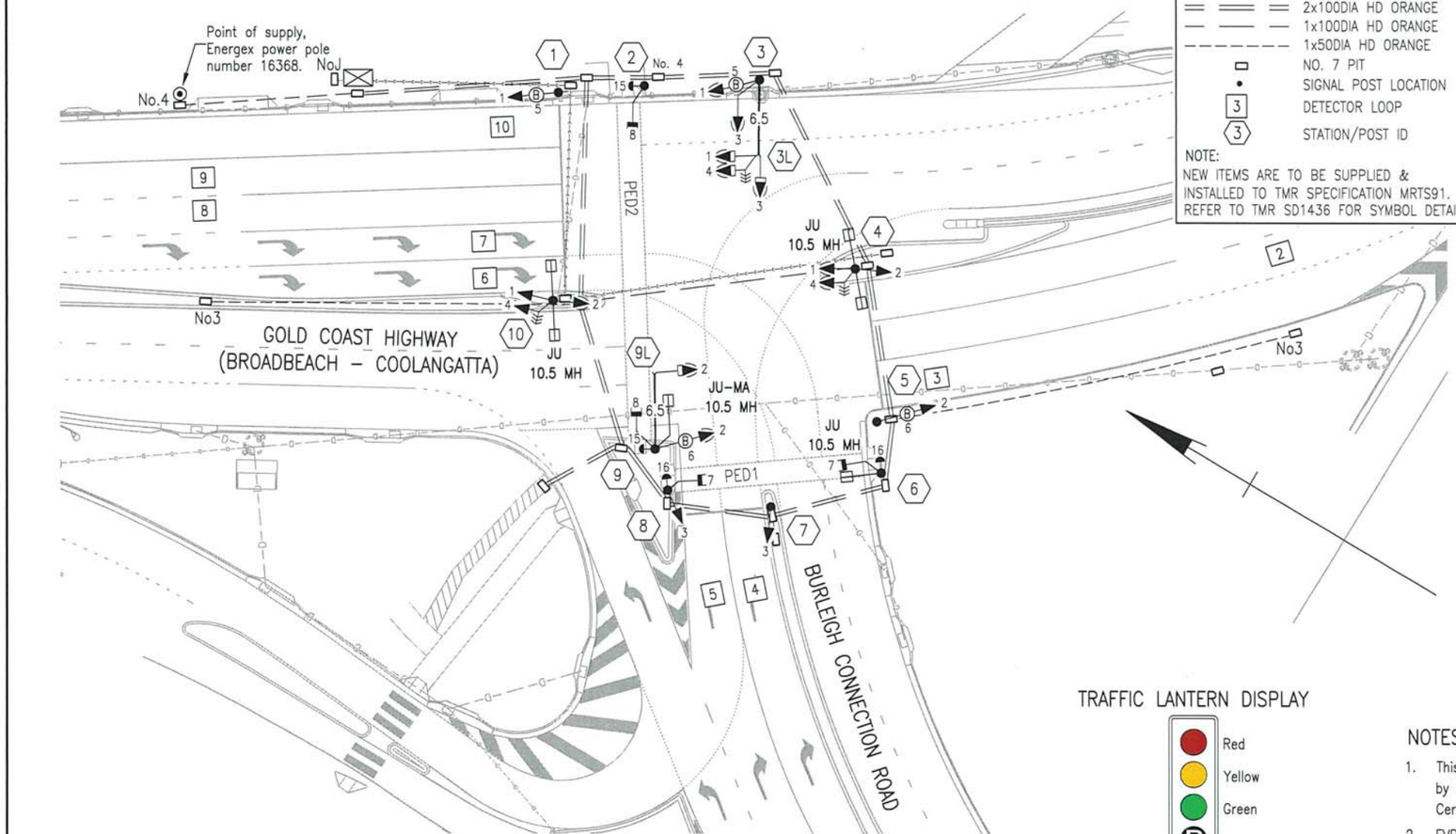
Site Number: M5045
UBD MAP 60 E6

Job No.	S20/R002/429
Contract. No.	–
Drawing No.	649301 B
Series Number	4 of 5

MRT_Detail (01/13)

Last Modified: Oct 17, 2016 - 12:41pm XREFS :- X_DROA o.dwg ; X_DTRS.dwg ; X_Survey.dwg ; X_Kerb design.dwg ; X_image.dwg ; X_DTRS_C.dwg

PHASE DIAGRAMS	A PHASE	B PHASE	C PHASE	D PHASE	E PHASE	F PHASE	G PHASE	PHASE
SIGNAL GROUPS	1 2 5 6 7	3 8	1 4 5					
VEHICLE/PED	VG1 VG2 VG5 VG6 PG1	VG3 PG2	VG1 VG4 VG5					
LOGICAL INPUT	8 9 1 8 10 3 16	4 5 15	8 9 6 7 10					
CALL	X X X X X X PED1	X X PED2	X X					
EXTEND	X X X X X X	X X	X X					
INCREMENT	X X X X		X X					
SPECIAL CONDITIONS	Sg5 and Sg6 early start if called.		Sg5 early start if called.					



LEGEND

***** UNLESS OTHERWISE STATED *****

- 2x100DIA HD ORANGE
- 1x100DIA HD ORANGE
- 1x50DIA HD ORANGE
- NO. 7 PIT
- SIGNAL POST LOCATION
- [3] DETECTOR LOOP
- (3) STATION/POST ID

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91. REFER TO TMR SD1436 FOR SYMBOL DETAILS

CONFLICT TABLE (X INDICATES CONFLICT)

VEHICLE GROUPS	1	2	3	4	5	6	7	8	9	10	11	12	PED GROUPS 1	2	3	4
1			X											X		
2			X	X										X		
3	X	X		X	X	X							X			
4		X	X			X							X	X		
5			X											X		
6			X	X										X		
7																
8																
9																
10																
11																
12																
PED GROUPS 1			X	X												
2	X	X		X	X	X										
3																
4																

DETECTOR TABLE

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	ADVANCE	35m
LOOP 2	P2	2	ADVANCE	35m
LOOP 3	P3	3	STOP LINE	4m
LOOP 4	P4	4	STOP LINE	6m
LOOP 5	P5	5	STOP LINE	6m
LOOP 6	P6	6	STOP LINE	6m
LOOP 7	P7	7	STOP LINE	6m
LOOP 8	P8	8	ADVANCE	35m
LOOP 9	Q9	9	ADVANCE	35m
LOOP 10	Q10	10	STOP LINE	4m
		11		
		12		
		13		
		14		
EXT2	E6	15	Pb2–AUDIO	
EXT1	E5	16	Pb1–AUDIO	

TRAFFIC LANTERN DISPLAY

Sg2/Sg6 on signal post 5 and mast arm 9.
Sg1/Sg5 on signal post 1 and mast arm 3.

NOTES:

1. This drawing has been compiled from mark up's provided by the electrical contractor that haven't been verified. Certification is limited to interpretation of mark up's only.
2. EVP modifications, connections amended as shown in layout.

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINAL TERMINALS	RUN 1 CORES USED	RUN 2 FINAL TERMINALS	RUN 2 CORES USED	RUN 3 FINAL TERMINALS	RUN 3 CORES USED
1	RED	A5	1	1	1	1		
	YELLOW	A4	2	2	2	2		
	GREEN	A3	3	3	3	3		
2	RED	A8	4	4	4	4		
	YELLOW	A7	5	5	5	5		
	GREEN	A6	6	6	6	6		
3	RED	A11	7	7	7	7		
	YELLOW	A10	8	8	8	8		
	GREEN	A9	9	9	9	9		
4	RED	A14	10	10	10	10		
	YELLOW	A13	11	11	11	11		
	GREEN	A12	12	12	12	12		
5	RED	B5						
	YELLOW	B4						
	GR/WH	B3	24	24	24	24		
6	RED	B8						
	YELLOW	B7						
	GR/WH	B6	16	16	16	16		
7	RED DW	B11	19	19				
	PED1							
	GREEN W	B9	20	20				
8	RED DW	B14	21	21				
	PED2							
	GREEN W	B12	22	22				
	EXT2 DET 15	E6	26	26				
	EXT1 DET 16	E5	25	25				
	230V	A2	23	23				
	DET COMMON	E3	27	GY				
	NEUTRAL	A1,B1 C1,D1	NL	BK	BK	NL	BK	BK
	SPARE CORES TO EARTH			13–15 17,18	1–3 7 16		13–15 17–23 25–Gy	4–6 13 15
	CABLE SIZE			29	19		29	19

CONTROLLER TYPE PHILIPS PSC3 QC8ID

B	As Constucted	17814	24.1.17
A	Original Issue		MF02.15A
	Revisions/Descriptions	Certification	Date / Microfiled

CAD FILES G:\NERD\ROAD PROJECTS\Elements\34\S20-R001-467\2017\M5101 GCHwy & Burleigh Connection Rd\5101 649617_B.dwg

Associated Job Nos: 160/11B/314
Auxiliary Drg Nos:

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 2 4 6 8 10m
Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST
GOLD COAST HIGHWAY (BROADBEACH–COOLANGATTA)
INTERSECTION WITH BURLEIGH CONNECTION ROAD

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
11B/10	0	N/A	0	11B/10

Through Chainage from Start of Gazettal 6.34km

TRAFFIC SIGNAL INSTALLATION OPERATIONS AND ELECTRICAL CONNECTION SHEET

Site Number: M5101
UBD Map 60 E5

Drawn: L.NOKHOVA
Designed: J.ONG

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
ELECTRICAL	A.CAUSLEY	ORIGINAL SIGNED	08751	16.01.2015

Queensland Government

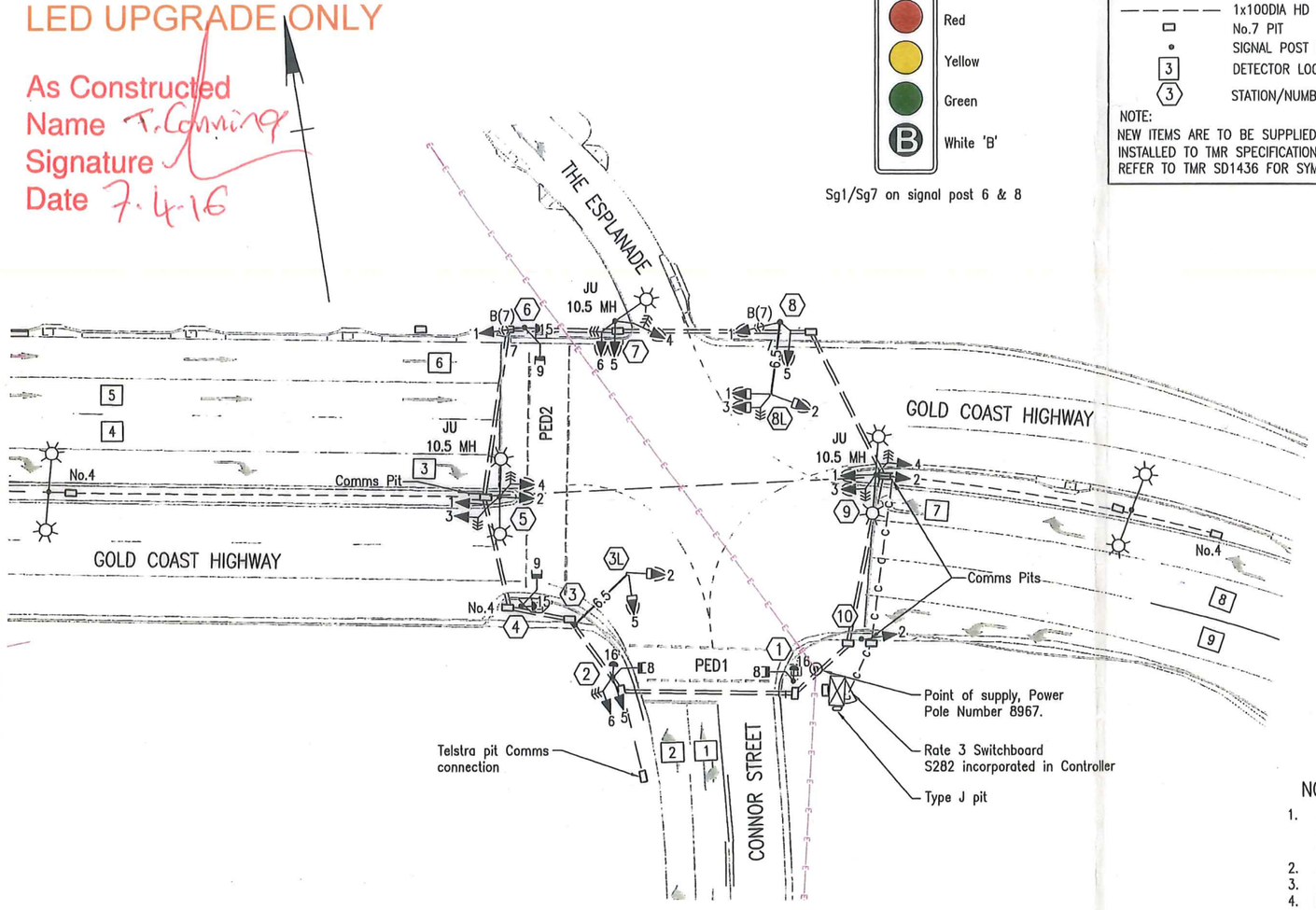
Job No. S20/R001/467
Contract. No.
Drawing No. 649617 B
Series Number TS–1 of 1
MRT_Detail (02/14)

Last Modified :- Jan 25, 2017 – 11:22am XREFS :-

PHASE DIAGRAMS	A PHASE						B PHASE				C PHASE				D PHASE				E PHASE				E1 PHASE				E2 PHASE			
SIGNAL GROUPS	1		2		7	8	1	3	6	7	2	4	8		5	6	9		3	4	6		1	3	6	7	2	4	8	
VEHICLE/PED	VG1		VG2		VG7	PG1	VG1	VG3	VG6	VG7	VG2	VG4	PG1		VG5	VG6	PG2		VG3	VG4	VG6		VG1	VG3	VG6	VG7	VG2	VG4	PG1	
LOGICAL INPUT	4	5	8	9	6	16	4	5	3	2	6	8	9	7	16		1	2	15		3	7	2		4	5	3	2	6	8	9	7	16	
CALL	X	X	X	X	X	PED1			X				X	PED1		X		PED2	X	X				X				X	PED1	
EXTEND	X	X	X	X	X				X				X			X			X	X				X				X		
INCREMENT	X	X	X	X																										
SPECIAL CONDITIONS	Early start on SG7 for Bus.						Introduce 'B' phase on 'Z' Neg Signal Early start on SG7 for Bus				Introduce 'C' phase on 'Z' Pos Signal				SG6 Red for PED2 Walk, then off.								Early start on SG7 for Bus.							

LED UPGRADE ONLY

As Constructed
Name T.Canning
Signature
Date 7.4.16



TRAFFIC LANTERN DISPLAY

Sg1/Sg7 on signal post 6 & 8

LEGEND

***** UNLESS OTHERWISE STATED *****

- 2x100DIA HD ORANGE
- 1x100DIA HD ORANGE
- No.7 PIT
- SIGNAL POST LOCATION
- [3] DETECTOR LOOP
- (3) STATION/NUMBER POST

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91. REFER TO TMR SD1436 FOR SYMBOL DETAILS

CONFLICT TABLE (X INDICATES CONFLICT)

VEHICLE GROUPS	1	2	3	4	5	6	7	8	9	10	11	12	PED GROUPS 1	2	3	4
1				X	X									X		
2			X		X	X								X		
3		X			X								X	X		
4	X				X		X									
5	X	X	X	X			X						X			
6		X											X	X		
7				X	X									X		
8																
9																
10																
11																
12																
PED GROUPS 1			X		X		X									
2	X	X	X			X	X									
3																
4																

DETECTOR TABLE

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	STOP LINE	4m
LOOP 2	P2	2	STOP LINE	4m
LOOP 3	P3	3	STOP LINE	6m
LOOP 4	P4	4	ADVANCE	35m
LOOP 5	P5	5	ADVANCE	35m
LOOP 6	P6	6	PRESENCE	4m
LOOP 7	P7	7	STOP LINE	4m
LOOP 8	P8	8	ADVANCE	35m
LOOP 9	Q9	9	ADVANCE	35m
EXT2	E6	15	Pb2–AUDIO	
EXT1	E5	16	Pb1–AUDIO	

NOTES:

1. As constructed information is based on mark up's provided by contractor for EVP works only and has not been verified on–site. Certification is limited to interpretation of contractor mark–up's only
2. All lanterns are Light Emitting Diode (LED) type.
3. JU – Joint Use Pole.
4. EPROM and software upgraded for EVP project.

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINIAL TERMINALS	RUN 1 CONNECTS	RUN 1 CORES USED	RUN 2 FINIAL TERMINALS	RUN 2 CONNECTS	RUN 2 CORES USED	RUN 3 FINIAL TERMINALS	RUN 3 CONNECTS	RUN 3 CORES USED
1	RED	A5				1	1		1	1	1
	YELLOW	A4				2	2		2	2	2
	GREEN	A3				3	3		3	3	3
2	RED	A8	4	4	4	4	4		4	4	4
	YELLOW	A7	5	5	5	5	5		5	5	5
	GREEN	A6	6	6	6	6	6		6	6	6
3	RED	A11				7	7		7	7	7
	YELLOW	A10				8	8		8	8	8
	GREEN	A9				9	9		9	9	9
4	RED	A14				10	10		10	10	
	YELLOW	A13				11	11		11	11	
	GREEN	A12				12	12		12	12	
5	RED	B5	13	13	13	13	13		13	13	
	YELLOW	B4	14	14	14	14	14		14	14	
	GREEN	B3	15	15	15	15	15		15	15	
6	RED	B8	16	16		16	16				
	YELLOW	B7	17	17		17	17				
	GREEN	B6	18	18		18	18				
7	RED										
	YELLOW										
	WHITE B	B9				24	24		24	24	
8	RED DW	B14	19	19							
	PED1										
	GREEN W	B12	20	20							
9	RED DW	C5				21	21				
	PED2										
	GREEN W	C3				22	22				
	EXT2 DET 15	E6				25	25				
	EXT1 DET 16	E5	26	26							
	230V	A2	23	23		23	23				
	DET COMMON	E3	27	GY		27	GY				
	NEUTRAL	A1,B1 C1,D1	NL	BK	BK	NL	BK		NL	BK	BK
	SPARE CORES TO EARTH			1–3 7–12 21,22 25,24	1–3 7–12 16–GY		19,20 26			16–23 25–GY	10–GY
	CABLE SIZE			29	29		29			29	29

CONTROLLER TYPE TYCO ECLIPSE EC1–62–16

C	As Constructed	LN	09350		22.07.15	
B	Controller Upgrade to Eclipse type.	LAG	04238	K.O'B	25.11.14	MT01/158
A	Issued For Construction					MT11/14A
	Revisions/Descriptions	Drawn	RPEQ	Certification	Date	M'filed

CAD FILES G:\NERD\ROAD PROJECTS\Elements\34\S20–R001–467\M5102 GCHwy & Connor St\M5102 649522_C.dwg

Last Modified :- Jul 23, 2015 - 8:47am XREFS :-

Associated Job Nos 160/11B/314

Auxiliary Drg Nos

Survey Data: Datum, Horiz. Grid, Height Origin, Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
GOLD COAST HIGHWAY
INTERSECTION WITH CONNOR STREET

Through Chainage from 6.20km – 6.75km

Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
11B/9	1.41	0.55	1.79	11B/11

TRAFFIC SIGNAL INSTALLATION OPERATIONS AND ELECTRICAL CONNECTION SHEET

Site Number M5102
UBD MAP 60 F6

Drawn L.GIBSON
Checked J.ONG

ENGINEERING CERTIFICATION (RPEQ)

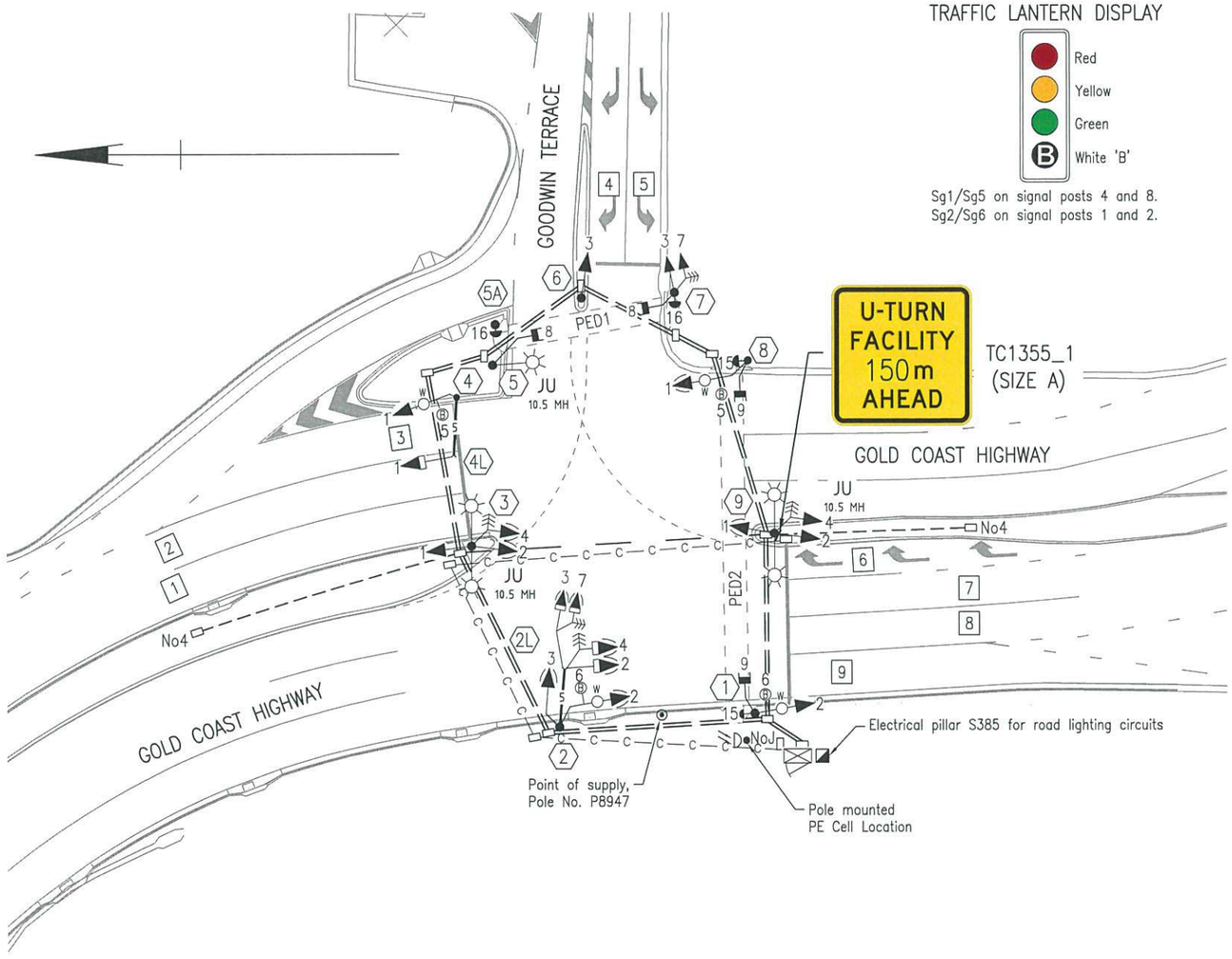
ENG. AREA	NAME	SIGNATURE	NO.	DATE
Electrical	Kerry O'Brien	Original Signed	04238	4–Nov–14

Queensland Government

Job No.	S20/R001/467
Contract. No.	–
Drawing No.	649522 C
Series Number	TS–01 of 1

MRT_Detail (02/14)

PHASE DIAGRAMS	A PHASE	B PHASE	C PHASE	D PHASE	E PHASE	F PHASE
SIGNAL GROUPS	1 2 5 6 8	3 7 9	2 4 6 7			
VEHICLE/PED	VG1 VG2 VG5 VG6 PG1	VG3 VG7 PG2	VG2 VG4 VG6 VG7			
LOGICAL INPUT	1 2 7 8 3 9 16	4 15	7 8 6 9 5			
CALL	X X X X X X PED1	X PED2	X X X			
EXTEND	X X X X X X	X	X X			
INCREMENT	X X					
SPECIAL CONDITIONS	SG5 and SG6 early start if called	SG7 red for PED2 walk, else off	SG6 early start if called			



TRAFFIC LANTERN DISPLAY

Sg1/Sg5 on signal posts 4 and 8.
Sg2/Sg6 on signal posts 1 and 2.

CONFLICT TABLE (X INDICATES CONFLICT)

VEHICLE GROUPS	1	2	3	4	5	6	7	8	9	10	11	12	PED GROUPS 1	2	3	4
1	\		X	X			X							X		
2		\	X											X		
3	X	X	\	X	X	X							X			
4	X		X	\	X								X	X		
5			X	X	\		X							X		
6			X		\									X		
7	X				X	\							X	X		
8						\										
9							\									
10								\								
11									\							
12										\						
PED GROUPS 1			X	X			X									
2	X	X		X	X	X	X									
3																
4																

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	ADVANCE	25m
LOOP 2	P2	2	ADVANCE	25m
LOOP 3	P3	3	STOP LINE	4m
LOOP 4	P4	4	STOP LINE	6m
LOOP 5	P5	5	STOP LINE	6m
LOOP 6	P6	6	STOP LINE	6m
LOOP 7	P7	7	ADVANCE	15m
LOOP 8	P8	8	ADVANCE	15m
LOOP 9	Q9	9	STOP LINE	4m
EXT2	E6	15	Pb2–AUDIO	
EXT1	E5	16	Pb1–AUDIO	

LEGEND

***** UNLESS OTHERWISE STATED *****

- 2x100DIA HD ORANGE
- 1x100DIA HD ORANGE
- 1x50DIA HD ORANGE
- COMMS CONDUIT
- No.7 PIT
- SIGNAL POST LOCATION
- DETECTOR LOOP
- STATION POST/ID

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91.
REFER TO TMR SD1436 FOR SYMBOL DETAILS

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINAL TERMINALS	RUN 1 CONNECTS	RUN 1 CORES USED	RUN 2 FINAL TERMINALS	RUN 2 CONNECTS	RUN 2 CORES USED	RUN 3 FINAL TERMINALS	RUN 3 CONNECTS	RUN 3 CORES USED
				W 1 9 8			W 2 2 4 3 4 2L 4L			W 7 5 6 5 5A	
1	RED	A5	1	1		1	1	1			
	YELLOW	A4	2	2		2	2	2			
	GREEN	A3	3	3		3	3	3			
2	RED	A8	4	4		4	4	4			
	YELLOW	A7	5	5		5	5	5			
	GREEN	A6	6	6		6	6	6			
3	RED	A11				7	7	7	7	7	
	YELLOW	A10				8	8	8	8	8	
	GREEN	A9				9	9	9	9	9	
4	RED	A14	10	10		10	10	10			
	YELLOW	A13	11	11		11	11	11			
	GREEN	A12	12	12		12	12	12			
5	RED										
	YELLOW										
	WHITE	B3	13	13		13	13				
6	RED										
	YELLOW										
	WHITE	B6	14	14		14	14				
7	RED	B11				15	15	13			
	YELLOW	B10				16	16	14			
	GREEN	B9				17	17	15			
8	RED	B14							19	19	
	PED1										
	GREEN	B12							20	20	
9	RED	C5	21	21							
	PED2										
	GREEN	C3	22	22							
EXT2 DET 15		E6	25	25					26	26	RED
EXT1 DET 16		E5							23	23	
230V		A2	23	23					27	GY	WHITE
DET COMMON		E3	27	GY		27	GY		NL	BK	
NEUTRAL		A1,B1 C1,D1	NL	BK		NL	BK	BK BK			
SPARE CORES TO EARTH				7–9 15–20 24,26			18–23 25,26	1–3, 16–GY 4–GY		5–18 21,22 24,25	
CABLE SIZE				29			29	29 29		29	4C+E

CONTROLLER TYPE PHILIPS PSC3 QC8ID

The works shown on this drawing are a factual representation of works constructed.

Name: S.Broclebank

File No.: 517/00327 Date: 26/8/19

G	As Constructed	D. Roesner 09350	23.8.2019	
F	SIGN TC1508–2 REMOVED	D. Roesner 09350	11.6.2019	
E	SG7 Modifications	D. Roesner 09350	30.4.2019	
D	As Constructed	J. Ong 17814	20.01.2017	MF.D
C	Pedestrian Safety Modifications	D. Roesner 09350	17.05.2016	MF07.16C
B	As Constructed	D. Roesner 09350	21.8.2015	MF09.15B
A	Original Issue			MF08.09A
	Revisions/Descriptions	Certification	Date	Microfiled

CAD FILES G:\NERD\ITS&E Asset Database\Gold Coast Hwy South (11B)\Traffic Signals\M5103 Goodwin Tce\Drawings\Current\M5103 457813_G.dwg

Associated Job Nos

Auxiliary Drg Nos

Survey Data: Datum; Horiz. Grid; Height Origin; Survey Books

Scales: 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

CITY OF GOLD COAST

GOLD COAST HWY (BROADBEACH – COOLANGATA)

INTERSECTION WITH GOODWIN TERRACE

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
11B/10	0.36	N/A	1.82	11B/11

Through Chainage from Start of Gazettal 6.72km

TRAFFIC SIGNAL INSTALLATION OPERATIONS AND ELECTRICAL CONNECTION SHEET

Site Number M5103 UBD Map60 F6

Drawn L.GIBSON

Designed L.GIBSON

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
ELECTRICAL	K.O'BRIEN	ORIGINAL SIGNED	04238	29.06.2009

Queensland Government

Job No. 927226

Contract. No.

Drawing No. 457813 G

Series Number of

MRT_Detail (02/14)

Last Modified :- Aug 28, 2019 - 2:46pm XREFS :-

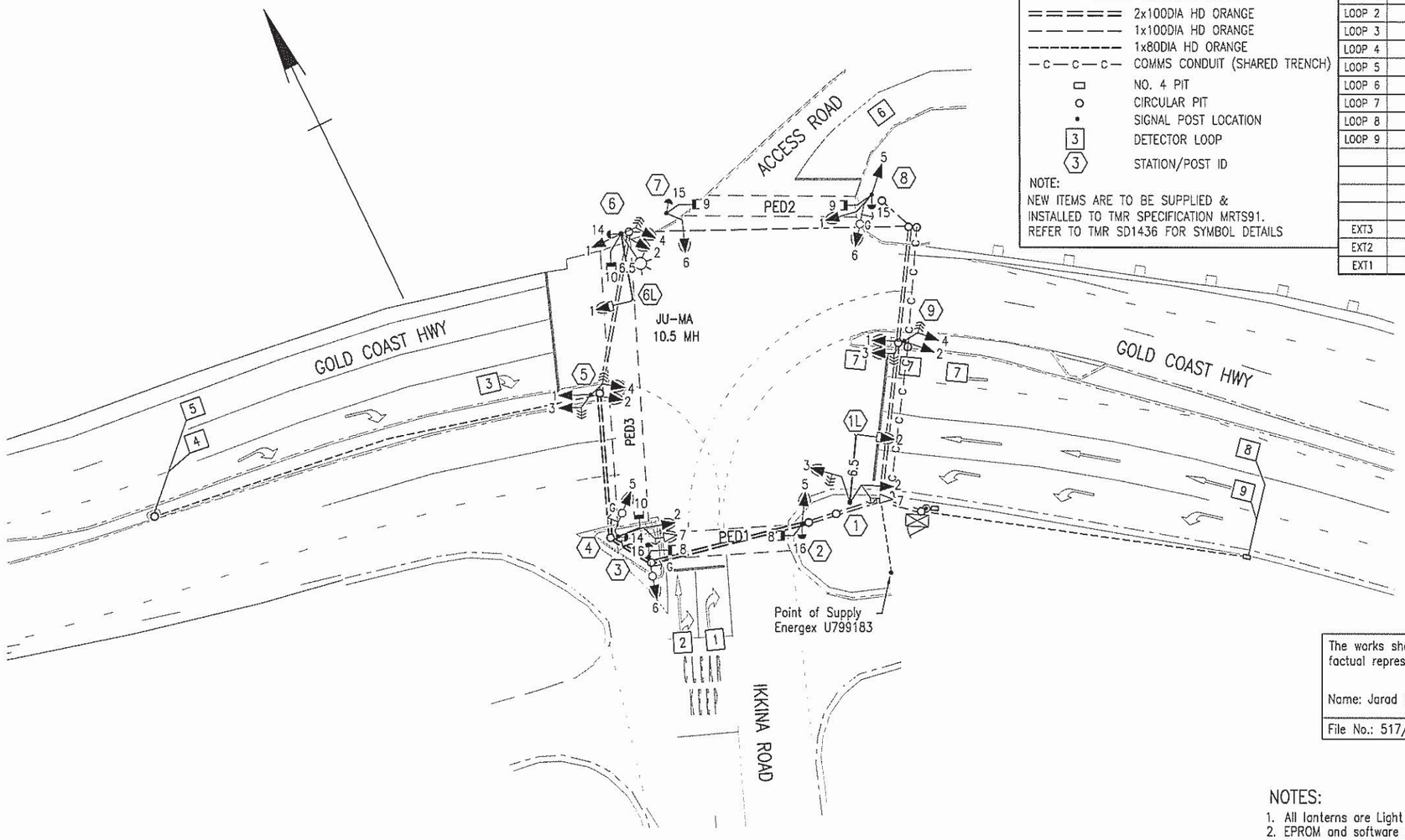
PHASE DIAGRAMS	A PHASE	B PHASE	C PHASE	D PHASE	E PHASE	F PHASE	F1 PHASE	F2 PHASE
SIGNAL GROUPS	1 2 8 9	1 3 9	2 4 8	5	6 10	3 4	1 3 9	2 4 8
VEHICLE/PED	VG1 VG2 PG1 PG2	VG1 VG3 PG2	VG2 VG4 PG1	VG5	VG6 PG3	VG3 VG4	VG1 VG3 PG2	VG2 VG4 PG1
LOGICAL INPUT	4 5 8 9 16 15	4 5 3 15	8 9 7 16	6	1 2 14	3 7	4 5 3 15	8 9 7 16
CALL	X X X X PED1 PED2			X	X X PED3	X X	X PED2	X PED1
EXTEND	X X X X	X	X	X	X X	X X	X	X
INCREMENT	X X X X							
SPECIAL CONDITIONS	SG4 Red off after t seconds. SG7 Red for PED1 walk, else off.	Introduce 'B' phase on 'Z' Neg Signal.	Introduce 'C' phase on 'Z' Pos Signal. SG7 Red for PED1 walk, else off.					SG7 Red for PED1 walk, else off

CONFLICT TABLE (X INDICATES CONFLICT)

VEHICLE GROUPS	1	2	3	4	5	6	7	8	9	10	11	12	PED GROUPS 1	2	3	4
1			X	X	X										X	
2			X		X	X									X	
3		X			X	X							X		X	
4	X				X	X								X		
5	X	X	X	X		X							X	X	X	
6	X	X	X	X	X								X	X		
7																
8																
9																
10																
11																
12																
PED GROUPS 1			X		X	X										
2				X	X	X										
3	X	X	X		X											
4																

DETECTOR TABLE

PHYSICAL LABEL	CONTROLLER TERMINAL	LOGICAL INPUT	LOOP/PB CONFIGURATION	DIST TO STOP LINE
LOOP 1	P1	1	STOP LINE	6m
LOOP 2	P2	2	STOP LINE	6m
LOOP 3	P3	3	STOP LINE	6m
LOOP 4	P4	4	ADVANCE	35m
LOOP 5	P5	5	ADVANCE	35m
LOOP 6	P6	6	STOP LINE	6m
LOOP 7	P7	7	PRESENCE	—
LOOP 8	P8	8	ADVANCE	35m
LOOP 9	Q9	9	ADVANCE	35m
		10		
		11		
		12		
		13		
EXT3	E7	14	Pb3–AUDIO	
EXT2	E6	15	Pb2–AUDIO	
EXT1	E5	16	Pb1–AUDIO	



LEGEND

***** UNLESS OTHERWISE STATED *****

- 2x100DIA HD ORANGE
- 1x100DIA HD ORANGE
- 1x80DIA HD ORANGE
- COMMS CONDUIT (SHARED TRENCH)
- NO. 4 PIT
- CIRCULAR PIT
- SIGNAL POST LOCATION
- [3] DETECTOR LOOP
- (3) STATION/POST ID

NOTE:
NEW ITEMS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91.
REFER TO TMR SD1436 FOR SYMBOL DETAILS

SIGNAL GROUPS	FUNCTION	CONTROLLER TERMINALS	RUN 1 FINAL TERMINALS	RUN 1 CORES USED	RUN 2 FINAL TERMINALS	RUN 2 CORES USED	RUN 3 FINAL TERMINALS	RUN 3 CORES USED
1	RED	A5	1	1	1	1		
	YELLOW	A4	2	2	2	2		
	GREEN	A3	3	3	3	3		
2	RED	A8	4	4 4	4	4		
	YELLOW	A7	5	5 5	5	5		
	GREEN	A6	6	6 6	6	6		
3	RED	A11	7	7	7	7		
	YELLOW	A10	8	8	8	8		
	GREEN	A9	9	9	9	9		
4	RED	A14	10	10	10	10		
	YELLOW	A13	11	11	11	11		
	GREEN	A12	12	12	12	12		
5	RED	B5	13	13	13	13		
	YELLOW	B4	14	14	14	14		
	GREEN	B3	15	15	15	15		
6	RED	B8	16	16	16	16		
	YELLOW	B7	17	17	17	17		
	GREEN	B6	18	18	18	18		
7	RED	B11	19	19				
8	RED DW	B14	20	20				
	PED1							
	GREEN W	B12	21	21				
9	RED DW	C5			19	19		
	PED2							
	GREEN W	C3			20	20		
10	RED DW	C8	22	22	21	21		
	PED3							
	GREEN W	C6	23	23	22	22		
EXT3 DET 14	E7	P3	PU3		P3	PU3		
EXT2 DET 15	E6				P2	PU2		
EXT1 DET 16	E5	P1	PU1					
230V	A2	A	RD		A	RD		
DET COMMON	E3	27	GY		PR	GY		
NEUTRAL	A1,B1 C1,D1	NL	BK	BK	NL	BK	BK	
SPARE CORES TO EARTH			24–27 OG P4	1–3, 7–GY		23–27 OG P1	4–GY	
CABLE SIZE			36	19		36	19	

CONTROLLER TYPE TYCO ECLIPSE EC1–62–16

The works shown on this drawing are a factual representation of works constructed.

Name: Jarad D Dodd

File No.: 517/00327 Date:

NOTES:

1. All lanterns are Light Emitting Diode (LED) type.
2. EPROM and software upgraded for EVP project
3. Point of supply for Traffic Signal Controller is Energex U799183. This controller also incorporates switchboard S311 which supplies the S250 luminaire at station 5L.

C	As Constructed		27.7.2019	
B	Pedestrian safety modifications	D.Roesner 09350	28.08.2018	
A	Original Issue A3			MF11.14A
	Revisions/Descriptions	Certification	Date	M'filed

CAD FILES G:\NERD\ROAD PROJECTS\Elements\34\477375\2019\PED Safety\M5104 649418_C.dwg

Last Modified :- Jun 26, 2019 - 10:39am XREFS :- 160257_Survey.dwg ; X-Image.dwg

Associated Job Nos

Auxiliary Drg Nos

Survey Data: Datum, Horiz. Grid, Height Origin, Survey Books

Scales 0 2 4 6 8 10m

Dimensions shown in metres except where shown otherwise

GOLD COAST CITY
GOLD COAST HIGHWAY
INTERSECTION WITH IKKINA ROAD

Reference Points

Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
11B/10	1.05	0.36	0.79	11B/911

Through Chainage from Start of Gazettal 7.91km

TRAFFIC SIGNAL INSTALLATION OPERATIONS AND ELECTRICAL CONNECTION SHEET

Site Number M5104 UBD MAP 60 G9

Checked J.ONG

Designed J.ONG

ENGINEERING CERTIFICATION (RPEQ)

ENG. AREA	NAME	SIGNATURE	NO.	DATE
ELECTRICAL	K.O'BRIEN	Original signed	04238	26.08.2014

Queensland Government

Job No.	R10/R004/410
Contract. No.	
Drawing No.	649418 C
Series Number	TS –1 of 1

MRT_Detail (06/13)

Appendix F: GEH Statistics

P5288 Koala Park Traffic Management

AIMSUN Turn Calibration (Dynamic)

AM Peak 0700-0800

GEH Turn Summary 0700-0800		
>10	0	0.0%
>5, <=10	7	9.5%
<=5	67	90.5%

ID	Intersection	Aimsun Code	Movement Code	From	To	Turn	Observed	Modelled	Abs. Diff (Mod - Obs)	% Diff (Mod - Obs)	GEH		
101	Tabliban Street	6488	101-1	W Burleigh Road (S)	Dunlin Drive (W)	L	85	105	20	23.5%	2.1		
	W Burleigh Road	6360	101-2		W Burleigh Road (N)	T	723	689	-34	-4.7%	1.3		
	Dunlin Drive	6363	101-3		Tabilban Street (E)	R	130	162	32	24.6%	2.6		
		25543	101-4		W Burleigh Road (S)	U	50	16	-34	-68.0%	5.9		
		6367	101-5	Tabilban Street (E)	W Burleigh Road (S)	L	125	109	-16	-12.8%	1.5		
		6366	101-6		Dunlin Drive (W)	T	64	43	-21	-32.8%	2.9		
		6364	101-7		W Burleigh Road (N)	R	50	56	6	12.0%	0.8		
		6359	101-8	W Burleigh Road (N)	Tabilban Street (E)	L	12	3	-9	-75.0%	3.3		
		6358	101-9		W Burleigh Road (S)	T	1057	933	-124	-11.7%	3.9		
		6356	101-10		Dunlin Drive (W)	R	69	63	-6	-8.7%	0.7		
		6391	101-11	Dunlin Drive (W)	W Burleigh Road (N)	L	82	102	20	24.4%	2.1		
		6355	101-12		Tabilban Street (E)	T	23	8	-15	-65.2%	3.8		
		6351	101-13		W Burleigh Road (S)	R	195	225	30	15.4%	2.1		
				All			2665	2514					
102	James Street	5434	102-1	W Burleigh Road (S)	Burleigh Street (W)	L	9	21	12	133.3%	3.1		
	W Burleigh Road	5438	102-2		W Burleigh Road (N)	T	383	413	30	7.8%	1.5		
	Burleigh Street	5440	102-3		James Street (E)	R	121	172	51	42.1%	4.2		
		5703	102-4	James Street (E)	W Burleigh Road (SW)	L	202	132	-70	-34.7%	5.4		
		5449	102-5		Burleigh Street (W)	T	51	73	22	43.1%	2.8		
		5451	102-6		W Burleigh Road (N)	R	54	57	3	5.6%	0.4		
		5468	102-7	W Burleigh Road (N)	James Street (E)	L	72	37	-35	-48.6%	4.7		
		5448	102-8		W Burleigh Road (SW)	T	539	673	134	24.9%	5.4		
		5446	102-9		Burleigh Street (W)	R	47	29	-18	-38.3%	2.9		
		5471	102-10	Burleigh Street (W)	W Burleigh Road (N)	L	59	36	-23	-39.0%	3.3		
		5442	102-11		James Street (E)	T	54	68	14	25.9%	1.8		
		5444	102-12		W Burleigh Road (SW)	R	167	195	28	16.8%	2.1		
				All			1952	1906					
103	W Burleigh Road	5378	103-1	Gold Coast Highway (S)	W Burleigh Road (SW)	L	224	256	32	14.3%	2.1		
	Gold Coast Highway	5313	103-2		Gold Coast Highway (NW)	T	1337	1158	-179	-13.4%	5.1		
		5322	103-3	Gold Coast Highway (N)	Gold Coast Highway (SE)	T	668	646	-22	-3.3%	0.9		
		5319	103-4		W Burleigh Road (SW)	R	442	508	66	14.9%	3.0		
		5323	103-5		Gold Coast Highway (NW)	U	17	0	-17	-100.0%	5.8		
		5339	103-6	W Burleigh Road (W)	Gold Coast Highway (NW)	L	233	282	49	21.0%	3.1		
		5317	103-7		Gold Coast Highway (SE)	R	232	223	-9	-3.9%	0.6		
				All			3540	3073					
104	Connor Street	5496	104-1	Connor Street (S)	Gold Coast Highway (W)	L	65	50	-15	-23.1%	2.0		
	Gold Coast Highway	5495	104-2		The Esplanade (NW)	T	38	17	-21	-55.3%	4.0		
	The Esplanade	5497	104-3		Gold Coast Highway (E)	R	82	56	-26	-31.7%	3.1		
		5492	104-4	Gold Coast Highway (E)	Connor Street (S)	L	26	12	-14	-53.8%	3.2		
		5493	104-5		Gold Coast Highway (W)	T	1504	1464	-40	-2.7%	1.0		
		5490	104-6		The Esplanade (NW)	R	60	54	-6	-10.0%	0.8		
		5500	104-9	Gold Coast Highway (W)	Gold Coast Highway (E)	T	807	766	-41	-5.1%	1.5		
		5499	104-10		Connor Street (S)	R	39	56	17	43.6%	2.5		
				All			2931	2514					
105	Gold Coast Highway	5634	105-1	Gold Coast Highway (S)	Gold Coast Highway (N)	T	1380	1341	-39	-2.8%	1.1		
	Goodwin Terrace	5632	105-2		Goodwin Terrace (E)	R	24	26	2	8.3%	0.4		
		5628	105-3	Goodwin Terrace (E)	Gold Coast Highway (S)	L	31	11	-20	-64.5%	4.4		
		5625	105-4		Gold Coast Highway (N)	R	238	216	-22	-9.2%	1.5		
		5644	105-5	Gold Coast Highway (N)	Goodwin Terrace (E)	L	195	172	-23	-11.8%	1.7		
		5630	105-6		Gold Coast Highway (S)	T	745	705	-40	-5.4%	1.5		
				All			2736	2471					
106	Gold Coast Highway	6337	106-1	Ikkina Road (S)	Gold Coast Highway (W)	L	38	47	9	23.7%	1.4		
	Ikkina Road	6322	106-2		Access (N)	T	4	0	-4	-100.0%	2.8		
		6323	106-3		Gold Coast Highway (E)	R	137	155	18	13.1%	1.5		
		6318	106-4	Gold Coast Highway (E)	Ikkina Road (S)	L	492	510	18	3.7%	0.8		
		6317	106-5		Gold Coast Highway (W)	T	1433	1386	-47	-3.3%	1.3		
		6316	106-6		Access (N)	R	4	2	-2	-50.0%	1.2		
		6312	106-7	Access (N)	Gold Coast Highway (E)	L	2	0	-2	-100.0%	2.0		
		6315	106-8		Ikkina Road (S)	T	4	3	-1	-25.0%	0.5		
		6314	106-9		Gold Coast Highway (W)	R	4	2	-2	-50.0%	1.2		
		6319	106-10	Gold Coast Highway (W)	Access (N)	L	1	1	0	0.0%	0.0		
		6320	106-11		Gold Coast Highway (E)	T	771	725	-46	-6.0%	1.7		
		6321	106-12		Ikkina Road (S)	R	43	21	-22	-51.2%	3.9		
				All			2933	2852					
107	Ikkina Road	25134	107-1	Elanora Drive (E)	Elanora Drive (W)	T	17	8	-9	-52.9%	2.5		
	Elanora Drive	25133	107-2		Ikkina Road (N)	R	12	2	-10	-83.3%	3.8		
		25131	107-3	Ikkina Road (N)	Elanora Drive (W)	L	0	5	5	#DIV/0!	3.2		
		25132	107-4		Elanora Drive (E)	R	6	3	-3	-50.0%	1.4		
		25135	107-5	Elanora Drive (W)	Ikkina Road (N)	L	9	6	-3	-33.3%	1.1		
		25136	107-6		Elanora Drive (E)	T	6	1	-5	-83.3%	2.7		
				All			50	25					
108	Reserve Street	4123	108-1	Ocean Parade (S)	Ocean Parade (W)	T	67	31	-36	-53.7%	5.1		
	Ocean Parade	4126	108-2		Reserve Street (N)	R	3	0	-3	-100.0%	2.4		
		4133	108-3	Reserve Street (E)	Ocean Parade (W)	L	1	0	-1	-100.0%	1.4		
		4131	108-4		Ocean Parade (E)	R	541	510	-31	-5.7%	1.4		
		4130	108-5	Ocean Parade (N)	Reserve Street (N)	L	174	149	-25	-14.4%	2.0		
		4128	108-6		Ocean Parade (E)	T	15	14	-1	-6.7%	0.3		
				All			801	704					
109	W Burleigh Road	6462	109-1	W Burleigh Road (S)	W Burleigh Road (N)	T	1000	984	-16	-1.6%	0.5		
		6478	109-2	Bunyip Street (E)	W Burleigh Road (S)	L	408	453	45	11.0%	2.2		
		6477	109-3	W Burleigh Road (N)	Bunyip Street (E)	L	73	23	-50	-68.5%	7.2		
		6475	109-4		W Burleigh Road (S)	T	1347	1257	-90	-6.7%	2.5		
				All			2828	2717					

P5288 Koala Park Traffic Management

AIMSUN Turn Calibration (Dynamic)

AM Peak 0800-0900

GEH Turn Summary 0800-0900		
>10	0	0.0%
>5, <=10	11	14.9%
<=5	63	85.1%

ID	Intersection	Aimsun Code	Movement Code	From	To	Turn	Observed	Modelled	Abs. Diff (Mod - Obs)	% Diff (Mod - Obs)	GEH		
101	Tabliban Street	6488	101-1	W Burleigh Road (S)	Dunlin Drive (W)	L	166	200	34	20.5%	2.5		
	W Burleigh Road	6360	101-2		W Burleigh Road (N)	T	1016	999	-17	-1.7%	0.5		
	Dunlin Drive	6363	101-3		Tabilban Street (E)	R	184	184	0	0.0%	0.0		
		25543	101-4		W Burleigh Road (S)	U	48	40	-8	-16.7%	1.2		
		6367	101-5	Tabilban Street (E)	W Burleigh Road (S)	L	175	221	46	26.3%	3.3		
		6366	101-6		Dunlin Drive (W)	T	95	88	-7	-7.4%	0.7		
		6364	101-7		W Burleigh Road (N)	R	75	42	-33	-44.0%	4.3		
		6359	101-8	W Burleigh Road (N)	Tabilban Street (E)	L	14	2	-12	-85.7%	4.2		
		6358	101-9		W Burleigh Road (S)	T	1130	1151	21	1.9%	0.6		
		6356	101-10		Dunlin Drive (W)	R	139	130	-9	-6.5%	0.8		
		6391	101-11	Dunlin Drive (W)	W Burleigh Road (N)	L	137	132	-5	-3.6%	0.4		
		6355	101-12		Tabilban Street (E)	T	54	37	-17	-31.5%	2.5		
		6351	101-13		W Burleigh Road (S)	R	235	267	32	13.6%	2.0		
				All			3468	3,493					
102	James Street	5434	102-1	W Burleigh Road (S)	Burleigh Street (W)	L	20	38	18	90.0%	3.3		
	W Burleigh Road	5438	102-2		W Burleigh Road (N)	T	479	580	101	21.1%	4.4		
	Burleigh Street	5440	102-3		James Street (E)	R	145	248	103	71.0%	7.3		
		5703	102-4	James Street (E)	W Burleigh Road (SW)	L	290	148	-142	-49.0%	9.6		
		5449	102-5		Burleigh Street (W)	T	85	85	0	0.0%	0.0		
		5451	102-6		W Burleigh Road (N)	R	105	54	-51	-48.6%	5.7		
		5468	102-7	W Burleigh Road (N)	James Street (E)	L	81	63	-18	-22.2%	2.1		
		5448	102-8		W Burleigh Road (SW)	T	630	880	250	39.7%	9.1		
		5446	102-9		Burleigh Street (W)	R	44	40	-4	-9.1%	0.6		
		5471	102-10	Burleigh Street (W)	W Burleigh Road (N)	L	70	56	-14	-20.0%	1.8		
		5442	102-11		James Street (E)	T	87	129	42	48.3%	4.0		
		5444	102-12		W Burleigh Road (SW)	R	271	263	-8	-3.0%	0.5		
				All			2572	2,584					
103	W Burleigh Road	5378	103-1	Gold Coast Highway (S)	W Burleigh Road (SW)	L	231	363	132	57.1%	7.7		
	Gold Coast Highway	5313	103-2		Gold Coast Highway (NW)	T	1338	1286	-52	-3.9%	1.4		
		5322	103-3	Gold Coast Highway (N)	Gold Coast Highway (SE)	T	831	742	-89	-10.7%	3.2		
		5319	103-4		W Burleigh Road (SW)	R	498	607	109	21.9%	4.6		
		5323	103-5		Gold Coast Highway (NW)	U	17	0	-17	-100.0%	5.8		
		5339	103-6	W Burleigh Road (W)	Gold Coast Highway (NW)	L	294	397	103	35.0%	5.5		
		5317	103-7		Gold Coast Highway (SE)	R	261	295	34	13.0%	2.0		
				All			4141	3,690					
104	Connor Street	5496	104-1	Connor Street (S)	Gold Coast Highway (W)	L	89	61	-28	-31.5%	3.2		
	Gold Coast Highway	5495	104-2		The Esplanade (NW)	T	35	29	-6	-17.1%	1.1		
	The Esplanade	5497	104-3		Gold Coast Highway (E)	R	103	77	-26	-25.2%	2.7		
		5492	104-4	Gold Coast Highway (E)	Connor Street (S)	L	22	16	-6	-27.3%	1.4		
		5493	104-5		Gold Coast Highway (W)	T	1503	1678	175	11.6%	4.4		
		5490	104-6		The Esplanade (NW)	R	106	40	-66	-62.3%	7.7		
		5500	104-9	Gold Coast Highway (W)	Gold Coast Highway (E)	T	941	908	-33	-3.5%	1.1		
		5499	104-10		Connor Street (S)	R	45	35	-10	-22.2%	1.6		
				All			3396	2,940					
105	Gold Coast Highway	5634	105-1	Gold Coast Highway (S)	Gold Coast Highway (N)	T	1362	1480	118	8.7%	3.1		
	Goodwin Terrace	5632	105-2		Goodwin Terrace (E)	R	11	23	12	109.1%	2.9		
		5628	105-3	Goodwin Terrace (E)	Gold Coast Highway (S)	L	34	22	-12	-35.3%	2.3		
		5625	105-4		Gold Coast Highway (N)	R	208	252	44	21.2%	2.9		
		5644	105-5	Gold Coast Highway (N)	Goodwin Terrace (E)	L	218	219	1	0.5%	0.1		
		5630	105-6		Gold Coast Highway (S)	T	922	873	-49	-5.3%	1.6		
				All			3147	2,869					
106	Gold Coast Highway	6337	106-1	Ikkina Road (S)	Gold Coast Highway (W)	L	47	38	-9	-19.1%	1.4		
	Ikkina Road	6322	106-2		Access (N)	T	14	0	-14	-100.0%	5.3		
		6323	106-3		Gold Coast Highway (E)	R	204	203	-1	-0.5%	0.1		
		6318	106-4	Gold Coast Highway (E)	Ikkina Road (S)	L	516	504	-12	-2.3%	0.5		
		6317	106-5		Gold Coast Highway (W)	T	1508	1533	25	1.7%	0.6		
		6316	106-6		Access (N)	R	7	0	-7	-100.0%	3.7		
		6312	106-7	Access (N)	Gold Coast Highway (E)	L	4	1	-3	-75.0%	1.9		
		6315	106-8		Ikkina Road (S)	T	2	1	-1	-50.0%	0.8		
		6314	106-9		Gold Coast Highway (W)	R	2	7	5	250.0%	2.4		
		6319	106-10	Gold Coast Highway (W)	Access (N)	L	2	3	1	50.0%	0.6		
		6320	106-11		Gold Coast Highway (E)	T	841	886	45	5.4%	1.5		
		6321	106-12		Ikkina Road (S)	R	34	30	-4	-11.8%	0.7		
				All			3181	3,206					
107	Ikkina Road	25134	107-1	Elanora Drive (E)	Elanora Drive (W)	T	21	13	-8	-38.1%	1.9		
	Elanora Drive	25133	107-2		Ikkina Road (N)	R	17	1	-16	-94.1%	5.3		
		25131	107-3	Ikkina Road (N)	Elanora Drive (W)	L	8	1	-7	-87.5%	3.3		
		25132	107-4		Elanora Drive (E)	R	15	12	-3	-20.0%	0.8		
		25135	107-5	Elanora Drive (W)	Ikkina Road (N)	L	12	10	-2	-16.7%	0.6		
		25136	107-6		Elanora Drive (E)	T	13	5	-8	-61.5%	2.7		
				All			86	42					
108	Reserve Street	4123	108-1	Ocean Parade (S)	Ocean Parade (W)	T	51	46	-5	-9.8%	0.7		
	Ocean Parade	4126	108-2		Reserve Street (N)	R	2	0	-2	-100.0%	2.0		
		4133	108-3	Reserve Street (E)	Ocean Parade (W)	L	1	0	-1	-100.0%	1.4		
		4131	108-4		Ocean Parade (E)	R	681	522	-159	-23.3%	6.5		
		4130	108-5	Ocean Parade (N)	Reserve Street (N)	L	217	191	-26	-12.0%	1.8		
		4128	108-6		Ocean Parade (E)	T	26	8	-18	-69.2%	4.4		
				All			978	767					
109	W Burleigh Road	6462	109-1	W Burleigh Road (S)	W Burleigh Road (N)	T	1418	1421	3	0.2%	0.1		
		6478	109-2	Bunyip Street (E)	W Burleigh Road (S)	L	423	338	-85	-20.1%	4.4		
		6477	109-3	W Burleigh Road (N)	Bunyip Street (E)	L	87	59	-28	-32.2%	3.3		
		6475	109-4		W Burleigh Road (S)	T	1511	1622	111	7.3%	2.8		
				All			3439	3,440					

P5288 Koala Park Traffic Management

AIMSUN Turn Calibration (Dynamic)

PM Peak 1600-1700

GEH Turn Summary 0700-0800		
>10	0	0.0%
>5, <=10	6	8.1%
<=5	68	91.9%

ID	Intersection	Aimsun Code	Movement Code	From	To	Turn	Observed	Modelled	Abs. Diff (Mod - Obs)	% Diff (Mod - Obs)	GEH		
101	Tabliban Street	6488	101-1	W Burleigh Road (S)	Dunlin Drive (W)	L	159	220	61	38.4%	4.4		
	W Burleigh Road	6360	101-2		W Burleigh Road (N)	T	937	792	-145	-15.5%	4.9		
	Dunlin Drive	6363	101-3		Tabilban Street (E)	R	377	384	7	1.9%	0.4		
		25543	101-4		W Burleigh Road (S)	U	31	26	-5	-16.1%	0.9		
		6367	101-5	Tabilban Street (E)	W Burleigh Road (S)	L	114	158	44	38.6%	3.8		
		6366	101-6		Dunlin Drive (W)	T	87	81	-6	-6.9%	0.7		
		6364	101-7		W Burleigh Road (N)	R	35	20	-15	-42.9%	2.9		
		6359	101-8	W Burleigh Road (N)	Tabilban Street (E)	L	23	17	-6	-26.1%	1.3		
		6358	101-9		W Burleigh Road (S)	T	789	693	-96	-12.2%	3.5		
		6356	101-10		Dunlin Drive (W)	R	140	97	-43	-30.7%	4.0		
		6391	101-11	Dunlin Drive (W)	W Burleigh Road (N)	L	211	258	47	22.3%	3.1		
		6355	101-12		Tabilban Street (E)	T	90	55	-35	-38.9%	4.1		
		6351	101-13		W Burleigh Road (S)	R	167	148	-19	-11.4%	1.5		
				All			3160	2,949					
102	James Street	5434	102-1	W Burleigh Road (S)	Burleigh Street (W)	L	21	55	34	161.9%	5.5		
	W Burleigh Road	5438	102-2		W Burleigh Road (N)	T	636	674	38	6.0%	1.5		
	Burleigh Street	5440	102-3		James Street (E)	R	182	187	5	2.7%	0.4		
		5703	102-4	James Street (E)	W Burleigh Road (SW)	L	121	168	47	38.8%	3.9		
		5449	102-5		Burleigh Street (W)	T	61	63	2	3.3%	0.3		
		5451	102-6		W Burleigh Road (N)	R	72	59	-13	-18.1%	1.6		
		5468	102-7	W Burleigh Road (N)	James Street (E)	L	96	55	-41	-42.7%	4.7		
		5448	102-8		W Burleigh Road (SW)	T	413	548	135	32.7%	6.2		
		5446	102-9		Burleigh Street (W)	R	77	42	-35	-45.5%	4.5		
		5471	102-10	Burleigh Street (W)	W Burleigh Road (N)	L	71	59	-12	-16.9%	1.5		
		5442	102-11		James Street (E)	T	73	78	5	6.8%	0.6		
		5444	102-12		W Burleigh Road (SW)	R	133	123	-10	-7.5%	0.9		
				All			2223	2,111					
103	W Burleigh Road	5378	103-1	Gold Coast Highway (S)	W Burleigh Road (SW)	L	211	270	59	28.0%	3.8		
	Gold Coast Highway	5313	103-2		Gold Coast Highway (NW)	T	898	825	-73	-8.1%	2.5		
		5322	103-3	Gold Coast Highway (N)	Gold Coast Highway (SE)	T	1089	1025	-64	-5.9%	2.0		
		5319	103-4		W Burleigh Road (SW)	R	361	372	11	3.0%	0.6		
		5323	103-5		Gold Coast Highway (NW)	U	11	0	-11	-100.0%	4.7		
		5339	103-6	W Burleigh Road (W)	Gold Coast Highway (NW)	L	322	367	45	14.0%	2.4		
		5317	103-7		Gold Coast Highway (SE)	R	429	426	-3	-0.7%	0.1		
				All			4277	3,285					
104	Connor Street	5496	104-1	Connor Street (S)	Gold Coast Highway (W)	L	107	115	8	7.5%	0.8		
	Gold Coast Highway	5495	104-2		The Esplanade (NW)	T	43	17	-26	-60.5%	4.7		
	The Esplanade	5497	104-3		Gold Coast Highway (E)	R	117	80	-37	-31.6%	3.7		
		5492	104-4	Gold Coast Highway (E)	Connor Street (S)	L	15	6	-9	-60.0%	2.8		
		5493	104-5		Gold Coast Highway (W)	T	1044	1085	41	3.9%	1.3		
		5490	104-6		The Esplanade (NW)	R	93	74	-19	-20.4%	2.1		
		5500	104-9	Gold Coast Highway (W)	Gold Coast Highway (E)	T	1403	1339	-64	-4.6%	1.7		
		5499	104-10		Connor Street (S)	R	30	27	-3	-10.0%	0.6		
				All			3568	2,792					
105	Gold Coast Highway	5634	105-1	Gold Coast Highway (S)	Gold Coast Highway (N)	T	940	942	2	0.2%	0.1		
	Goodwin Terrace	5632	105-2		Goodwin Terrace (E)	R	34	23	-11	-32.4%	2.1		
		5628	105-3	Goodwin Terrace (E)	Gold Coast Highway (S)	L	46	21	-25	-54.3%	4.3		
		5625	105-4		Gold Coast Highway (N)	R	205	244	39	19.0%	2.6		
		5644	105-5	Gold Coast Highway (N)	Goodwin Terrace (E)	L	241	264	23	9.5%	1.4		
		5630	105-6		Gold Coast Highway (S)	T	1362	1247	-115	-8.4%	3.2		
				All			3345	2,741					
106	Gold Coast Highway	6337	106-1	Ikkina Road (S)	Gold Coast Highway (W)	L	43	24	-19	-44.2%	3.3		
	Ikkina Road	6322	106-2		Access (N)	T	5	2	-3	-60.0%	1.6		
		6323	106-3		Gold Coast Highway (E)	R	342	326	-16	-4.7%	0.9		
		6318	106-4	Gold Coast Highway (E)	Ikkina Road (S)	L	303	384	81	26.7%	4.4		
		6317	106-5		Gold Coast Highway (W)	T	1063	990	-73	-6.9%	2.3		
		6316	106-6		Access (N)	R	9	0	-9	-100.0%	4.2		
		6312	106-7	Access (N)	Gold Coast Highway (E)	L	8	0	-8	-100.0%	4.0		
		6315	106-8		Ikkina Road (S)	T	4	2	-2	-50.0%	1.2		
		6314	106-9		Gold Coast Highway (W)	R	6	0	-6	-100.0%	3.5		
		6319	106-10	Gold Coast Highway (W)	Access (N)	L	6	1	-5	-83.3%	2.7		
		6320	106-11		Gold Coast Highway (E)	T	1229	1240	11	0.9%	0.3		
		6321	106-12		Ikkina Road (S)	R	57	31	-26	-45.6%	3.9		
				All			3075	3,000					
107	Ikkina Road	25134	107-1	Elanora Drive (E)	Elanora Drive (W)	T	17	6	-11	-64.7%	3.2		
	Elanora Drive	25133	107-2		Ikkina Road (N)	R	13	0	-13	-100.0%	5.1		
		25131	107-3	Ikkina Road (N)	Elanora Drive (W)	L	3	7	4	133.3%	1.8		
		25132	107-4		Elanora Drive (E)	R	15	18	3	20.0%	0.7		
		25135	107-5	Elanora Drive (W)	Ikkina Road (N)	L	3	6	3	100.0%	1.4		
		25136	107-6		Elanora Drive (E)	T	38	11	-27	-71.1%	5.5		
				All			89	48					
108	Reserve Street	4123	108-1	Ocean Parade (S)	Ocean Parade (W)	T	30	31	1	3.3%	0.2		
	Ocean Parade	4126	108-2		Reserve Street (N)	R	2	0	-2	-100.0%	2.0		
		4133	108-3	Reserve Street (E)	Ocean Parade (W)	L	2	0	-2	-100.0%	2.0		
		4131	108-4		Ocean Parade (E)	R	271	362	91	33.6%	5.1		
		4130	108-5	Ocean Parade (N)	Reserve Street (N)	L	497	365	-132	-26.6%	6.4		
		4128	108-6		Ocean Parade (E)	T	37	30	-7	-18.9%	1.2		
				All			839	788					
109	W Burleigh Road	6462	109-1	W Burleigh Road (S)	W Burleigh Road (N)	T	1525	1468	-57	-3.7%	1.5		
		6478	109-2	Bunyip Street (E)	W Burleigh Road (S)	L	221	203	-18	-8.1%	1.2		
		6477	109-3	W Burleigh Road (N)	Bunyip Street (E)	L	60	39	-21	-35.0%	3.0		
		6475	109-4		W Burleigh Road (S)	T	1033	986	-47	-4.5%	1.5		
				All			2839	2,696					

P5288 Koala Park Traffic Management

AIMSUN Turn Calibration (Dynamic)

PM Peak 1700-1800

GEH Turn Summary 0800-0900		
>10	0	0.0%
>5, <=10	8	10.8%
<=5	66	89.2%

ID	Intersection	Aimsun Code	Movement Code	From	To	Turn	Observed	Modelled	Abs. Diff (Mod - Obs)	% Diff (Mod - Obs)	GEH		
101	Tabliban Street	6488	101-1	W Burleigh Road (S)	Dunlin Drive (W)	L	172	189	17	9.9%	1.3		
	W Burleigh Road	6360	101-2		W Burleigh Road (N)	T	1033	955	-78	-7.6%	2.5		
	Dunlin Drive	6363	101-3		Tabilban Street (E)	R	351	445	94	26.8%	4.7		
		25543	101-4		W Burleigh Road (S)	U	25	39	14	56.0%	2.5		
		6367	101-5	Tabilban Street (E)	W Burleigh Road (S)	L	75	98	23	30.7%	2.5		
		6366	101-6		Dunlin Drive (W)	T	67	78	11	16.4%	1.3		
		6364	101-7		W Burleigh Road (N)	R	32	16	-16	-50.0%	3.3		
		6359	101-8	W Burleigh Road (N)	Tabilban Street (E)	L	24	14	-10	-41.7%	2.3		
		6358	101-9		W Burleigh Road (S)	T	775	675	-100	-12.9%	3.7		
		6356	101-10		Dunlin Drive (W)	R	106	95	-11	-10.4%	1.1		
		6391	101-11	Dunlin Drive (W)	W Burleigh Road (N)	L	159	198	39	24.5%	2.9		
		6355	101-12		Tabilban Street (E)	T	106	63	-43	-40.6%	4.7		
		6351	101-13		W Burleigh Road (S)	R	123	139	16	13.0%	1.4		
				All			3048	3,004					
102	James Street	5434	102-1	W Burleigh Road (S)	Burleigh Street (W)	L	24	34	10	41.7%	1.9		
	W Burleigh Road	5438	102-2		W Burleigh Road (N)	T	660	730	70	10.6%	2.7		
	Burleigh Street	5440	102-3		James Street (E)	R	187	186	-1	-0.5%	0.1		
		5703	102-4	James Street (E)	W Burleigh Road (SW)	L	107	147	40	37.4%	3.5		
		5449	102-5		Burleigh Street (W)	T	78	57	-21	-26.9%	2.6		
		5451	102-6		W Burleigh Road (N)	R	58	63	5	8.6%	0.6		
		5468	102-7	W Burleigh Road (N)	James Street (E)	L	118	73	-45	-38.1%	4.6		
		5448	102-8		W Burleigh Road (SW)	T	350	525	175	50.0%	8.4		
		5446	102-9		Burleigh Street (W)	R	52	48	-4	-7.7%	0.6		
		5471	102-10	Burleigh Street (W)	W Burleigh Road (N)	L	76	80	4	5.3%	0.5		
		5442	102-11		James Street (E)	T	101	59	-42	-41.6%	4.7		
		5444	102-12		W Burleigh Road (SW)	R	88	125	37	42.0%	3.6		
				All			2160	2,127					
103	W Burleigh Road	5378	103-1	Gold Coast Highway (S)	W Burleigh Road (SW)	L	168	264	96	57.1%	6.5		
	Gold Coast Highway	5313	103-2		Gold Coast Highway (NW)	T	851	821	-30	-3.5%	1.0		
		5322	103-3	Gold Coast Highway (N)	Gold Coast Highway (SE)	T	1154	1133	-21	-1.8%	0.6		
		5319	103-4		W Burleigh Road (SW)	R	349	385	36	10.3%	1.9		
		5323	103-5		Gold Coast Highway (NW)	U	8	0	-8	-100.0%	4.0		
		5339	103-6	W Burleigh Road (W)	Gold Coast Highway (NW)	L	329	395	66	20.1%	3.5		
		5317	103-7		Gold Coast Highway (SE)	R	463	485	22	4.8%	1.0		
				All			4130	3,483					
104	Connor Street	5496	104-1	Connor Street (S)	Gold Coast Highway (W)	L	123	111	-12	-9.8%	1.1		
	Gold Coast Highway	5495	104-2		The Esplanade (NW)	T	44	14	-30	-68.2%	5.6		
	The Esplanade	5497	104-3		Gold Coast Highway (E)	R	173	90	-83	-48.0%	7.2		
		5492	104-4	Gold Coast Highway (E)	Connor Street (S)	L	29	5	-24	-82.8%	5.8		
		5493	104-5		Gold Coast Highway (W)	T	1069	1028	-41	-3.8%	1.3		
		5490	104-6		The Esplanade (NW)	R	85	54	-31	-36.5%	3.7		
		5500	104-9	Gold Coast Highway (W)	Gold Coast Highway (E)	T	1473	1533	60	4.1%	1.5		
		5499	104-10		Connor Street (S)	R	46	33	-13	-28.3%	2.1		
				All			3459	2,930					
105	Gold Coast Highway	5634	105-1	Gold Coast Highway (S)	Gold Coast Highway (N)	T	859	909	50	5.8%	1.7		
	Goodwin Terrace	5632	105-2		Goodwin Terrace (E)	R	29	17	-12	-41.4%	2.5		
		5628	105-3	Goodwin Terrace (E)	Gold Coast Highway (S)	L	41	19	-22	-53.7%	4.0		
		5625	105-4		Gold Coast Highway (N)	R	175	174	-1	-0.6%	0.1		
		5644	105-5	Gold Coast Highway (N)	Goodwin Terrace (E)	L	248	256	8	3.2%	0.5		
		5630	105-6		Gold Coast Highway (S)	T	1439	1450	11	0.8%	0.3		
				All			3223	2,825					
106	Gold Coast Highway	6337	106-1	Ikkina Road (S)	Gold Coast Highway (W)	L	36	30	-6	-16.7%	1.0		
	Ikkina Road	6322	106-2		Access (N)	T	2	3	1	50.0%	0.6		
		6323	106-3		Gold Coast Highway (E)	R	366	406	40	10.9%	2.0		
		6318	106-4	Gold Coast Highway (E)	Ikkina Road (S)	L	246	348	102	41.5%	5.9		
		6317	106-5		Gold Coast Highway (W)	T	1006	916	-90	-8.9%	2.9		
		6316	106-6		Access (N)	R	6	1	-5	-83.3%	2.7		
		6312	106-7	Access (N)	Gold Coast Highway (E)	L	8	2	-6	-75.0%	2.7		
		6315	106-8		Ikkina Road (S)	T	4	0	-4	-100.0%	2.8		
		6314	106-9		Gold Coast Highway (W)	R	8	2	-6	-75.0%	2.7		
		6319	106-10	Gold Coast Highway (W)	Access (N)	L	0	3	3	#DIV/0!	2.4		
		6320	106-11		Gold Coast Highway (E)	T	1376	1453	77	5.6%	2.0		
		6321	106-12		Ikkina Road (S)	R	29	35	6	20.7%	1.1		
				All			3087	3,199					
107	Ikkina Road	25134	107-1	Elanora Drive (E)	Elanora Drive (W)	T	14	6	-8	-57.1%	2.5		
	Elanora Drive	25133	107-2		Ikkina Road (N)	R	10	0	-10	-100.0%	4.5		
		25131	107-3	Ikkina Road (N)	Elanora Drive (W)	L	9	6	-3	-33.3%	1.1		
		25132	107-4		Elanora Drive (E)	R	16	19	3	18.8%	0.7		
		25135	107-5	Elanora Drive (W)	Ikkina Road (N)	L	8	14	6	75.0%	1.8		
		25136	107-6		Elanora Drive (E)	T	22	7	-15	-68.2%	3.9		
				All			79	52					
108	Reserve Street	4123	108-1	Ocean Parade (S)	Ocean Parade (W)	T	29	18	-11	-37.9%	2.3		
	Ocean Parade	4126	108-2		Reserve Street (N)	R	0	0	0	#DIV/0!	0.0		
		4133	108-3	Reserve Street (E)	Ocean Parade (W)	L	4	0	-4	-100.0%	2.8		
		4131	108-4		Ocean Parade (E)	R	216	345	129	59.7%	7.7		
		4130	108-5	Ocean Parade (N)	Reserve Street (N)	L	389	432	43	11.1%	2.1		
		4128	108-6		Ocean Parade (E)	T	42	31	-11	-26.2%	1.8		
				All			680	826					
109	W Burleigh Road	6462	109-1	W Burleigh Road (S)	W Burleigh Road (N)	T	1564	1599	35	2.2%	0.9		
		6478	109-2	Bunyip Street (E)	W Burleigh Road (S)	L	170	245	75	44.1%	5.2		
		6477	109-3	W Burleigh Road (N)	Bunyip Street (E)	L	45	54	9	20.0%	1.3		
		6475	109-4		W Burleigh Road (S)	T	958	899	-59	-6.2%	1.9		
				All			2737	2,797					