Project Halogen Traffic Impact Assessment

Grenof Water Technologies Pty Ltd

P003805-R01

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Premise

PART OF THE Amey GROUP

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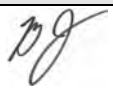
Bradley Jones		Danielle Bamber		Bradley Jones	

ABBREVIATIONS

a	Longitudinal grade
AADT	Annual average daily traffic
AC	Asphaltic concrete pavement
AGRD04A-23ed3.2	Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections
AGTM03-09	Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis, 2009 edition
AGTM06-20	Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management
AN	Ammonium nitrate
ASD	Approach sight distance
ATLM	Audio tactile line marking
AUL	Auxiliary left
BAL	Basic left
BAR	Basic right
Bruce Hwy / Gladstone – Mt Larcom Rd	Bruce Highway / Gladstone – Mount Larcom Road intersection
Bruce Hwy (N)	Bruce Highway north of Gladstone – Mount Larcom Road
Bruce Hwy (S)	Bruce Highway south of Gladstone – Mount Larcom Road
CAMs	Curve alignment markers
CHR	Channelised right
Cl_2	Chlorine gas
CMDG D1	Capricorn Municipal Development Guidelines Geometric Road Design
CMDG D2	Capricorn Municipal Development Guidelines Pavement Design
CQG	CQG Consulting
d	Coefficient of deceleration
DCA	Definitions for coding accidents
DoS	Degree of saturation
D_T	Decision time
ESAs	Equivalent standard axles
FFI	Fortescue Future Industries
GEM	Green Energy Manufacturing Centre
Gladstone – Mt Larcom Rd (E)	Gladstone – Mount Larcom Road (Hanson Road) east of Landing Road
Gladstone – Mt Larcom Rd (W)	Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway

GML	General mass limit
GN	Granular pavement
GPC	Gladstone Ports Corporation
GPIA	Department of Transport and Main Roads "Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment"
GRC	Gladstone Regional Council
GTIA	Department of Transport and Main Roads "Guide to Traffic Impact Assessment"
GTIA:FAQ	Department of Transport and Main Roads "Guide to Traffic Impact Assessment: Frequently Asked Questions (December 2017)"
GWT	Grenof Water Technologies Pty Ltd
h	Hours
Ha	hectare
Hanson Rd / Landing Rd	Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection
HCl	Hydrochloric acid
HML	Higher mass limit
HPA	High purity alumina
HV	Heavy vehicles
HVpd	Heavy vehicles per day
HVph	Heavy vehicles per hour
IBC	Intermediate bulk container
L	Litre
Landing Rd (N)	Landing Road north of Fishermans Road
Landing Rd (S)	Landing Road between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road)
LV	Light vehicle
LVph	Light vehicles per hour
m	Metre
MC	Marginal cost
MCU	Material Change of Use
MGSD	Minimum gap sight distance
min	Minutes
NaCl	Salt
NaOCl	Sodium hypochlorite

NaOH	Caustic soda
NDD	Normal design domain
NOR	Northern Oil Refinery
OCG	Office of the Coordinator General
O_T	Observation time
PFF	Peak flow factor
PIAM	Gladstone Regional Council's "Pavement Impact Assessment Methodology" Revision D March 2022
Premise	Premise Australia Pty Ltd
PUP	Public utility plant
RPEQ	Registered professional engineer of Queensland
RRPMs	Raised retroreflective pavement markers
RSA	Accredited road safety auditor
R_T	Reaction time
SAR	Standard axle repetitions
SCR	State-controlled road
SDA	Gladstone State Development Area
SIDRA	SIDRA Intersection Version 10 software
SISD	Safe intersection sight distance
t	Tonnes
t_a	Critical gap acceptance time
t/m^3	Tonnes per cubic metre
TIA	Traffic Impact Assessment
TMR	Department of Transport and Main Roads
V	Design speed
vpd	Vehicles per day
vph	Vehicles per hour

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EXECUTIVE SUMMARY

Grenof Water Technologies Pty Ltd (GWT) is proposing to develop a chlor-alkali facility over a project area of approximately 6.9 hectares (Ha) at 56 Fishermans Road, Yarwun, over land described as Lot 1 on SP200899 and Lot 1 on MPH32292.

With consideration to both the development traffic profile and traffic profile of the surrounding road network, four (4) peak periods were identified as potential design peak hours being:

1. Morning peak hour: 5:45AM – 6:45AM peak for both development and Landing Road traffic;
2. Noon peak hour: 11:30AM – 12:30PM peak for Bruce Highway traffic;
3. Afternoon peak hour:
    - 3:00PM – 4:00PM peak for development traffic; and
    - 3:45PM – 4:45PM peak for Landing Road traffic; and
4. Evening peak hour: 5:15PM – 6:15PM peak for development traffic.

Comparing development generated traffic to opening year "without development" traffic during the four (4) identified peak periods it was concluded that the development:

> Will significantly (>5%) increase traffic:
    - On Fishermans Road between the development access and Landing Road;
    - At the Landing Road / Fishermans Road intersection;
    - On Landing Road between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road); and
    - At the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection.
> Will not significantly (<5%) increase traffic on Gladstone – Mount Larcom Road (Hanson Road).
> May significantly (>5%) increase turning movements between Gladstone – Mount Larcom Road and the Bruce Highway south of Gladstone – Mount Larcom Road.

Further analysis with respect to variations in development traffic and observed traffic over the course of a day concluded:

> For Fishermans Road, the Landing Road / Fishermans Road intersection, Landing Road and the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection:
    - Design peak hours are the morning and afternoon peak hours; and
    - The noon and evening peak hours are not design peak hours.
> The development will result in a relatively small increase in vehicle movements at the Bruce Highway / Gladstone – Mount Larcom Road intersection and only road safety impacts need to be assessed and mitigated at this location.

GWT advise that construction activities are not expected to generate over-size-over-mass (OSOM) vehicle movements or more vehicle movements than peak operations traffic. Therefore, construction traffic is expected to be no worse than operation traffic and only operations traffic has been assessed to mitigate both operations and construction impacts.

Existing road safety issues were identified from analysis of 16 years of historic road crash data for Fishermans Road, Landing Road, Gladstone – Mount Larcom Road (Hanson Road) and intersecting roads within 200m of these road links. Risk assessment of existing road safety issues concluded that the proposed development will not increase the risk score of any existing risk items above their "without development" level and no action is required to mitigate existing road safety issues.

A safety assessment of the surrounding road network concluded that, as the development is located in the Gladstone SDA, any changes to the road environment as a result of the development should be subject to a road safety audit by an accredited road safety auditor at the detailed design stage. The only proposed change to the road environment is construction of approximately 150m of Fishermans Road between Landing Road and the proposed entry gate to provide access to the development including upgrading of the Landing Road / Fishermans Road intersection.

Turn warrant assessments concluded that:

- The site access on Fishermans Road warrants basic left and right (BAL / BAR) turn treatments;
- The Landing Road / Fishermans Road intersection also warrants BAL / BAR turn treatments; and
- The Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection warrants basic left (BAL) and channelised right (CHR) turn treatments.

Basic turn treatments do not provide deceleration lanes for turning traffic but instead provide shoulder widening which allows turning and through vehicles to manoeuvre past each other at low speed. This requirement will need to be considered in the design and construction of Fishermans Road between Landing Road and the proposed development access.

Existing turn treatments at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection already satisfy the requirements of the turn warrant assessment.

Analysis of the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection based on design year (2038) "with development" traffic volumes concluded that the intersection will operate well below its practical capacity with acceptable delays. Queueing at the intersection is not expected to exceed one (1) vehicle except on Landing Road during the afternoon peak hour where queues of up to three (3) vehicles may form. Queueing is not expected to adversely impact on the operation of any adjacent intersections or accesses.

Capacity analysis is unnecessary for the proposed development access on Fishermans Road or the Landing Road / Fishermans Road intersection due to the low forecast traffic volumes even during design peak periods in the design year (2038) "with development" scenario.

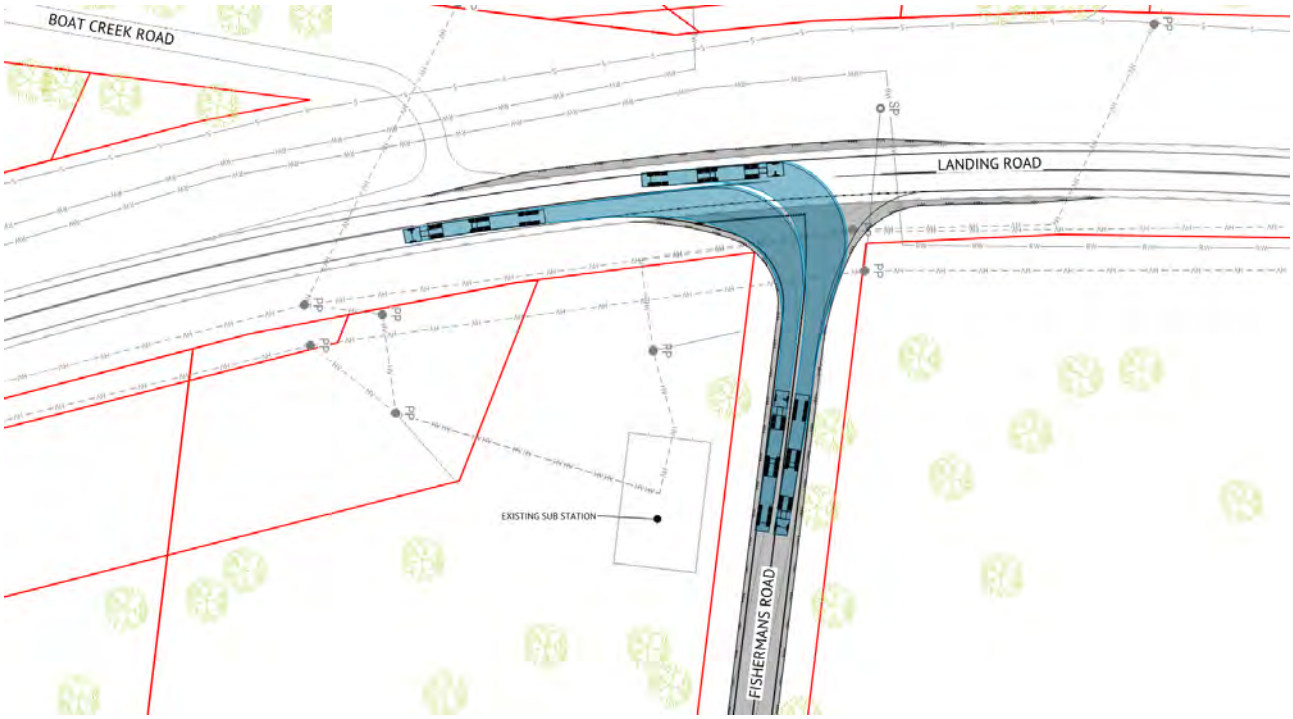
Fishermans Road between Landing Road and the proposed project site access should be constructed to provide a 9.0m wide sealed carriageway with one (1) 3.5m wide traffic lane in each direction with 1.0m wide sealed shoulders. Fishermans Road pavement design traffic is calculated to be 7.730×10^5 ESAs per lane.

When Fishermans Road is upgraded between Landing Road and the proposed project site access a speed limit of 80km/h should be imposed for consistency with the surrounding road network and to ensure achievement of minimum approach sight distance (ASD) requirements for drivers using the upgraded section of Fishermans Road. When Fishermans Road east of the proposed project site access is sealed (not part of this project) a speed limit review should be undertaken to assess if a reduction in speed limit is required.

Figure 1 shows warranted turn treatments at the Landing Road / Fishermans Road intersection. With the Fishermans Road reserve being just 20m wide, an intersection angle of 80-degrees, and no truncations of the road reserve boundaries it is difficult to accommodate the B-double swept paths in the existing road reserves and relocation of public utility plant (PUP) will likely be required. Alternative solutions include:

- Acquisition of land on the southeast corner of the intersection from the electricity substation site to increase the Fishermans Road reserve width at the intersection, square up the intersection angle and allow realignment of Fishermans Road away from existing power poles on the northeast corner of the intersection; or
- Relocating the proposed development access from the narrow Fishermans Road reserve to be directly on Landing Road to the south of the electricity substation site.

Figure 1 – Landing Road / Fishermans Road intersection layout



All other roads and intersection in the impact assessment area are currently approved for use by B-doubles up to 26m in length.

Visibility at intersections in the study area was assessed during a site inspection conducted between 9:00AM and 12:00PM on 24 September 2025. This confirmed that public road intersections in the impact assessment area comply with minimum requirements for safe intersection sight distance (SISD).

To mitigate the development's impacts on state-controlled road (SCR) pavements, a one (1) off payment of $20,818.01 should be made to the Department of Transport and Main Roads (TMR) but only if the development commences operation prior to 2028. If the development does not commence operation until 2028 or later, the development impact on state-controlled road pavements will not be significant (<5%).

The proposed development will use approximately 800m of Landing Road under the governing authority of Gladstone Regional Council (GRC) between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road). Annual project generated traffic on Landing Road between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road) is calculated to be:

- Outbound (southbound) = 3.49 x 10^4 ESAs (SAR4s) per annum
- Inbound (northbound) = 1.32 x 10^4 ESAs (SAR4s) per annum

The development will not significantly (>5%) increase traffic volumes crossing any:

- Bridges or culverts on the SCR network; or
- Railway lines.

1. INTRODUCTION

Grenof Water Technologies Pty Ltd (GWT) is proposing to develop a chlor-alkali facility over a project area of approximately 6.9 hectares (Ha) at 56 Fishermans Road, Yarwun, over land described as Lot 1 on SP200899 and Lot 1 on MPH32292. Premise Australia Pty Ltd (Premise) was engaged by CQG Consulting (CQG) to prepare a Traffic Impact Assessment (TIA) to from part of the material change of use (MCU) application to the Office of the Coordinator General (OCG) for development approval.

1.1 Scope and Study Area

The project site is located approximately 300m east of Landing Road which connects Fishermans Road to the nearest state-controlled road (SCR) which is Gladstone – Mount Larcom Road, locally known as Hanson Road between Gladstone and Landing Road, approximately 800m to the south. Landing Road intersects Gladstone – Mount Larcom Road approximately midway between Gladstone Central and the Bruce Highway as shown by Figure 2. The study area for this TIA consists of:

- Project Halogen access on Fishermans Road;
- Fishermans Road from the Project Halogen Access to Landing Road;
- Landing Road / Fishermans Road intersection;
- Landing Road from Fishermans Road to Gladstone – Mount Larcom Road (Hanson Road);
- Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection;
- Gladstone Mount Larcom Road from Landing Road to the Bruce Highway; and
- Bruce Highway / Gladstone – Mount Larcom Road intersection.

Figure 2 – Study Area

1.2 Pre-lodgement Meeting Notes

CQG facilitated an agency briefing for the OCG on 3 September 2025. Following the briefing, the Department of Transport and Main Roads (TMR) supplied the pre-lodgement advice enclosed in Appendix A.

2. EXISTING CONDITIONS

2.1 Land Use and Zoning

The project site is located on the southern side of Fishermans Road immediately to the east of an electricity substation. The land is located within a Special Purpose Zone of the Gladstone Regional Council (GRC) Planning Scheme and the Material Transportation and Services Corridor Precinct of the Gladstone SDA Development Scheme.

2.2 Adjacent Land Uses / Approvals

Land to the north of Fishermans Road is currently undeveloped and zoned Rural in the GRC Planning Scheme and Industry Investigation Precinct of the Gladstone State Development Area (SDA) Development Scheme.

Other land near the project site is zoned either Special Purpose or Special Industry in the GRC Planning Scheme and generally falls within the Port Related Industry Precinct of the Gladstone SDA Development Scheme. Figure 3 shows existing development in these areas including:

- Alpha HPA
- Cement Australia
- Fortescue Future Industries (FFI) Green Energy Manufacturing Centre (GEM)
- Northern Oil Refinery (NOR)
- Orica Yarwun – AN & Sodium Cyanide Plant
- Rio Tinto Alumina Limited

Also within the Special Purpose and Special Industry zones of the GRC Planning Scheme, the Fishermans Landing Land Use Precincts of the Gladstone Ports Corporation (GPC) 2012 Land Use Plan is located to the east and northeast of the project site along the coast.

Figure 3 – The project site and surrounding land uses

2.3 Surrounding Road Network Details

Figure 2 shows the study area road network with additional detail in the vicinity of the project site shown by Figure 4.

Figure 4 – Surrounding road network

2.3.1 FRONTAGE ROADS

2.3.1.1 Fishermans Road

Fishermans Road is a rural access road under the governing authority of GRC which is generally aligned east-west between Landing Road and GPC's Fishermans Landing Land Use Precincts as shown by Figure 4. As shown by Figure 5, Fishermans Road comprises a five (5) metre (m) wide, unsealed carriageway in a 20m wide reserve. No speed limit signs are installed on Fishermans Road and therefore the default rural speed limit of 100km/h applies.

Figure 5 – Fishermans Road looking west from the proposed project site access

2.3.1.2 Landing Road

Landing Road is a rural distributor under the governing authority of GRC which extends generally north from Gladstone – Mount Larcom Road (Hanson Road) as shown by Figure 4. As shown by Figure 6, Landing Road comprises a 10m wide, undivided carriageway with a single 3.5m wide traffic lane and 1.5m wide sealed shoulder for each direction of travel in a 40m wide reserve. Landing Road has a posted speed limit of 80km/h over most of its length, but the speed limit is reduced to 60km/h at the Gladstone – Mount Larcom Road (Hanson Road) intersection. Landing Road is approved for use by B-doubles up to 26m in length operating at the higher mass limit (HML).

Figure 6 – Landing Road looking south from 60m south of Fishermans Road

2.3.2 OTHER ROAD LINKS

2.3.2.1 Gladstone – Mount Larcom Road (Hanson Road)

Gladstone – Mount Larcom Road is a national highway under the governing authority of TMR which is generally aligned east-west between the Dawson Highway, Gladstone Central, and the Bruce Highway, Mount Larcom, as shown by Figure 2. Gladstone – Mount Larcom Road is locally known as Hanson Road between Dawson Highway, Gladstone Central, and Landing Road, Yarwun. As shown by Figure 7, Gladstone – Mount Larcom Road (Hanson Road) generally comprises an undivided carriageway with a single 3.5m wide traffic lane for each direction of travel. The speed limit on Gladstone – Mount Larcom Road (Hanson Road) varies from 60km/h at its eastern end to 100km/h at its western end with some localised speed limit reductions at intersections. Gladstone – Mount Larcom Road (Hanson Road) is approved for use by B-doubles up to 26m in length operating at the HML.

Figure 7 – Gladstone – Mount Larcom Road looking east from the Bruce Highway

2.3.2.2 Bruce Highway

The Bruce Highway as shown by Figure 2 is a national highway under the governing authority of TMR which is generally aligned north-south between Brisbane and Cairns. The Bruce Highway between Benaraby and Rockhampton generally comprises an undivided carriageway with a single 3.5m wide traffic lane for each direction of travel. The speed limit on the Bruce Highway is 70km/h through the township of Mount Larcom. The Bruce Highway is approved for use by B-doubles up to 26m in length operating at the HML.

2.3.3 INTERSECTIONS

2.3.3.1 Landing Road / Fishermans Road Priority T-Intersection

Fishermans Road forms a T-intersection on the eastern side of Landing Road on the inside of a curve as shown by Figure 8. The intersection is controlled by the T-junction rule and simple turn treatments exist on Landing Road. The posted speed limit on Landing Road at the intersection is 80km/h. Figure 8 also shows Boat Creek Road forming a T-intersection on the western side a left-right staggered-T arrangement with Fishermans Road on Landing Road with a stagger distance of approximately 60m.

Figure 8 – Landing Road / Fishermans Road priority T-intersection

2.3.3.2 Gladstone – Mount Larcom Road (Hanson Road) / Landing Road Priority T-Intersection

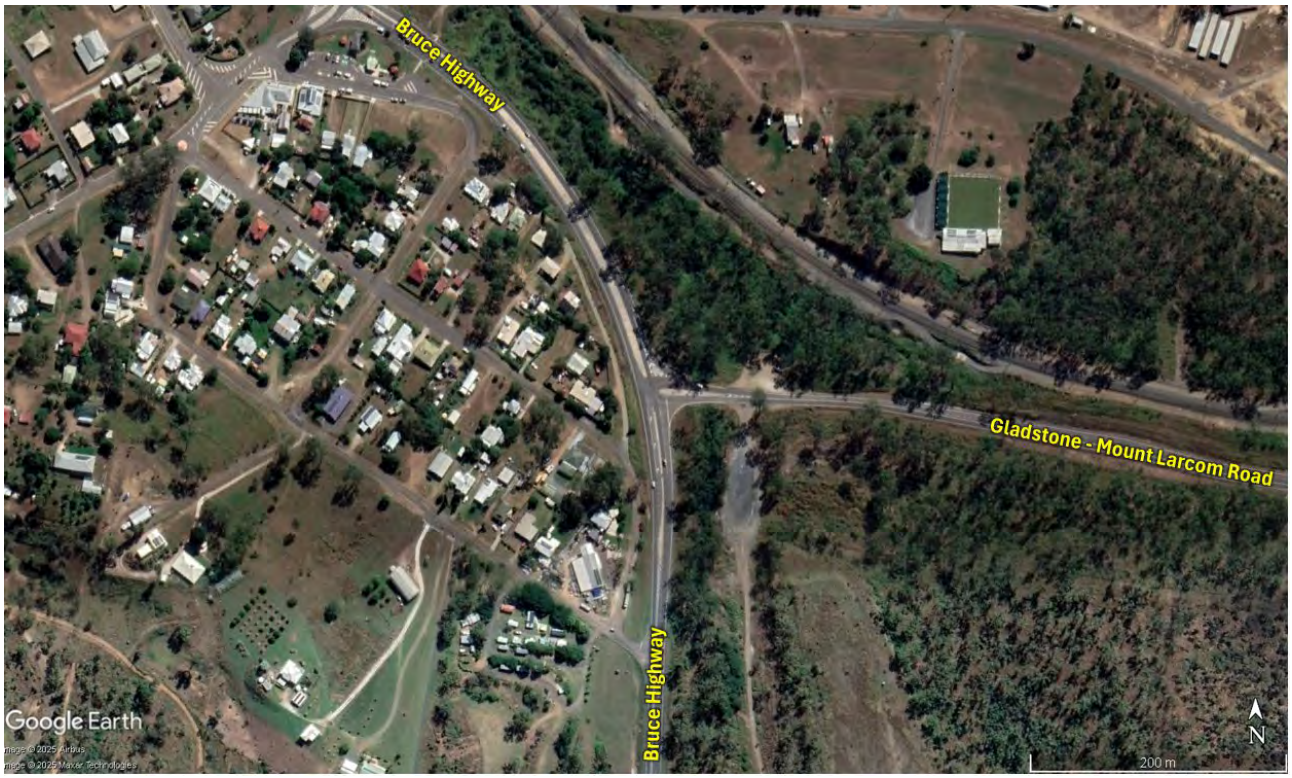
Landing Road forms a T-intersection on the northern side of Gladstone – Mount Larcom Road (Hanson Road) on the outside of a curve as shown by Figure 9. The intersection is controlled by a give way sign installed on the Landing Road approach. Gladstone – Mount Larcom Road (Hanson Road) includes 3.0m wide turning lanes. The lengths of the turn lanes are 125m including 30m taper for the auxiliary left (AUL) turn, and 200m including 50m taper for the channelised right (CHR) turn. Pavement markings designate a stage crossing for bicycles on the western leg of the intersection. At the intersection the posted speed limit is 80km/h on Gladstone – Mount Larcom Road (Hanson Road) and 60km/h on Landing Road.

Figure 9 – Gladstone – Mount Larcom Road (Hanson Road) / Landing Road priority T-intersection

2.3.3.3 Bruce Highway / Gladstone – Mount Larcom Road Priority T-intersection

Gladstone – Mount Larcom Road forms a T-intersection on the eastern side of the Bruce Highway on the outside of a curve as shown by Figure 10. The intersection is controlled by a stop sign installed on the Gladstone – Mount Larcom Road approach and a give way sign controls the left turn from the Bruce Highway to Gladstone – Mount Larcom Road. Turn lanes are provided on the Bruce Highway with the channelised left (CHL) turn lane being 175m long including 105m taper, and the channelised right (CHR) turn lane being 100m long including 25m taper. The posted speed limit on all intersection approaches is 70km/h.

Figure 10 – Bruce Highway / Gladstone – Mount Larcom Road priority T-intersection



2.4 Traffic Volumes

TMR supplied 12-hour (6:00AM – 6:00PM) count data collected over the period 2009 to 2021 at various intersections on Gladstone – Mount Larcom Road (Hanson Road). The most relevant of this data is identified as count data collected in the year 2020 at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection (Wednesday 11 November 2020) and the Bruce Highway / Gladstone – Mount Larcom Road intersection (Thursday 22 October 2020). This data is enclosed in Appendix B and summarised in Figure 11. Note that:

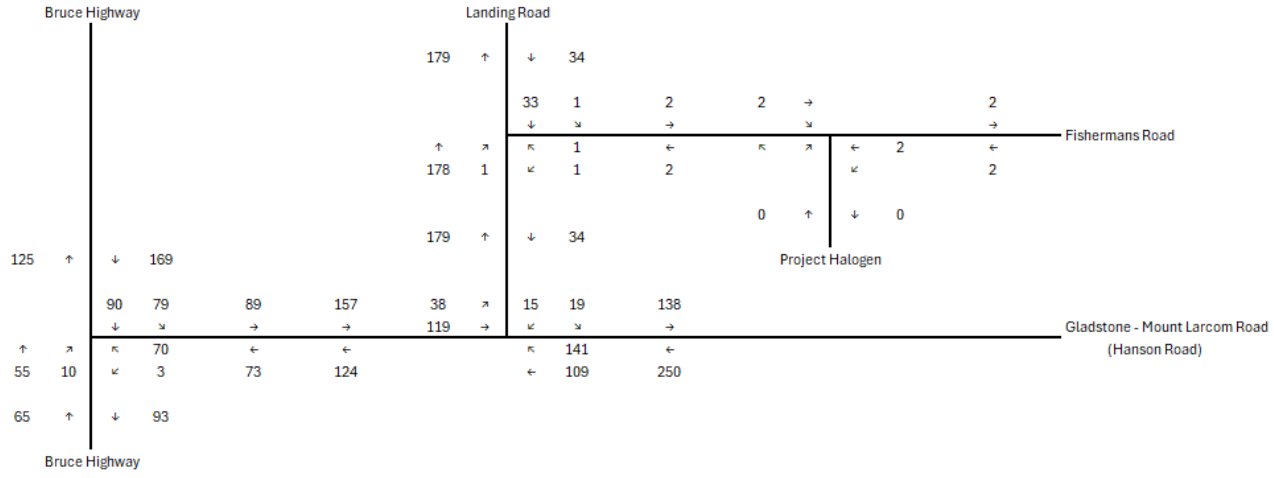
> For the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection:
  - The first hour of the count period (**6:00AM – 7:00AM**) is the morning peak hour with a total intersection entering volume of **441 vehicles per hour** (vph).
  - From the start of the count period the total volume of traffic entering the intersection steadily decreases to a minimum of **286vph** in the early afternoon (**1:15PM – 2:15PM**)
  - Over the next hour, traffic increases rapidly to exceed the observed morning peak hour by 3:15PM and remains at this level until 5:15PM with the afternoon peak hour (**3:45PM – 4:45PM**) having a total intersection entering volume of **539vph**.
> For the Bruce Highway / Gladstone – Mount Larcom Road intersection:
  - The first hour of the count period (**6:00AM – 7:00AM**) is the hour with the lowest observed intersection entering volume, that is, **307vph**.
  - Traffic rises to over 500vph by 8:15AM and generally remains at this level until the intersection entering volume peaks at **570vph** in the middle of the day (**11:30AM – 12:30PM**).
  - Traffic then decreases steadily to the end of the count period with a minor peak of **487vph** at the same time as the afternoon peak hour at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection (**3:45PM – 4:45PM**).

Figure 12 shows traffic volumes in the study area during the three (3) identified peak hours of morning (6:00AM – 7:00AM), noon (11:30AM – 12:30PM) and afternoon (3:45PM – 4:45PM). To estimate turning volumes at the Landing Road / Fisherman Road intersection it is assumed that:

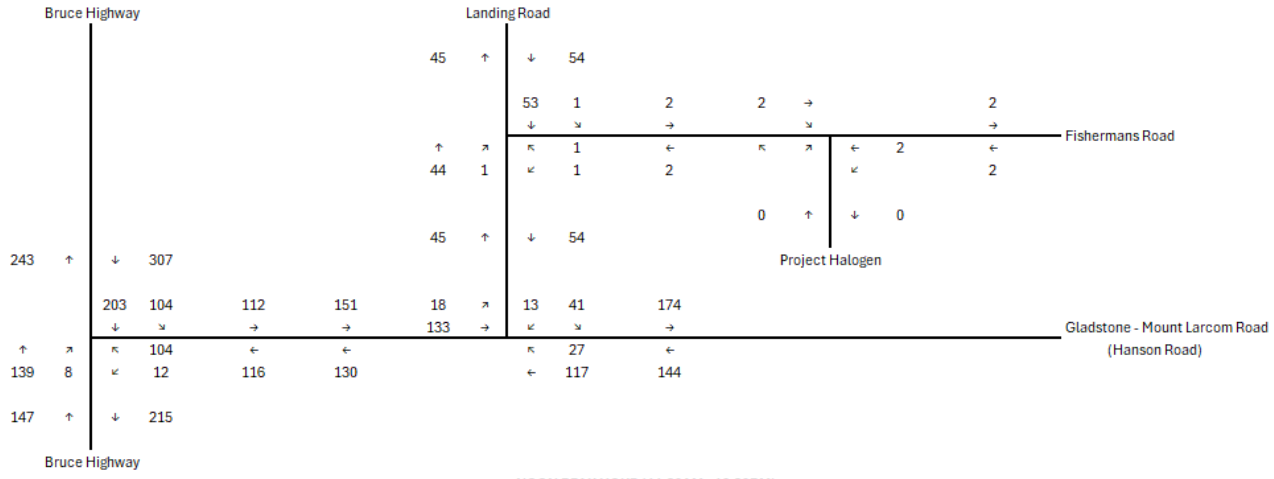
> A minimal amount of traffic (1vph) makes each turning movement in and out of Fishermans Road; and
> There is no change in Landing Road traffic between Gladstone – Mount Larcom Road (Hanson Road) and Fishermans Road.

Figure 11 – 2020 Intersection Counts – Total Traffic per Hour

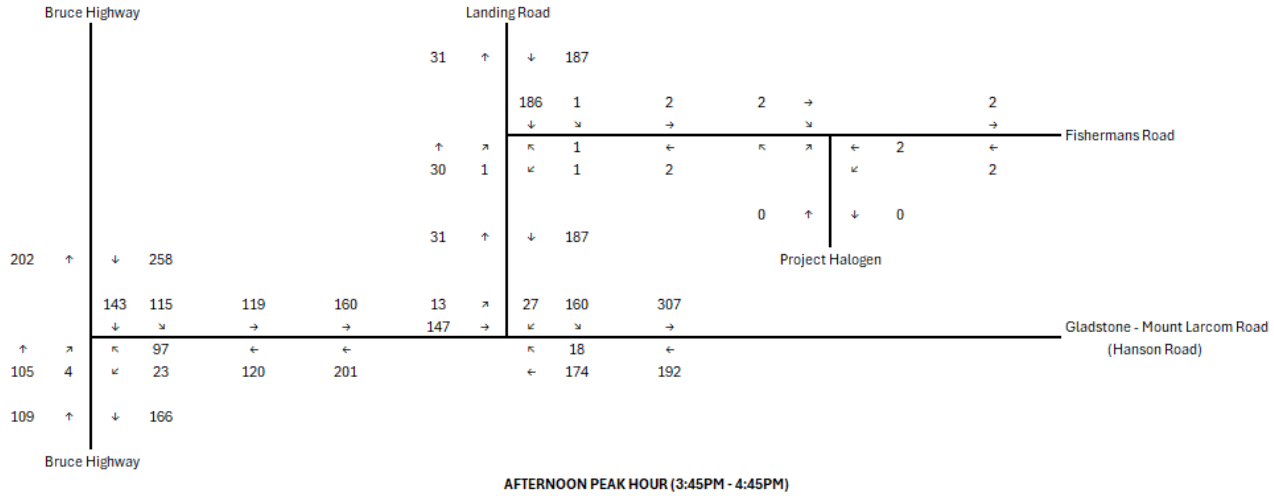
Figure 12 – 2020 intersection counts – peak hour turning volumes



MORNING PEAK HOUR (6:00AM - 7:00AM)



NOON PEAK HOUR (11:30AM - 12:30PM)



AFTERNOON PEAK HOUR (3:45PM - 4:45PM)

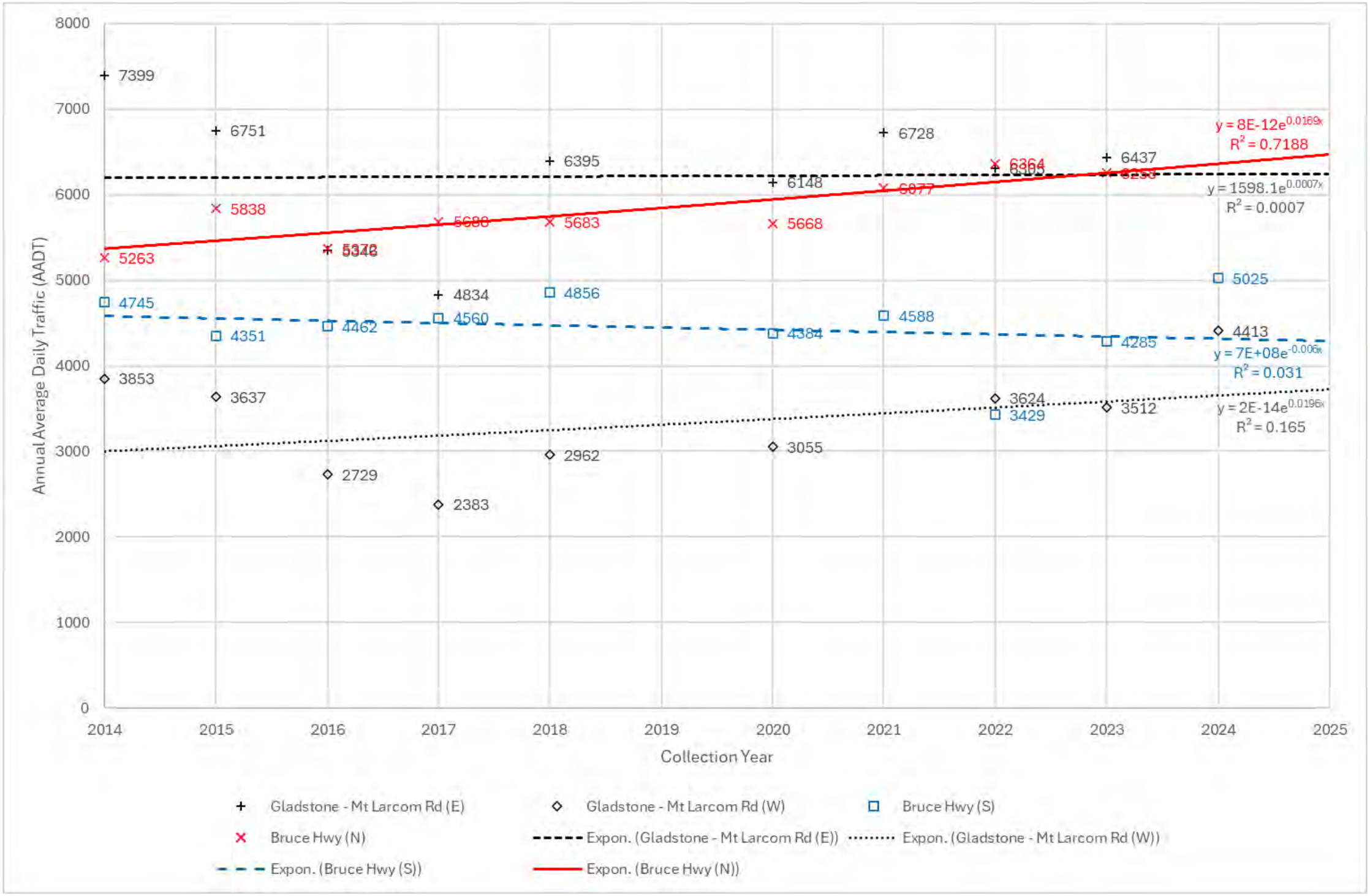
To estimate changes in traffic since the intersection counts were conducted in 2020, a review was undertaken of 2014-2024 traffic census data which is available through the Queensland Government Open Data Portal. The following count sites were identified as relevant to the study area:

- Gladstone – Mount Larcom Road: 535m W Esplanade, E Calliope R Anabranch (representing Gladstone – Mount Larcom Road (Hanson Road) between Landing Road and Red Rover Road);
- Gladstone – Mount Larcom Road: 800m W of Calliope River Rd, Yarwun (representing Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway);
- Bruce Highway: 250m N of Carrara Rd, River Ranch (representing the Bruce Highway south of Gladstone – Mount Larcom Road); and
- Bruce Highway: 1,625m S of Epala Rd, Ambrose (representing the Bruce Highway north of Gladstone – Mount Larcom Road).

Figure 13 charts annual average daily traffic (AADT) against the year in which the data was collected along with exponential trend lines. Note that:

- The **long-term compound growth rate** is generally just under **2% per annum** (1.96% for Gladstone – Mount Larcom Road west of Landing Road and 1.69% for Bruce Highway north of Gladstone – Mount Larcom Road) but:
  - No clear trend is identifiable from the nine (9) data points available for Gladstone – Mount Larcom Road (Hanson Road) east of Landing Road (R^2 = 0.0007); and
  - There has been a downward trend in traffic on the Bruce Highway south of Gladstone – Mount Larcom Road (-0.6% per annum).
- For all sites, 2020 AADT is below the long-term trend line which may reflect travel restrictions associated with the COVID19 transport disruption.
- The most recent census data (2024 for Gladstone – Mount Larcom Road west of Landing Road and Bruce Highway south of Gladstone – Mount Larcom Road, and 2023 for Gladstone – Mount Larcom Road east of Landing Road and Bruce Highway north of Gladstone – Mount Larcom Road) for all sites is on or above the long-term trend line.

Figure 13 – 2014 to 2024 Traffic Census Data



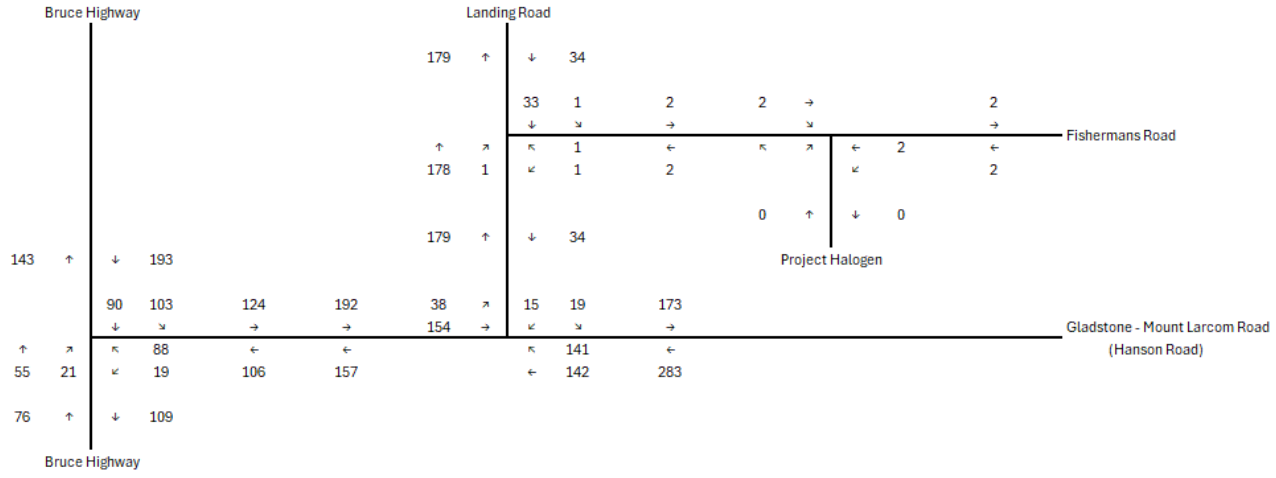
GRC supplied traffic count information for Landing Road between Hanson Road and Fishermans Road which was collected over the period 26 May and 17 June 2021. This data is enclosed in Appendix C. It indicates that average daily traffic on Landing Road between Hanson Road and Fishermans Road was 1,507vpd of which 502 vpd were heavy vehicles (HVs), that is 33%.

The 2021 Landing Road count by GRC consistently reports less traffic on Landing Road than the 2020 Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection count by TMR with GRC data being up to 40% less than TMR data for the same hour. This contrasts with the 2014-2024 traffic census data which indicates that for the three (3) sites which were counted in 2021, AADT was above the long-term trend line.

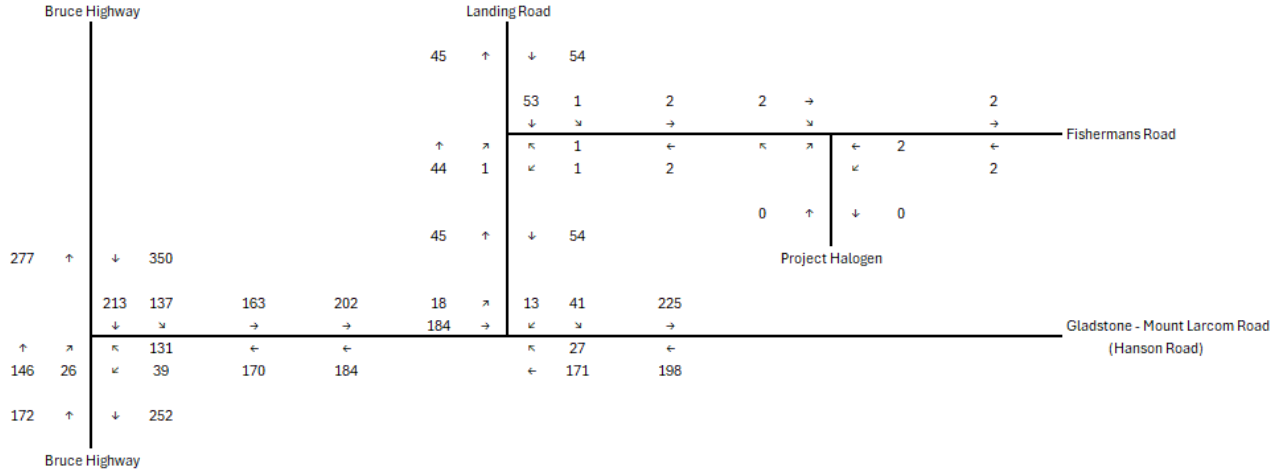
Based on the review of available traffic data, Figure 14 shows estimated existing (2025) traffic volumes in the study area during the three (3) identified peak hours. Existing (2025) traffic volumes were estimated by factoring up mid-block volumes from 2020 intersection counts (refer Figure 12) by:

- Landing Road = 0%
- Gladstone – Mount Larcom Road (Hanson Road) east of Landing Road = more than 9% (1.8% per annum)
- Gladstone – Mount Larcom Road, Landing Road to Bruce Highway = up to 46% (9.2% per annum)
- Bruce Highway south of Gladstone – Mount Larcom Road = 17% (3.4% per annum)
- Bruce Highway north of Gladstone – Mount Larcom Road = 14% (2.8% per annum)

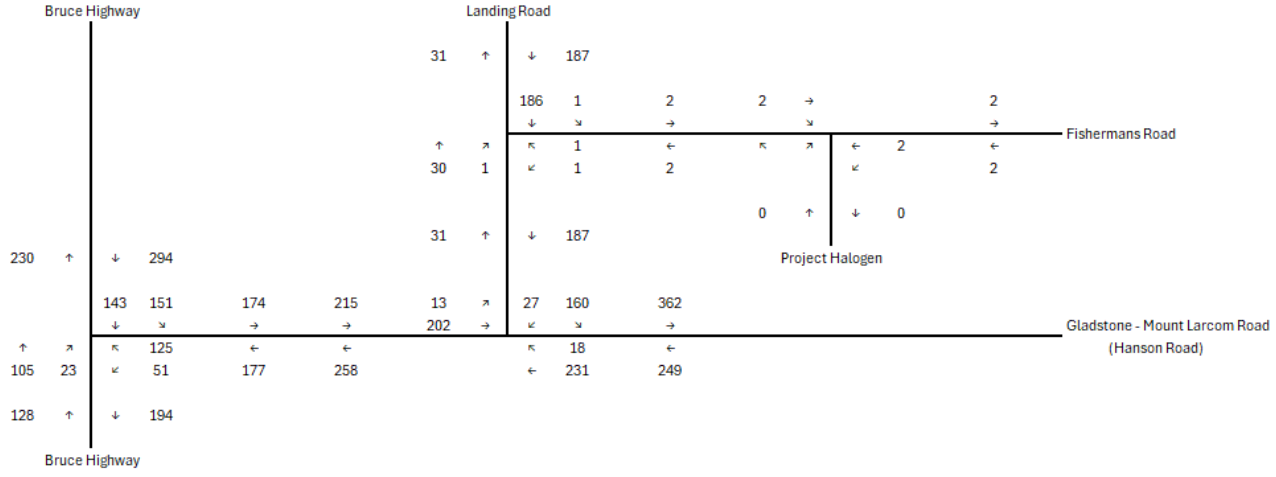
Figure 14 – Estimated existing (2025) peak hour intersection turning volumes



MORNING PEAK HOUR (6:00AM - 7:00AM)



NOON PEAK HOUR (11:30AM - 12:30PM)



AFTERNOON PEAK HOUR (3:45PM - 4:45PM)

2.5 Road Safety Issues

TMR supplied road crash data for the full length of Fishermans Road, Landing Road and Gladstone – Mount Larcom Road (Hanson Road) and intersecting roads within 200m of these links. The supplied data includes:

- Fatal crashes from 1 January 2008 to 31 March 2025; and
- Non-fatal casualty (Hospitalisation, medical treatment and minor injury crashes from 1 January 2008 to 30 November 2024.

For data analysis, all records were assigned to one (1) of the following crash locations:

- Landing Rd (N) = Landing Road north of Fishermans Road including associated intersections.
- Landing Rd (S) = Landing Road between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road) including associated intersections.
- Hanson Rd / Landing Rd = Within 200m of Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection.
- Gladstone – Mt Larcom Rd (Gladstone Central) = Gladstone – Mount Larcom Road (Hanson Road) east of Auckland Creek.
- Gladstone – Mt Larcom Rd (E) = Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and Landing Road.
- Gladstone – Mt Larcom Rd (W) = Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway.
- Bruce Hwy / Gladstone – Mt Larcom Rd = Within 200m of the Bruce Highway / Gladstone – Mount Larcom Road intersection.

No crashes were reported on Fishermans Road or within 150m of the Landing Road / Fishermans Road intersection.

Appendix D contains a crash factor matrix for the 16-years prior to the most recently reported crash, which is December 2008 to November 2024. Appendix D also includes diagrams showing definitions for coding accidents (DCA). The following observations are made with respect to the crash factor matrix data:

- Landing Rd (N): Three (3) crashes were reported on Landing Road north of Fishermans Road in the assessment period and all resulted in hospitalisation. Two (2) were off path crashes (DCA 700 and 800 series) at night, one (1) of which involved an articulated vehicle, and the other crash was a collision between a car / station wagon turning right out of Guerassimoff Road and a northbound articulated vehicle on Landing Road (DCA 104) which occurred at approximately 3PM. All crashes occurred when the road surface was dry.
- Landing Rd (S): Two (2) crashes were reported on Landing Road between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road) in the assessment period and both resulted in hospitalisation. One (1) was a motorcycle hit kangaroo / wallaby crash (DCA 609) which occurred on a dry road at night, and the other was an off left bend into object crash involving a rigid truck (DCA 804) which occurred on a wet road during the day.

> Hanson Rd / Landing Rd: Two (2) crashes were reported at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection in the assessment period. Both crashes were collisions between a light vehicle (LV) turning right out of Landing Road and an eastbound light vehicle of Gladstone – Mount Larcom Road (Hanson Road) and resulted in medical treatment. Both crashes occurred between 1PM and 5PM. The road surface was dry for one (1) crash and wet for the other.

> Gladstone – Mt Larcom Rd (Gladstone Central):

- A total of 83 crashes were reported on Gladstone – Mount Larcom Road (Hanson Road) east of Auckland Creek during the assessment period including 46 hospitalisation crashes, 28 medical treatment crashes, and nine (9) minor injury crashes.
- 13 of the 46 hospitalisation crashes were adjacent approach crashes (DCA 100 series). Adjacent approach crashes also accounted for nine (9) medical treatment and two (2) minor injury crashes. Only LVs were involved in adjacent approach.
- 10 of the 46 hospitalisation crashes were run off road crashes (DCA 700 and 800 series). Run off road crashes also accounted for two (2) medical treatment and two (2) minor injury crashes. The 14 crashes involved primarily LVs but also included crashes involving five (5) motorcycles. All run off road crashes occurred on dry roads except for two (2) crashes which occurred on wet roads and did not involve motorcycles.
- Seven (7) of the 46 hospitalisation crashes were right turn opposed crashes (DCA 202). Right turn opposed crashes also accounted for four (4) medical treatment and one (1) minor injury crash. Only light vehicles were involved in the crashes.
- Six (6) of the 46 hospitalisation crashes were rear end crashes (DCA 301 to 303). Rear end crashes also accounted for eight (8) medical treatment and one (1) minor injury crash. Rear end collisions involved a range of vehicle types including one (1) bus / coach, three (3) motorcycles, 24 LVs, two (2) rigid trucks and one (1) special purpose vehicle.
- Three (3) of the 46 hospitalisation crashes involved vehicles in parallel lanes (DCA 305 to 309). Vehicles in parallel lanes crashes also accounted for one (1) medical treatment and one (1) minor injury crash. One (1) of the hospitalisation crashes was a parallel lane side swipe crash involving bicycles. The only other vehicles involved in parallel lanes crashes were LVs.
- Three (3) of the 46 hospitalisation crashes and one (1) of the medical treatment crashes were a pedestrian crash (DCA 000 series). The vehicle involved in all pedestrian crashes was a car / station wagon and all crashes occurred when the road surface was dry.
- Two (2) of the 46 hospitalisation crashes were manoeuvring crashes (DCA 400 series). Manoeuvring crashes also accounted for three (3) medical treatment and two (2) minor injury crashes. The seven (7) crashes involved primarily LVs but one (1) articulated vehicles, one (1) bicycle and one (1) motorcycle were all involved in from footway crashes (DCA 408).

- Gladstone – Mt Larcom Rd (E):
  - A total of 41 crashes were reported on Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and Landing Road during the assessment period including two (2) fatal crashes, 23 hospitalisation crashes, 15 medical treatment crashes, and one (1) minor injury crashes.
  - One (1) of the two (2) fatal crashes was a pedestrian crash which occurred at approximately 6PM when the road surface was dry. In addition to the fatal crash, there was one (1) other pedestrian crash (DCA 000 series) which resulted in hospitalisation. The vehicle involved in all pedestrian crashes was a car / station wagon. The hospitalisation pedestrian crash occurred when the road surface was wet, involved a pedestrian walking along the carriageway (DCA 005), and occurred at approximately 1AM.
  - The other fatal crash was a head on collision (DCA 201). In addition to the fatal crash, there were three (3) other head on crashes with two (2) resulting in hospitalisation and one (1) in medical treatment. All head on collisions occurred on dry road surfaces during daylight hours. All head on collisions involved only LV.
  - Other crash types which significantly contribute towards the 23 reported hospitalisation crashes included:
    - Run off road crashes (DCA 700 and 800 series): Nine (9) hospitalisation, five (5) medical treatment and one (1) minor injury crashes. The 15 crashes involved primarily LVs but also included crashes involving two (2) motorcycles, three (3) articulated vehicles and two (2) road trains / B-doubles / triples.
    - Rear end crashes (DCA 301): Five (5) hospitalisation and four (4) medical treatment crashes. Rear end collisions all involved at least one (1) LV and also included three (3) motorcycles, one (1) rigid truck and one (1) road train / B-double / triple.
    - On path crashes (DCA 600 series): Two (2) hospitalisation and one (1) medical treatment crash. The two (2) hospitalisation crashes involved motorcycles which struck a temporary object on the carriageway in one (1) case and a kangaroo / wallaby in the other. The medical treatment crash involved a car / station wagon and a special purpose vehicle. All three (3) crashes occurred in daylight on dry roads.
    - Intersection crashes (DCA 100 series and 202): One (1) hospitalisation and four (4) medical treatment crashes. Only LVs were involved in intersection crashes apart from two (2) motorcycles which were part of separate through-through collisions (DCA 101) with LVs, one (1) of which resulted in hospitalisation.
    - Leaving driveway crashes (DCA 406): One (1) hospitalisation crash between an articulated vehicle entering the roadway and a car / station wagon.
    - Vehicles in parallel lanes side swipe crashes (DCA 305): One (1) hospitalisation crash involving a bicycle and a car / station wagon.
    - Cutting in overtaking crashes (DCA 504): One (1) hospitalisation crash involving two (2) westbound LVs occurred at approximately 5AM on a dry road.

> Gladstone – Mt Larcom Rd (W):

- A total of 57 crashes were reported on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway during the assessment period including three (3) fatal crashes, 29 hospitalisation crashes, 24 medical treatment crashes, and one (1) minor injury crash.
- Two (2) of the three (3) fatal crashes were off path on curve into object crashes (DCA 803 and 804). In addition to the two (2) fatal crashes, there were 10 other off path on curve hit object crashes with five (5) resulting in hospitalisation and five (5) in medical treatment. These crashes all involved LVs except for one (1) motorcycle crash which was fatal and one (1) articulated vehicle crash which resulted in hospitalisation. All off path on curve hit object crashes occurred on a dry road surface with three (3) of the crashes occurring at night and nine (9) occurring in daylight.
- The other fatal crash was a head on collision (DCA 201). In addition to the fatal crash, there were seven (7) other head on collisions with three (3) resulting in hospitalisation and four (4) in medical treatment. In total, head on collisions involved 10 LVs, one (1) rigid truck, three (3) articulated vehicles, one (1) road train / B-double / triple and one (1) other vehicle.
- Other crash types which contribute towards the 29 hospitalisation crashes are:
  - Other off path crashes (DCA 700 and 800 series excluding DCA 803 and 804): 13 hospitalisation, seven (7) medical treatment and one (1) minor injury crash. These crashes involved a range of vehicle types including 12 LVs, four (4) articulated vehicles, two (2) road trains / B-doubles / triples, two (2) rigid trucks, and one (1) motorcycle.
  - Through-right crashes (DCA 104 and 202): four (4) hospitalisation and one (1) medical treatment crash. Only LVs were involved in intersection crashes apart from one (1) articulated vehicle.
  - Rear end crashes (DCA 301): Two (2) hospitalisation and three (3) medical treatment crashes. The five (5) crashes involved primarily LVs but also included two (2) rigid trucks and one (1) articulated vehicle.
  - Hit animal crashes (DCA 609): Two (2) hospitalisation and two (2) medical treatment crashes. Only cars / station wagons were involved in these crashes which all occurred in darkness on dry roads. Three (3) of the four (4) animals involved were cattle and one (1) was a wild animal. Both hospitalisation crashes involved cattle.
- The other two (2) reported crashes at the intersection (both resulting in medical treatment) were a pedestrian crash (DCA 000) with a car / station wagon, and a single opposing vehicles crash (DCA 200) involving an articulated vehicle and two (2) utilities / panel vans.

> Bruce Hwy / Gladstone – Mt Larcom Rd:

- A total of eight (8) crashes were reported at the Bruce Highway / Gladstone – Mount Larcom Road intersection during the assessment period including five (5) hospitalisation crashes, two (2) medical treatment crashes and one (1) minor injury crash.
- Single vehicle crashes (DCA 600, 700 and 800 series) accounted for five (5) of the crashes including four (4) hospitalisation crashes and one (1) medical treatment crash.
  > The four (4) hospitalisation crashes were all off path on curve crashes (DCA 800) which occurred between midnight and 7AM when the road was dry. The crashes all involved LVs except for one (1) of the hospitalisation crashes which involved an articulated vehicle which went off path while making a left turn (DCA 806). Two of the other crashes were mount island crashes (DCA 808) and the other one (1) was an off let bend into object crash (DCA 804).
  > The one (1) medical treatment crash occurred when the road was wet and involved a light vehicle colliding with a temporary object on the carriageway (DCA 607). The crash occurred at approximately 9AM.
- The other three (3) crashes were all collisions between light vehicles turning right out of Gladstone – Mount Larcom Road and southbound vehicles on the Bruce Highway (DCA 104). The only one (1) of these three (3) crashes to result in hospitalisation involved a southbound road train / B-double / triple. The other two (2) crashes involved only LVs and resulted in one (1) medical treatment and one (1) minor injury crash. All through-right crashes occurred between 7AM and 1PM.

2.6 Pavement

TMR supplied road asset data for Gladstone – Mount Larcom Road (Hanson Road) as enclosed in Appendix E.

With respect to Gladstone – Mount Larcom Road (Hanson Road) east of Landing Road (Chainages 0km to 12.29km):

- 2024 AADT ranged from 10,586 vehicles per day (vpd) near Dawson Highway, Gladstone Central, and 5,151vpd immediately east of Landing Road, Yarwun.
- HV comprised 8.6% to 20.76% of AADT.
- There has been little if any growth in two (2) way traffic over the preceding five (5) years except within Gladstone Central.
- The existing standard axle repetitions (SAR) are:
  - Gazettal (westbound) direction = 1,600 to 2,486.4 SAR per day
  - Against gazettal (eastbound) direction = 1,638.4 to 3,312 SAR per day
- The link comprises 7.455km of undivided carriageway and 4.845km of divided carriageway.
- The undivided carriageway segments comprise:
  - 3.838km of granular pavement (GN) with marginal costs ranging from 2.33 to 4.97 cent/SAR/km;
  - 3.317km of asphaltic concrete pavement (AC) with marginal costs ranging from 1.09 to 5.18 cent/SAR/km; and
  - 0.3km for which marginal costs (MC) are not available.
- The divided carriageway segments comprise:
  - 4.287km of GN with marginal costs ranging from 4.12 to 15.67 cent/SAR/km; and
  - 5.403km of AC with marginal costs ranging from 2.296 to 6.94 cent/SAR/km.

With respect to Gladstone – Mount Larcom Road between Landing Road (Chainage 12.29km) and the Bruce Highway (chainage 32.14km):

- 2024 AADT was 3,631 vpd.
- HV comprise approximately 18% of AADT.
- Over the preceding five (5) years traffic grew at approximately 10% per annum
- The existing SAR are:
  - Gazettal (westbound) direction = 1,276.8 SAR per day
  - Against gazettal (eastbound) direction = 1,225.6 SAR per day
- The link consists of an undivided carriageway including:
  - 19km of GN with marginal costs ranging from 2.67 to 5.23 cent/SAR/km; and
  - 0.94km of AC with marginal costs ranging from 2.96 to 4.9 cent/SAR/km.

2.7 Transport Infrastructure

Rail infrastructure in the study area consists of North Coast Line and Blackwater System.

Gladstone – Mount Larcom Road (Hanson Road) is crossed by rail lines at four (4) locations east of Landing Road and two (2) locations between Landing Road and the Bruce Highway. All crossings are grade separated. In general the crossings provide road-over-rail bridges but rail-over-road bridges are provided at two (2) locations east of Landing Road.

The Fishermans Landing Branch of North Coast Line forms a level crossing with Fishermans Road at its eastern end. The Fishermans Road reserve ends on the western side of the rail corridor and a gate on the eastern side of the rail corridor restricts access to GPC land.

There are no rail crossings of Landing Road.

3. PROPOSED DEVELOPMENT DETAILS

3.1 Development Site Plan

The latest development site plan is enclosed in Appendix F.

Figure 15 shows that the northern end of the site will be occupied by plant & equipment and accessed via a proposed one-way loop service road. An office & admin area is designated near the centre of the site with a parking area located adjacent to both the plant & equipment and office & admin areas. A new access road to the facility is to be constructed in the Fishermans Road reserve from Landing Road to an entry gate & walls with ID signage at the western end of the site.

Figure 15 – Development Site Plan (CQG, 2025)

3.2 Operational Details

GWT has provided advice on proposed development operational details.

Plant & equipment is proposed to operate 24-hours per day, seven (7) days per week with crews of five (5) staff operating 12-hour shifts. Shift changes would occur at 6:00AM and 6:00PM.

In addition to the shift crews, a further 14 day-staff will be employed by the site. Day staff will generally work hours similar to standard business hours but include salaried staff operating under flexible working arrangements. Also, some day staff will be on-call outside standard business hours. To the extent that it is within the control of GWT, it is intended to stagger start and finish times for day staff.

The only input to plant & equipment operations which is expected to be transported by road is salt (NaCl). Plant & equipment is expected to consume approximately 150 tonnes (t) of salt per day.

The plant & equipment is proposed to produce the following offtakes:

- Chlorine gas (Cl_2): 283.5 t per week
- Caustic soda (NaOH): 535 t per week
- Sodium hypochlorite (NaOCl): 1,322.9 t per week
- Hydrochloric acid (HCl): 647.9 t per week

GWT advise that chlorine gas will be exported in 1,000kg drums and 70kg drums. Chlorine delivery vehicles are expected to be loaded with empty drums when they return to site.

Caustic soda, sodium hypochlorite and hydrochloric acid are proposed to be transported as bulk liquids and in 1,000 litre (L) intermediate bulk containers (IBCs). GWT advise that coordinating the return of empty IBCs on delivery vehicles is impractical and therefore it is anticipated that vehicles which deliver caustic soda, sodium hypochlorite and hydrochloric acid from the site will return unloaded and a separate fleet of vehicles will be required for the delivery of empty IBCs to site and that the IBC delivery vehicles will depart unloaded.

GWT's haulage contractor has advised that import of salt and export of chlorine gas, caustic soda, sodium hypochlorite and hydraulic acid can all be scheduled to occur between 6:00AM and 4:00PM on weekdays with sufficient on-site storage provided to accommodate plant & equipment operations overnight and on weekends.

Waste collection from the site is proposed to occur twice per week and GWT have recommended allowing for one (1) visit per day to the site for maintenance or deliveries which are not part of normal operations.

3.3 Proposed Access and Parking

GWT propose to pave and seal approximately 150m of Fishermans Road between Landing Road and the proposed entry gate to provide access to the development.

As shown by Figure 15, a parking area will be provided on site adjacent to both the plant & equipment and office & admin areas.

4. DEVELOPMENT TRAFFIC

4.1 Traffic Generation

4.1.1 LIGHT VEHICLE TRAFFIC GENERATION

Conservatively, all staff are assumed to travel in separate LVs.

Shift staff are expected to arrive over the 15 minutes (min) prior to the start of their shift and depart over the 15 min following the completion of their shift. That is, shift changes will generate 5 inbound and 5 outbound LV trips between 5:45 and 6:15 in both the morning and evening.

Day-staff are assumed to arrive at site between 5:45AM and 9:15PM, and depart site between 2:45PM and 6:15PM on weekdays at an average rate of 4LV per hour (LVph). These periods overlap with shift change times. Therefore, the peak hours for LV traffic generation are expected to be:

- **Morning peak hour (5:45AM – 6:45AM): nine (9) inbound LVs and five (5) outbound LVs**; and
- **Evening peak hour (5:15PM – 6:15PM): five (5) inbound LVs and nine (9) outbound LVs**,

4.1.2 HEAVY VEHICLE TRAFFIC GENERATION

4.1.2.1 Weekly Heavy Vehicle Traffic Generation

4.1.2.1.1 Salt Import

The plant & equipment is proposed to consume approximately 1,040 t per week of NaCl. NaCl is proposed to be transported in bulk by B-doubles. TMR's "Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment" (GPIA) indicates that an Austroads class 10 vehicle (B-double) typically has a 40.0t payload with an unloaded mass of 22.5t and a legal loading of 62.5t when loaded to the general mass limit (GML). Therefore, each week NaCl import will generate:

- **26 inbound loaded (62.5t) B-doubles**; and
- **26 outbound unloaded (22.5t) B-doubles**.

4.1.2.1.2 Chlorine Gas Export

The plant & equipment is proposed to produce 283.5t per week of Cl_2 for export with:

- 80% (226.8t) transported in 1,000kg drums (227 1,000kg-drums); and
- 20% (56.7t) transported in 70kg drums (810 70kg-drums).

All Cl_2 drums are to be transported by semi-trailer.

GWT have advised that a full 1,000kg drum weights 1.85t and a full 70kg drum weighs 100kg.

GPIA indicates that an Austroads class 9 vehicle (six (6) axle articulated vehicle) typically has a 26.5t payload with an unloaded mass of 16.0t and a legal loading of 42.5t when loaded to the GML. Therefore, a semitrailer could carry 14 1,000-kg drums (14t of Cl_2) or 265 70kg drums (18.55t of Cl_2).

Therefore, each week Cl_2 export will generate:

- **17 outbound semitrailers** of **full** 1,000kg drums **(41.9t)**;
- **17 inbound semitrailers** of **empty** 1,000kg drums **(27.9t)**;
- **Four (4) outbound semitrailers** of **full** 70kg drums **(42.5t)**; and
- **Four (4) inbound semitrailers** of **empty** 70kg drums **(24.0t)**.

4.1.2.1.3 Caustic Soda Export

The plant & equipment is proposed to produce 535t per week of NaOH for export with:

- 465t transported in bulk by B-double; and
- 70t transported in IBC by four (4) axle truck.

Therefore, each week NaOH export in bulk will generate:

- **12 outbound loaded (62.5t) B-doubles**; and
- **12 inbound unloaded (22.5t) B-doubles**.

GWT have advised that an empty IBC weighs 50kg and exported NaOH will have a density of 1.52 tonnes per cubic metre (t/m^3).

GPIA indicates that an Austroads class 5 vehicle (four (4) axle truck) typically has a 15.0t payload with an unloaded mass of 12.5t and a legal loading of 27.5 when loaded to the GML. Therefore, a four (4) axle truck can carry nine (9) IBCs of NaOH (13.68t).

Therefore, each week NaOH export in IBCs will generate:

- **Six (6) outbound loaded (26.6t) four (4) axle trucks**; and
- **Six (6) inbound unloaded (12.5t) four (4) axle trucks**.

4.1.2.1.4 Sodium Hypochlorite Export

The plant & equipment is proposed to produce 1,322.93t per week of NaOCl for export with:

- 70% (926.05t) exported in bulk by B-double;
- 20% (264.59t) exported in bulk by four (4) axle truck; and
- 10% (132.29t) exported in IBCs by four (4) axle truck.

GWT has advised that exported NaOCl will have a density of $1.2t/m^3$. Therefore, a four (4) axle truck can carry 12 IBCs of NaOCl (14.4t).

Therefore, each week NaOCl export will generate:

- **24 outbound loaded (62.5t) B-doubles**;
- **24 inbound unloaded (22.5t) B-doubles**;
- **18 outbound loaded (27.5t) four (4) axle trucks** of bulk NaOCl;
- **10 outbound loaded (27.5t) four (4) axle trucks** of NaOCl IBCs; and
- **28 inbound unloaded (12.5) four (4) axle trucks**.

4.1.2.1.5 Hydrochloric Acid Export

The plant & equipment is proposed to produce 647.92 t per week of HCl for export with:

- 40% exported in bulk; and
- 60% exported in IBCs.

All HCl is to be transported by four (4) axle truck.

GWT has advised that exported HCl will have a density of 1.15 t/m^3. Therefore, a four (4) axle truck can carry 12 IBCs of HCl (13.8t).

Therefore, each week hydrochloric acid export will generate:

- **18 outbound loaded (27.5t) four (4) axle trucks** of bulk HCl;
- **29 outbound loaded (26.9t) four (4) axle trucks** of HCl IBCs; and
- **47 inbound unloaded (12.5) four (4) axle trucks**.

4.1.2.1.6 Intermediate Bulk Container Import

Each week 497 IBCs will be required for the export of caustic soda, sodium hypochlorite and hydrochloric acid. IBCs are assumed to be imported empty on six (6) axle articulated vehicles (semi-trailer). The capacity of a semi-trailer is expected to be limited by volume to 48 empty ICBs.

Therefore, each week IBC import will generate:

- **11 inbound loaded (18.4t) semi-trailers**; and
- **11 outbound unloaded (16.0t) semi-trailers**.

4.1.2.1.7 Waste Export

Waste is to be exported from site twice per week. Waste export is assumed to be undertaken by two (2) axle truck. GPIA indicates that an Austroads class 3 vehicle (two (2) axle truck) typically has an unloaded mass of 8.5t and a legal loading of 15.0t when loaded to the GML. Therefore, each week waste export is assumed to generate:

- **Two (2) inbound unloaded (8.5t) two (2) axle trucks**; and
- **Two (2) outbound loaded (15.0t) two (2) axle trucks**.

4.1.2.2 Daily Heavy Vehicle Traffic Generation

Table 1 summarises the development's weekly HV traffic generation (refer Section 4.1.2.1) and converts this to daily HV traffic generation. Two (2) types of daily HV traffic generation are calculated being:

- Average day = HV per week ÷ 7 days per week = 25.3 HV per day (HVpd) one (1) way
- Peak day = (HV per week ÷ 5 haulage days per week) rounded up to the nearest whole number = 41 HVpd one (1) way

Table 1 – Heavy Vehicle Traffic Generation per Day

Vehicle	Purpose	Mass (t)		One-way Volume		
		Inbound	Outbound	Per Week	Average Day	Peak Day
B-doubles	NaCl	62.5	22.5	26	3.7	6
	NaOH	22.5	62.5	12	1.7	3
	NaOCl	22.5	62.5	24	3.4	5
	Total			**62**	**8.9**	**14**
Semi-trailers	Cl_2 1,000kg-drums	27.9	41.9	17	2.4	4
	Cl_2 70kg-drums	24.0	42.5	4	0.6	1
	IBCs	18.4	16.0	11	1.6	3
	Total			**32**	**4.6**	**8**
Four (4) axle trucks	NaOH	12.5	26.6	6	0.9	2
	NaOCl bulk	12.5	27.5	18	2.6	4
	NaOCl IBC	12.5	27.5	10	1.4	2
	HCl bulk	12.5	27.5	18	2.6	4
	HCl IBC	12.5	26.9	29	4.1	6
	Total			**81**	**11.6**	**18**
Two (2) axle trucks	Waste	8.5	15.0	2	0.3	1
Total				**177**	**25.3**	**41**

4.1.2.3 Heavy Vehicle Traffic Generation Peak Hour

The one (1) way peak hour HV traffic generation is calculated by dividing peak day HV traffic generation (41 HVpd) by the number of hours (h) of haulage per day (10h) (refer Section 3.2) and rounding up to the nearest whole number. Therefore, the peak hour HV traffic generation is estimated to be **five (5) HV per hour (HVph) one (1) way** or **10 HVph two (2) way**.

The peak hour for HV traffic generation could occur at any time between 6:00AM and 4:00PM. Therefore, the peak hour for HV traffic generation may coincide with the morning peak hour for LV traffic generation.

4.1.3 DESIGN PEAK HOUR TRAFFIC GENERATION

Discussion of intersection count data in Section 2.4 identified three (3) peak hours on the surrounding road network being:

- Morning peak hour: 6:00AM – 7:00AM;
- Noon peak hour: 11:30AM – 12:30PM; and
- Afternoon peak hour: 3:45PM – 4:45PM.

The morning peak hour on the surrounding road network (6:00AM – 7:00AM) may coincide with the morning peak hour for LV traffic generation (5:45AM-6:45AM) and the peak hour for HV traffic generation (6:00AM – 4:00PM). Therefore, during the morning peak hour on the surrounding road network (6:00AM – 7:00AM) the development may generate:

- Nine (9) inbound LVs;
- Five (5) outbound LVs;
- Five (5) inbound HVs; and
- Five (5) outbound HVs.

The noon peak hour on the surrounding road network (11:30AM – 12:30PM) may coincide with the peak hour for HV traffic generation (6:00AM – 4:00PM) but LV traffic generation is not expected to be significant between 9:15AM and 2:45PM. Therefore, during the noon peak hour on the surrounding road network (11:30AM – 12:30PM) the development may generate:

- Five (5) inbound HVs; and
- Five (5) outbound HVs.

The afternoon peak hour on the surrounding road network (3:45PM – 4:45PM) may coincide with the peak hour for HV traffic generation (6:00AM – 4:00PM) and the departure of day-staff (2:45PM – 6:15PM. Therefore, during the afternoon peak hour on the surrounding road network (3:45PM – 4:45PM) the development may generate:

- Four (4) outbound LVs;
- Five (5) inbound HVs; and
- Five (5) outbound HVs.

The evening peak hour for development generation of LV trips does not coincide with a peak period for the surrounding road network or heavy vehicle haulage activities. The total traffic generation during this our is expected to be similar to the developments traffic generation during the afternoon peak hour and greater than the developments traffic generation during the noon peak hour. During the evening peak hour (5:15PM – 6:15PM) the development may generate:

- Five (5) inbound LVs;
- Nine (9) outbound LVs;

4.2 Trip Distribution

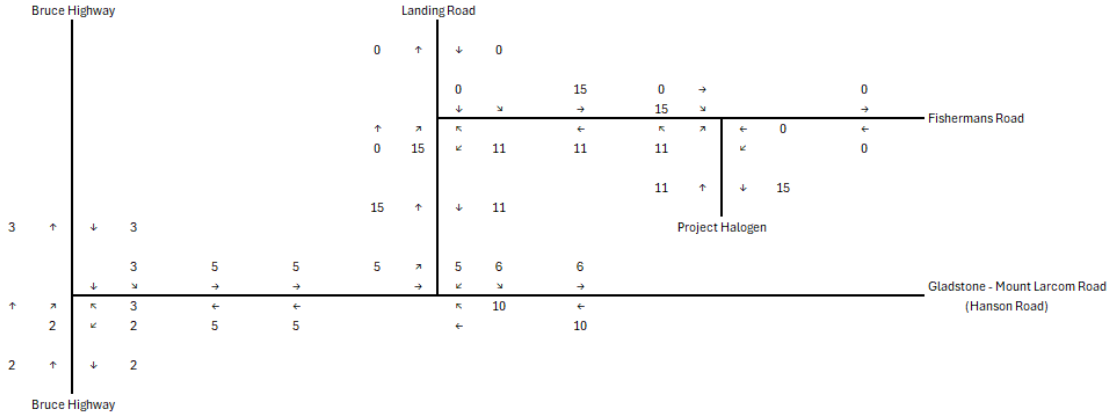
The anticipated distribution of development traffic is:

- LV traffic generation: 100% from / to Gladstone (east) via Gladstone – Mount Larcom Road (Hanson Road)
- Salt import: 100% from Port Alma (north) via Bruce Highway
- NaOH bulk export by B-double: 100% east via Gladstone – Mount Larcom Road (Hanson Road)
- Waste export: 100% to Gladstone (east) via Gladstone – Mount Larcom Road (Hanson Road)
- All other HV traffic: via Bruce Highway:
  - 60% north
  - 40% south

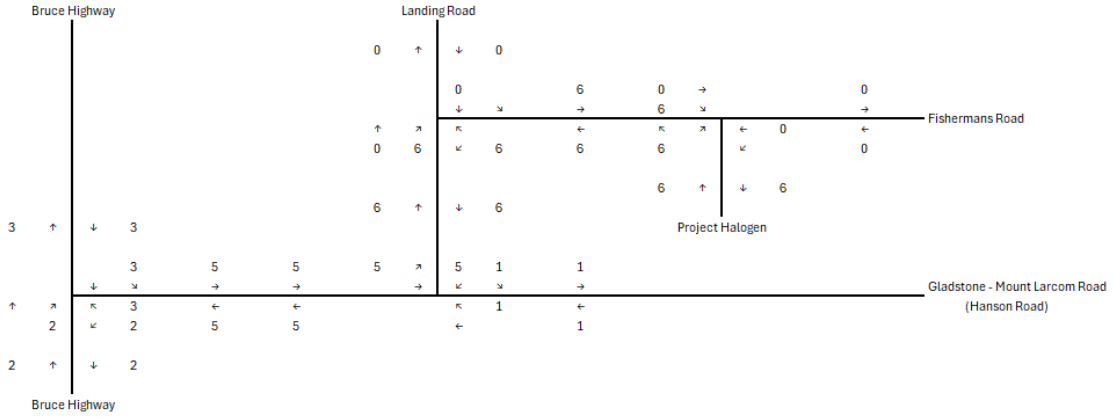
4.3 Development Traffic Volumes on the Network

Based on the traffic generation calculated in Section 4.1 and distribution described in Section 4.2, Figure 16 shows development traffic volumes on the network. Note that individual vehicles movements have been rounded up to the nearest whole number to provide a conservative estimate of development traffic impacts.

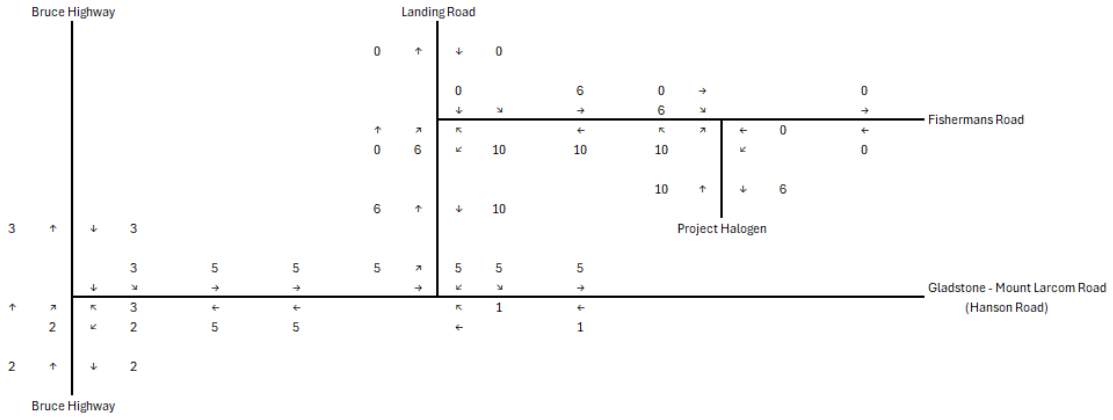
Figure 16 – Development Traffic Volumes on the Network



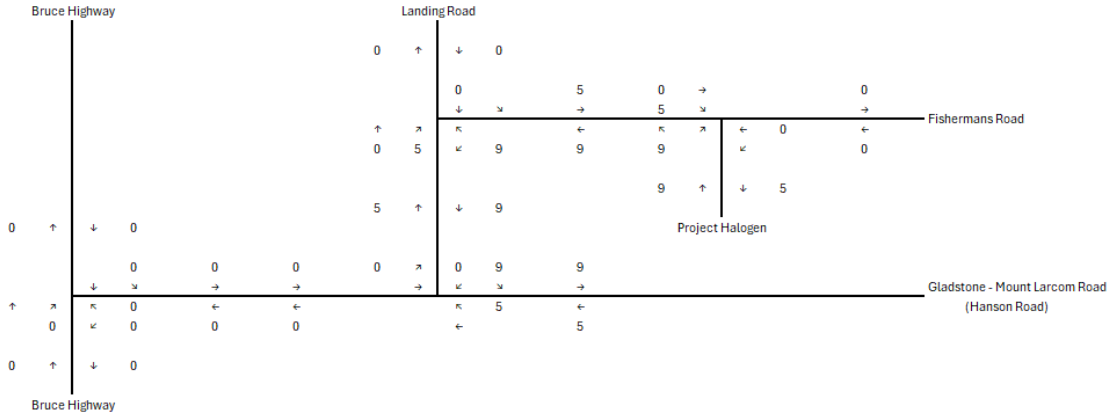
MORNING PEAK HOUR (5:45AM - 6:45AM)



NOON PEAK HOUR (11:30AM - 12:30PM)



AFTERNOON PEAK HOUR (3:00PM - 4:00PM)



EVENING PEAK HOUR (5:15PM - 6:15PM)

5. IMPACT ASSESSMENT AND MITIGATION

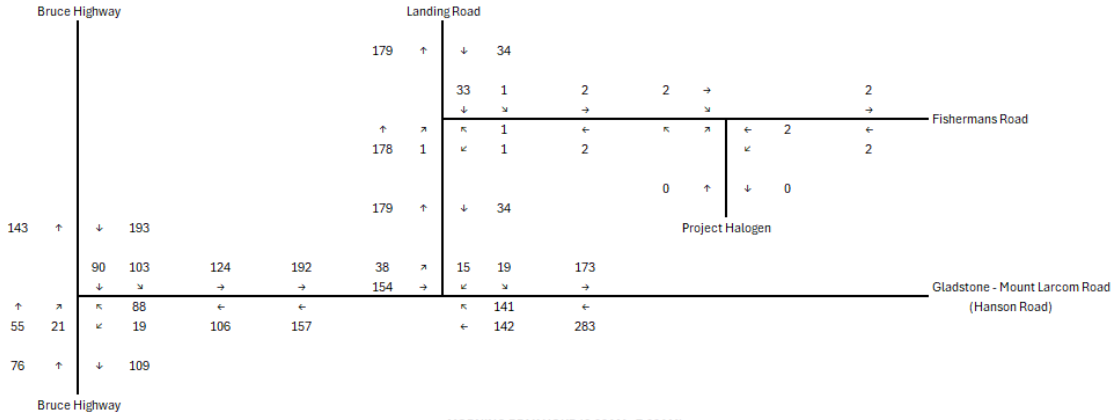
5.1 With and Without Development Traffic Volumes

5.1.1 "WITHOUT DEVELOPMENT" TRAFFIC VOLUMES

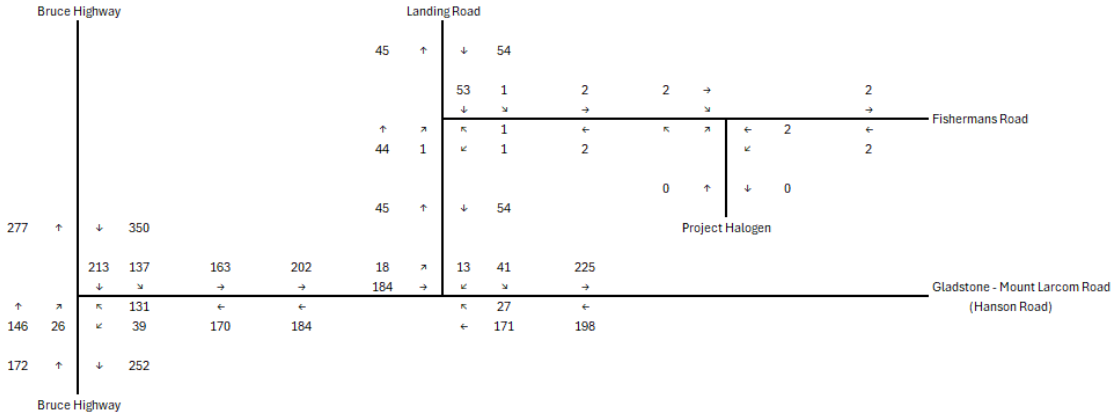
Existing (2025) traffic is adopted as opening year "without development" traffic. In accordance with TMR's "Guide to Traffic Impact Assessment: Frequently Asked Questions (December 2017)" (GTIA:FAQ) this is valid so long as the final stage of development construction is completed within three (3) years, that is by 2028. Figure 17 shows estimated opening year "without development" traffic volumes. The volumes match the estimated existing (2025) peak hour intersection turning volumes for the morning (6:00AM – 7:00AM), noon (11:30AM – 12:30PM) and afternoon (3:45PM – 4:45PM) peak hours, and also includes "without development" traffic volumes on the surrounding road network during the evening peak hour for development generation (5:00PM – 6:00PM) which is estimated from 2020 intersection count data using the methodology described in Section 2.4.

Allowing for the final stage of development construction to be completed in 2028, the design year is taken as 2038 being 10 years after the opening year. Design year (2038) "without development" traffic was estimated by growing all existing (2025) traffic movements as shown by Figure 17 at the long-term growth rate, that is 2% per annum as indicated in Section 2.4, for 13 years assuming simple growth in accordance with Section A4 of the GTIA. Figure 18 shows estimated design year (2038) "without development" traffic volumes.

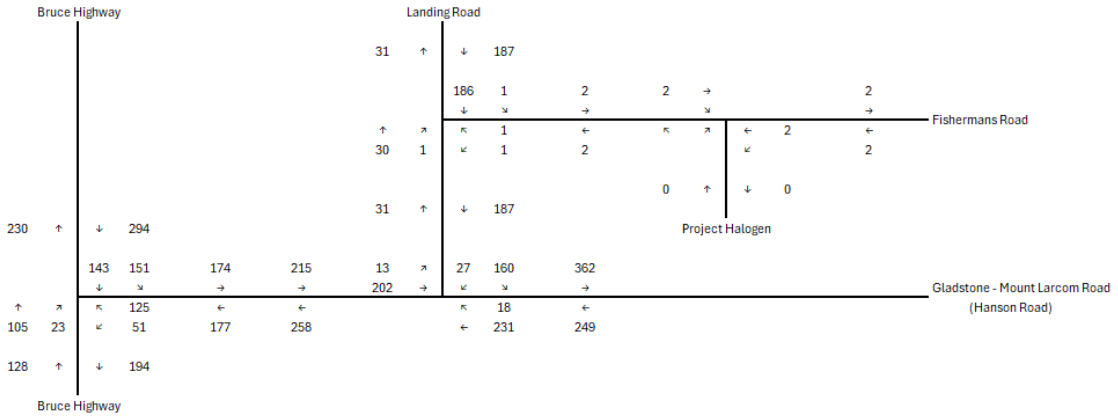
Figure 17 – Estimated opening year (2025 – 2028) "without development" peak hour traffic volumes



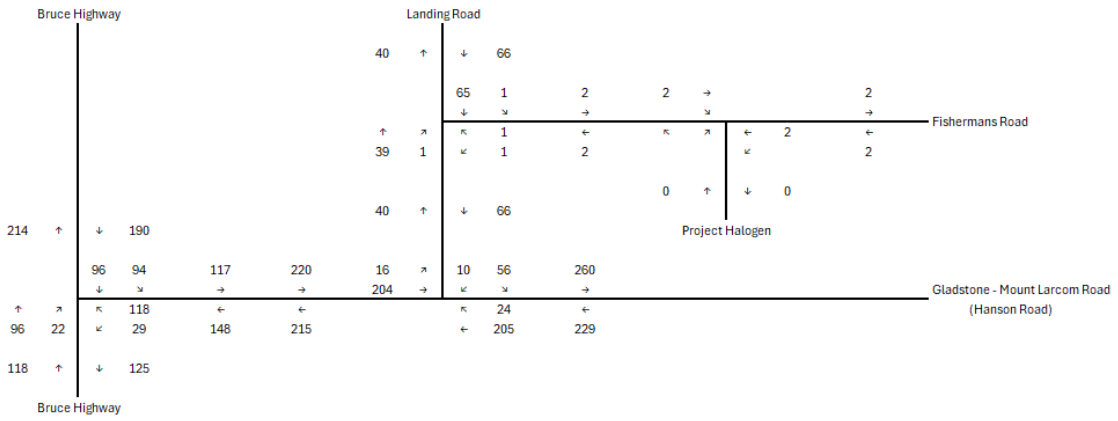
MORNING PEAK HOUR (6:00AM - 7:00AM)



NOON PEAK HOUR (11:30AM - 12:30PM)

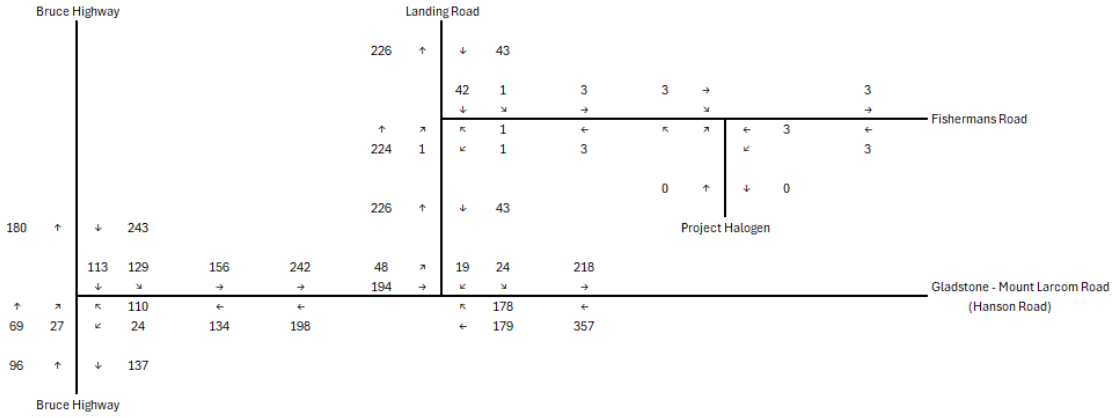


AFTERNOON PEAK HOUR (3:45PM - 4:45PM)

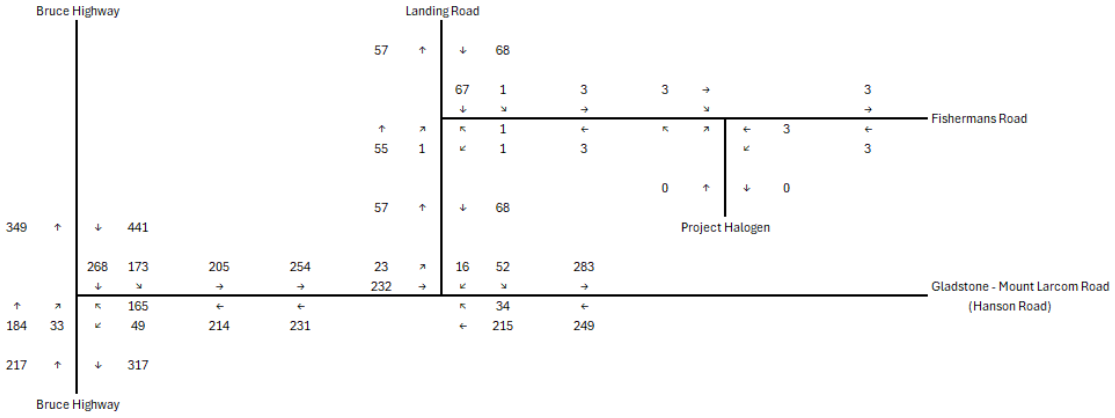


EVENING PEAK HOUR (5:00PM - 6:00PM)

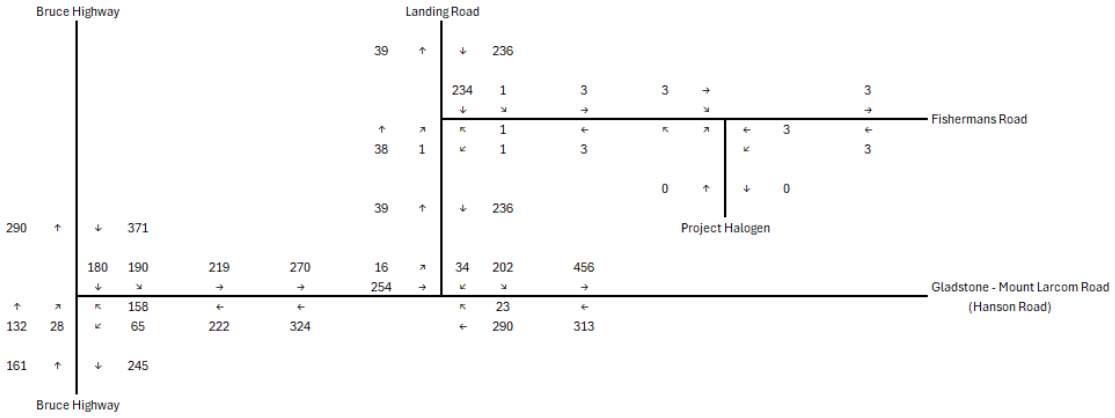
Figure 18 – Estimated design year (2038) "without development" peak hour traffic volumes



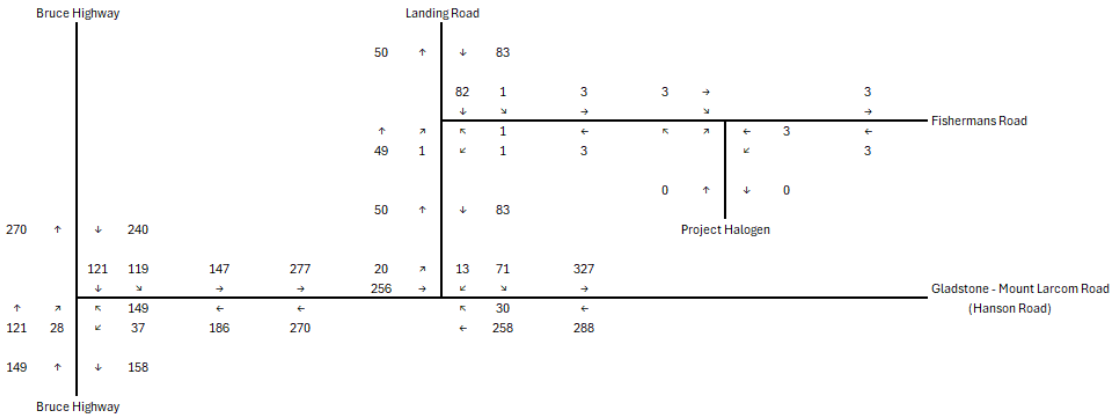
MORNING PEAK HOUR (6:00AM - 7:00AM)



NOON PEAK HOUR (11:30AM - 12:30PM)



AFTERNOON PEAK HOUR (3:45PM - 4:45PM)



EVENING PEAK HOUR (5:00PM - 6:00PM)

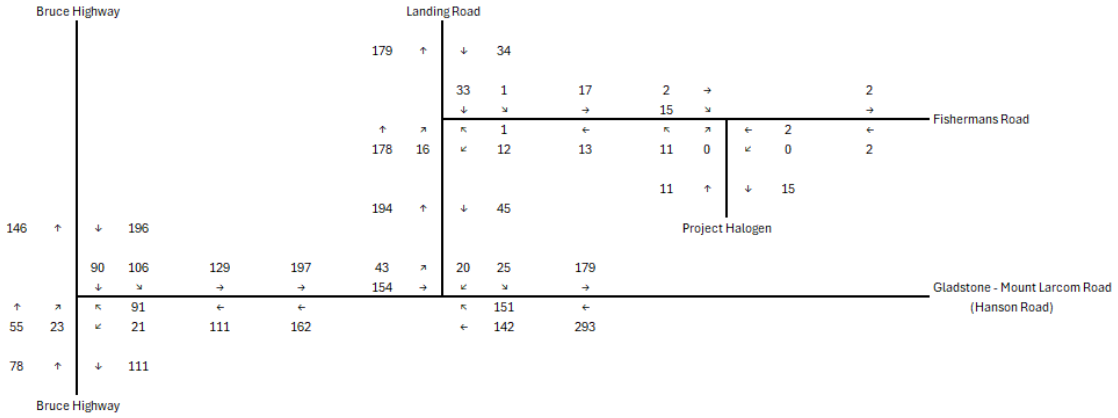
5.1.2 "WITH DEVELOPMENT" TRAFFIC VOLUMES

"With development" traffic volumes are estimated by summing "without development" traffic volumes (refer Section 5.1.1) and development traffic volumes (refer Section 4).

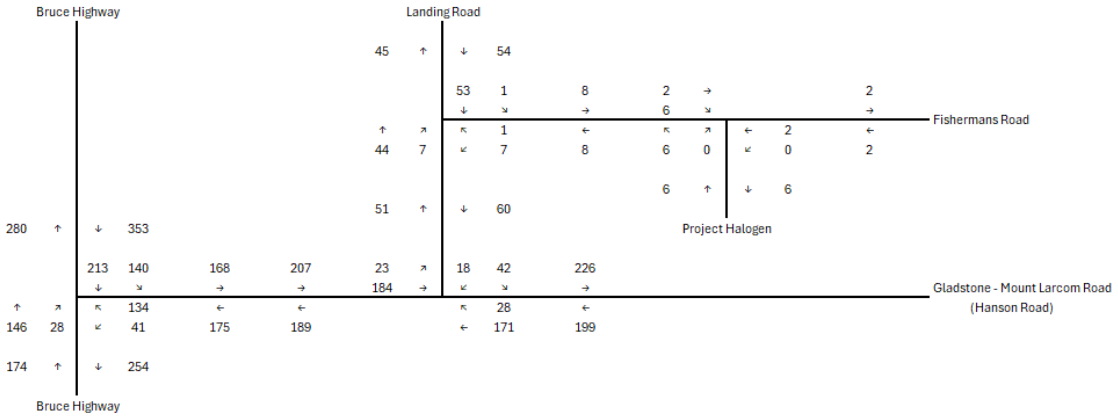
Figure 19 shows estimated design peak hour "with development" traffic volumes in the study area in the opening year. Opening year "with development" traffic is the sum of opening year (2025 - 2028) traffic shown by Figure 17 and development traffic shown by Figure 16, and is valid so long as the final stage of development construction is completed within three (3) years, that is by 2028

Figure 20 shows estimated design peak hour "with development" traffic volumes in the study area in the design year (2038). Design year (2038) "with development" traffic is the sum of design year (2038) "without development" traffic shown by Figure 18 and development traffic shown by Figure 16.

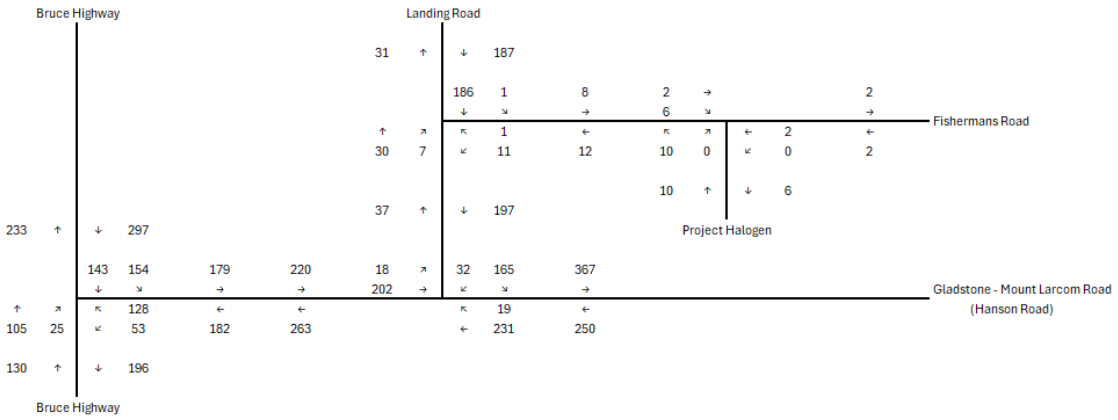
Figure 19 – Estimated opening year (2025 – 2028) "with development" traffic



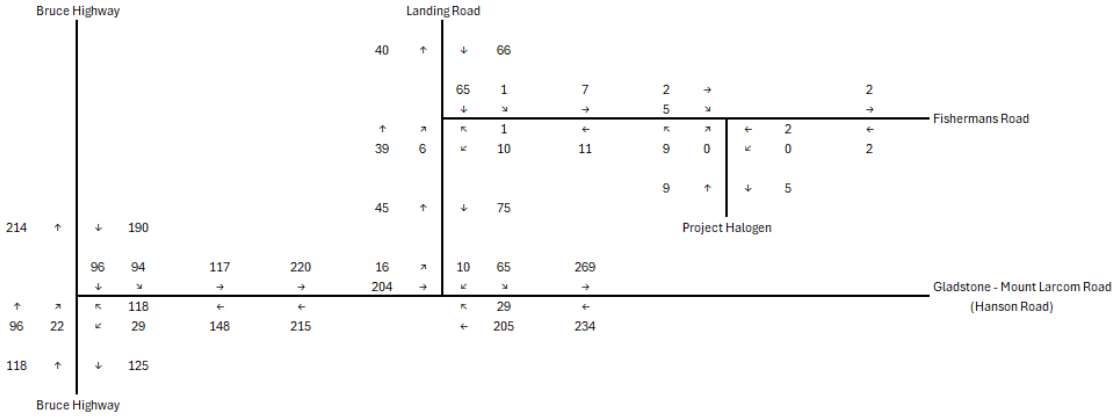
MORNING PEAK HOUR



NOON PEAK HOUR (11:30AM - 12:30PM)

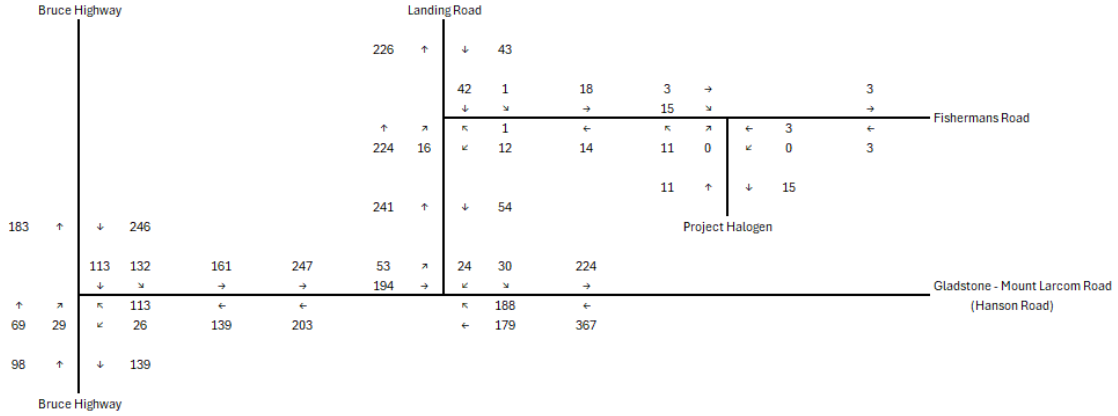


AFTERNOON PEAK HOUR

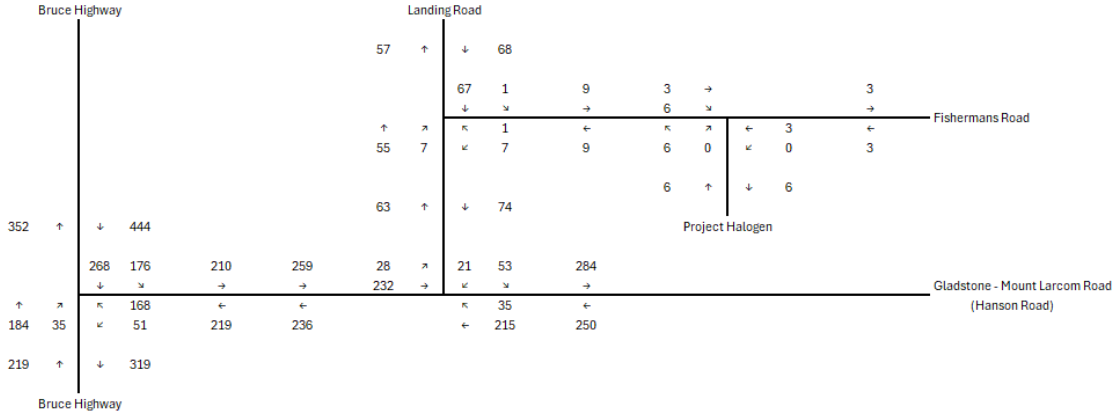


EVENING PEAK HOUR

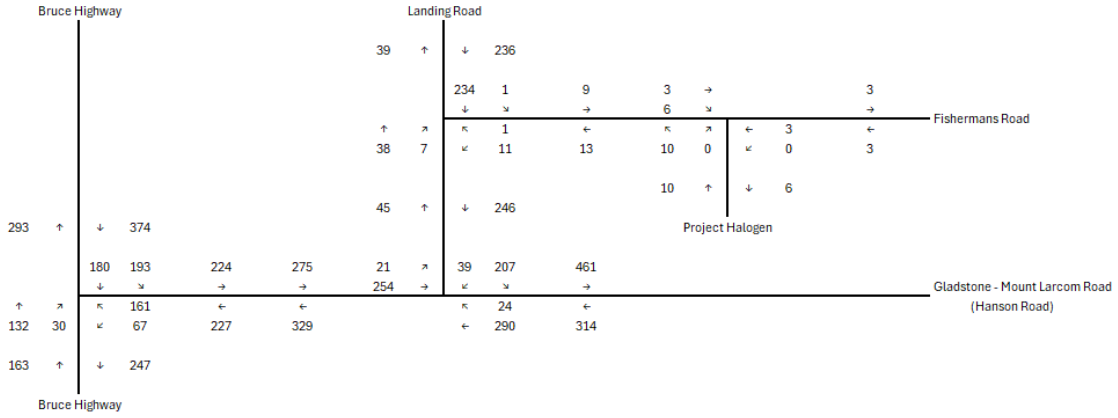
Figure 20 – Estimated design year (2038) "with development" traffic



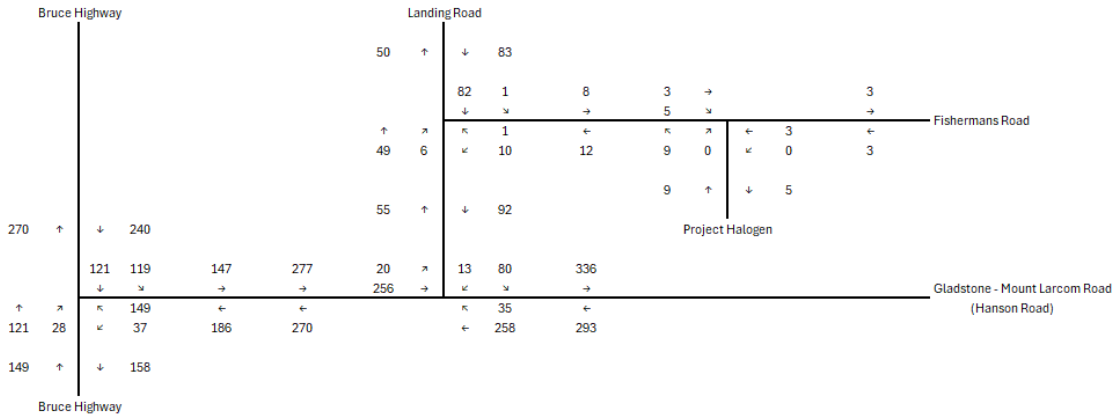
MORNING PEAK HOUR



NOON PEAK HOUR (11:30AM - 12:30PM)



AFTERNOON PEAK HOUR



EVENING PEAK HOUR

5.1.3 RELATIVE IMPACT

The GTIA specifies that, for most impact types, assessment is only required where development traffic exceeds 5% of the base traffic in the design peak periods in the year of opening. Figure 21 shows the impact of development traffic as shown by Figure 16 relative to opening year (2025 – 2028) "without development" traffic as shown by Figure 17. Movements where development traffic is estimated to exceed 5% of base traffic are highlighted in red. Based on this analysis it is concluded that the development:

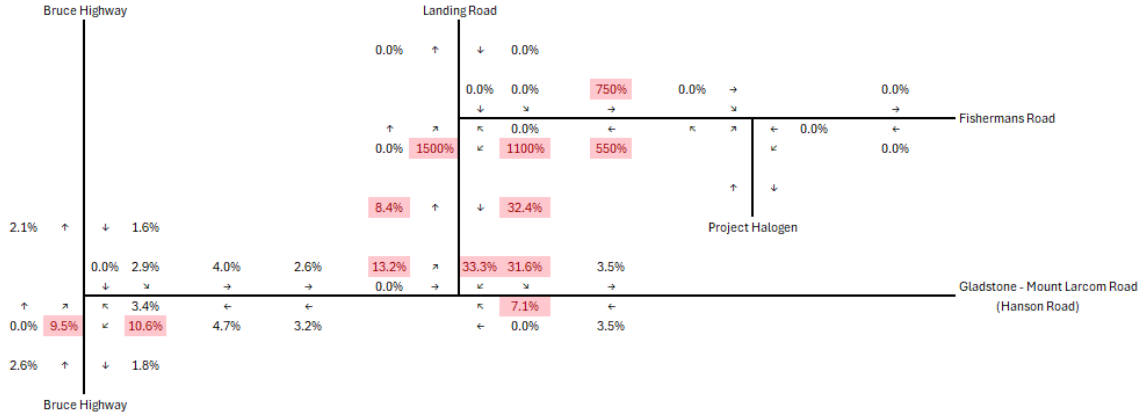
- Will significantly increase traffic:
  - On Fishermans Road between the development access and Landing Road;
  - At the Landing Road / Fishermans Road intersection;
  - On Landing Road between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road); and
  - At the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection.
- Will not significantly increase traffic on Gladstone – Mount Larcom Road (Hanson Road).
- May significantly increase turning movements between Gladstone – Mount Larcom Road and the Bruce Highway south of Gladstone – Mount Larcom Road.

Note however that:

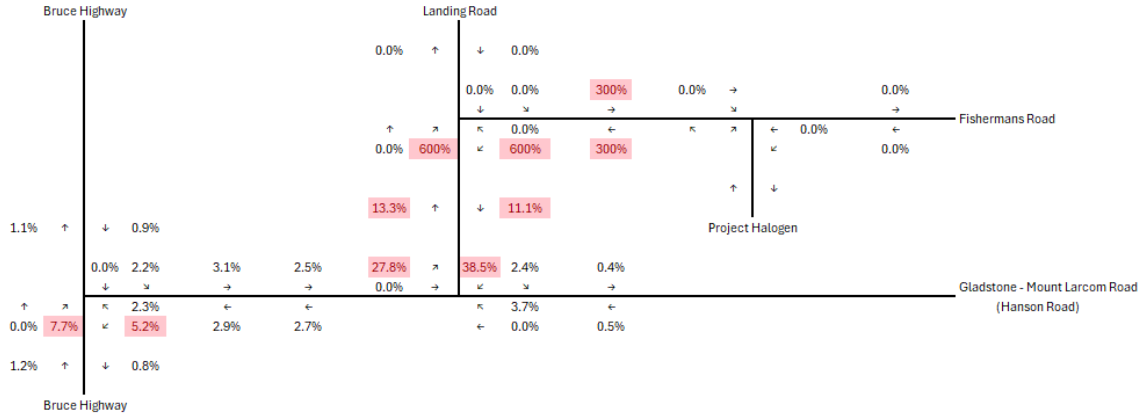
- Peak periods on the surrounding road network as identified from historic count data (refer Section 2.4) generally do not coincide with anticipated peaks in development traffic (as discussed in Section 4.1.3); and
- The estimation of peak hour development traffic, particularly HV traffic, is based on a number of conservative assumptions. In the case of turning movements between Gladstone – Mount Larcom Road and the Bruce Highway south of Gladstone – Mount Larcom Road these conservative assumptions may have overestimated development traffic by more than 50%.

Therefore, further analysis has been undertaken with respect to temporal variations in development traffic and observed traffic over the course of a day as described in the following sub-sections.

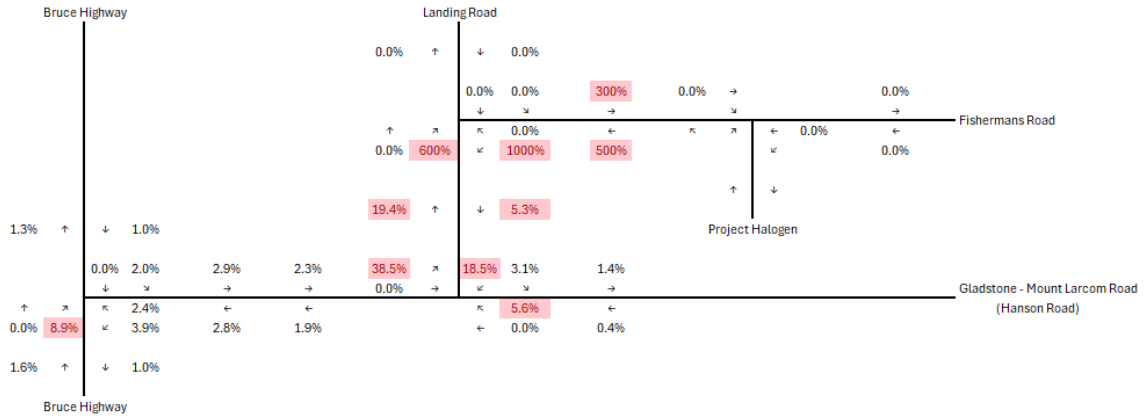
Figure 21 – Development impact relative to opening year (2025 – 2028) "without development" traffic



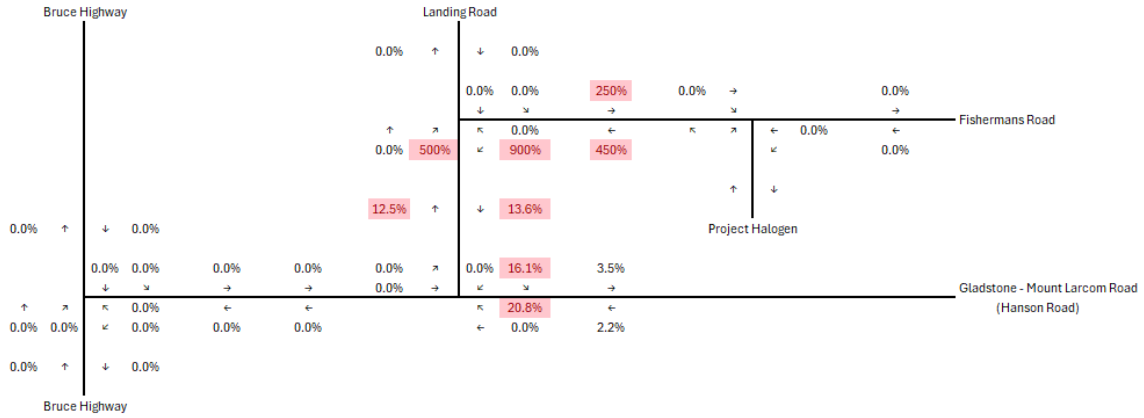
MORNING PEAK HOUR



NOON PEAK HOUR (11:30AM - 12:30PM)



AFTERNOON PEAK HOUR



EVENING PEAK HOUR

5.1.3.1 Landing Road Design Peak Periods

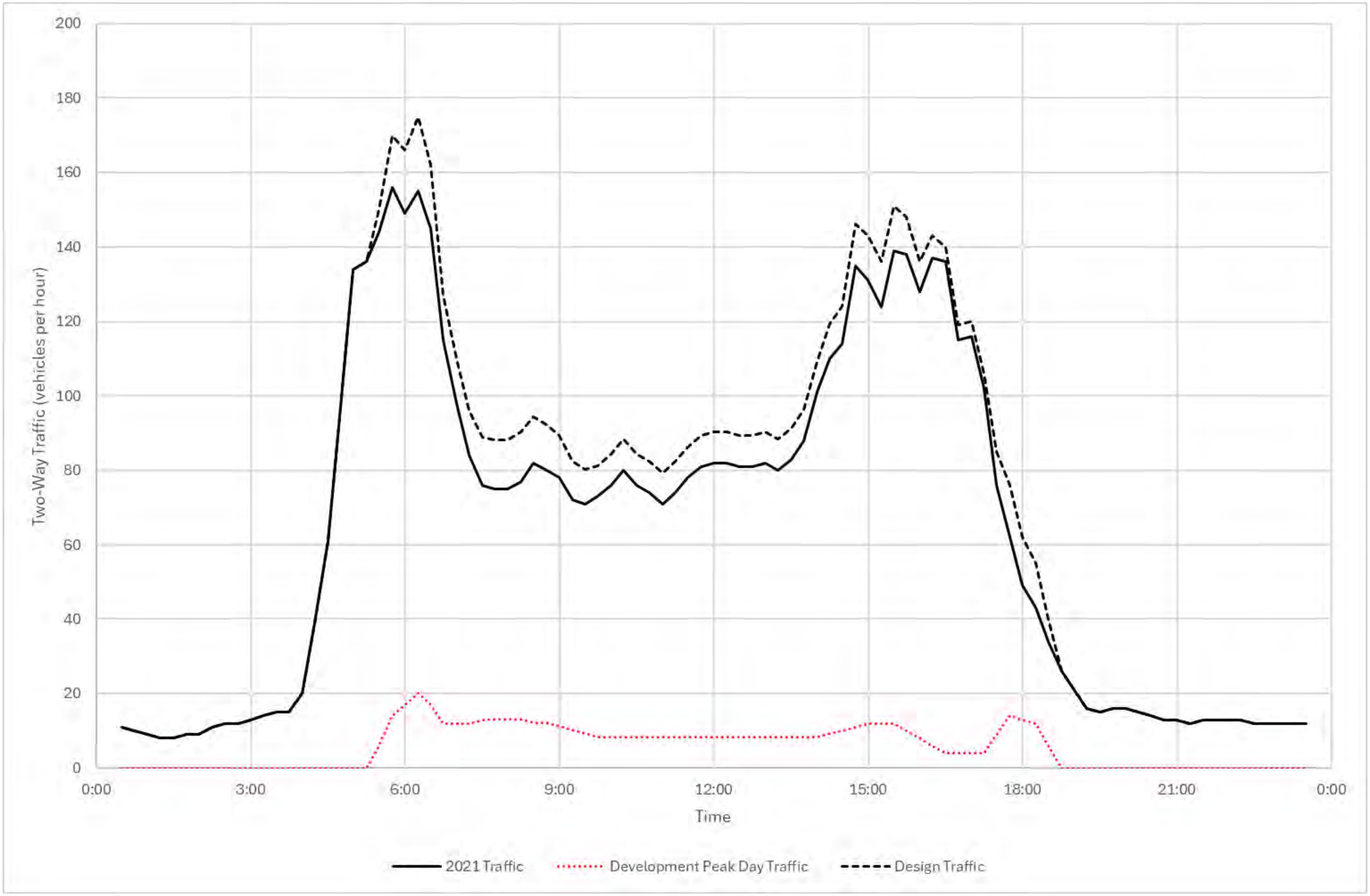
Figure 22 shows the estimated variation in development traffic over the course of the peak day relative to 2021 Landing Road count data supplied by GRC.

The morning peak in development traffic coincides with the morning peak hour on Landing Road resulting in "with development" traffic volumes which are significantly increased in the morning peak hour. Therefore, the morning peak hour is a design peak hour for Landing Road

The afternoon peak in development traffic though not as intense as the morning peak is broader in duration. The afternoon peak in Landing Road traffic is also broader in duration. The combination of these two (2) broad peaks makes the afternoon peak hour a design peak hour for Landing Road.

Landing Road traffic outside of the above peak periods is less than 60% of its peak level. Therefore, even with the addition of development traffic the noon and evening peak hours are not design peak hours for Landing Road.

Figure 22 – Estimated with and without development traffic volumes on Landing Road



5.1.3.2 Gladstone – Mount Larcom Road (Hanson Road) Design Peak Periods

Figure 23 shows the estimated variation in development traffic over the course of the peak day relative to 2020 Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection count data supplied by TMR.

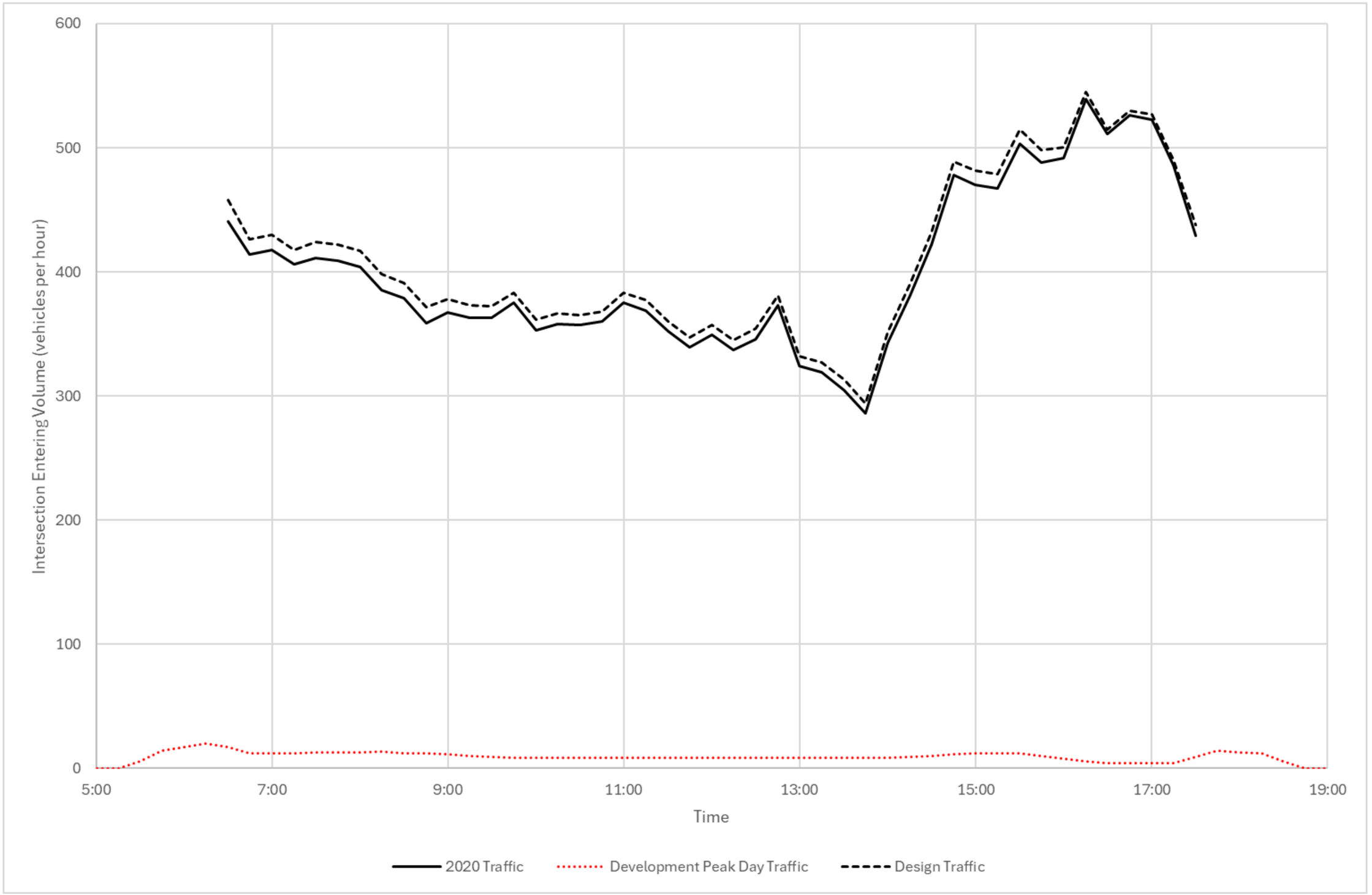
For the entire duration of the 12-hour intersection count, the impact of development traffic on the total volume of traffic entering the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection is less than 5%, however, as indicated in Figure 21, the development may increasing turning movements in and out of Landing Road by more than 5% during any of the assessed peak periods..

The morning peak in development traffic coincides with the morning peak hour at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection. Therefore, the morning peak hour is a design peak hour for Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection.

The afternoon peak hour at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection is more clearly defined than on Landing Road (refer Section 5.1.3.1) and actually occurs between the afternoon and evening peak hours in development traffic generation when development traffic is expected to be even less than is forecast for the noon peak hour. Despite this the superposition of afternoon peak hour traffic at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection and afternoon peak hour development traffic generation by the development will be assessed as a design peak hour.

As on Landing Road (refer Section 5.1.3.1), the noon and evening peak hours are not design peak hours for the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection.

Figure 23 – Estimated with and without development traffic volumes at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection



5.1.3.3 Bruce Highway Design Peak Period

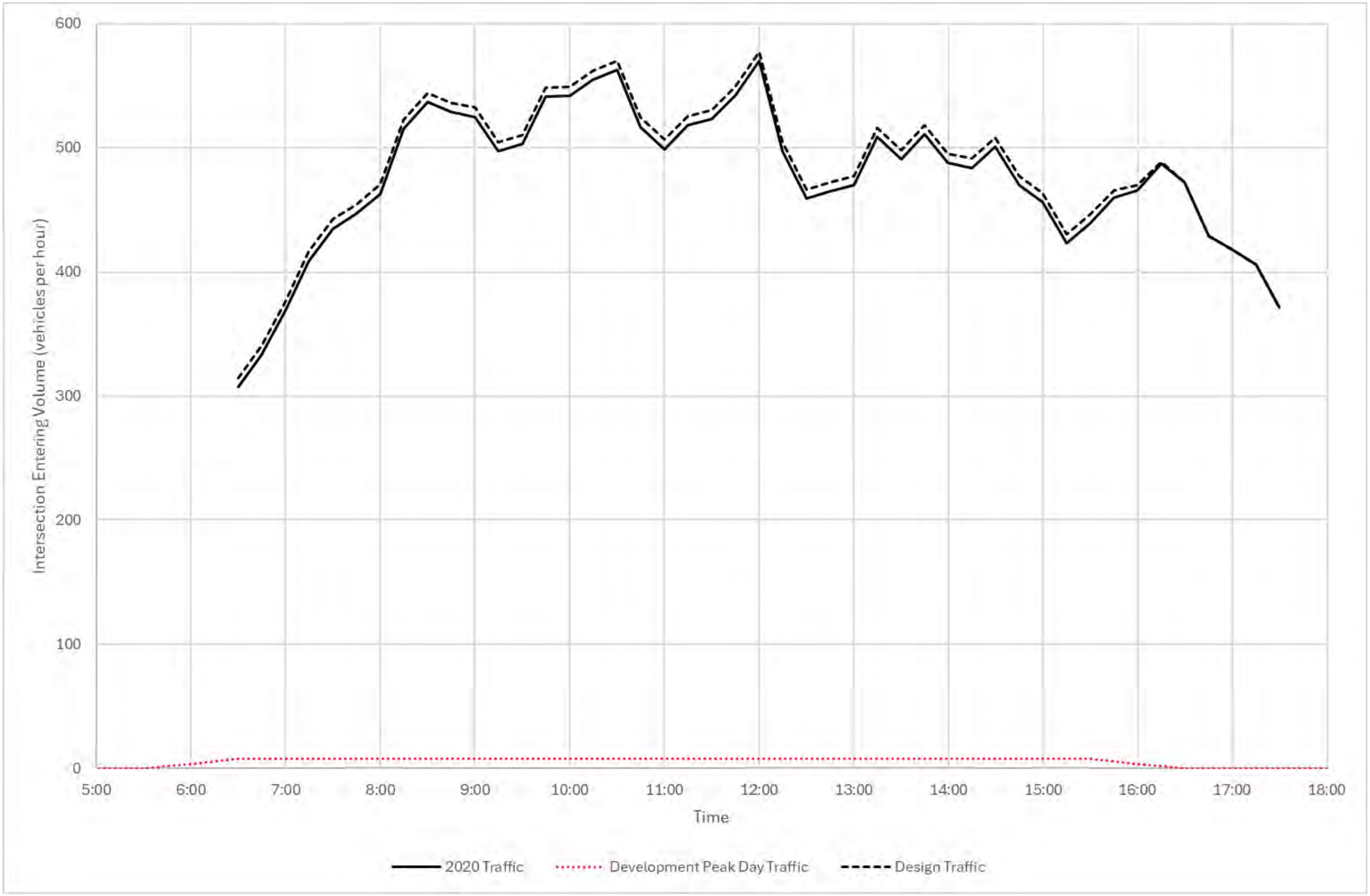
Figure 24 shows the estimated variation in development traffic over the course of the peak day relative to 2020 Bruce Highway / Gladstone – Mount Larcom Road intersection count data supplied by TMR.

For the entire duration of the 12-hour intersection count, the impact of development traffic on the total volume of traffic entering the Bruce Highway / Gladstone – Mount Larcom Road intersection is less than 3%.

Unlike Landing Road (refer Figure 22), there is no clear peak in traffic at the Bruce Highway / Gladstone – Mount Larcom Road intersection with the total intersection entering volume observed top fluctuate between 500vph and 600vph from 8:00AM to 12:00PM and remain above 400vph from 12:00PM until after 5:00PM.

The GTIA:FAQ indicates that if a development will result in a relatively small increase in vehicle movements, e.g. 2 – 3 movements on a rural road, but the impact is over the 5% threshold TMR expects industry to adopt a pragmatic approach to applying the GTIA and does not expect mitigation of minor traffic impacts unless the increase will result in an unacceptable safety risk. This scenario is considered to apply to the proposed developments impacts on the Bruce Highway / Gladstone – Mount Larcom Road intersection.

Figure 24 – Estimated with and without development traffic volumes at the Bruce Highway / Gladstone – Mount Larcom Road intersection



5.2 Construction Traffic Impact Assessment and Mitigation

GWT advise that construction activities are not expected to generate:

- Over-size-over-mass (OSOM) vehicle movements; or
- More vehicle movements than peak operations traffic (refer Section 4).

Therefore, assessment of design peak period traffic during operations is considered to provide adequate assessment of construction traffic.

5.3 Road Safety Impact Assessment and Mitigation

The GTIA specifies the following two (2) stage process for assessment of road safety impacts:

1. Risk assessment to determine the change in risk profile associated with existing road safety issues as a result of the development; and
2. Safety assessment to determine if changes to the road environment require either a road safety audit by an accredited road safety auditor (RSA), or a road safety assessment by either an RSA or a registered professional engineering of Queensland (RPEQ)

5.3.1 RISK ASSESSMENT

The risk assessment process specified by the GTIA involves the following steps:

- Evaluate potential consequences based on accident severity from 1, property damage only, to 5, fatality;
- Evaluate potential likelihood from 1, rare, to 5, almost certain; and
- Sum the potential consequence and likelihood values to determine the risk score with scores up to and including 4 being low risk, 5 to 7 medium risk, and 8 or greater high risk.

Table 2 summarises the road safety risk assessment with further detail provided in the following sub-sections. The impact assessment area is taken as consisting of:

- Landing Road including the intersection with Fishermans Road; and
- Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and the Bruce Highway including the intersections with Landing Road and the Bruce Highway.

Table 2 – Road Safety Risk Assessment

	Without development			With development				With development & mitigation		
Risk item	**Likelihood**	**Consequence**	**Risk Score**	**Likelihood**	**Consequence**	**Risk Score**	**Mitigation measures**	**Likelihood**	**Consequence**	**Risk Score**
Pedestrians	1	5	M	2	5	M	No action			
Landing Road intersections	1	4	M	2	4	M	No action			
Gladstone – Mt Larcom Rd (E) intersections	3	3	M	3	3	M	No action			
Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection	2	3	M	3	3	M	No action			
Gladstone – Mt Larcom Rd (W) intersections	2	4	M	2	4	M	No action			
Bruce Highway / Gladstone – Mount Larcom Road intersection	2	4	M	3	4	M	No action			
Gladstone – Mt Larcom Rd (E) head on	1	5	M	1	5	M	No action			
Gladstone – Mt Larcom Rd (W) head on	3	4	M	3	4	M	No action			
Gladstone – Mt Larcom Rd (W) non-head-on opposing vehicle movements	1	4	M	1	4	M	No action			
Gladstone – Mt Larcom Rd (E) rear end	3	4	M	3	4	M	No action			
Gladstone – Mt Larcom Rd (W) rear end	2	4	M	2	4	M	No action			
Parallel lanes	1	4	M	2	4	M	No action			
Driveway	1	4	M	2	4	M	No action			
Overtaking	1	4	M	2	4	M	No action			
Animal on Landing Road	1	4	M	2	4	M	No action			
Animal on Gladstone – Mount Larcom Road	2	4	M	2	4	M	No action			
Temporary object on carriageway	1	4	M	2	4	M	No action			
Landing Road run off road	2	4	M	3	4	M	No action			
Gladstone – Mt Larcom Rd (E) clear zone	1	4	M	1	4	M	No action			
Gladstone – Mt Larcom Rd (W) clear zone on straight	3	4	M	3	4	M	No action			
Gladstone – Mt Larcom Rd (W) clear zone on curve	1	4	M	1	4	M	No action			
Gladstone – Mt Larcom Rd (E) off carriageway objects on straight	3	4	M	3	4	M	No action			
Gladstone – Mt Larcom Rd (E) off carriageway objects on curves	2	4	M	2	4	M	No action			
Gladstone – Mt Larcom Rd (W) off carriageway objects on straights	1	4	M	1	4	M	No action			

	Without development			With development				With development & mitigation		
Risk item	**Likelihood**	**Consequence**	**Risk Score**	**Likelihood**	**Consequence**	**Risk Score**	**Mitigation measures**	**Likelihood**	**Consequence**	**Risk Score**
Gladstone – Mt Larcom Rd (W) off carriageway objects on curves	2	5	M	2	5	H	No action			
Bruce Highway / Gladstone – Mount Larcom Road intersection off carriageway objects	1	4	M	2	4	M	No action			
Loss of control on Gladstone – Mt Larcom Rd (E) carriageway	1	4	M	1	4	M	No action			
Loss of control on Gladstone – Mt Larcom Rd (W) carriageway on straights	1	4	M	1	4	M	No action			
Loss of control on Gladstone – Mt Larcom Rd (W) carriageway on curves	2	4	M	2	4	M	No action			
Gladstone – Mt Larcom Rd (E) islands	1	4	M	1	4	M	No action			
Gladstone – Mt Larcom Rd (W) islands	2	4	M	2	4	M	No action			

5.3.1.1 "Without Development" Risk Assessment

To provide an objective assessment of the potential likelihood, Premise uses the average recurrence interval / frequency criteria listed in Table 3. These criteria are more conservative that those suggested by GTIA:FAQ but are consistent with other TMR guidelines that three (3) fatal or serious injury (potential consequence 4) accidents in five (5) years (potential likelihood 4) is high risk and should be mitigated. The highest risk scores resulted from consideration of the highest consequence / most severe accidents unless otherwise noted.

Table 3 – Potential Likelihood Evaluation Criteria

Potential Likelihood	Average Recurrence Interval	Accidents over 16 Years
Almost Certain (5)	≤1 year	16 or more
Likely (4)	≤ 2 years	8 to 15
Moderate (3)	≤ 4 years	4 to 7
Unlikely (2)	≤ 8 years	2 or 3
Rare (1)	> 8 years	1

Based on the 16 years of crash data supplied by TMR (refer Section 2.5), the identified existing risk items are:

- **Pedestrians**: There were a total of three (3) pedestrian crashes (DCA 000 series) in the study area including one (1) fatal, one (1) hospitalisation, and one (1) medical treatment. Therefore, a fatal pedestrian crash (potential consequence 5) in the study area is rare (potential likelihood 1) resulting in a medium risk score (6).
- **Landing Road intersections**: There was one (1) intersection crash (DCA 104) on Landing Road, excluding the Gladstone – Mount Larcom Road (Hanson Road) intersection, and it resulted in hospitalisation. Therefore, a hospitalisation crash (potential consequence 4) at a Landing Road intersection is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Gladstone – Mt Larcom Rd (E) intersections**: There were four (4) intersection crashes (DCA 100 series) on Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and Landing Road including one (1) hospitalisation and three (3) medical treatment. Therefore, at intersections on Gladstone – Mount Larcom Road east of Landing Road a hospitalisation crash (potential consequence 4) is rare (potential likelihood 1) but the probability of a medical treatment crash (potential consequence 3) is moderate (potential likelihood 3) resulting in a medium risk score (6).
- **Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection**: There were two (2) crashes within 200m of the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection. Both were adjacent through-right crashes (DCA 104) which resulted in medical treatment. Therefore, a medical treatment crash (potential consequence 3) at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection is unlikely (potential likelihood 2) resulting in a medium risk score (5).
- **Gladstone – Mt Larcom Rd (W) intersections**: There were four (4) adjacent approach crashes (DCA 100 series) at intersections on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway including three (3) hospitalisation and one (1) medical treatment. Therefore, a hospitalisation crash (potential consequence 4) due to adjacent approaches on Gladstone – Mount Larcom Road west of Landing Road is unlikely (potential likelihood 2) resulting in a medium risk score (6).

- **Bruce Highway / Gladstone – Mount Larcom Road intersection**: There were four (4) intersection crashes (DCA 104 and 806) at the Bruce Highway / Gladstone – Mount Larcom Road intersection including two (2) hospitalisation, one (1) medical treatment and one (1) minor injury. Therefore, a hospitalisation crash (potential consequence 4) at the Bruce Highway – Gladstone Mount Larcom Road intersection is unlikely (potential likelihood 2) resulting in a medium risk score (6).
- **Gladstone – Mt Larcom Rd (E) head on**: There were four (4) head on crashes (DCA 201) on Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and Landing Road including one (1) fatal, two (2) hospitalisation, and one (1) medical treatment. Therefore, a fatal head on crash (potential consequence 5) on Gladstone – Mount Larcom Road (Hanson Road) east of Landing Road is rare (potential likelihood 1) resulting in a medium risk score (6).
- **Gladstone – Mt Larcom Rd (W) head on**: There were eight (8) head on crashes (DCA 201) on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway including one (1) fatal, three (3) hospitalisation and four (4) medical treatment. Therefore, head on collisions on Gladstone – Mount Larcom Road west of Landing Road resulting in a fatality (potential consequence 5) are rare (potential likelihood 1) but the probability of a hospitalisation crash (potential consequence 4) is moderate (potential likelihood 3) resulting in a medium risk score (7).
- **Gladstone – Mount Larcom Road non-head-on opposing vehicle movements**: There was three (3) non-head-on opposing vehicle movement crashes (DCA 200 and 202) on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway including one (1) hospitalisation and two (2) medical treatment. Therefore, a hospitalisation crash (potential consequence 4) due to an opposing vehicle crash other than a head-on collision on Gladstone – Mount Larcom Road west of Landing Road is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Gladstone – Mt Larcom Rd (E) rear end**: There were nine (9) rear end collisions on Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and Landing Road including five (5) hospitalisation and four (4) medical treatment. Therefore, the probability of a rear end collision on Gladstone – Mount Larcom Road (Hanson Road) east of Landing Road resulting in hospitalisation (potential consequence 4) is moderate (potential likelihood 3) resulting in a medium risk score (7).
- **Gladstone – Mt Larcom Rd (W) rear end**: There were five (5) rear end collisions on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway including two (2) hospitalisation and three (3) medical treatment. Therefore, a rear end collision on Gladstone – Mount Larcom Road west of Landing Road resulting in hospitalisation (potential consequence 4) is unlikely (potential likelihood 2) resulting in a medium risk score (6).
- **Parallel lanes**: There was one (1) parallel lanes (DCA 305) crash in the study area, and it resulted in hospitalisation. Therefore, a hospitalisation crash (potential consequence 4) due to parallel lanes is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Driveways**: There was one (1) entering from driveway crash (DCA 406) in the study area, and it resulted in hospitalisation. Therefore, a hospitalisation crash (potential consequence 4) at a driveway is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Overtaking**: There was one (1) overtaking crash (DCA 500 series) in the study area, and it resulted in hospitalisation. Therefore, a hospitalisation crash (potential consequence 4) due to overtaking is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Animal on Landing Road**: There was one (1) hit animal crash (DCA 609) on Landing Road and it resulted in hospitalisation. Therefore, a hospitalisation crash (potential consequence 4) due to an animal on Landing Road is rare (potential likelihood 1) resulting in a medium risk score (5).

- **Animal on Gladstone – Mount Larcom Road (Hanson Road)**: There were five (5) hit animal crashes (DCA 609) on Gladstone – Mount Larcom Road between Auckland Creek and the Bruce Highway including three (3) hospitalisation and two (2) medical treatment. Therefore, a hospitalisation crash (potential consequence 4) due to an animal on Gladstone – Mount Larcom Road (Hanson Road) is unlikely (potential likelihood 2) resulting in a medium risk score (6).
- **Temporary objects on carriageway**: There were three (3) crashes other than hit animal crashes involving objects on the carriageway (DCA 607 and 610) including one (1) hospitalisation and two (2) medical treatment. Therefore, a hospitalisation crash (potential consequence 4) due to a temporary object on a carriageway is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Landing Road run off road**: There were three (3) run off road crashes (DCA 700 and 800 series) on Landing Road and all resulted in hospitalisation. Therefore, a run off road hospitalisation crash (potential consequence 4) on Landing Road is unlikely (potential likelihood 2) resulting in a medium risk score (6).
- **Gladstone – Mt Larcom Rd (E) clear zone**: There were two (2) off carriageway on (DCA 701, 702, 801 or 802) on Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and Landing Road including one (1) hospitalisation and one (1) medical treatment. Therefore, an off-carriageway crash resulting in hospitalisation (potential consequence 4) on Gladstone – Mount Larcom Road (Hanson Road) east of Landing Road is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Gladstone – Mt Larcom Rd (W) clear zone on straight**: There were six (6) off carriageway on straight crashes (DCA 701, 702 and 707) on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway with all resulting in hospitalisation. Therefore, the probability of an off carriageway on straight crash resulting in hospitalisation (potential consequence 4) on Gladstone – Mount Larcom Road west of Landing Road is moderate (potential likelihood 3) resulting in a medium risk score (7).
- **Gladstone – Mt Larcom Rd (W) clear zone on curve**: There were three (3) off carriageway on curve crashes (DCA 801 and 802) on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway including one (1) hospitalisation and two (2) medical treatment. Therefore, an off carriageway on curve crash resulting in hospitalisation (potential consequence 4) on a curve on Gladstone – Mount Larcom Road west of Landing Road is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Gladstone – Mt Larcom Rd (E) off carriageway objects on straight**: There were six (6) off carriageway on straight hit object crashes (DCA 703 and 704) on Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and Landing Road including four (4) hospitalisation and two (2) medical treatment. Therefore, the probability of an off carriageway on straight hit object crash resulting in hospitalisation (potential consequence 4) is moderate (potential likelihood 3) on Gladstone – Mount Larcom Road (Hanson Road) east of Landing Road resulting in a medium risk score (7).
- **Gladstone – Mt Larcom Rd (E) off carriageway objects on curves**: There were two (2) off carriageway on curve hit object crashes (DCA 803 and 804) on Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and Landing Road, and both resulted in hospitalisation. Therefore, an off carriageway on curve hit object crash resulting in hospitalisation (potential consequence 4) on Gladstone – Mount Larcom Road east of Landing Road is unlikely (potential likelihood 2) resulting in a medium risk score (6).
- **Gladstone – Mt Larcom Rd (W) off carriageway objects on straights**: There were three (3) off carriageway on straight hit object crashes (DCA 703 and 704) on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway including one (1) hospitalisation and two (2) medical treatment. Therefore, an off carriageway on straight hit object crash resulting in hospitalisation (potential consequence 4) on Gladstone – Mount Larcom Road west of Landing Road is rare (potential likelihood 1) resulting in a medium risk score (5).

- **Gladstone – Mt Larcom Rd (W) off carriageway objects on curves**: There were 12 off carriageway on curve hit object crashes (DCA 803 and 804) on Gladstone – Mount Larcom Road (Hanson Road) between Landing Road and the Bruce Highway including two (2) fatal, five (5) hospitalisation and five (5) medical treatment. Therefore, an off carriageway on curve hit object crash resulting in a fatality (potential consequence 5) on Gladstone – Mount Larcom Road west of Landing Road is unlikely (potential likelihood 2) resulting in a medium risk score (7).
- **Bruce Highway / Gladstone – Mount Larcom Road off carriageway objects**: There was one (1) off carriageway on curve hit object crash (DCA 804) on the Bruce Highway within 200m of the intersection with Gladstone – Mount Larcom Road, and it resulted in hospitalisation. Therefore, a hospitalisation crash (potential consequence 4) due to off carriageway objects at the Bruce Highway / Gladstone – Mount Larcom Road intersection is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Loss of control on Gladstone – Mt Larcom Rd (E) carriageway**: There were two (2) out of control on carriageway crashes (DCA 705 and 805) on Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and Landing Road including one (1) hospitalisation and one (1) medical treatment. Therefore, loss of control on the Gladstone – Mount Larcom Road (Hanson Road) carriageway east of Landing Road resulting in hospitalisation (potential consequence 4) is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Loss of control on Gladstone – Mt Larcom Rd (W) carriageway on straight**: There were two (2) out of control on carriageway on straight crashes (DCA 705) on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway including one (1) hospitalisation and one (1) medical treatment. Therefore, loss of control on the Gladstone – Mount Larcom Road carriageway on straights west of Land Road resulting in hospitalisation (potential consequence 4) is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Loss of control on Gladstone – Mt Larcom Rd (W) carriageway on curves**: There were four (4) out of control on carriageway on curve crashes (DCA 805) on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway including three (3) hospitalisation and one (1) medical treatment. Therefore, loss of control on the Gladstone – Mount Larcom Road carriageway on curves west of Landing Road resulting in hospitalisation (potential consequence 4) is unlikely (potential likelihood 2) resulting in a medium risk score (6)
- **Gladstone – Mt Larcom Rd (E) islands**: There were three (3) mount island crashes (DCA 708 and 808) on Gladstone – Mount Larcom Road (Hanson Road) between Auckland Creek and Landing Road including one (1) hospitalisation, one (1) medical treatment and one (1) minor injury. Therefore, a hospitalisation crash (potential consequence 4) involving an island on Gladstone – Mount Larcom Road (Hanson Road) east of Landing Road is rare (potential likelihood 1) resulting in a medium risk score (5).
- **Gladstone – Mt Larcom Rd (W) islands**: There were three (3) mount island crashes (DCA 808) on Gladstone – Mount Larcom Road between Landing Road and the Bruce Highway including the Bruce Highway / Gladstone – Mount Larcom Road intersection. All resulted in hospitalisation. Therefore, a hospitalisation crash (potential consequence 4) involving an island on Gladstone – Mount Larcom Road west of Landing Road is unlikely (potential likelihood 2) resulting in a medium risk score (6).

5.3.1.2 "With Development" Risk Assessment

To provide an objective assessment of the potential likelihood increase due to development, Premise uses the development traffic impact criteria listed in Table 4

Table 4 – Potential Likelihood Increase Criteria

Potential Likelihood Increase	Development Traffic Impact
+4 bands	>700%
+3 bands	300% - 700%
+2 bands	100% - 300%
+1 bands	5% - 100%
No increase	≤5%

Section 5.1.3 indicates that the proposed development will increase traffic:

- On Gladstone – Mount Larcom Road (Hanson Road) by less than 5% except at the intersections with Landing Road and the Bruce Highway. Therefore, the potential likelihood of risk items associated with Gladstone – Mount Larcom Road are not expected to increase except where the risk is associated with one (1) of the two (2) identified intersections.
- At the Bruce Highway / Gladstone – Mount Larcom Road intersection and on Landing Road (excluding the Fishermans Road intersection) by less than 40% increasing the potential likelihood of associated risks by one (1) band.
- On Fishermans Road and at the Landing Road / Fishermans Road intersection by more than 700%. However, over 16 years no crashes were reported on Fishermans Road or at the Landing Road / Fishermans Road intersection. Therefore, the one (1) band increase in potential likelihood for risk items associated with Landing Road including Landing Road intersections is considered to adequately capture the potential increase in risk score resulting from the use of Fishermans Road and the Landing Road / Fishermans Road intersection by development traffic.

Based on the above increases in potential likelihood, the proposed development is not expected to increase the risk score of any existing risk items above their "without development" level and no action is required to mitigate existing road safety issues.

5.3.2 SAFETY ASSESSMENT

All roads in the study area have a traffic volume less than 8,000vpd or a speed limit less than 80km/h and are therefore assessed in accordance with the GTIA as having a medium level of risk.

As the proposed development is located within the Gladstone SDA it is considered a Major Development in accordance with the definition provided by the GTIA and a road safety audit is required for proposed changes to the road environment of roads with a medium level of risk.

Therefore, any changes to the road environment should be subject to a road safety audit by an accredited road safety auditor at the detailed design stage.

5.4 Access and Frontage Impact Assessment and Mitigation

5.4.1 TURN WARRANT ASSESSMENT

Turn warrant assessments were undertaken in accordance with normal design domain (NDD) warrants contained in Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management (AGTM06-20) are enclosed in Appendix G for the:

- Proposed development access on Fishermans Road;
- Landing Road / Fishermans Road intersection; and
- Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection.

All assessments were undertaken based on design year (2038) "with development" traffic volumes.

The critical peak for the access on Fishermans Road was identified as the morning peak hour. During the morning peak hour basic left and right (BAL / BAR) turn treatments are warranted on Fishermans Road at the development site access.

Turn warrant assessments for both Landing Road intersections were undertaken for the two (2) design peak hours identified in Section 5.1.3 being the morning and afternoon peak hours. The Landing Road / Fishermans Road intersection was found to warrant BAL / BAR turn treatments during both peak periods. The critical peak for the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection was identified as the morning peak hour with a basic left (BAL) turn treatment and a channelised right (CHR) turn treatment warranted on Gladstone – Mount Larcom Road (Hanson Road) at the Landing Road intersection.

Basic turn treatments do not provide deceleration lanes for turning traffic but instead provide shoulder widening which allows turning and through vehicles to manoeuvre past each other at low speed. This requirement will need to be considered in the design and construction of Fishermans Road between Landing Road and the proposed development access.

The CHR turn treatment provides a deceleration lane which allows right turning vehicles to decelerate clear of through traffic from the design speed of the road to a complete stop before reaching the back of the queue of vehicles waiting to turn right. With the posted speed limit on Gladstone – Mount Larcom Road (Hanson Road) being 80km/h at the Landing Road intersection, Austroads Guide to Road Design Part 4A : Unsignalised and Signalised Intersections (AGRD04A-23ed3.2) the deceleration lane length should be at least 100m for a design speed of 90km/h, that is, 10km/h above the posted speed limit. Section 2.3.3.2 indicates that existing turn treatments at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection already satisfy the requirements of the turn warrant assessment.

5.4.2 INTERSECTION ANALYSIS

The 2009 edition of Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis (AGTM03-09) states that capacity considerations are usually not significant at unsignalised intersections with minor roads where there are relatively low volumes of cross and turning traffic and capacity analysis is unnecessary. Table 5 reproduced from AGTM03-09 sets out details of intersection volumes below which capacity analysis is unnecessary.

Table 5 – Intersection Volumes below which Capacity Analysis is Unnecessary (AGTM03-09)

Type of road	Light cross and turning volumes maximum design hour volumes vehicles per hour (two way)		
Two-lane major road	400	500	650
Cross road	250	200	100
Four-lane major road	1000	1500	2000
Cross road	100	50	25

Based on Table 5 capacity analysis is unnecessary for the:

- Proposed development access on Fishermans Road; and
- Landing Road / Fishermans Road intersection.

Intersection analysis for the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection was undertaken using SIDRA Intersection Version 10 software (SIDRA). SIDRA is an advanced analytical traffic tool for the evaluation of intersection performance, and reports intersection performance in terms of a range of parameters including:

- **Demand Flows:** The modelled number of vehicles arriving at the intersection during the assessment hour. Demand flows are calculated by dividing the peak hour volume by the peak flow factor (PFF). SIDRA's default PFF of 95% has been adopted for the purposes of this traffic impact assessment.
- **Degree of Saturation (DoS):** The ratio of the demand flow to the theoretical capacity. A priority control intersection is considered to be operating at its practical capacity when the DoS reaches 0.80.
- **Average Delay:** The mean control delay, including both queuing and geometric delays, for all vehicles arriving during the assessment period. This also accounts for any delay experienced after the end of the flow period until the departure of the last vehicle that arrived during that period. The GTIA states that where average peak-hour delays at priority-controlled intersections exceed 42 seconds, the intersection should be upgraded for safety reasons.
- **95th Percentile Back of Queue Length:** The maximum backward extent of the queue relative to the stop line or give-way / yield line during a signal cycle or gap acceptance cycle below which 95% of all queue lengths fall. The 95th percentile back of queue length is generally accepted as the maximum queue length for design purpose.

Consistent with the weekday average proportion of HVs on Landing Road (refer Section 2.4), the SIDRA model for the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection assumes HVs comprise 33% of all intersection movements during the design peak periods which is a conservative assumption relative to the proportion of HVs reported on Gladstone – Mount Larcom Road (Hanson Road) (refer Section 2.6). SIDRA outputs for the existing Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection geometry based on design year (2038) "with development" traffic volumes (refer Figure 20) during the design peak hours, that is the morning and afternoon peak hours as identified in Section 5.1.3.2, are enclosed in Appendix H. Key points are:

- The maximum DoS is 0.431 which is the reported DoS for the Landing Road approach to Gladstone – Mount Larcom Road (Hanson Road) during the afternoon peak hour. This is well below the practical capacity of a priority-controlled intersection (DoS << 0.80).
- The maximum average delay to any movement is reported as 23.8sec for the right turn from Landing Road to Gladstone – Mount Larcom Road during the afternoon peak hour. This delay is acceptable.
- The 95th percentile back of queue length on Landing Road during the afternoon peak hour is calculated to be three (3) vehicles and is not expected to adversely impact on the operation of any adjacent intersections or accesses. The 95th percentile back of queue lengths calculated for Gladstone – Mount Larcom Road (Hanson Road) in the afternoon peak hour and all approaches in the morning peak hour are no more than one (1) vehicle which is ideal.

5.4.3 INTERSECTION LAYOUT

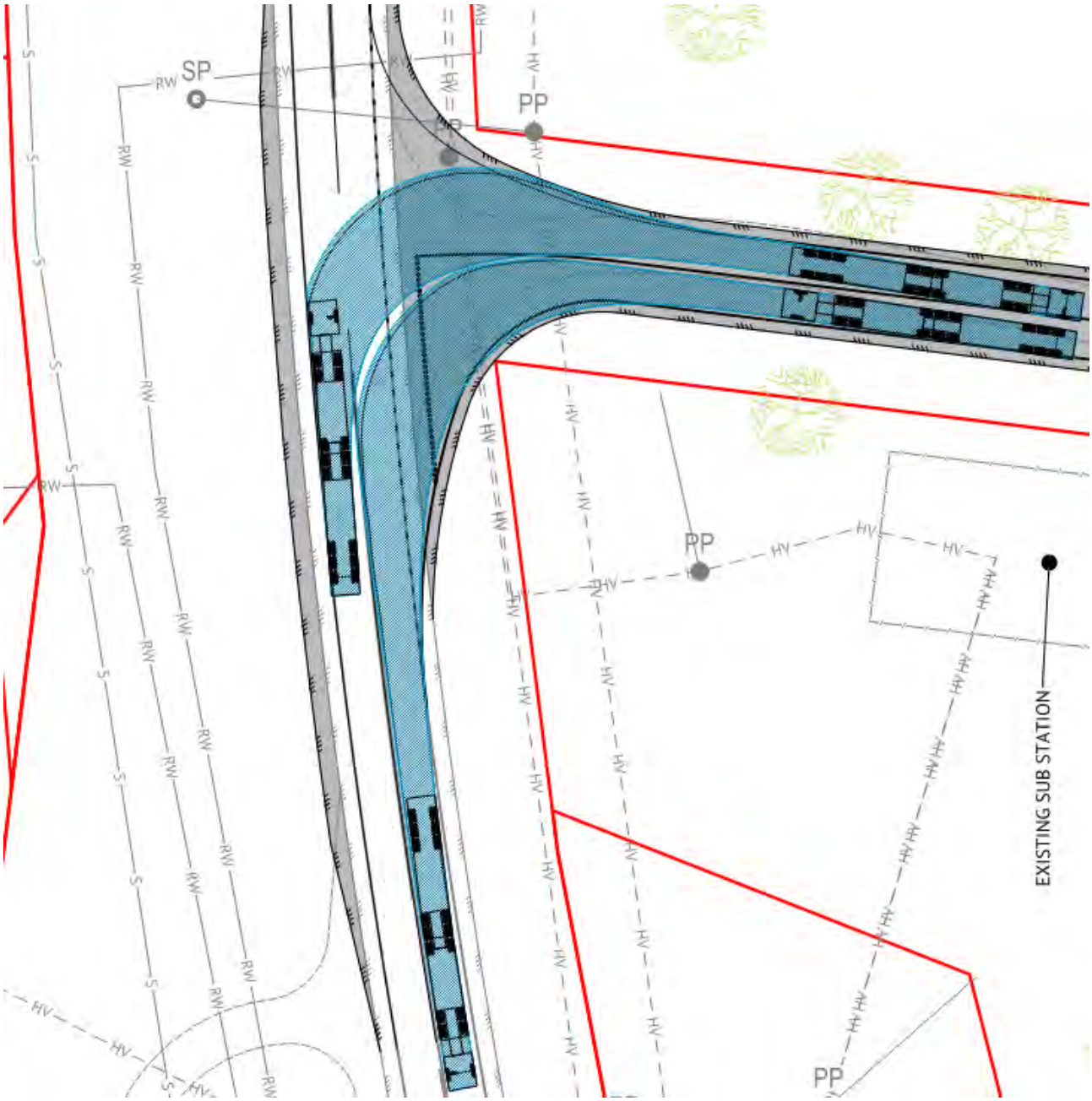
Appendix I contains drawings of the Landing Road / Fishermans Road intersection including:

- SKC001: Existing site plan
- SKC002: Proposed site plan
- SKC003: Vehicle swept paths
- SKC004: Safe intersection sight distance plan
- SKC005: Roadworks details

SKC002 and SKC005 show minimum upgrade works required for compliance with the preceding analysis.

Figure 25 reproduces the swept paths of B-doubles at the Landing Road / Fishermans Road intersection from SKC003.

Figure 25 – Landing Road / Fishermans Road intersection B-double swept paths (P003805-SKC003-rev3)



With the Fishermans Road reserve being just 20m wide, an intersection angle of 80-degrees, and no truncations of the road reserve boundaries it is difficult to accommodate the B-double swept paths in the existing road reserves and relocation of public utility plant (PUP) will likely be required (refer SKC002). Alternative solutions include:

- Acquisition of land on the southeast corner of the intersection from the electricity substation site to increase the Fishermans Road reserve width at the intersection, square up the intersection angle and allow realignment of Fishermans Road away from existing power poles on the northeast corner of the intersection; or
- Relocating the proposed development access from the narrow Fishermans Road reserve to be directly on Landing Road to the south of the electricity substation site as shown by Figure 26.

Figure 26 – Landing Road development access option

All other existing intersections in the study area where the proposed development is expected to generate turning movements are currently approved for use by B-doubles up to 26m in length.

5.4.4 SIGHT DISTANCES

Visibility at intersections in the study area was assessed during a site inspection conducted between 9:00AM and 12:00PM on 24 September 2025.

The GTIA specifies minimum sight distance requirements for accesses and intersections as:

- Approach sight distance (ASD) required to the road surface at all intersections and accesses;
- Safe intersection sight distance (SISD) desirable between a vehicle using a public road intersection and a vehicle approaching on the major road; and
- Minimum gap sight distance (MGSD) acceptable between a vehicle using a public road intersection and a vehicle approaching on the major road.

ASD, SISD and MGSD are defined in AGRD04A-23ed3.2 which also provides formulae for calculating the acceptable minimum sight distances in the NDD.

ASD is the distance at which a driver can see any line marking on the road surface at the intersection. ASD should be sufficient to allow a driver to react to the intersection and, if necessary, come to a complete stop before entering the intersection. Minimum ASD is calculated using the formula

$$ASD = \frac{R_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

where

R_T = reaction time

V = design speed
= 10km/h above the posted speed limit

d = coefficient of deceleration
= 0.36 (desirable value for most urban and rural road types)

a = longitudinal grade
= 0 (level road)

Table 6 reproduced from AGRD04A-23ed3.2 shows minimum ASD values in the NDD.

Table 6 – Approach Sight Distance and Corresponding Minimum Crest Vertical Curve Size for Sealed Roads (AGRD04a-23-ed3.2)

Design speed (km/h)	Based on approach sight distance for a car[1] $h_1 = 1.1$, $h_2 = 0$, $d = 0.36$[2]					
	$R_T = 1.5$ sec[3]		$R_T = 2.0$ sec		$R_T = 2.5$ sec	
	ASD (m)	*K*	ASD (m)	*K*	ASD (m)	*K*
40	34	5.3	40	7.2	–	–
50	48	10.5	55	13.8	–	–
60	64	18.8	73	24.0	–	–
70	83	31.1	92	38.9	–	–
80	103	48.5	114	59.5	–	–
90	126	72.3	139	87.3	151	104
100	151	104	165	124	179	146
110	–	–	193	171	209	198
120	–	–	224	229	241	264
130	–	–	257	301	275	344
Truck stopping capability provided by the minimum crest curve size[4]	$h_1 = 2.4$ m, $h_2 = 0$ m, $d = 0.22$					

1 *If the average grade over the braking length is not zero, calculate the approach sight distance (ASD) values using the correction factors in Table 3.4 (or use Equation 1) by applying the average grade over the braking length.*
2 *In constrained locations (typically lower volume roads, less important roads, mountainous roads, lower speed urban roads and tunnels), a coefficient of deceleration of 0.46 may be used. For any horizontal curve with a side friction factor greater than the desirable maximum value for cars (in constrained locations), use a coefficient of deceleration of 0.41. The resultant crest curve size can then be calculated using the relevant equations in AGRD Part 3 (Austroads 2016a).*
3 *A 1.5 sec reaction time is only to be used in constrained situations where drivers will be alert. Typical situations are given in Table 5.2 of AGRD Part 3. The general minimum reaction time is 2 sec.*
4 *This check case assumes the same combination of design speed and reaction time as those listed in the table, except that the 120 km/h and 130 km/h speeds are not used.*

Notes:
K is the length of vertical curve in metres for a 1% grade change.

SISD is the distance at which a driver can see a vehicle moving into a collision situation and decelerate to a stop before reaching the collision point. Minimum SISD is calculated using the formula

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)}$$

where the meaning of variables is as for ASD with decision time, D_T, being the sum of reaction time, R_T, and observation time, O_T, which is assumed to be 3.0sec.

Table 7 reproduced from AGRD04A-23ed3.2 shows minimum SISD values in the NDD.

Table 7 – Safe Intersection Sight Distance and Corresponding Minimum Crest Vertical Curve Size for Sealed Roads (AGRD04A-23ed3.2)

Design speed (km/h)	Based on safe intersection sight distance for cars[1] h_1 = 1.1; h_2 = 1.25, d = 0.36[2]; Observation time = 3 sec					
	R_T = 1.5 sec[3]		R_T = 2.0 sec		R_T = 2.5 sec	
	SISD (m)	K	SISD (m)	K	SISD (m)	K
40	67	4.9	73	6	–	–
50	90	8.6	97	10	–	–
60	114	14	123	16	–	–
70	141	22	151	25	–	–
80	170	31	181	35	–	–
90	201	43	214	49	226	55
100	234	59	248	66	262	74
110	–	–	285	87	300	97
120	–	–	324	112	341	124
130	–	–	365	143	383	157

1 *If the average grade over the braking length is not zero, calculate the safe intersection sight distance (SISD) values using the correction factors in Table 3.4 (or use Equation 2) by applying the average grade over the braking length.*
2 *A coefficient of deceleration of greater than 0.36 is not provided in this table. The provision of SISD requires more conservative values than for other sight distance models (e.g. the stopping sight distance model allows values up to 0.46 in constrained situations). This is because there is a much higher likelihood of colliding with hazards at intersections (that is, other vehicles). Comparatively, there is a relatively low risk of hitting a small object on the road (the stopping sight distance model).*
3 *A 1.5 sec reaction time is only to be used in constrained situations where drivers will be alert. Typical situations are given in Table 5.2 of AGRD Part 3. The general minimum reaction time is 2 sec.*

Notes:
K is the length of vertical curve for a 1% change in grade.

MGSD is based on distances corresponding to the critical acceptance gap that drivers are prepared to accept when undertaking a crossing or turning manoeuvre at intersections. MGSD is measured from the point of conflict between approaching and entering vehicles back along the centre of the travel lane of the approaching vehicle. The MGSD is dependent on the critical acceptance time, t_a, that the driver of an entering vehicle accepts to see a vehicle in the conflicting streams to safely commence the desired manoeuvre. The critical gap for cars is generally accepted as 5.0sec. Trucks are likely to require significantly longer gaps in order to avoid disruption of through traffic. However, drivers of large trucks are likely to rely on through traffic slowing down to let them enter making the provision of SISD more important.

5.4.4.1 Fishermans Road access

Figure 5 shows visibility from the proposed project site access on Fishermans Road is clear to Landing Road approximately 150m to the west.

Figure 27 shows visibility from the proposed project site access on Fishermans Road is clear to the bend in Fishermans Road approximately 100m to the east (refer Figure 15).

Figure 27 – Fishermans Road looking east from the proposed project site access

For the proposed project site access on Fishermans Road, only ASD is required.

With approximately 150m of separation between the proposed project site access on Fishermans Road and Landing Road achievement of ASD requires adoption of a design speed of 90km/h which implies a posted speed limit on Fishermans Road of 80km/h which is consistent with the posted speed limit on Landing Road and on Gladstone – Mount Larcom Road (Hanson Road) at Landing Road.

With approximately 100m of separation between the proposed project site access on Fishermans Road and the bend to the east, ASD is achieved for a design speed of:

- 70km/h based on the maximum reaction time applicable to this speed of 2.0sec; or
- 80km/h based on a reaction time of 1.5sec for alert driving conditions.

When Fishermans Road is upgraded between Landing Road and the proposed project site access a speed limit of 80km/h should be imposed for consistency with the surrounding road network and to ensure achievement of minimum ASD requirements for drivers using the upgraded section of Fishermans Road. When Fishermans Road east of the proposed project site access is sealed (not part of this project) a speed limit review should be undertaken to assess if a reduction in speed limit is required.

5.4.4.2 Landing Road / Fishermans Road Intersection

With a posted speed limit of 80km/h the recommended minimum sight distance provision on Landing Road at the Fishermans Road intersection is SISD of 226m based on a design speed, V, of 90km/h which is 10km/h above the posted speed limit and unalerted driving conditions, that is R_T = 2.5sec. Figure 28 and Figure 29 show visibility along Landing Road from Fishermans Road to both the south and north respectively, and confirm that the recommended SISD is provided as indicated by P003805-SKC004-rev4 enclosed in Appendix I..

Figure 28 – Landing Road looking south from Fishermans Road

Figure 29 – Landing Road looking north from Fishermans Road

5.4.4.3 Gladstone – Mount Larcom Road (Hanson Road) / Landing Road Intersection

As at the Landing Road / Fishermans Road intersection (refer Section 5.4.4.2), the recommended minimum sight distance provision on Gladstone – Mount Larcom Road (Hanson Road) at the Landing Road intersection is SISD of 226m. Figure 30 and Figure 31 show visibility along Gladstone – Mount Larcom Road (Hanson Road) to both the west and east respectively, and demonstrate that the recommended SISD is provided.

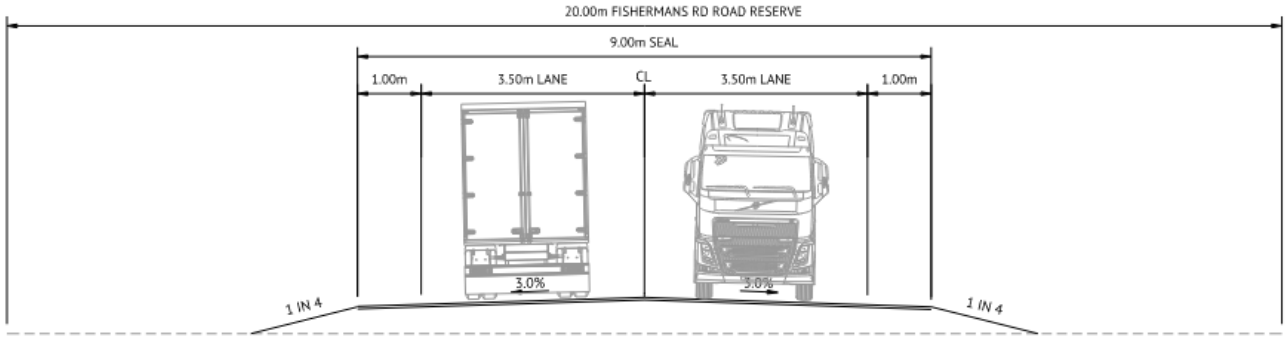
Figure 30 – Gladstone – Mount Larcom Road looking west from Landing Road

Figure 31 – Gladstone – Mount Larcom Road (Hanson Road) looking west from Landing Road

5.5 Road Link Capacity Assessment and Mitigation

Figure 32, reproduced from P003805-SKC005-rev3 enclosed in Appendix I, shows the recommended typical section for Fishermans Road which features a 9.0m wide sealed carriageway providing one (1) 3.5m wide traffic lane in each direction with 1.0m wide sealed shoulders consistent with GRC's requirements for a Rural Industrial Road as defined in the Capricorn Municipal Development Guidelines Geometric Road Design (CMDG D1). CMDG D1 indicates that this road type is suitable for up to 5,000vpd.

Figure 32 – Recommended Fishermans Road typical section (P003805-SKC005-rev3)



CMDG D1 recommends a minimum road reserve width of 30m for a Rural Industrial Road with an absolute minimum rural road reserve of 25m for a Rural Access Road. The Fishermans Road reserve however is only 20m wide. Road reserve widening may be required at intersections or to accommodate road functions other than the conveyance of traffic, e.g. stormwater management.

All other roads in the study area have a cross section which exceeds the minimum standard specified for the Fishermans Road typical section and are currently approved for use by B-doubles up to 26m in length.

5.6 Pavement Impact Assessment and Mitigation

TMR's GPIA and GRCs "Pavement Impact Assessment Methodology" Revision D March 2022 (PIAM) both require the pavement impact of development traffic to be expressed in terms of SAR4s / Equivalent Standard Axles (ESAs). To address this requirement, Appendix J includes:

- Calculation of development SAR4s / ESAs (and SAR5s) using the methodology demonstrated in the GPIA based on heavy vehicle configurations and loadings indicated in Section 4.1.2.1, and the average day volumes in Table 1;
- Assignment of development SAR4s / ESAs to the state-controlled and local government road networks in accordance with the trip distribution indicated in Section 4.2; and
- Identification of road links with >5% development SAR4s / ESAs impact based on:
  - Gladstone – Mount Larcom Road (Hanson Road): The existing SARs supplied by TMR (refer Appendix E); and
  - Landing Road: The existing ESAs calculated in accordance with the PIAM using count data supplied by TMR (refer Appendix C).

5.6.1 STATE-CONTROLLED ROADS

The pavement impact assessment for SCRs has been completed in accordance with the GPIA.

The impact assessment area is identified as Gladstone – Mount Larcom Road (Hanson Road) between chainages 4.625km (Albert Road / George Brake Drive interchange) and 32.14km (Bruce Highway).

Road asset data supplied by TMR is enclosed in Appendix E and summarised in Section 2.6.

Background SAR4s (ESAs) were supplied by TMR as part of the road asset data.

Development SAR4s (ESAs) are calculated in Appendix J as 95.701 SAR4s (ESAs) per day outbound and 36.286 SAR4s (ESAs) per day inbound.

Development SAR4s (ESAs) are assigned to the SCR network in Appendix J in accordance with the trip distribution indicated in Section 4.2.

As calculated in Appendix J, development SAR4s (ESAs) on Gladstone – Mount Larcom Road westbound from Landing Road (chainage 12.29km) to the Bruce Highway (chainage 32.14km) are calculated to be 6.6% of background SAR4s (ESAs). The percentage impact of development SAR4s (ESAs) on background SAR4 (ESAs) is less than 5% for all other SCR links.

Appendix K contains calculation of contributions to offset development impacts on the westbound pavement of Gladstone – Mount Larcom Road westbound from Landing Road (chainage 12.29km) to the Bruce Highway (chainage 32.14km). The total contribution is calculated to be $20,818.01 per year.

Note that the long term growth rate estimated from 10 years of traffic census data is 1.96% per annum (refer Section 2.4) and TMR reports a growth rate over the five (5) years preceding 2024 of 10.94% per annum on Gladstone – Mount Larcom Road westbound (refer Appendix E) from chainage 12.29km (Landing Road) to chainage 32.14km (Bruce Highway). Therefore, development SAR4s (ESAs) on Gladstone – Mount Larcom Road westbound from Landing Road (chainage 12.29km) to the Bruce Highway (chainage 32.14km) are expected to be less than 5% of background SAR4s (ESAs) within 12 months and may not be significant by the time development commences operation. On this basis it is suggested that:

- If the development commences operation prior to 2028, a one (1) off payment of $20,818.01 would mitigate the developments impacts on SCR pavements; and
- If the development does not commence operation until 2028 or later, the development impact on SCR pavements will not be significant (<5%).

5.6.2 LOCAL GOVERNMENT ROADS

The PIAM indicates that the pavement impact assessment for local government roads will be completed by GRC based on information provided by the applicant. The information required by GRC is provided below. The proposed roads that are to be used by the project are:

- Fishermans Road (Project Halogen access to Landing Road); and
- Landing Road (Fishermans Road to Gladstone – Mount Larcom Road (Hanson Road)).

5.6.2.1 Fishermans Road

As shown in Appendix F and stated in Section 3.3, GWT propose to pave and seal approximately 150m of Fishermans Road between Landing Road and the proposed entry gate to provide access to the development. Design traffic for the new Fishermans Road pavement is calculated in accordance with Capricorn Municipal Development Guidelines Pavement Design (CMDG D2) based on:

- Pavement design life = 20 years (CMDG D2.05.1).
- The proposed carriageway width is greater than 7.0m (refer Section 5.5) and therefore traffic in each direction of travel can be considered separately (CMDG D2.05.4).
- Construction traffic is expected to be no worse than operations traffic (refer Section 5.2).
- In service traffic, N_s = 95.701 ESAs (SAR4s) per day in the loaded direction (refer Appendix J).
- With development traffic on Landing Road is estimated to be 150 – 700 vpd and therefore, in accordance with Table D2.05.1 of CMDG D2, a traffic growth rate, r, of 0.01 is assumed.
- For a design life of 20 years and a growth rate of 0.010, Table D2.05.2 of CMDG D2 indicates the value of the growth factor, Y, is 22.13.
- Fishermans Road is not expected to be utilised by bus services.
- Waste collection vehicles are included in the calculated "in service" traffic (refer Appendix J).

Based on the above assumptions, Fishermans Road pavement design traffic is calculated to be **7.730×10^5 ESAs** per lane.

5.6.2.2 Landing Road

The proposed development will used approximately 800m of Landing Road from Fishermans Road to Gladstone – Mount Larcom Road (Hanson Road) as shown by Figure 4.

Appendix J calculates average daily project generated traffic on Landing Road between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road) to be:

- Outbound (southbound) = 95.701 ESAs (SAR4s) per day
- Inbound (northbound) = 36.286 ESAs (SAR4s) per day

Multiplying the average daily project generated traffic by 365 days per year (consistent with CMDG D2.05.5) the annual project generated traffic on Landing Road between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road) is:

- Outbound (southbound) = 3.49×10^4 ESAs (SAR4s) per annum
- Inbound (northbound) = 1.32×10^4 ESAs (SAR4s) per annum

5.7 Transport Infrastructure Impact Assessment and Mitigation

The development will not significantly (>5%) increase traffic volumes crossing any:

- Bridges or culverts on the SCR network; or
- Railway lines.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of Impacts and Mitigation Measures Proposed

> With consideration to both the development traffic profile and traffic profile of the surrounding road network, four (4) peak periods were identified as potential design peak hours being:

a. Morning peak hour: 5:45AM – 6:45AM peak for both development and Landing Road traffic;

b. Noon peak hour: 11:30AM – 12:30PM peak for Bruce Highway traffic;

c. Afternoon peak hour:

> 3:00PM – 4:00PM peak for development traffic; and

> 3:45PM – 4:45PM peak for Landing Road traffic; and

d. Evening peak hour: 5:15PM – 6:15PM peak for development traffic.

> Comparing development traffic to opening year (2025 – 2028) "without development" traffic during the four (4) identified peak periods it was concluded that the development:

- Will significantly (>5%) increase traffic:
  > On Fishermans Road between the development access and Landing Road;
  > At the Landing Road / Fishermans Road intersection;
  > On Landing Road between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road); and
  > At the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection.
- Will not significantly (<5%) increase traffic on Gladstone – Mount Larcom Road (Hanson Road).
- May significantly (>5%) increase turning movements between Gladstone – Mount Larcom Road and the Bruce Highway south of Gladstone – Mount Larcom Road.

> Further analysis with respect to variations in development traffic and observed traffic over the course of a day concluded:

- For Fishermans Road, the Landing Road / Fishermans Road intersection, Landing Road and the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection:
  > Design peak hours are the morning and afternoon peak hours; and
  > The noon and evening peak hours are not design peak hours.
- The development will result in a relatively small increase in vehicle movements at the Bruce Highway / Gladstone – Mount Larcom Road intersection and only road safety impacts need to be assessed and mitigated at this location.

> Grenof Water Technologies Pty Ltd (GWT) advise that construction activities are not expected to generate over-size-over-mass (OSOM) vehicle movements or more vehicle movements than peak operations traffic. Therefore, construction traffic is expected to be no worse than operation traffic and only operations traffic has been assessed to mitigate both operations and construction impacts.

> Existing road safety issues were identified from analysis of 16 years of historic road crash data for Fishermans Road, Landing Road, Gladstone – Mount Larcom Road (Hanson Road) and intersecting roads within 200m of these road links. Risk assessment of existing road safety issues concluded that the proposed development will not increase the risk score of any existing risk items above their "without development" level and no action is required to mitigate existing road safety issues.

- A safety assessment of the surrounding road network concluded that, as the development is located in the Gladstone State Development Area (SDA), any changes to the road environment as a result of the development should be subject to a road safety audit by an accredited road safety auditor at the detailed design stage. The only proposed change to the road environment is construction of approximately 150m of Fishermans Road between Landing Road and the proposed entry gate to provide access to the development including upgrading of the Landing Road / Fishermans Road intersection.
- Turn warrant assessments concluded that:
  - The site access on Fishermans Road warrants basic left and right (BAL / BAR) turn treatments;
  - The Landing Road / Fishermans Road intersection also warrants BAL / BAR turn treatments; and
  - The Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection warrants basic left (BAL) and channelised right (CHR) turn treatments.
- Basic turn treatments do not provide deceleration lanes for turning traffic but instead provide shoulder widening which allows turning and through vehicles to manoeuvre past each other at low speed. This requirement will need to be considered in the design and construction of Fishermans Road between Landing Road and the proposed development access.
- Existing turn treatments at the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection already satisfy the requirements of the turn warrant assessment.
- Analysis of the Gladstone – Mount Larcom Road (Hanson Road) / Landing Road intersection based on design year (2038) "with development" traffic volumes concluded that the intersection will operate well below its practical capacity with acceptable delays. Queueing at the intersection is not expected to exceed one (1) vehicle except on Landing Road during the afternoon peak hour where queues of up to three (3) vehicles may form. Queueing is not expected to adversely impact on the operation of any adjacent intersections or accesses.
- Capacity analysis is unnecessary for the proposed development access on Fishermans Road or the Landing Road / Fishermans Road intersection due to the low forecast traffic volumes even during design peak periods in the design year (2038) "with development" scenario.
- Appendix I contains drawings of the Landing Road / Fishermans Road intersection including the warranted turn treatments. With the Fishermans Road reserve being just 20m wide, an intersection angle of 80-degrees, and no truncations of the road reserve boundaries it is difficult to accommodate the B-double swept paths in the existing road reserves and relocation of public utility plant (PUP) will likely be required (refer SKC002). Alternative solutions include:
  - Acquisition of land on the southeast corner of the intersection from the electricity substation site to increase the Fishermans Road reserve width at the intersection, square up the intersection angle and allow realignment of Fishermans Road away from existing power poles on the northeast corner of the intersection; or
  - Relocating the proposed development access from the narrow Fishermans Road reserve to be directly on Landing Road to the south of the electricity substation site.
- All other existing intersection in the study area where the proposed development is expected to generate turning movements are currently approved for use by B-doubles up to 26m in length.

- When Fishermans Road is upgraded between Landing Road and the proposed project site access a speed limit of 80km/h should be imposed for consistency with the surrounding road network and to ensure achievement of minimum approach sight distance (ASD) requirements for drivers using the upgraded section of Fishermans Road. When Fishermans Road east of the proposed project site access is sealed (not part of this project) a speed limit review should be undertaken to assess if a reduction in speed limit is required.
- Visibility at intersections in the study area was assessed during a site inspection conducted between 9:00AM and 12:00PM on 24 September 2025. This confirmed that public road intersections in the impact assessment area comply with minimum requirements for safe intersection sight distance (SISD).
- Fishermans Road between Landing Road and the proposed project site access should be constructed to provide a 9.0m wide sealed carriageway with one (1) 3.5m wide traffic lane in each direction with 1.0m wide sealed shoulders. Fishermans Road pavement design traffic is calculated to be 7.730 x 10^5 ESAs per lane. All other roads in the study area have a cross section which exceeds the minimum standard specified for the Fishermans Road typical section and are currently approved for use by B-doubles up to 26m in length.
- To mitigate the development's impacts on state-controlled road (SCR) pavements, a one (1) off payment of $20,818.01 should be made to the Department of Transport and Main Roads (TMR) but only if the development commences operation prior to 2028. If the development does not commence operation until 2028 or later, the development impact on state-controlled road pavements will not be significant (<5%).
- The proposed development will use approximately 800m of Landing Road under the governing authority of Gladstone Regional Council (GRC) between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road). Annual development generated traffic on Landing Road between Fishermans Road and Gladstone – Mount Larcom Road (Hanson Road) is calculated to be:
  - Outbound (southbound) = 3.49 x 10^4 ESAs (SAR4s) per annum
  - Inbound (northbound) = 1.32 x 10^4 ESAs (SAR4s) per annum
- The development will not significantly (>5%) increase traffic volumes crossing any:
  - Bridges or culverts on the SCR network; or
  - Railway lines.

6.2 Certification Statement and Authorisation

This report was prepared by Bradley Jones (RPEQ 19986) in accordance with the GTIA. Traffic Impact Assessment Certification is enclosed in Appendix L.

APPENDIX A

PRE-LODGEMENT ADVICE

Bradley Jones

From: Scott Lucke <scott.lucke@cqgroup.com.au>
Sent: Wednesday, 3 September 2025 3:11 PM
To: Bradley Jones
Subject: [#P003805] 25054 Project Halogen - initial referral agency feedback from TMR
Attachments: 25054 Project Halogen Agency Briefing submission_Rev 2.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Bradley,

See below comments from TMR based on pre-lodgement information provided.

Let me know if you have any concerns or further clarifications you'd like me to follow up with TMR.

For your information please see attached the powerpoint presentation which has been circulated to TMR and informed their feedback.

Cheers.

Regards,

Scott Lucke
Principal Planner

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M: +61 423 707 578
E: scott.lucke@cqgroup.com.au
A: 180 Quay Street, Rockhampton QLD 4700

CQG Consulting www.cqgroup.com.au

Rockhampton | Gladstone | Brisbane | Mackay | Townsville
ABN: 61 107 574 514

From: Rachel Ritchie <Rachel.Ritchie@coordinatorgeneral.qld.gov.au>
Sent: Wednesday, September 3, 2025 3:07 PM
To: Scott Lucke <scott.lucke@cqgroup.com.au>
Cc: Scott Barnes <Scott.barnes@grenof.com>; Jason Brooks <Jason.brooks@grenof.com>; Cathee Miller <cathee.miller@cqgroup.com.au>; Patrice Brown <patrice.brown@cqgroup.com.au>
Subject: Project Halogen - initial referral agency feedback from TMR

Hi Scott

As mentioned in the pre-lodgement meeting today, I have circulated the slide deck to the Department of Transport and Main Roads (TMR) for initial review and comment. Below is a summary of their key comments and recommendations. I note that some of the matters they raised you had indicated were underway at our pre-lodgement meeting this morning.

Approvals:

- According to the layout plan the site is obtaining access off the local road Landing Road. Landing Road intersects with the state-controlled road. Provided no direct access to the state-controlled road is being sought, the applicant will not be required to obtain approval from TMR under s 62 of the *Transport Infrastructure Act 1994* for a permitted access location.

General interests:

- TMR's interest in this application is understanding the potential traffic impacts associated with both the construction and operational phases of this project on the broader state-controlled road network.
- From the information available it is not clear whether traffic impacts will be generally limited to construction, or whether large amounts of haulage vehicles / staff movements and so on will be required as part of the ongoing project.
- The Landing Road / Gladstone – Mount Larcom Road intersection appears to be currently configured with channelised turning lanes for left and right turning movements these appear to be full length.
- It is recommended that the applicant be required to submit a Traffic Impact Assessment as part of the application to outline the transport impacts associated with the proposal. This will provide the information necessary for the department to understand whether this project and the traffic movements associated with it will result in any impacts to the transport network that may require mitigation.
- Absent any understanding of the traffic movements associated with this proposal, the department's advice is limited to requesting a Traffic Impact Assessment whilst being clear that the level of assessment required will be defined by the nature of the use and which triggers under Table 6.4 of the GTIA are exceeded. It may be the case that the assessment merely needs to show that none of those thresholds are met; in such a case that is the limit of the assessment

Recommendation:

General – Traffic Impact Assessment

- The information available indicates the use is a chemical plant which is intended to produce up to 160,000 tonnes per year of material. Beyond this figure there does not appear to be any information to understand the broader transport impacts on state-controlled roads.
- At this stage the department's advice is to undertake a Traffic Impact Assessment in accordance with the TMR Guide to Traffic Impact Assessment. The extent of this assessment will depend on the nature of the use, how it operates, the number of staff movements and how material is to be transported from the site. The assessment should analyse both the construction and operational phases of the project.
- The assessment should examine the impact assessment area classes and the impact assessment years to determine if further assessment is required. For example some impact assessment area types may not be relevant, or may not meet the necessary thresholds for further assessment. As an example, it is not clear if the material from this site is being piped for export elsewhere or is intended to be hauled on trucks. In the latter case the assessment should consider whether this transport is likely to trigger any pavement impacts. Where any of the impact assessment areas are triggered the Traffic Impact Assessment must undertake the further assessments required as defined by the correlating chapters in the GTIA.

Please let me know if you have any queries or once you undertake a detailed traffic assessment, I would be happy to arrange a pre-lodgement meeting with TMR if that would assist or send through draft material to TMR for further review.

Kind Regards
Rachel

Rachel Ritchie
Senior Planner, Planning and Services
Office of the Coordinator-General
Department of State Development, Infrastructure and Planning
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1 William Street, Brisbane
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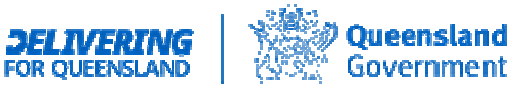

APPENDIX B

12-HOUR INTERSECTION COUNT DATA

Intersection Survey Report
Analysis Report

Version 1.2

Traffic Data Systems
Operational Technologies
Statewide Network Operations Branch | Infrastructure Management and Delivery Division

About this dashboard

The Intersection Survey Dashboard provides you with quick reference and detailed tabular layouts for an intersection's traffic and pedestrian flow counts for a selected date. For each leg of the intersection, the traffic volume inflow and outflow are reported, and where available, broken down into light and heavy vehicles.

Important information: the data in this report are actual traffic counts. The data is not averaged nor does it display an Annual Average Daily Traffic (AADT).

For additional information regarding intersection count data or for assistance with this dashboard please contact the Traffic Data Systems team: SNO_TDSAM@tmr.qld.gov.au

Definitions

Important Information: It is important to note that data in this report are the actual traffic counts for the associated time interval on the date indicated. This report does not display an Annual Average Daily Traffic (AADT).

Angle: The angle used to determine leg direction (available in advanced view) is specified in degrees how far off north the leg points.

Count Time: Counts are reported in 24-hour time format and the value represents the time at the end of an interval. For instance, if counts are hourly, 1700 represents the counting period from 6:00pm to 7:00pm.

District: For administration purposes from 1 February 2015 the Department of Transport and Main Roads has divided Queensland into 12 Districts. District is displayed as District Number - Name.

Leg: Refers to the road segments that construct the intersection. Leg 1 is usually denoted as the most northern leg, then each leg increases in number clockwise.

Pedestrians: Pedestrian counts are collected where required. A pedestrian is counted as moving across a leg, irrespective of direction.

Peak: time intervals throughout the day in which the traffic volume is at a local maximum.

Road Section: is the Gazetted road from which the traffic data is collected. Each Road Section is given a code, allocated sequentially in Gazettal Direction. Larger roads are broken down into sections and identified by an ID code with a suffix for easier data collection and reporting (eg. 10A, 10B, 10C). Road Sections are then broken into AADT Segments which are determined by traffic volume.

Road Section Name: The name of a gazetted road section within a major road. Larger roads are broken down into sections for easier data collection and reporting. For example, the Bruce Highway is identified by the number 10, an alpha suffix is added to indicate the Road Section '10A' being Brisbane-Gympie.

Vehicle Class: The 12 Austroads vehicle categories or classes into which vehicles are placed or binned. Traffic classes are formed in a hierarchical format. In this dashboard, the 12 categories are collapsed into light, heavy, and all vehicles only.

Vehicle Turning Movements: Turning movemnets describe the action of a vehicle at the intersection.

L Left hand turn
T Through traffic
R Right hand turn
U U-turn

Disclaimer

The materials presented in this resource are distributed by the Department of Transport and Main Roads for and on behalf of the State of Queensland as an information source only.

The department makes no statements, representations or warranties about the accuracy or completeness of, and you should not rely on, any information contained in this site.

The Department of Transport and Main Roads disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs which you might incur as a result of the information contained in this resource being inaccurate or incomplete in any way.

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Intersection Survey Report
Wednesday, 11 November 2020

Area
Region: Central Queensland
District: Fitzroy

Intersection
ID: 14458
Description: Landing Rd, Yarwun
Volume: 4,819

Spatial
Latitude: -23.820263
Longitude: 151.152156

Instructions
1. Select an intersection from the map
2. Select a date below

Select Date
Wednesday, 11 November 2020

Date Filters

Year (Optional)
All

Location Filters (Optional)

Region
All

District
All

Road Filter
All

Intersection Filters (Optional)

Intersection ID
Multiple values

Description Search
All

Number of Legs
All

Select an intersection and date to load a report.
Click in empty space on the map to clear selection.

Intersection Summary

Intersectio..	Leg Number	Leg Angle	Road ID	Description	
14458	1	110	F255	Landing Rd @ Gladstone- Mt Larcom Rd	IN: 2,286 OUT: 2,132
	3	290	181	GML Rd to G'stone @ Landing Rd	IN: 1,828 OUT: 1,834
	4	15	181	G'Stone-MtL'com Rd to MtL'com@Landing Rd	IN: 705 OUT: 853

Satellite View

Traffic movement summary

Leg Number	Vehicle Turning Movement	
1	Right	500
	Through	1,632
3	Left	205
	Through	1,629
4	Left	657
	Right	196
Total Traffic		4,819

Intersection Survey Report
Wednesday, 11 November 2020

Area
Region: Central Queensland
District: Fitzroy

Intersection
ID: 14458
Description: Landing Rd, Yarwun
Volume: 4,819

Spatial
Latitude: -23.820263
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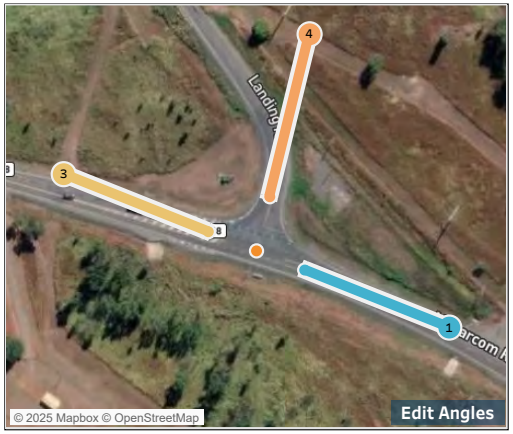
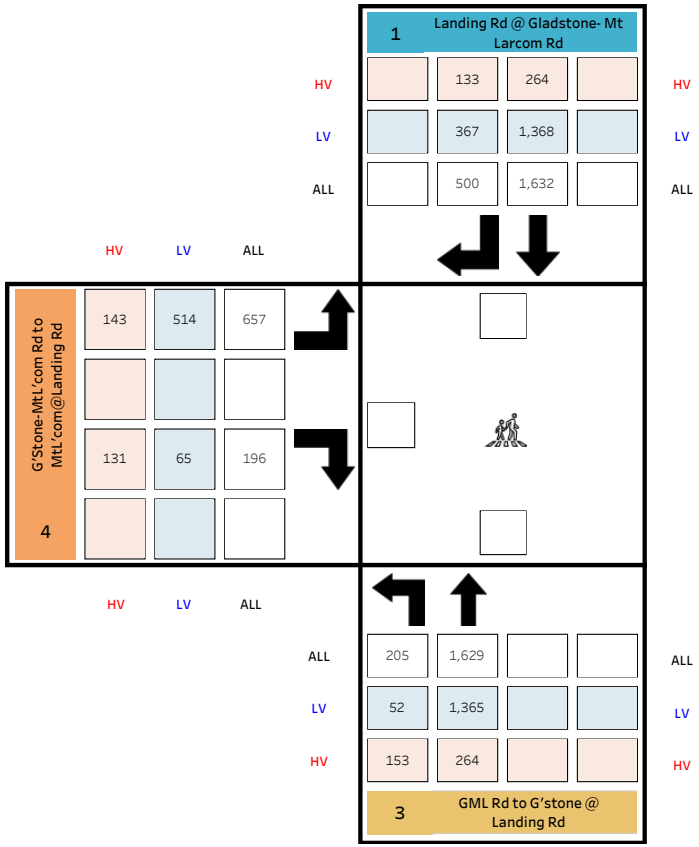




Intersection Summary

Leg Number	Description	
1	Landing Rd @ Gladstone- Mt Larcom Rd	OUT: 2,132 IN: 2,286
3	GML Rd to G'stone @ Landing Rd	OUT: 1,834 IN: 1,828
4	G'Stone-MtL'com Rd to MtL'com@Landing Rd	OUT: 853 IN: 705

Global Filters

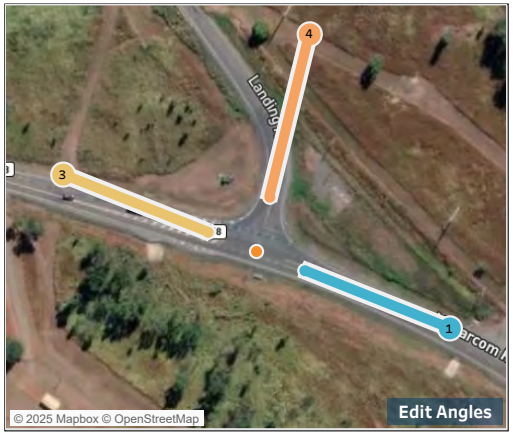
Survey Date
Wednesday, 11 November 2020

Intersection Survey Report
Wednesday, 11 November 2020

Area
Region: Central Queensland
District: Fitzroy

Intersection
ID: 14458
Description: Landing Rd, Yarwun
Volume: 4,819

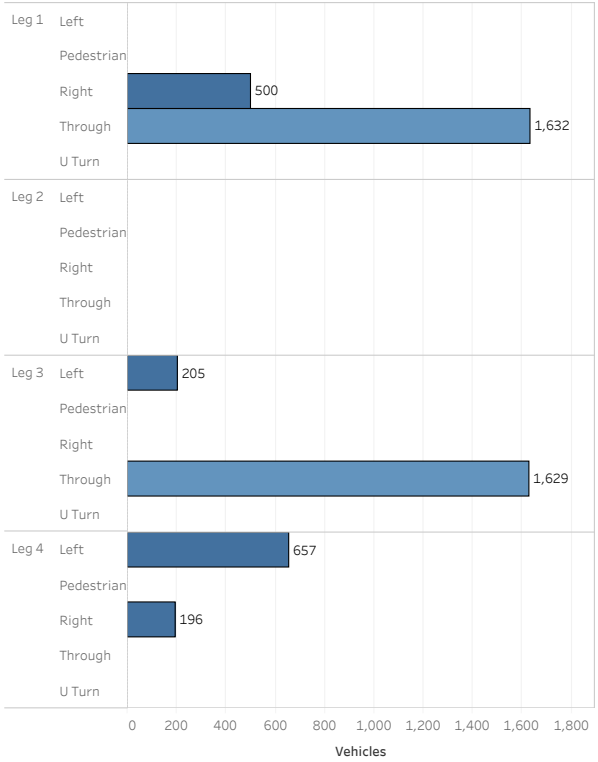
Spatial
Latitude: -23.820263
Longitude: 151.152156



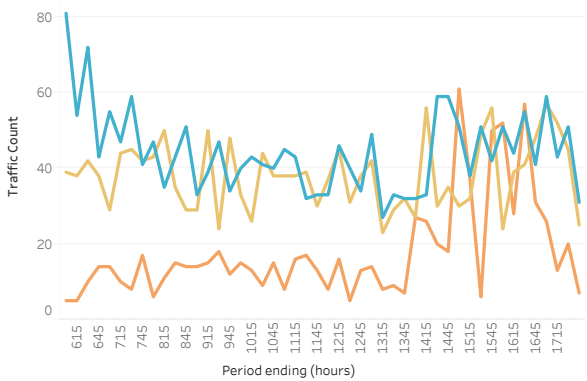
Intersection Summary

Leg Number	Description	
1	Landing Rd @ Gladstone- Mt Larcom Rd	**OUT:** 2,132 **IN:** 2,286
3	GML Rd to G'stone @ Landing Rd	**OUT:** 1,834 **IN:** 1,828
4	G'Stone-MtL'com Rd to MtL'com@Landing Rd	**OUT:** 853 **IN:** 705

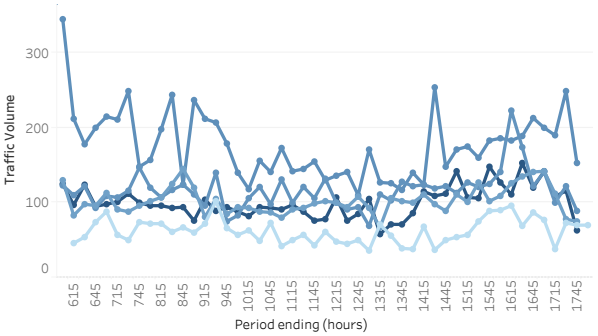
Traffic volume in each direction of travel



Traffic volume for each leg over collection period



Volume summary of recent collection dates (lighter is older)



Global Filters

Survey Date
Wednesday, 11 November 2020

Page Filters

Traffic Class Code
All

Legend

Intersection Leg Number
- 1
- 3
- 4

Time	Leg 1 Landing Rd Through	Leg 1 Landing Rd Right	Leg 3 GML Rd to Left	Leg 3 GML Rd to Through	Leg 4 G'Stone-M Left	Leg 4 G'Stone-M Right	Grand Tota Total
600	29	52	8	31	3	2	125
615	17	37	11	27	4	1	97
630	29	43	12	30	4	6	124
645	34	9	7	31	8	6	95
700	30	25	6	23	11	3	98
715	34	13	3	41	9	1	101
730	40	19	1	44	6	2	112
745	37	4	4	38	11	6	100
800	35	12	5	38	5	1	96
815	20	15	8	42	6	5	96
830	33	10	1	34	12	3	93
845	39	12	2	27	7	7	94
900	28	5	7	22	11	3	76
915	31	8	7	43	8	7	104
930	31	16	3	21	7	11	89
945	26	8	3	45	11	1	94
1000	35	5	11	22	13	2	88
1015	35	8	3	23	7	6	82
1030	33	8	4	40	6	3	94
1045	34	6	5	33	10	5	93
1100	37	8	2	36	8	0	91
1115	37	6	3	35	10	6	97
1130	23	9	5	34	16	1	88
1145	30	3	7	23	11	2	76
1200	26	7	3	34	5	3	78
1215	38	8	3	42	9	7	107
1230	35	5	5	26	4	1	76
1245	26	8	2	36	10	3	85
1300	38	11	5	37	10	4	105
1315	21	6	2	21	6	2	58
1330	26	7	3	26	8	1	71
1345	23	9	4	28	7	0	71
1400	23	9	5	22	16	11	86
1415	27	6	4	52	19	7	115
1430	45	14	2	28	18	2	109
1445	53	6	3	32	14	4	112
1500	47	4	0	30	50	11	142
1515	32	6	2	30	34	3	107
1530	45	6	3	46	5	1	106
1545	37	5	6	50	39	11	148
1600	50	1	1	23	48	4	127
1615	39	5	3	36	24	4	111
1630	48	7	3	38	49	8	153
1645	36	5	2	46	22	9	120
1700	51	8	4	53	22	4	142
1715	36	7	5	47	13	0	108
1730	46	5	5	40	15	5	116
1745	27	4	2	23	6	1	63
Period Tota	1,632	500	205	1,629	657	196	4,819

Intersection Survey Report
Analysis Report

Version 1.2

Traffic Data Systems
Operational Technologies
Statewide Network Operations Branch | Infrastructure Management and Delivery Division

About this dashboard

The Intersection Survey Dashboard provides you with quick reference and detailed tabular layouts for an intersection's traffic and pedestrian flow counts for a selected date. For each leg of the intersection, the traffic volume inflow and outflow are reported, and where available, broken down into light and heavy vehicles.

Important information: the data in this report are actual traffic counts. The data is not averaged nor does it display an Annual Average Daily Traffic (AADT).

For additional information regarding intersection count data or for assistance with this dashboard please contact the Traffic Data Systems team: SNO_TDSAM@tmr.qld.gov.au

Definitions

Important Information: It is important to note that data in this report are the actual traffic counts for the associated time interval on the date indicated. This report does not display an Annual Average Daily Traffic (AADT).

Angle: The angle used to determine leg direction (available in advanced view) is specified in degrees how far off north the leg points.

Count Time: Counts are reported in 24-hour time format and the value represents the time at the end of an interval. For instance, if counts are hourly, 1700 represents the counting period from 6:00pm to 7:00pm.

District: For administration purposes from 1 February 2015 the Department of Transport and Main Roads has divided Queensland into 12 Districts. District is displayed as District Number - Name.

Leg: Refers to the road segments that construct the intersection. Leg 1 is usually denoted as the most northern leg, then each leg increases in number clockwise.

Pedestrians: Pedestrian counts are collected where required. A pedestrian is counted as moving across a leg, irrespective of direction.

Peak: time intervals throughout the day in which the traffic volume is at a local maximum.

Road Section: is the Gazetted road from which the traffic data is collected. Each Road Section is given a code, allocated sequentially in Gazettal Direction. Larger roads are broken down into sections and identified by an ID code with a suffix for easier data collection and reporting (eg. 10A, 10B, 10C). Road Sections are then broken into AADT Segments which are determined by traffic volume.

Road Section Name: The name of a gazetted road section within a major road. Larger roads are broken down into sections for easier data collection and reporting. For example, the Bruce Highway is identified by the number 10, an alpha suffix is added to indicate the Road Section '10A' being Brisbane-Gympie.

Vehicle Class: The 12 Austroads vehicle categories or classes into which vehicles are placed or binned. Traffic classes are formed in a hierarchical format. In this dashboard, the 12 categories are collapsed into light, heavy, and all vehicles only.

Vehicle Turning Movements: Turning movemnets describe the action of a vehicle at the intersection.

L Left hand turn
T Through traffic
R Right hand turn
U U-turn

Disclaimer

The materials presented in this resource are distributed by the Department of Transport and Main Roads for and on behalf of the State of Queensland as an information source only.

The department makes no statements, representations or warranties about the accuracy or completeness of, and you should not rely on, any information contained in this site.

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Copyright

Intersection Survey Report
Thursday, 22 October 2020

Area
Region: Central Queensland
District: Fitzroy

Intersection
ID: 127
Description: Bruce Hwy (10E)/Gladstone-Mt Larcom(181)
Volume: 5,601

Spatial
Latitude: -23.813207
Longitude: 150.982519

Instructions
1. Select an intersection from the map
2. Select a date below

Select Date
Thursday, 22 October 2020

Date Filters

Year (Optional)
All

Location Filters (Optional)

Region
All

District
All

Road Filter
All

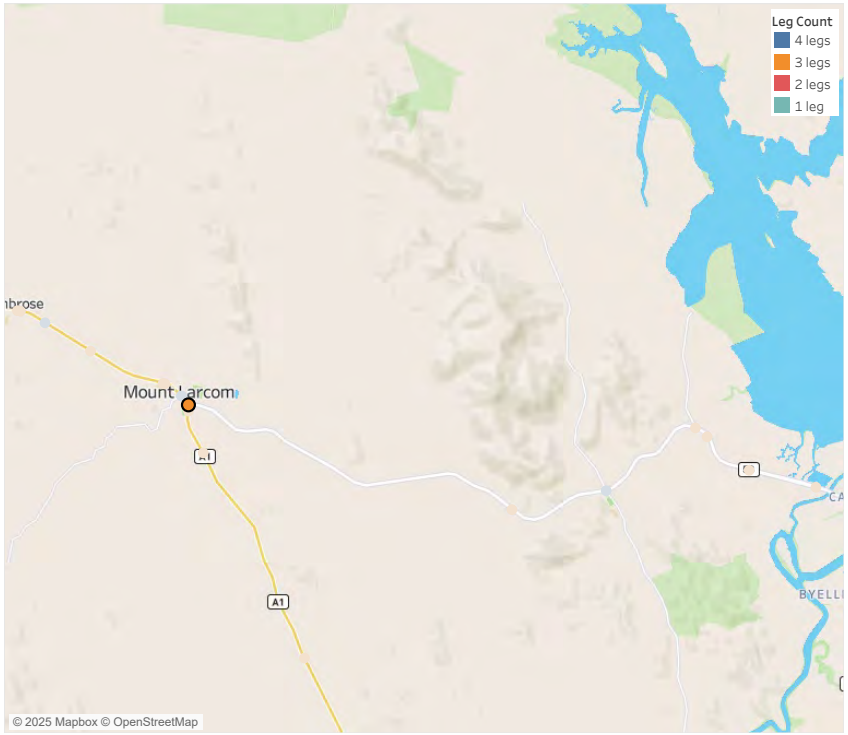
Intersection Filters (Optional)

Intersection ID
Multiple values

Description Search
All

Number of Legs
All

Select an intersection and date to load a report.
Click in empty space on the map to clear selection.



Intersection Summary

Intersectio..	Leg Number	Leg Angle	Road ID	Description	
127	1	0	10E	Bruce Hwy to R'ton @ Gstone-MtLarcom Rd	**IN:** 2,502 **OUT:** 2,927
	2	90	181	Gladstone-Mt.Larcom Rd @ Bruce Hwy	**IN:** 1,244 **OUT:** 1,240
	3	180	10E	Bruce Hwy to Benaraby@G'stone-Mt.Larcom	**IN:** 1,855 **OUT:** 1,434

Satellite View

Traffic movement summary

Leg Number	Vehicle Turning Movement	
1	Left	1,165
	Pedestrian	0
	Through	1,761
	U Turn	1
2	Left	94
	Pedestrian	0
	Right	1,146
	U Turn	0
3	Pedestrian	0
	Right	79
	Through	1,355
	U Turn	0
Total Traffic		**5,601**

Intersection Survey Report
Thursday, 22 October 2020

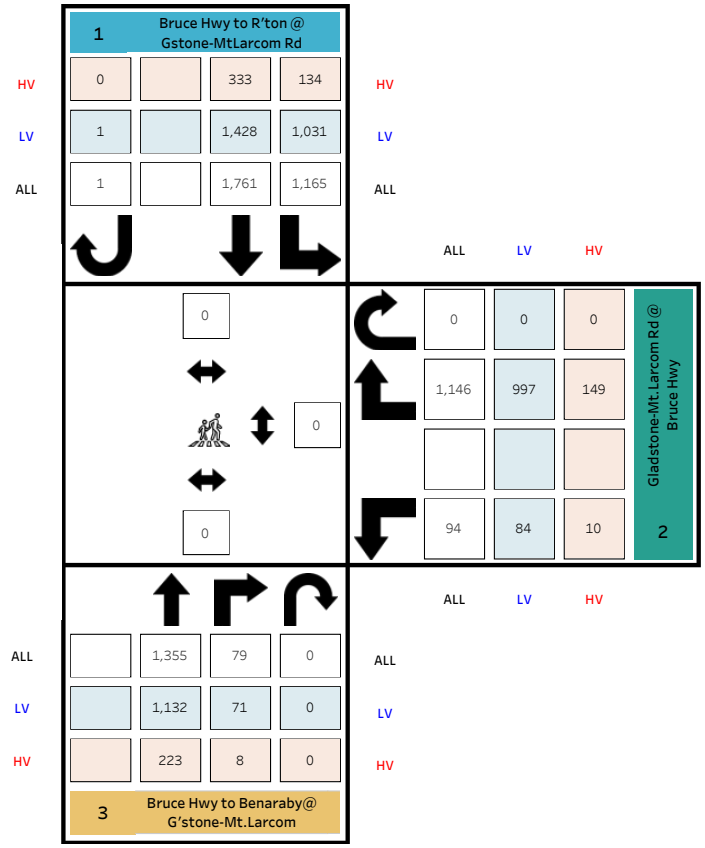
Area
Region: Central Queensland
District: Fitzroy

Intersection
ID: 127
Description: Bruce Hwy (10E)/Gladstone-Mt Larcom(181)
Volume: 5,601

Spatial
Latitude: -23.813207
Longitude: 150.982519

Intersection Summary

Leg Number	Description	
1	Bruce Hwy to R'ton @ Gstone-MtLarcom Rd	OUT: 2,927 IN: 2,502
2	Gladstone-Mt.Larcom Rd @ Bruce Hwy	OUT: 1,240 IN: 1,244
3	Bruce Hwy to Benaraby@G'stone-Mt.Larcom	OUT: 1,434 IN: 1,855



Global Filters

Survey Date
Thursday, 22 October 2020

Intersection Survey Report
Thursday, 22 October 2020

Area
Region: Central Queensland
District: Fitzroy

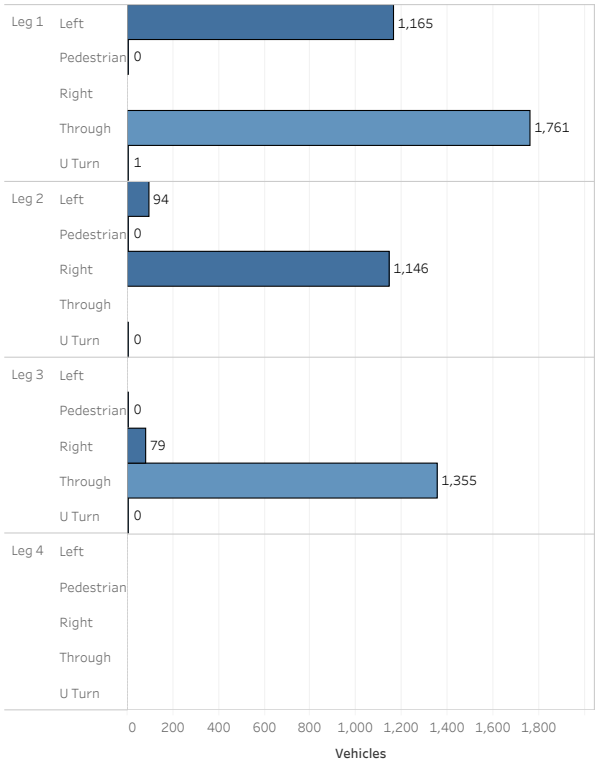
Intersection
ID: 127
Description: Bruce Hwy (10E)/Gladstone-Mt Larcom(181)
Volume: 5,601

Spatial
Latitude: -23.813207
Longitude: 150.982519

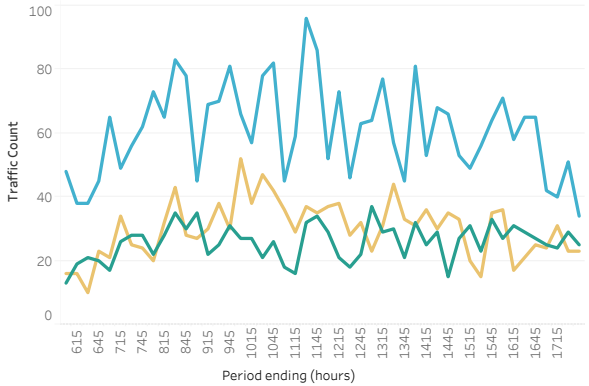
Intersection Summary

Leg Number	Description	
1	Bruce Hwy to R'ton @ Gstone-MtLarcom Rd	OUT: 2,927 IN: 2,502
2	Gladstone-Mt.Larcom Rd @ Bruce Hwy	OUT: 1,240 IN: 1,244
3	Bruce Hwy to Benaraby@G'stone-Mt.Larcom	OUT: 1,434 IN: 1,855

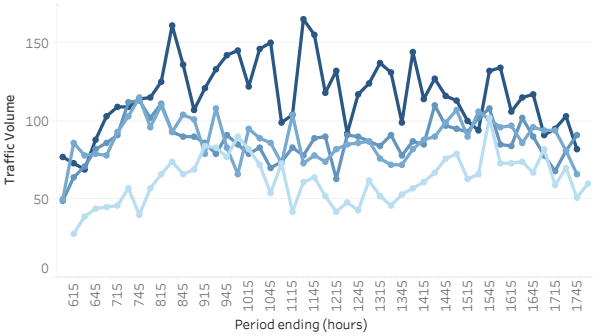
Traffic volume in each direction of travel



Traffic volume for each leg over collection period



Volume summary of recent collection dates (lighter is older)



Global Filters

Survey Date
Thursday, 22 October 2020

Page Filters

Traffic Class Code
All

Legend

Intersection Leg Number
1
2
3

Time	Leg 1 Bruce Hwy Left	Leg 1 Bruce Hwy Through	Leg 1 Bruce Hwy U Turn	Leg 1 Bruce Hwy Pedestrian	Leg 2 Gladstone Left	Leg 2 Gladstone Right	Leg 2 Gladstone U Turn	Leg 2 Gladstone Pedestrian	Leg 3 Bruce Hwy Through	Leg 3 Bruce Hwy Right	Leg 3 Bruce Hwy U Turn	Leg 3 Bruce Hwy Pedestrian	Grand Total Total
600	24	24	0	0	1	12	0	0	14	2	0	0	77
615	17	21	0	0	1	18	0	0	12	4	0	0	73
630	16	22	0	0	0	21	0	0	9	1	0	0	69
645	22	23	0	0	1	19	0	0	20	3	0	0	88
700	26	39	0	0	3	14	0	0	21	0	0	0	103
715	16	33	0	0	0	26	0	0	27	7	0	0	109
730	25	31	0	0	4	24	0	0	24	1	0	0	109
745	39	23	0	0	1	27	0	0	21	3	0	0	114
800	36	37	0	0	1	21	0	0	19	1	0	0	115
815	30	35	0	0	0	28	0	0	28	4	0	0	125
830	33	50	0	0	1	34	0	0	39	4	0	0	161
845	23	55	0	0	0	30	0	0	26	2	0	0	136
900	17	28	0	0	1	34	0	0	26	1	0	0	107
915	33	36	0	0	0	22	0	0	29	1	0	0	121
930	30	40	0	0	2	23	0	0	37	1	0	0	133
945	21	60	0	0	0	31	0	0	30	0	0	0	142
1000	20	46	0	0	1	26	0	0	49	3	0	0	145
1015	17	40	0	0	2	25	0	0	38	0	0	0	122
1030	29	49	0	0	0	21	0	0	45	2	0	0	146
1045	32	50	0	0	3	23	0	0	41	1	0	0	150
1100	16	29	0	0	0	18	0	0	34	2	0	0	99
1115	14	45	0	0	1	15	0	0	27	2	0	0	104
1130	33	63	0	0	5	27	0	0	35	2	0	0	165
1145	27	59	0	0	5	29	0	0	34	1	0	0	155
1200	18	34	0	0	1	28	0	0	36	1	0	0	118
1215	26	47	0	0	1	20	0	0	34	4	0	0	132
1230	18	28	0	0	1	17	0	0	27	1	0	0	92
1245	28	35	0	0	3	19	0	0	32	0	0	0	117
1300	26	38	0	0	7	30	0	0	22	1	0	0	124
1315	19	58	0	0	3	26	0	0	31	0	0	0	137
1330	18	39	0	0	1	29	0	0	41	3	0	0	131
1345	19	26	0	0	1	20	0	0	31	2	0	0	99
1400	32	49	0	0	1	31	0	0	30	1	0	0	144
1415	25	27	1	0	0	25	0	0	34	2	0	0	114
1430	29	39	0	0	1	28	0	0	27	3	0	0	127
1445	24	42	0	0	0	15	0	0	33	2	0	0	116
1500	21	32	0	0	1	26	0	0	32	1	0	0	113
1515	22	27	0	0	3	28	0	0	19	1	0	0	100
1530	28	28	0	0	0	23	0	0	15	0	0	0	94
1545	32	32	0	0	7	26	0	0	33	2	0	0	132
1600	33	38	0	0	2	25	0	0	35	1	0	0	134
1615	27	31	0	0	12	19	0	0	16	1	0	0	106
1630	23	42	0	0	2	27	0	0	21	0	0	0	115
1645	30	35	0	0	3	24	0	0	25	0	0	0	117
1700	18	24	0	0	3	22	0	0	23	1	0	0	91
1715	19	21	0	0	3	21	0	0	31	0	0	0	95
1730	20	31	0	0	2	27	0	0	21	2	0	0	103
1745	14	20	0	0	3	22	0	0	21	2	0	0	82
Period Tota	1,165	1,761	1	0	94	1,146	0	0	1,355	79	0	0	5,601

APPENDIX C

LANDING ROAD COUNT DATA

GRC, 2025

MetroCount Traffic Executive
Vehicle Counts (Virtual Day)

VirtVehicleCount-105 -- English (ENA)

Datasets:

Site:	**[Landing Road] Between Hanson Rd & Fishermans Rd Ch 0.33**
Attribute:	Through traffic
Direction:	3 - South bound, A trigger first. **Lane:** 0
Survey Duration:	11:09 Wednesday, 26 May 2021 => 9:38 Thursday, 17 June 2021,
Zone:	
File:	Landing Road 0 2021-06-17 0938.EC0 (Plus)
Identifier:	AD24768C MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default axle (v5.08)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**0:00 Thursday, 27 May 2021 => 0:00 Thursday, 17 June 2021 (21)**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound), P = South, Lane = 0-16
Separation:	Headway > 0 sec, Span 0 - 100 metre
Name:	Default Profile
Scheme:	Vehicle classification (AustRoads94)
Units:	Metric (metre, kilometre, m/s, km/h, kg, tonne)
In profile:	Vehicles = 31641 / 33669 (93.98%)

*** Virtual Day - Total=1507, 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
11	**9**	**11**	**15**	**61**	**144**	**145**	**76**	**82**	**71**	**75**	**78**	**81**	**83**	**114**	**139**	**135**	**76**	**34**	**15**	**13**	**13**	**12**	**12**
3	2	3	3	3	39	**51**	21	20	18	20	18	21	21	26	**47**	46	25	11	3	4	3	3	3
3	2	2	3	8	**45**	38	21	21	19	22	19	20	21	34	**30**	20	21	8	3	3	3	3	3
3	2	4	5	24	**26**	32	18	20	14	18	21	21	19	28	**21**	30	16	10	5	4	3	3	3
2	2	3	4	26	**34**	24	16	21	20	16	20	19	22	26	**41**	40	14	5	4	3	4	3	3

AM Peak 0515 - 0615 (156), AM PHF=0.77 PM Peak 1500 - 1600 (139), PM PHF=0.74

Numbers have been rounded to the nearest integer.

MetroCount Traffic Executive
Vehicle Counts (Virtual Day)

VirtVehicleCount-106 -- English (ENA)

Datasets:

Site: **[Landing Road] Between Hanson Rd & Fishermans Rd Ch 0.33**
Attribute: Through traffic
Direction: 3 - South bound, A trigger first. **Lane:** 0
Survey Duration: 11:09 Wednesday, 26 May 2021 => 9:38 Thursday, 17 June 2021,
Zone:
File: Landing Road 0 2021-06-17 0938.EC0 (Plus)
Identifier: AD24768C MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default axle (v5.08)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: **0:00 Thursday, 27 May 2021 => 0:00 Thursday, 17 June 2021 (21)**
Included classes: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range: 10 - 160 km/h.
Direction: North, East, South, West (bound), P = South, Lane = 0-16
Separation: Headway > 0 sec, Span 0 - 100 metre
Name: Default Profile
Scheme: Vehicle classification (AustRoads94)
Units: Metric (metre, kilometre, m/s, km/h, kg, tonne)
In profile: Vehicles = 10546 / 33669 (31.32%)

*** Virtual Day - Total=502, 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
5	**4**	**4**	**4**	**11**	**23**	**42**	**32**	**38**	**31**	**34**	**32**	**35**	**33**	**38**	**38**	**35**	**20**	**11**	**7**	**7**	**7**	**7**	**5**
1	1	1	1	2	4	7	**9**	9	8	9	7	9	8	9	**10**	11	5	2	1	2	2	2	1
1	1	1	1	3	9	**13**	9	9	9	10	8	9	8	**10**	10	7	8	2	1	2	2	2	1
1	1	1	1	3	4	**13**	7	10	6	8	8	9	8	**10**	8	9	4	4	2	2	2	2	1
1	1	1	1	4	5	**11**	7	10	8	7	8	8	9	**10**	10	8	3	3	2	2	2	1	1

AM Peak 0615 - 0715 (45), AM PHF=0.89 PM Peak 1415 - 1515 (40), PM PHF=0.96

Numbers have been rounded to the nearest integer.

MetroCount Traffic Executive
Daily Classes by Direction

DayClassSplit-107 -- English (ENA)

Datasets:

Site: **[Landing Road] Between Hanson Rd & Fishermans Rd Ch 0.33**
Attribute: Through traffic
Direction: 3 - South bound, A trigger first. **Lane:** 0
Survey Duration: 11:09 Wednesday, 26 May 2021 => 9:38 Thursday, 17 June 2021,
Zone:
File: Landing Road 0 2021-06-17 0938.EC0 (Plus)
Identifier: AD24768C MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default axle (v5.08)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: **0:00 Thursday, 27 May 2021 => 0:00 Thursday, 17 June 2021 (21)**
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range: 10 - 160 km/h.
Direction: North, East, South, West (bound), P = South, Lane = 0-16
Separation: Headway > 0 sec, Span 0 - 100 metre
Name: Default Profile
Scheme: Vehicle classification (AustRoads94)
Units: Metric (metre, kilometre, m/s, km/h, kg, tonne)
In profile: Vehicles = 31641 / 33669 (93.98%)

Daily Classes by Direction

DayClassSplit-107
Site: Landing Road.0.0S
Description: **Between Hanson Rd & Fishermans Rd Ch 0.33**
Filter time: **0:00 Thursday, 27 May 2021 => 0:00 Thursday, 17 June 2021**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Monday, 24 May 2021

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tue*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wed*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thu	1180	18	154	50	27	0	2	13	243	329	2	0	2018
(%)	58.5	0.9	7.6	2.5	1.3	0.0	0.1	0.6	12.0	16.3	0.1	0.0	
AB	584	9	75	25	13	0	1	6	123	166	1	0	1003
AB%	49.5	50.0	48.7	50.0	48.1	0.0	50.0	46.2	50.6	50.5	50.0	0.0	49.7
BA	596.0	9.0	79.0	25.0	14.0	0.0	1.0	7.0	120.0	163.0	1.0	0.0	1015.0
BA%	50.5	50.0	51.3	50.0	51.9	0.0	50.0	53.8	49.4	49.5	50.0	0.0	50.3
Fri	1129	9	124	67	29	0	2	19	227	245	3	0	1854
(%)	60.9	0.5	6.7	3.6	1.6	0.0	0.1	1.0	12.2	13.2	0.2	0.0	
AB	554	4	60	37	14	0	0	9	112	122	3	0	915
AB%	49.1	44.4	48.4	55.2	48.3	0.0	0.0	47.4	49.3	49.8	100.0	0.0	49.4
BA	575.0	5.0	64.0	30.0	15.0	0.0	2.0	10.0	115.0	123.0	0.0	0.0	939.0
BA%	50.9	55.6	51.6	44.8	51.7	0.0	100.0	52.6	50.7	50.2	0.0	0.0	50.6
Sat	460	14	43	3	16	2	0	2	181	36	0	0	757
(%)	60.8	1.8	5.7	0.4	2.1	0.3	0.0	0.3	23.9	4.8	0.0	0.0	
AB	225	6	22	2	8	1	0	1	90	20	0	0	375
AB%	48.9	42.9	51.2	66.7	50.0	50.0	0.0	50.0	49.7	55.6	0.0	0.0	49.5
BA	235.0	8.0	21.0	1.0	8.0	1.0	0.0	1.0	91.0	16.0	0.0	0.0	382.0
BA%	51.1	57.1	48.8	33.3	50.0	50.0	0.0	50.0	50.3	44.4	0.0	0.0	50.5
Sun	338	8	37	4	8	0	0	0	32	38	0	0	465
(%)	72.7	1.7	8.0	0.9	1.7	0.0	0.0	0.0	6.9	8.2	0.0	0.0	
AB	161	5	18	2	4	0	0	0	16	19	0	0	225
AB%	47.6	62.5	48.6	50.0	50.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	48.4
BA	177.0	3.0	19.0	2.0	4.0	0.0	0.0	0.0	16.0	19.0	0.0	0.0	240.0
BA%	52.4	37.5	51.4	50.0	50.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	51.6

Average daily volume

Entire week

	777	12	90	31	20	1	1	9	171	162	1	0	1274
(%)	61.0	1.0	7.0	2.4	1.6	0.0	0.1	0.7	13.4	12.7	0.1	0.0	
AB	381	6	44	17	10	0	0	4	85	82	1	0	630
AB%	49.1	49.0	48.9	53.2	48.8	50.0	25.0	47.1	49.9	50.5	80.0	0.0	49.4
BA	395.8	6.3	45.8	14.5	10.3	0.3	0.8	4.5	85.5	80.3	0.3	0.0	644.0
BA%	50.9	51.0	51.1	46.8	51.2	50.0	75.0	52.9	50.1	49.5	20.0	0.0	50.6

Weekdays

	1155	14	139	59	28	0	2	16	235	287	3	0	1936
(%)	59.6	0.7	7.2	3.0	1.4	0.0	0.1	0.8	12.1	14.8	0.1	0.0	
AB	569	7	68	31	14	0	1	8	118	144	2	0	959
AB%	49.3	48.1	48.6	53.0	48.2	0.0	25.0	46.9	50.0	50.2	80.0	0.0	49.5
BA	585.5	7.0	71.5	27.5	14.5	0.0	1.5	8.5	117.5	143.0	0.5	0.0	977.0
BA%	50.7	51.9	51.4	47.0	51.8	0.0	75.0	53.1	50.0	49.8	20.0	0.0	50.5

Weekend

	399	11	40	4	12	1	0	1	107	37	0	0	611
(%)	65.3	1.8	6.5	0.6	2.0	0.2	0.0	0.2	17.4	6.1	0.0	0.0	
AB	193	6	20	2	6	1	0	1	53	20	0	0	300
AB%	48.4	50.0	50.0	57.1	50.0	50.0	0.0	50.0	49.8	52.7	0.0	0.0	49.1
BA	206.0	5.5	20.0	1.5	6.0	0.5	0.0	0.5	53.5	17.5	0.0	0.0	311.0
BA%	51.6	50.0	50.0	42.9	50.0	50.0	0.0	50.0	50.2	47.3	0.0	0.0	50.9

*** - Incomplete**

Daily Classes by Direction

DayClassSplit-107
Site: Landing Road.0.0S
Description: **Between Hanson Rd & Fishermans Rd Ch 0.33**
Filter time: **0:00 Thursday, 27 May 2021 => 0:00 Thursday, 17 June 2021**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Monday, 31 May 2021

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	1157	13	146	57	25	2	0	6	229	240	1	0	1876
(%)	61.7	0.7	7.8	3.0	1.3	0.1	0.0	0.3	12.2	12.8	0.1	0.0	
AB	548	7	76	27	13	1	0	3	119	125	1	0	920
AB%	47.4	53.8	52.1	47.4	52.0	50.0	0.0	50.0	52.0	52.1	100.0	0.0	49.0
BA	609.0	6.0	70.0	30.0	12.0	1.0	0.0	3.0	110.0	115.0	0.0	0.0	956.0
BA%	52.6	46.2	47.9	52.6	48.0	50.0	0.0	50.0	48.0	47.9	0.0	0.0	51.0
Tue	1202	10	158	45	33	0	0	3	225	242	1	0	1919
(%)	62.6	0.5	8.2	2.3	1.7	0.0	0.0	0.2	11.7	12.6	0.1	0.0	
AB	576	4	82	23	17	0	0	1	116	124	0	0	943
AB%	47.9	40.0	51.9	51.1	51.5	0.0	0.0	33.3	51.6	51.2	0.0	0.0	49.1
BA	626.0	6.0	76.0	22.0	16.0	0.0	0.0	2.0	109.0	118.0	1.0	0.0	976.0
BA%	52.1	60.0	48.1	48.9	48.5	0.0	0.0	66.7	48.4	48.8	100.0	0.0	50.9
Wed	1139	8	161	61	25	0	0	7	228	221	3	0	1853
(%)	61.5	0.4	8.7	3.3	1.3	0.0	0.0	0.4	12.3	11.9	0.2	0.0	
AB	537	4	86	32	13	0	0	3	115	119	2	0	911
AB%	47.1	50.0	53.4	52.5	52.0	0.0	0.0	42.9	50.4	53.8	66.7	0.0	49.2
BA	602.0	4.0	75.0	29.0	12.0	0.0	0.0	4.0	113.0	102.0	1.0	0.0	942.0
BA%	52.9	50.0	46.6	47.5	48.0	0.0	0.0	57.1	49.6	46.2	33.3	0.0	50.8
Thu	1176	10	169	31	23	3	0	14	252	210	2	0	1890
(%)	62.2	0.5	8.9	1.6	1.2	0.2	0.0	0.7	13.3	11.1	0.1	0.0	
AB	553	6	91	15	11	2	0	7	132	110	1	0	928
AB%	47.0	60.0	53.8	48.4	47.8	66.7	0.0	50.0	52.4	52.4	50.0	0.0	49.1
BA	623.0	4.0	78.0	16.0	12.0	1.0	0.0	7.0	120.0	100.0	1.0	0.0	962.0
BA%	53.0	40.0	46.2	51.6	52.2	33.3	0.0	50.0	47.6	47.6	50.0	0.0	50.9
Fri	1081	12	133	23	17	0	0	4	197	168	1	0	1636
(%)	66.1	0.7	8.1	1.4	1.0	0.0	0.0	0.2	12.0	10.3	0.1	0.0	
AB	466	6	74	14	9	0	0	2	105	90	0	0	766
AB%	43.1	50.0	55.6	60.9	52.9	0.0	0.0	50.0	53.3	53.6	0.0	0.0	46.8
BA	615.0	6.0	59.0	9.0	8.0	0.0	0.0	2.0	92.0	78.0	1.0	0.0	870.0
BA%	56.9	50.0	44.4	39.1	47.1	0.0	0.0	50.0	46.7	46.4	100.0	0.0	53.2
Sat	346	9	41	6	12	1	0	0	164	28	0	0	607
(%)	57.0	1.5	6.8	1.0	2.0	0.2	0.0	0.0	27.0	4.6	0.0	0.0	
AB	179	4	19	4	6	1	0	0	78	15	0	0	306
AB%	51.7	44.4	46.3	66.7	50.0	100.0	0.0	0.0	47.6	53.6	0.0	0.0	50.4
BA	167.0	5.0	22.0	2.0	6.0	0.0	0.0	0.0	86.0	13.0	0.0	0.0	301.0
BA%	48.3	55.6	53.7	33.3	50.0	0.0	0.0	0.0	52.4	46.4	0.0	0.0	49.6
Sun	302	5	48	1	6	0	0	0	65	27	0	0	454
(%)	66.5	1.1	10.6	0.2	1.3	0.0	0.0	0.0	14.3	5.9	0.0	0.0	
AB	149	3	27	1	3	0	0	0	33	13	0	0	229
AB%	49.3	60.0	56.3	100.0	50.0	0.0	0.0	0.0	50.8	48.1	0.0	0.0	50.4
BA	153.0	2.0	21.0	0.0	3.0	0.0	0.0	0.0	32.0	14.0	0.0	0.0	225.0
BA%	50.7	40.0	43.8	0.0	50.0	0.0	0.0	0.0	49.2	51.9	0.0	0.0	49.6

Average daily volume

Entire week

	915	10	122	32	20	1	0	5	194	162	1	0	1462
(%)	62.6	0.7	8.4	2.2	1.4	0.1	0.0	0.3	13.3	11.1	0.1	0.0	
AB	430	5	65	17	10	1	0	2	100	85	1	0	715
AB%	47.0	50.7	53.2	51.8	51.1	66.7	0.0	47.1	51.3	52.5	50.0	0.0	48.9
BA	485.0	4.7	57.3	15.4	9.9	0.3	0.0	2.6	94.6	77.1	0.6	0.0	747.4
BA%	53.0	49.3	46.8	48.2	48.9	33.3	0.0	52.9	48.7	47.5	50.0	0.0	51.1

Weekdays

	1151	11	153	43	25	1	0	7	226	216	2	0	1835
(%)	62.7	0.6	8.4	2.4	1.3	0.1	0.0	0.4	12.3	11.8	0.1	0.0	
AB	536	5	82	22	13	1	0	3	117	114	1	0	894
AB%	46.6	50.9	53.3	51.2	51.2	60.0	0.0	47.1	51.9	52.5	50.0	0.0	48.7
BA	615.0	5.2	71.6	21.2	12.0	0.4	0.0	3.6	108.8	102.6	0.8	0.0	941.2
BA%	53.4	49.1	46.7	48.8	48.8	40.0	0.0	52.9	48.1	47.5	50.0	0.0	51.3

Weekend

	324	7	45	4	9	1	0	0	115	28	0	0	531
(%)	61.1	1.3	8.4	0.7	1.7	0.1	0.0	0.0	21.6	5.2	0.0	0.0	
AB	164	4	23	3	5	1	0	0	56	14	0	0	268
AB%	50.6	50.0	51.7	71.4	50.0	100.0	0.0	0.0	48.5	50.9	0.0	0.0	50.4
BA	160.0	3.5	21.5	1.0	4.5	0.0	0.0	0.0	59.0	13.5	0.0	0.0	263.0
BA%	49.4	50.0	48.3	28.6	50.0	0.0	0.0	0.0	51.5	49.1	0.0	0.0	49.6

*** - Incomplete**

Daily Classes by Direction

DayClassSplit-107
Site: Landing Road.0.0S
Description: **Between Hanson Rd & Fishermans Rd Ch 0.33**
Filter time: **0:00 Thursday, 27 May 2021 => 0:00 Thursday, 17 June 2021**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Monday, 7 June 2021

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	1063	7	153	30	23	0	1	4	244	71	0	0	1596
(%)	66.6	0.4	9.6	1.9	1.4	0.0	0.1	0.3	15.3	4.4	0.0	0.0	
AB	509	4	87	15	11	0	0	2	125	36	0	0	789
AB%	47.9	57.1	56.9	50.0	47.8	0.0	0.0	50.0	51.2	50.7	0.0	0.0	49.4
BA	554.0	3.0	66.0	15.0	12.0	0.0	1.0	2.0	119.0	35.0	0.0	0.0	807.0
BA%	52.1	42.9	43.1	50.0	52.2	0.0	100.0	50.0	48.8	49.3	0.0	0.0	50.6
Tue	1181	11	159	50	17	0	1	4	206	88	4	0	1721
(%)	68.6	0.6	9.2	2.9	1.0	0.0	0.1	0.2	12.0	5.1	0.2	0.0	
AB	587	6	83	25	10	0	1	2	104	44	2	0	864
AB%	49.7	54.5	52.2	50.0	58.8	0.0	100.0	50.0	50.5	50.0	50.0	0.0	50.2
BA	594.0	5.0	76.0	25.0	7.0	0.0	0.0	2.0	102.0	44.0	2.0	0.0	857.0
BA%	50.3	45.5	47.8	50.0	41.2	0.0	0.0	50.0	49.5	50.0	50.0	0.0	49.8
Wed	1134	7	153	42	15	1	0	4	126	157	1	0	1640
(%)	69.1	0.4	9.3	2.6	0.9	0.1	0.0	0.2	7.7	9.6	0.1	0.0	
AB	535	3	87	23	8	1	0	2	66	79	0	0	804
AB%	47.2	42.9	56.9	54.8	53.3	100.0	0.0	50.0	52.4	50.3	0.0	0.0	49.0
BA	599.0	4.0	66.0	19.0	7.0	0.0	0.0	2.0	60.0	78.0	1.0	0.0	836.0
BA%	52.8	57.1	43.1	45.2	46.7	0.0	0.0	50.0	47.6	49.7	100.0	0.0	51.0
Thu	1483	5	156	36	15	4	2	4	144	149	4	0	2002
(%)	74.1	0.2	7.8	1.8	0.7	0.2	0.1	0.2	7.2	7.4	0.2	0.0	
AB	599	2	91	21	8	3	1	2	91	91	3	0	912
AB%	40.4	40.0	58.3	58.3	53.3	75.0	50.0	50.0	63.2	61.1	75.0	0.0	45.6
BA	884.0	3.0	65.0	15.0	7.0	1.0	1.0	2.0	53.0	58.0	1.0	0.0	1090.0
BA%	59.6	60.0	41.7	41.7	46.7	25.0	50.0	50.0	36.8	38.9	25.0	0.0	54.4
Fri	1276	19	99	36	28	0	0	5	175	155	1	0	1794
(%)	71.1	1.1	5.5	2.0	1.6	0.0	0.0	0.3	9.8	8.6	0.1	0.0	
AB	515	10	62	20	17	0	0	2	99	93	0	0	818
AB%	40.4	52.6	62.6	55.6	60.7	0.0	0.0	40.0	56.6	60.0	0.0	0.0	45.6
BA	761.0	9.0	37.0	16.0	11.0	0.0	0.0	3.0	76.0	62.0	1.0	0.0	976.0
BA%	59.6	47.4	37.4	44.4	39.3	0.0	0.0	60.0	43.4	40.0	100.0	0.0	54.4
Sat	420	1	35	8	10	0	0	4	121	23	0	0	622
(%)	67.5	0.2	5.6	1.3	1.6	0.0	0.0	0.6	19.5	3.7	0.0	0.0	
AB	166	0	24	4	5	0	0	2	68	13	0	0	282
AB%	39.5	0.0	68.6	50.0	50.0	0.0	0.0	50.0	56.2	56.5	0.0	0.0	45.3
BA	254.0	1.0	11.0	4.0	5.0	0.0	0.0	2.0	53.0	10.0	0.0	0.0	340.0
BA%	60.5	100.0	31.4	50.0	50.0	0.0	0.0	50.0	43.8	43.5	0.0	0.0	54.7
Sun	316	14	26	7	6	0	0	0	62	21	0	0	452
(%)	69.9	3.1	5.8	1.5	1.3	0.0	0.0	0.0	13.7	4.6	0.0	0.0	
AB	140	7	15	4	3	0	0	0	36	12	0	0	217
AB%	44.3	50.0	57.7	57.1	50.0	0.0	0.0	0.0	58.1	57.1	0.0	0.0	48.0
BA	176.0	7.0	11.0	3.0	3.0	0.0	0.0	0.0	26.0	9.0	0.0	0.0	235.0
BA%	55.7	50.0	42.3	42.9	50.0	0.0	0.0	0.0	41.9	42.9	0.0	0.0	52.0

Average daily volume

Entire week

	982	9	112	30	16	1	1	4	154	95	1	0	1404
(%)	69.9	0.7	7.9	2.1	1.2	0.1	0.0	0.3	11.0	6.8	0.1	0.0	
AB	436	5	64	16	9	1	0	2	84	53	1	0	669
AB%	44.4	50.0	57.5	53.6	54.4	80.0	50.0	48.0	54.6	55.4	50.0	0.0	47.7
BA	546.0	4.6	47.4	13.9	7.4	0.1	0.3	1.9	69.9	42.3	0.7	0.0	734.4
BA%	55.6	50.0	42.5	46.4	45.6	20.0	50.0	52.0	45.4	44.6	50.0	0.0	52.3

Weekdays

	1227	10	144	39	20	1	1	4	179	124	2	0	1751
(%)	70.1	0.6	8.2	2.2	1.1	0.1	0.0	0.2	10.2	7.1	0.1	0.0	
AB	549	5	82	21	11	1	0	2	97	69	1	0	837
AB%	44.7	51.0	56.9	53.6	55.1	80.0	50.0	47.6	54.2	55.3	50.0	0.0	47.8
BA	678.4	4.8	62.0	18.0	8.8	0.2	0.4	2.2	82.0	55.4	1.0	0.0	913.2
BA%	55.3	49.0	43.1	46.4	44.9	20.0	50.0	52.4	45.8	44.7	50.0	0.0	52.2

Weekend

	368	8	31	8	8	0	0	2	92	22	0	0	537
(%)	68.5	1.4	5.7	1.4	1.5	0.0	0.0	0.4	17.0	4.1	0.0	0.0	
AB	153	4	20	4	4	0	0	1	52	13	0	0	250
AB%	41.6	46.7	63.9	53.3	50.0	0.0	0.0	50.0	56.8	56.8	0.0	0.0	46.5
BA	215.0	4.0	11.0	3.5	4.0	0.0	0.0	1.0	39.5	9.5	0.0	0.0	287.5
BA%	58.4	53.3	36.1	46.7	50.0	0.0	0.0	50.0	43.2	43.2	0.0	0.0	53.5

*** - Incomplete**

Daily Classes by Direction

DayClassSplit-107
Site: Landing Road.0.0S
Description: **Between Hanson Rd & Fishermans Rd Ch 0.33**
Filter time: **0:00 Thursday, 27 May 2021 => 0:00 Thursday, 17 June 2021**
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

Monday, 14 June 2021

	1	2	3	4	5	6	7	8	9	10	11	12	Total
Mon	1351	3	101	16	24	0	1	0	175	265	1	0	1937
(%)	69.7	0.2	5.2	0.8	1.2	0.0	0.1	0.0	9.0	13.7	0.1	0.0	
AB	531	1	61	8	13	0	0	0	104	150	1	0	869
AB%	39.3	33.3	60.4	50.0	54.2	0.0	0.0	0.0	59.4	56.6	100.0	0.0	44.9
BA	820.0	2.0	40.0	8.0	11.0	0.0	1.0	0.0	71.0	115.0	0.0	0.0	1068.0
BA%	60.7	66.7	39.6	50.0	45.8	0.0	100.0	0.0	40.6	43.4	0.0	0.0	55.1
Tue	1523	6	131	32	20	1	2	4	177	273	3	0	2172
(%)	70.1	0.3	6.0	1.5	0.9	0.0	0.1	0.2	8.1	12.6	0.1	0.0	
AB	607	2	74	18	9	1	1	2	97	158	2	0	971
AB%	39.9	33.3	56.5	56.3	45.0	100.0	50.0	50.0	54.8	57.9	66.7	0.0	44.7
BA	916.0	4.0	57.0	14.0	11.0	0.0	1.0	2.0	80.0	115.0	1.0	0.0	1201.0
BA%	60.1	66.7	43.5	43.8	55.0	0.0	50.0	50.0	45.2	42.1	33.3	0.0	55.3
Wed	1638	11	173	36	20	0	2	8	195	289	4	0	2376
(%)	68.9	0.5	7.3	1.5	0.8	0.0	0.1	0.3	8.2	12.2	0.2	0.0	
AB	577	5	97	23	11	0	1	4	115	184	1	0	1018
AB%	35.2	45.5	56.1	63.9	55.0	0.0	50.0	50.0	59.0	63.7	25.0	0.0	42.8
BA	1061.0	6.0	76.0	13.0	9.0	0.0	1.0	4.0	80.0	105.0	3.0	0.0	1358.0
BA%	64.8	54.5	43.9	36.1	45.0	0.0	50.0	50.0	41.0	36.3	75.0	0.0	57.2
Thu*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fri*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sun*	0	0	0	0	0	0	0	0	0	0	0	0	0
(%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AB	0	0	0	0	0	0	0	0	0	0	0	0	0
AB%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BA%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average daily volume

Entire week

	1504	7	135	28	21	0	2	4	182	276	3	0	2162
(%)	69.6	0.3	6.2	1.3	1.0	0.0	0.1	0.2	8.4	12.8	0.1	0.0	
AB	572	3	77	16	11	0	1	2	105	164	1	0	953
AB%	38.0	40.0	57.3	58.3	51.6	100.0	40.0	50.0	57.8	59.5	50.0	0.0	44.1
BA	932.3	4.0	57.7	11.7	10.3	0.0	1.0	2.0	77.0	111.7	1.3	0.0	1209.0
BA%	62.0	60.0	42.7	41.7	48.4	0.0	60.0	50.0	42.2	40.5	50.0	0.0	55.9

Weekdays

	1504	7	135	28	21	0	2	4	182	276	3	0	2162
(%)	69.6	0.3	6.2	1.3	1.0	0.0	0.1	0.2	8.4	12.8	0.1	0.0	
AB	572	3	77	16	11	0	1	2	105	164	1	0	953
AB%	38.0	40.0	57.3	58.3	51.6	100.0	40.0	50.0	57.8	59.5	50.0	0.0	44.1
BA	932.3	4.0	57.7	11.7	10.3	0.0	1.0	2.0	77.0	111.7	1.3	0.0	1209.0
BA%	62.0	60.0	42.7	41.7	48.4	0.0	60.0	50.0	42.2	40.5	50.0	0.0	55.9

Weekend No complete days.

*** - Incomplete**

APPENDIX D

CRASH FACTOR MATRIX

DCA Code	Direction of key vehicle	Total	Crash Refs	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	North	East	South	West	No Primary
				Number of crashes each year																	Direction of opposing vehicle				
Bruce Hwy / Gladstone - Mt Larcom Rd																									
104	South	3	#126, 147, 171													1	1		1					3	
607	North	1	#12			1																			
804	North	1	#120												1										
806	South	1	#59						1																
808	North	2	#111, 169											1					1						
Total				**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**3**	**0**
Gladstone - Mt Larcom Rd (W)																									
0	East	1	#67							1															
104	West	4	#49, 148, 150, 162					1									2	1			4				
200	North	1	#35					1													1		1		
	East	4	#19, 72, 73, 79				1			1	2													4	
	North	1	#181																	1			1		
	South	1	#26				1														1				
	West	2	#87, 149									1					1					2			
201	**SUM**	**8**		**0**	**0**	**0**	**2**	**0**	**0**	**1**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**2**	**1**	**4**	**0**
202	East	1	#178																	1				1	
	East	2	#61, 96						1			1										2			
	North	1	#18				1															3			1
	West	2	#57, 183						1											1				2	
301	**SUM**	**5**		**0**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**5**	**0**	**2**	**1**
	North	1	#142													1									
	West	3	#122, 166, 212		1										1			1			1				
609	**SUM**	**4**		**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
	South	1	#6			1																			
	West	1	#203	1																					
700	**SUM**	**2**		**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	North	1	#206		1																				
	West	1	#127													1									
701	**SUM**	**2**		**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	East	2	#77, 130								1					1									
	West	1	#81								1														
702	**SUM**	**3**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
703	East	1	#211		1																1				1
	East	1	#118												1										
	West	1	#40					1																	
704	**SUM**	**2**		**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	East	1	#65							1															
	North	1	#50					1																	
705	**SUM**	**2**		**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
707	East	1	#25				1																		
	East	2	#15, 143				1									1									
	West	1	#168															1							
801	**SUM**	**3**		**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	East	5	#14, 41, 84, 95, 144				1	1				2					1								
	North	1	#119												1										
	West	3	#64, 108, 129							1				1		1									
803	**SUM**	**9**		**0**	**0**	**0**	**1**	**1**	**0**	**1**	**0**	**2**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	North	1	#20				1																	1	1
	South	1	#110											1											
	West	1	#161															1							
804	**SUM**	**3**		**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
	East	2	#85, 170									1							1						
	South	2	#32, 125					1							1										
805	**SUM**	**4**		**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
808	West	1	#63							1															
Total				**1**	**3**	**1**	**7**	**6**	**2**	**5**	**4**	**5**	**0**	**2**	**4**	**5**	**4**	**4**	**1**	**3**	**8**	**7**	**2**	**8**	**3**

DCA Code	Direction of key vehicle	Animal - other	Animal - stock	Pedestrian	Bicycle	Bus/Coach	Moped	Motorcycle	Car/Station wagon	Utility/Panel van	Rigid truck	Articulated truck	Road train/B-double/Triple	Special Purpose Vehicle	Railway stock	Towed device	Other	Sealed - Dry	Unsealed - Dry	Sealed - Wet	Unsealed - Wet	Dawn/Dusk	Daylight	Darkness - Lighted	Darkness - Not lighted	Unknown
		Type of road users																Surface conditions				Light conditions				
Bruce Hwy / Gladstone - Mt Larcom Rd																										
104	South								2	3			1					2		1			3			
607	North								1											1			1			
804	North								1									1						1		
806	South											1						1					1			
808	North								1	1								2						2		
Total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**4**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**6**	**0**	**2**	**0**	**0**	**5**	**3**	**0**	**0**
Gladstone - Mt Larcom Rd (W)																										
0	East			1					1									1				1				
104	West								3	4		1						4				2	2			
200	North									2		1						1					1			
	East								4	1	1	2						2		2			4			
	North								1	1								1					1			
	South								1				1					1					1			
	West								2			1					1	2							2	
201	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**2**	**1**	**3**	**1**	**0**	**0**	**0**	**1**	**6**	**0**	**2**	**0**	**0**	**6**	**0**	**2**	**0**
202	East								1	1								1				1				
	East								2	1	1							2					2			
	North								1	1	1							1					1			
	West								1	2		1						1		1			2			
301	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**4**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**1**	**0**	**0**	**5**	**0**	**0**	**0**
	North								1								1	1							1	
	West	1							3									3							3	
609	**SUM**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**
	South								1									1					1			
	West									1								1					1			
700	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**
	North												1					1				1				
	West								1											1			1			
701	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**1**	**1**	**0**	**0**	**0**
	East							1		1								2				1	1			
	West									1								1							1	
702	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**1**	**0**	**1**	**0**
703	East								1									1					1			
	East								1									1					1			
	West								1									1							1	
704	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**
	East									1								1							1	
	North										1							1					1			
705	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**
707	East											1						1					1			
	East											1	1					1	1				2			
	West											1						1					1			
801	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**
	East							1	2	2								5					3		2	
	North											1						1					1			
	West								3									3					2		1	
803	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**6**	**0**	**3**	**0**
	North								1									1					1			
	South								1									1					1			
	West								1									1					1			
804	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**
	East								1		1							2					1		1	
	South								2									1		1		1			1	
805	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**1**	**1**	**0**	**2**	**0**
808	West											1						1					1			
Total		**1**	**0**	**1**	**0**	**0**	**0**	**2**	**37**	**19**	**5**	**11**	**3**	**0**	**0**	**0**	**2**	**51**	**1**	**5**	**0**	**7**	**36**	**0**	**14**	**0**

DCA Code	Direction of key vehicle	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Property damage only	Minor injury	Medical treatment	Hospitalisation	Fatal
		Time-of-day																								Severity				
Bruce Hwy / Gladstone - Mt Larcom Rd																														
104	South									1			1	1													1	1	1	
607	North										1																	1		
804	North			1																									1	
806	South							1																					1	
808	North		1			1																							2	
Total		**0**	**1**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**5**	**0**
Gladstone - Mt Larcom Rd (W)																														
0	East																	1										1		
104	West										1						1		2									1	3	
200	North							1																				1		
	East							1		1			1					1										3		1
	North													1															1	
	South														1														1	
	West		1																				1					1	1	
201	**SUM**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**4**	**3**	**1**
202	East						1																						1	
	East							1			1																	1	1	
	North								1																			1		
	West							1							1													1	1	
301	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	**0**
	North																				1								1	
	West				1		1														1							2	1	
609	**SUM**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**0**
	South													1														1		
	West															1											1			
700	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**
	North						1																						1	
	West														1														1	
701	**SUM**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**
	East													1				1											2	
	West			1																									1	
702	**SUM**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**
703	East														1													1		
	East																	1											1	
	West																			1								1		
704	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**
	East																								1				1	
	North																	1										1		
705	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**
707	East						1																						1	
	East							1						1														1	1	
	West													1														1		
801	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**
	East	1						1		1							1					1						3	1	1
	North											1																	1	
	West				1						1		1															2	1	
803	**SUM**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**1**
	North															1														1
	South															1													1	
	West															1													1	
804	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**
	East							1																	1				2	
	South		1				1																					1	1	
805	**SUM**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**3**	**0**
808	West																1												1	
Total		**1**	**2**	**1**	**2**	**0**	**5**	**7**	**1**	**2**	**3**	**1**	**2**	**5**	**4**	**4**	**3**	**5**	**2**	**1**	**2**	**1**	**1**	**0**	**2**	**0**	**1**	**24**	**29**	**3**

				Number of crashes each year																	ection of opposing vehi					Type of road users																Surface conditions				Light conditions					Time-of-day																								Severity				
DCA Code	Direction of key vehicle	Total	Crash Refs	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	North	East	South	West	No Primary	Animal - other	Animal - stock	Pedestrian	Bicycle	Bus/Coach	Moped	Motorcycle	Car/Station wagon	Utility/Panel van	Rigid truck	Articulated truck	Road train/B-double/Triple	Special Purpose Vehicle	Railway stock	Towed device	Other	Sealed - Dry	Unsealed - Dry	Sealed - Wet	Unsealed - Wet	Dawn/Dusk	Daylight	Darkness - Lighted	Darkness - Not lighted	Unknown	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Property damage only	Minor injury	Medical treatment	Hospitalisation	Fatal
Gladstone - Mt Larcom Road (E)																																																																															
0	Unknow	1	#124												1													1					1									1						1																				1										1
5	South	1	#115											1									1					1					1											1					1			1																											1	
	North	1	#42					1														1										1		1								1					1													1																		1		
	South	2	#98, 156									1						1						2								1	2	1								1		1		1	1									1								1													1	1	
101	**SUM**	**3**		**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**
103	North	1	#207		1																	2											2	1								1							1																				1								1		
	East	3	#93, 99, 112									1	1	1								1		3								1	4				2					3					3													1					1	1											1	1	1
	West	1	#11			1																1											1	1								1					1																			1												1	
201	**SUM**	**4**		**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**1**
202	West	1	#76								1											1											1	1								1					1										1																					1		
	East	5	#33, 34, 58, 106, 123					2	1				1		1						2	4			1							2	5	3								5				1	4									1	1					1				2											2	3	
	South	1	#210		1																	2			1								1	1								1							1																									1				1	
	West	3	#109, 159, 173											1				1	1					3								1	1	2	1		1					3				1	2									1							1					1									2	1	
301	**SUM**	**9**		**0**	**1**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**0**	**2**	**6**	**0**	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**7**	**6**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**2**	**6**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	**5**	**0**
305	East	1	#21				1															1							1				1									1					1																					1									1	
406	South	1	#89									1										1											1			1						1					1																			1												1	
504	West	1	#208		1																			1									1	1								1							1							1																							1	
607	North	1	#1			1																		1	1							1										1					1																1																1	
609	East	1	#137													1																1										1					1									1																							1	
610	North	1	#22				1															1		1	1								1					1				1					1															1															1		
701	North	2	#36, 45					2															1	1	1											1	1					2					1		1																		1						1				1	1	
	North	1	#8			1																1			1											1						1							1			1																											1		
	South	2	#134, 174													1			1														1				1					2						1	1					1		1																					1	1	
	West	2	#128, 213		1											1									1							1		1								2					1		1		1								1																			2	
703	**SUM**	**5**		**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**1**	**1**	**3**	**0**	**1**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**3**	**0**
704	West	1	#92									1																					1									1							1																				1									1	
705	South	1	#102										1																				1									1						1							1																								1	
708	West	2	#145, 157														1	1															2									1		1			1	1			1														1											1	1		
803	East	2	#86, 113									1		1																				1		1						2					1		1													1								1									2	
805	East	1	#71							1																						1										1				1																							1								1		
808	East	1	#165															1															1									1						1																								1							1	
Total				**0**	**4**	**3**	**2**	**5**	**1**	**1**	**1**	**5**	**3**	**4**	**2**	**3**	**1**	**4**	**2**	**0**	**2**	**16**	**2**	**12**	**7**	**0**	**0**	**2**	**1**	**0**	**0**	**10**	**29**	**14**	**1**	**4**	**5**	**1**	**0**	**0**	**0**	**38**	**0**	**3**	**0**	**4**	**22**	**5**	**10**	**0**	**2**	**2**	**0**	**1**	**1**	**6**	**2**	**0**	**1**	**2**	**0**	**3**	**2**	**1**	**2**	**5**	**1**	**2**	**4**	**1**	**1**	**0**	**1**	**1**	**0**	**1**	**15**	**23**	**2**

DCA Code	Direction of key vehicle	Total	Crash Refs	Number of crashes each year																	ection of opposing vehi				
				2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	North	East	South	West	No Primary
Gladstone - Mt Larcom Road (Gladstone Central)																									
	North	1	#141													1						1			
	West	1	#176																1			1			
1	**SUM**	**2**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**0**
3	North	1	#13				1																	1	
4	West	1	#105										1									1			
	East	7	#3, 4, 101, 104, 140,		2								2			1		1		1	2		5		
	North	3	#114, 136, 146											1		1	1				1	3			
	South	3	#7, 52, 121			1		1							1							1		2	
	West	2	#83, 182								1									1	2				
101	**SUM**	**15**		**0**	**0**	**3**	**0**	**1**	**0**	**0**	**1**	**0**	**2**	**1**	**1**	**2**	**1**	**1**	**0**	**2**	**5**	**4**	**5**	**2**	**0**
102	North	3	#27, 151, 154				1										1	1				4			
	North	3	#10, 17, 184			1	1													1		1	1	1	
	South	2	#31, 131					1								1						1		1	
104	**SUM**	**5**		**0**	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**2**	**1**	**2**	**0**
107	South	1	#60						1															1	
	South	1	#70							1											1				
	West	1	#107										1									1			
201	**SUM**	**2**		**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**
	North	1	#44					1															1		
	South	7	#5, 55, 80, 139,		2	1			1		1					1		1			7				
	West	4	#94, 100, 160, 172									1	1				1		1			4			
202	**SUM**	**12**		**0**	**2**	**1**	**0**	**1**	**1**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**7**	**4**	**1**	**0**	**0**
	East	3	#75, 82, 152								2						1					3			
	North	3	#38, 43, 62					2	1												2	2			1
	South	4	#54, 56, 167, 177						2									1	1				5		
	West	1	#175															1						1	
301	**SUM**	**11**		**0**	**0**	**0**	**0**	**2**	**3**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**1**	**0**	**2**	**5**	**5**	**1**	**1**
	East	1	#90								1											1			
	North	2	#74, 117								1			1							2				
302	**SUM**	**3**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**
303	East	1	#37					1														1			
	North	2	#39, 46					2													2				
	South	1	#209		1																		1		
305	**SUM**	**3**		**0**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**0**
306	South	1	#28					1															1		
308	South	1	#116											1									1		
400	North	1	#205		1																	2			1
	South	1	#68							1													1		
	West	1	#138													1								1	
401	**SUM**	**2**		**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**
406	West	1	#180																	1	1				
408	South	3	#23, 51, 103				1	1					1									2	2		1
700	West	1	#24				1																		
703	North	1	#9			1																			
704	West	1	#133													1									
705	West	2	#29, 47					2																	
708	East	1	#16				1																		
800	East	1	#135													1									
802	South	1	#155															1							
803	North	1	#91									1													
	South	2	#2, 88			1						1													
	West	1	#163															1							
804	**SUM**	**3**		**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	South	1	#164															1							
	West	1	#66							1															
808	**SUM**	**2**		**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total				**0**	**4**	**7**	**6**	**12**	**5**	**3**	**6**	**3**	**6**	**3**	**1**	**8**	**4**	**8**	**3**	**4**	**20**	**29**	**18**	**8**	**3**
Hanson Rd / Landing Rd																									
104	North	2	#30, 78					1			1											1		1	
Landing Rd (N)																									
104	East	1	#48					1													1				
700	Unknow	1	#132													1									
805	North	1	#53						1																
Total				**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**

DCA Code	Direction of key vehicle	Type of road users																Surface conditions				Light conditions				
		Animal - other	Animal - stock	Pedestrian	Bicycle	Bus/Coach	Moped	Motorcycle	Car/Station wagon	Utility/Panel van	Rigid truck	Articulated truck	Road train/B-double/Triple	Special Purpose Vehicle	Railway stock	Towed device	Other	Sealed - Dry	Unsealed - Dry	Sealed - Wet	Unsealed - Wet	Dawn/Dusk	Daylight	Darkness - Lighted	Darkness - Not lighted	Unknown
Gladstone - Mt Larcom Road (Gladstone Central)																										
	North			1					1									1					1			
	West			1					1									1						1		
1	**SUM**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**
3	North			1					1									1					1			
4	West			1					1									1						1		
	East								9	5								4		3		2	4	1		
	North								7									3					3			
	South								6									3					2	1		
	West								5									2					1	1		
101	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**27**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**3**	**0**	**2**	**10**	**3**	**0**	**0**
102	North								5	2								2		1		1	2			
	North								5	1								2		1			3			
	South								1	3								2					2			
104	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**1**	**0**	**0**	**5**	**0**	**0**	**0**
107	South								2									1					1			
	South								1		1							1					1			
	West								2									1						1		
201	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**
	North								2									1					1			
	South								9	5								6		1		1	6			
	West								7	1								4				1	2	1		
202	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**1**	**0**	**2**	**9**	**1**	**0**	**0**
	East								5	1								2		1			2	1		
	North							1	5									2		1			3			
	South					1			4	2	1			1				4					4			
	West									1	1							1					1			
301	**SUM**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**14**	**4**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**9**	**0**	**2**	**0**	**0**	**10**	**1**	**0**	**0**
	East							2										1					1			
	North								1	3								2					2			
302	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**
303	East								1	1								1					1			
	North								3	3								2					2			
	South				1					1								1				1				
305	**SUM**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**
306	South								1	1								1						1		
308	South								1	1								1					1			
400	North									2								1					1			
	South								1	1								1				1				
	West								1	1								1					1			
401	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**
406	West								2									1					1			
408	South				1			1	3			1						3					3			
700	West								1									1						1		
703	North									1								1					1			
704	West								1									1				1				
705	West							2										2					2			
708	East							1										1					1			
800	East								1											1			1			
802	South							1										1					1			
803	North								2									1						1		
	South								1	1							1	1		1				2		
	West									1								1						1		
804	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**
	South									1								1						1		
	West							1										1						1		
808	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**
Total		**0**	**0**	**4**	**2**	**1**	**0**	**9**	**99**	**39**	**3**	**1**	**0**	**1**	**0**	**0**	**1**	**73**	**0**	**10**	**0**	**8**	**59**	**16**	**0**	**0**
Hanson Rd / Landing Rd																										
104	North								2	2								1		1			2			
Landing Rd (N)																										
104	East								1			1						1					1			
700	Unknow								1									1						1		
805	North											1						1							1	
Total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**

DCA Code	Direction of key vehicle	Time-of-day																								Severity				
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Property damage only	Minor injury	Medical treatment	Hospitalisation	Fatal
Gladstone - Mt Larcom Road (Gladstone Central)																														
	North										1																		1	
	West						1																						1	
1	**SUM**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**
3	North										1																	1		
4	West																				1								1	
	East													1	1		2	1	1		1						1	1	5	
	North								1		1			1														1	2	
	South		1													1			1									2	1	
	West																		1			1						1	1	
101	**SUM**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**2**	**1**	**1**	**2**	**1**	**3**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**5**	**9**	**0**
102	North						1				1			1														1	2	
	North											1	1	1														1	2	
	South															1	1										1	1		
104	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**2**	**0**
107	South																	1										1		
	South												1																1	
	West																							1					1	
201	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**
	North										1																		1	
	South					1					2	1				3												2	5	
	West								1								1			2							1	2	1	
202	**SUM**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**3**	**1**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**7**	**0**
	East	1										1			1														3	
	North						1		1									1										1	2	
	South							1				1	1	1														3	1	
	West											1															1			
301	**SUM**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**3**	**1**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**6**	**0**
	East																1											1		
	North									1		1																2		
302	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**
303	East																		1									1		
	North												1	1														1	1	
	South							1																					1	
305	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**
306	South																							1					1	
308	South											1															1			
400	North								1																			1		
	South							1																			1			
	West													1															1	
401	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**
406	West																1											1		
408	South												1			1		1									1	1	1	
700	West	1																									1			
703	North							1																					1	
704	West																		1										1	
705	West												1					1										1	1	
708	East																		1										1	
800	East							1																					1	
802	South																		1										1	
803	North		1																									1		
	South																						1	1			1		1	
	West																				1								1	
804	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**2**	**0**
	South																						1						1	
	West																							1					1	
808	**SUM**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**0**
Total		**2**	**2**	**0**	**0**	**1**	**3**	**5**	**4**	**1**	**7**	**7**	**6**	**7**	**2**	**6**	**6**	**5**	**7**	**2**	**3**	**1**	**2**	**4**	**0**	**0**	**9**	**28**	**46**	**0**
Hanson Rd / Landing Rd																														
104	North															1		1										2		
Landing Rd (N)																														
104	East																1												1	
700	Unknow																							1					1	
805	North																						1						1	
Total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**3**	**0**

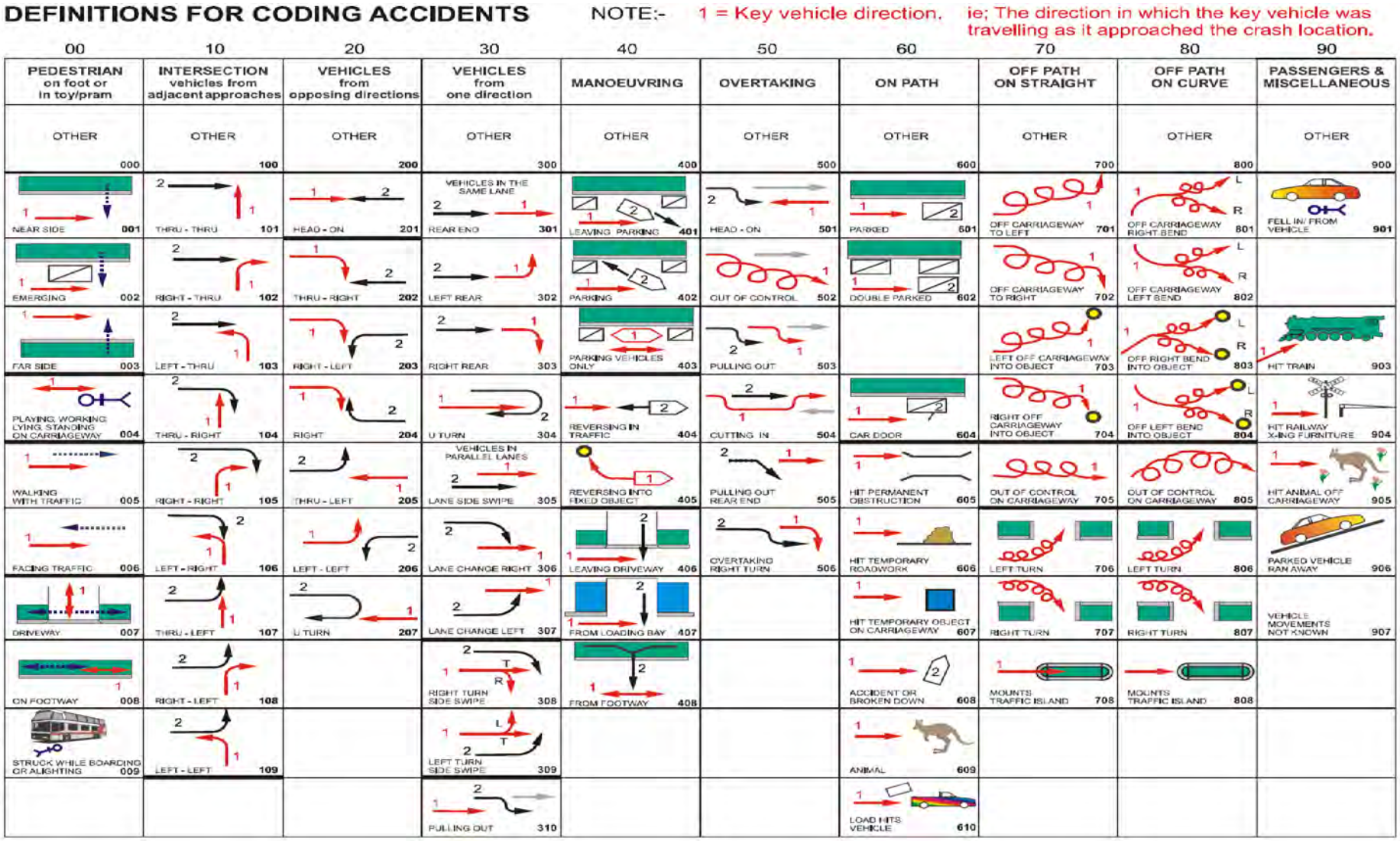
DCA Code	Direction of key vehicle	Total	Crash Refs	Number of crashes each year																
				2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Landing Rd (S)																				
609	North	1	#69							1										
804	East	1	#97									1								
Total				0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0

DCA Code	ection of opposing vehic					Type of road users															
	North	East	South	West	No Primary	Animal - other	Animal - stock	Pedestrian	Bicycle	Bus/Coach	Moped	Motorcycle	Car/Station wagon	Utility/Panel van	Rigid truck	Articulated truck	Road train/B-double/Triple	Special Purpose Vehicle	Railway stock	Towed device	Other
609												1									
804															1						
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0

DCA Code	Surface conditions				Light conditions				
	Sealed - Dry	Unsealed - Dry	Sealed - Wet	Unsealed - Wet	Dawn/Dusk	Daylight	Darkness - Lighted	Darkness - Not lighted	Unknown
609	1							1	
804			1			1			
Total	1	0	1	0	0	1	0	1	0

DCA Code	Time-of-day																								Severity				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Property damage only	Minor injury	Medical treatment	Hospitalisation	Fatal
609				1																								1	
804														1														1	
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0

Figure B 3: Department of Transport and Main Roads Queensland



APPENDIX E
ROAD ASSET DATA

Disclaimer

While every care is taken to ensure the accuracy of this data, Transport Systems Asset Management (TSAM), Department of Transport and Main Roads makes no representation or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses (including indirect or consequential damage) and costs which you might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

Confidentiality disclaimer

Confidentiality:
The Approved Party must:
(a) keep all Confidential Information confidential
(b) use the Confidential Information only for the purpose of its dealings with the Customer
(c) do its best to ensure that any Confidential Information in its possession or control is protected against loss or unauthorised access, use, modification or disclosure or other misuse
(d) not disclose the Confidential Information to any person except:
(i) with the Customer's prior written consent (consent is at the absolute discretion of, and subject to any conditions imposed by, the Customer); or
(ii) as required by law.
The Approved Party must:
(a) not take or retain any material containing any Confidential Information after the end of the Contract or the contract providing for the performance of services by the Approved Party (Approved Party's Contract); and
(b) immediately deliver up to the Customer, at the Customer's request, all documents (in any media) in its possession or control containing the Confidential Information.

Notes

- Reference number: **DR3520**
- Data extraction date: **01/09/2025**
- Extracted data source: **Roadlink**
- Marginal cost and AADT data in Roadlink is available only for the primary through carriageways within the State Controlled Road Network (SCRN)
- Data were provided between the closest reference points that include the requested range (see 'Road list' worksheet for reference point descriptions and chainages)
- Marginal cost unit for sealed segments: cent/SAR/km
- Marginal cost unit for unsealed segments: cent/LU/km
- Table 7 contents is sourced from the ARMIS Coding Booklet, issued by the Department of Transport and Main Roads (2019)

Data definitions

- AADT – the Annual Average Daily Traffic is the number of vehicles measured during 24 hours, averaged over a year
- AADT_CLASS_1A - the Annual Average Daily Traffic for short vehicles (light vehicles)
- AADT_CLASS_1B - the Annual Average Daily Traffic for trucks and buses
- AADT_CLASS_1C - the Annual Average Daily Traffic for articulated vehicles
- AADT_CLASS_1D - the Annual Average Daily Traffic for road trains
- AADT_NONHV - the Annual Average Daily Traffic for light vehicles
- PERCENT_NONHV - the percentage of the Annual Average Daily Traffic (AADT_CLASS_1A) represented by light vehicles
- AADT_HV - the Annual Average Daily Traffic for heavy vehicles
- PERCENT_HV - the percentage of the Annual Average Daily Traffic (AADT_CLASS_1B+AADT_CLASS_1C+AADT_CLASS_1D) represented by heavy vehicles
- ExistingSAR = (AADT_HV * 2.9) for Bruce Hwy, calculated for sealed segments
- ExistingSAR = (AADT_HV *3.2) for other state controlled roads, calculated for sealed segments
- ExistingLU = (AADT_CLASS_1A*1.00) + (AADT_CLASS_1B*1.10) + (AADT_CLASS_1C*2.48) + (AADT_CLASS_1D*5.25), calculated for unsealed segments

Contents

Links to references

Guide to Traffic Impact Assessment

Refer to the downloadable pdf **"Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment"**. The Pavement Impact Assessment Practice Note provides further guidance on how to prepare a pavement impact assessment, including step-by-step examples for a number of different development scenarios.

Notes
Disclaimers

Table 2
Reference point descriptions

ROAD_SECTION_ID	CARRIAGEWAY_CODE	ThroughDistance	ROAD_SECTION_RP	RPDescription
181	2	0	181/1	Int. 181 with 46A Dawson Highway (Gladstone-Biloela) at Int. of Bramston and Glenlyon Streets.
181	2	0.175	181/1F	Int. 181 with Gladstone Port Access Road (183) opposite Railway Street.
181	1	5.27	181/2	East Abut. Calliope River Bridge.
181	1	18.62	181/4A	East Abut. Railway Overbridge.
181	1	32.14	181/5	End of 181 Gladstone-Mt Larcom Road. Int. with 10E Bruce Highway (Benaraby- Rockhampton).

Notes
Disclaimers

Table 3
Marginal cost data for sealed segments of the selected road sections

RoadName	ROAD_SECTION_ID	SUPERSET_CWAY	CARRIAGEWAY_CODE	TDIST_START	TDIST_END	Length	SEAL_FLAG	MC_COSTING_PAVEMENT_TYPE	MarginalCost
GLADSTONE - MOUNT LARCOM	181	1	2	0	0.1	0.1	sealed	AC	2.57
GLADSTONE - MOUNT LARCOM	181	3	3	0	0.1	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	0.1	0.2	0.1	sealed	AC	2.29
GLADSTONE - MOUNT LARCOM	181	3	3	0.1	0.2	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	0.2	0.3	0.1	sealed	AC	3.57
GLADSTONE - MOUNT LARCOM	181	3	3	0.2	0.3	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	0.3	0.4	0.1	sealed	AC	3.85
GLADSTONE - MOUNT LARCOM	181	3	3	0.3	0.4	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	0.4	0.5	0.1	sealed	AC	3.94
GLADSTONE - MOUNT LARCOM	181	3	3	0.4	0.5	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	0.5	0.6	0.1	sealed	AC	4.97
GLADSTONE - MOUNT LARCOM	181	3	3	0.5	0.6	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	0.6	0.7	0.1	sealed	AC	3.41
GLADSTONE - MOUNT LARCOM	181	3	3	0.6	0.7	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	0.7	0.8	0.1	sealed	AC	3.45
GLADSTONE - MOUNT LARCOM	181	3	3	0.7	0.8	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	0.8	0.9	0.1	sealed	AC	3.49
GLADSTONE - MOUNT LARCOM	181	3	3	0.8	0.9	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	0.9	1	0.1	sealed	AC	3.31
GLADSTONE - MOUNT LARCOM	181	3	3	0.9	1	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	1	1.1	0.1	sealed	AC	4.2
GLADSTONE - MOUNT LARCOM	181	3	3	1	1.1	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	1.1	1.2	0.1	sealed	AC	3.68
GLADSTONE - MOUNT LARCOM	181	3	3	1.1	1.2	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	1.2	1.3	0.1	sealed	AC	3.72
GLADSTONE - MOUNT LARCOM	181	3	3	1.2	1.3	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	1.3	1.4	0.1	sealed	AC	4.32
GLADSTONE - MOUNT LARCOM	181	3	3	1.3	1.4	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	1.4	1.5	0.1	sealed	AC	3.68
GLADSTONE - MOUNT LARCOM	181	3	3	1.4	1.5	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	1.5	1.6	0.1	sealed	AC	3.74
GLADSTONE - MOUNT LARCOM	181	3	3	1.5	1.6	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	1.6	1.7	0.1	sealed	AC	3.14
GLADSTONE - MOUNT LARCOM	181	3	3	1.6	1.7	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	1.7	1.8	0.1	sealed	AC	4.2
GLADSTONE - MOUNT LARCOM	181	3	3	1.7	1.8	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	1.8	1.9	0.1	sealed	AC	4.33
GLADSTONE - MOUNT LARCOM	181	3	3	1.8	1.9	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	1.9	2	0.1	sealed	AC	3.63
GLADSTONE - MOUNT LARCOM	181	3	3	1.9	2	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	2	2.1	0.1	sealed	AC	3.92
GLADSTONE - MOUNT LARCOM	181	3	3	2	2.1	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	2.1	2.2	0.1	sealed	AC	4.01
GLADSTONE - MOUNT LARCOM	181	3	3	2.1	2.2	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	2.2	2.277	0.077	sealed	AC	3.61
GLADSTONE - MOUNT LARCOM	181	3	3	2.2	2.277	0.077	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	1	2.277	2.3	0.023	sealed	AC	3.61
GLADSTONE - MOUNT LARCOM	181	1	1	2.3	2.4	0.1	sealed	AC	2.99
GLADSTONE - MOUNT LARCOM	181	1	1	2.4	2.5	0.1	sealed	AC	3.02
GLADSTONE - MOUNT LARCOM	181	1	1	2.5	2.6	0.1	sealed	AC	2.96
GLADSTONE - MOUNT LARCOM	181	1	1	2.6	2.7	0.1	sealed	AC	3.03
GLADSTONE - MOUNT LARCOM	181	1	1	2.7	2.8	0.1	sealed	AC	3.05
GLADSTONE - MOUNT LARCOM	181	1	1	2.8	2.9	0.1	sealed	AC	2.93
GLADSTONE - MOUNT LARCOM	181	1	1	2.9	3	0.1	sealed	AC	3.05
GLADSTONE - MOUNT LARCOM	181	1	1	3	3.1	0.1	sealed	MC	
GLADSTONE - MOUNT LARCOM	181	1	1	3.1	3.2	0.1	sealed	AC	4.17
GLADSTONE - MOUNT LARCOM	181	1	2	3.2	3.3	0.1	sealed	AC	3.78
GLADSTONE - MOUNT LARCOM	181	3	3	3.2	3.3	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	3.3	3.37	0.07	sealed	AC	4.09
GLADSTONE - MOUNT LARCOM	181	3	3	3.3	3.37	0.07	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	1	3.37	3.4	0.03	sealed	AC	4.09
GLADSTONE - MOUNT LARCOM	181	1	1	3.4	3.5	0.1	sealed	AC	4.03
GLADSTONE - MOUNT LARCOM	181	1	1	3.5	3.6	0.1	sealed	AC	3.69
GLADSTONE - MOUNT LARCOM	181	1	1	3.6	3.7	0.1	sealed	AC	3.25
GLADSTONE - MOUNT LARCOM	181	1	1	3.7	3.756	0.056	sealed	AC	2.96
GLADSTONE - MOUNT LARCOM	181	1	2	3.756	3.8	0.044	sealed	AC	2.96
GLADSTONE - MOUNT LARCOM	181	3	3	3.756	3.8	0.044	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	3.8	3.892	0.092	sealed	AC	2.98
GLADSTONE - MOUNT LARCOM	181	3	3	3.8	3.892	0.092	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	1	3.892	3.9	0.008	sealed	AC	2.98
GLADSTONE - MOUNT LARCOM	181	1	1	3.9	4	0.1	sealed	MC	
GLADSTONE - MOUNT LARCOM	181	1	1	4	4.1	0.1	sealed	AC	3.13
GLADSTONE - MOUNT LARCOM	181	1	1	4.1	4.2	0.1	sealed	AC	2.91
GLADSTONE - MOUNT LARCOM	181	1	1	4.2	4.3	0.1	sealed	AC	2.33
GLADSTONE - MOUNT LARCOM	181	1	1	4.3	4.4	0.1	sealed	AC	3.1
GLADSTONE - MOUNT LARCOM	181	1	1	4.4	4.5	0.1	sealed	AC	3.23
GLADSTONE - MOUNT LARCOM	181	1	1	4.5	4.6	0.1	sealed	AC	3.28
GLADSTONE - MOUNT LARCOM	181	1	1	4.6	4.7	0.1	sealed	AC	3.25
GLADSTONE - MOUNT LARCOM	181	1	1	4.7	4.8	0.1	sealed	AC	2.91
GLADSTONE - MOUNT LARCOM	181	1	1	4.8	4.9	0.1	sealed	AC	2.82
GLADSTONE - MOUNT LARCOM	181	1	1	4.9	5	0.1	sealed	AC	2.92
GLADSTONE - MOUNT LARCOM	181	1	1	5	5.1	0.1	sealed	GN	2.85
GLADSTONE - MOUNT LARCOM	181	1	1	5.1	5.2	0.1	sealed	GN	3.53
GLADSTONE - MOUNT LARCOM	181	1	1	5.2	5.3	0.1	sealed	AC	1.63
GLADSTONE - MOUNT LARCOM	181	1	1	5.3	5.4	0.1	sealed	AC	1.09
GLADSTONE - MOUNT LARCOM	181	1	1	5.4	5.5	0.1	sealed	AC	1.09
GLADSTONE - MOUNT LARCOM	181	1	1	5.5	5.6	0.1	sealed	GN	2.33
GLADSTONE - MOUNT LARCOM	181	1	1	5.6	5.7	0.1	sealed	GN	2.66
GLADSTONE - MOUNT LARCOM	181	1	1	5.7	5.8	0.1	sealed	GN	2.88
GLADSTONE - MOUNT LARCOM	181	1	1	5.8	5.9	0.1	sealed	GN	2.88
GLADSTONE - MOUNT LARCOM	181	1	1	5.9	6	0.1	sealed	GN	2.82
GLADSTONE - MOUNT LARCOM	181	1	1	6	6.1	0.1	sealed	GN	2.72
GLADSTONE - MOUNT LARCOM	181	1	1	6.1	6.2	0.1	sealed	GN	2.93
GLADSTONE - MOUNT LARCOM	181	1	1	6.2	6.3	0.1	sealed	GN	3.7
GLADSTONE - MOUNT LARCOM	181	1	1	6.3	6.4	0.1	sealed	GN	3.56
GLADSTONE - MOUNT LARCOM	181	1	1	6.4	6.5	0.1	sealed	GN	3.1
GLADSTONE - MOUNT LARCOM	181	1	1	6.5	6.6	0.1	sealed	GN	2.8
GLADSTONE - MOUNT LARCOM	181	1	1	6.6	6.7	0.1	sealed	GN	2.81
GLADSTONE - MOUNT LARCOM	181	1	1	6.7	6.8	0.1	sealed	GN	2.68
GLADSTONE - MOUNT LARCOM	181	1	1	6.8	6.9	0.1	sealed	GN	2.57
GLADSTONE - MOUNT LARCOM	181	1	1	6.9	7	0.1	sealed	MC	
GLADSTONE - MOUNT LARCOM	181	1	1	7	7.063	0.063	sealed	GN	4.04
GLADSTONE - MOUNT LARCOM	181	1	2	7.063	7.1	0.037	sealed	AC	4.04
GLADSTONE - MOUNT LARCOM	181	3	3	7.063	7.1	0.037	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	7.1	7.2	0.1	sealed	GN	4.17
GLADSTONE - MOUNT LARCOM	181	3	3	7.1	7.2	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	7.2	7.3	0.1	sealed	GN	4.93
GLADSTONE - MOUNT LARCOM	181	3	3	7.2	7.3	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	7.3	7.4	0.1	sealed	AC	5.07
GLADSTONE - MOUNT LARCOM	181	3	3	7.3	7.4	0.1	sealed	AC	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	7.4	7.5	0.1	sealed	GN	4.12
GLADSTONE - MOUNT LARCOM	181	3	3	7.4	7.5	0.1	sealed	GN	6.94
GLADSTONE - MOUNT LARCOM	181	1	2	7.5	7.6	0.1	sealed	GN	5.21
GLADSTONE - MOUNT LARCOM	181	3	3	7.5	7.6	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	7.6	7.7	0.1	sealed	GN	5.03
GLADSTONE - MOUNT LARCOM	181	3	3	7.6	7.7	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	7.7	7.8	0.1	sealed	GN	5.24
GLADSTONE - MOUNT LARCOM	181	3	3	7.7	7.8	0.1	sealed	GN	15.67

GLADSTONE - MOUNT LARCOM	181	1	1	12.3	12.4	0.1	sealed	AC	3.14
GLADSTONE - MOUNT LARCOM	181	1	1	12.4	12.5	0.1	sealed	AC	3
GLADSTONE - MOUNT LARCOM	181	1	1	12.5	12.6	0.1	sealed	GN	3.02
GLADSTONE - MOUNT LARCOM	181	1	1	12.6	12.7	0.1	sealed	GN	2.86
GLADSTONE - MOUNT LARCOM	181	1	1	12.7	12.8	0.1	sealed	GN	3.02
GLADSTONE - MOUNT LARCOM	181	1	1	12.8	12.9	0.1	sealed	GN	2.99
GLADSTONE - MOUNT LARCOM	181	1	1	12.9	13	0.1	sealed	GN	3.9
GLADSTONE - MOUNT LARCOM	181	1	1	13	13.1	0.1	sealed	GN	3.25
GLADSTONE - MOUNT LARCOM	181	1	1	13.1	13.2	0.1	sealed	GN	2.95
GLADSTONE - MOUNT LARCOM	181	1	1	13.2	13.3	0.1	sealed	GN	2.82
GLADSTONE - MOUNT LARCOM	181	1	1	13.3	13.4	0.1	sealed	GN	3.33
GLADSTONE - MOUNT LARCOM	181	1	1	13.4	13.5	0.1	sealed	GN	4.23
GLADSTONE - MOUNT LARCOM	181	1	1	13.5	13.6	0.1	sealed	GN	4.35
GLADSTONE - MOUNT LARCOM	181	1	1	13.6	13.7	0.1	sealed	GN	4.25
GLADSTONE - MOUNT LARCOM	181	1	1	13.7	13.8	0.1	sealed	GN	4.08
GLADSTONE - MOUNT LARCOM	181	1	1	13.8	13.9	0.1	sealed	GN	4.13
GLADSTONE - MOUNT LARCOM	181	1	1	13.9	14	0.1	sealed	GN	4.58
GLADSTONE - MOUNT LARCOM	181	1	1	14	14.1	0.1	sealed	GN	5.23
GLADSTONE - MOUNT LARCOM	181	1	1	14.1	14.2	0.1	sealed	GN	4
GLADSTONE - MOUNT LARCOM	181	1	1	14.2	14.3	0.1	sealed	GN	4.01
GLADSTONE - MOUNT LARCOM	181	1	1	14.3	14.4	0.1	sealed	GN	4.71
GLADSTONE - MOUNT LARCOM	181	1	1	14.4	14.5	0.1	sealed	GN	4.4
GLADSTONE - MOUNT LARCOM	181	1	1	14.5	14.6	0.1	sealed	GN	4.17
GLADSTONE - MOUNT LARCOM	181	1	1	14.6	14.7	0.1	sealed	GN	4.03
GLADSTONE - MOUNT LARCOM	181	1	1	14.7	14.8	0.1	sealed	GN	4.15
GLADSTONE - MOUNT LARCOM	181	1	1	14.8	14.9	0.1	sealed	GN	4.03
GLADSTONE - MOUNT LARCOM	181	1	1	14.9	15	0.1	sealed	GN	4.05
GLADSTONE - MOUNT LARCOM	181	1	1	15	15.1	0.1	sealed	GN	4.13
GLADSTONE - MOUNT LARCOM	181	1	1	15.1	15.2	0.1	sealed	GN	4.2
GLADSTONE - MOUNT LARCOM	181	1	1	15.2	15.3	0.1	sealed	GN	3.45
GLADSTONE - MOUNT LARCOM	181	1	1	15.3	15.4	0.1	sealed	GN	3.03
GLADSTONE - MOUNT LARCOM	181	1	1	15.4	15.5	0.1	sealed	GN	3.08
GLADSTONE - MOUNT LARCOM	181	1	1	15.5	15.6	0.1	sealed	GN	3.01
GLADSTONE - MOUNT LARCOM	181	1	1	15.6	15.7	0.1	sealed	GN	2.99
GLADSTONE - MOUNT LARCOM	181	1	1	15.7	15.8	0.1	sealed	GN	3.05
GLADSTONE - MOUNT LARCOM	181	1	1	15.8	15.9	0.1	sealed	GN	2.97
GLADSTONE - MOUNT LARCOM	181	1	1	15.9	16	0.1	sealed	GN	2.98
GLADSTONE - MOUNT LARCOM	181	1	1	16	16.1	0.1	sealed	GN	3.04
GLADSTONE - MOUNT LARCOM	181	1	1	16.1	16.2	0.1	sealed	GN	3.67
GLADSTONE - MOUNT LARCOM	181	1	1	16.2	16.3	0.1	sealed	AC	4.79
GLADSTONE - MOUNT LARCOM	181	1	1	16.3	16.4	0.1	sealed	GN	4.4
GLADSTONE - MOUNT LARCOM	181	1	1	16.4	16.5	0.1	sealed	GN	3.77
GLADSTONE - MOUNT LARCOM	181	1	1	16.5	16.6	0.1	sealed	GN	3.1
GLADSTONE - MOUNT LARCOM	181	1	1	16.6	16.7	0.1	sealed	GN	3
GLADSTONE - MOUNT LARCOM	181	1	1	16.7	16.8	0.1	sealed	GN	2.95
GLADSTONE - MOUNT LARCOM	181	1	1	16.8	16.9	0.1	sealed	GN	2.99
GLADSTONE - MOUNT LARCOM	181	1	1	16.9	17	0.1	sealed	GN	2.97
GLADSTONE - MOUNT LARCOM	181	1	1	17	17.1	0.1	sealed	GN	2.99
GLADSTONE - MOUNT LARCOM	181	1	1	17.1	17.2	0.1	sealed	GN	4.18
GLADSTONE - MOUNT LARCOM	181	1	1	17.2	17.3	0.1	sealed	GN	3.03
GLADSTONE - MOUNT LARCOM	181	1	1	17.3	17.4	0.1	sealed	GN	2.99
GLADSTONE - MOUNT LARCOM	181	1	1	17.4	17.5	0.1	sealed	GN	2.96
GLADSTONE - MOUNT LARCOM	181	1	1	17.5	17.6	0.1	sealed	GN	3
GLADSTONE - MOUNT LARCOM	181	1	1	17.6	17.7	0.1	sealed	GN	3.01
GLADSTONE - MOUNT LARCOM	181	1	1	17.7	17.8	0.1	sealed	GN	3.03
GLADSTONE - MOUNT LARCOM	181	1	1	17.8	17.9	0.1	sealed	GN	3.19
GLADSTONE - MOUNT LARCOM	181	1	1	17.9	18	0.1	sealed	GN	4.29
GLADSTONE - MOUNT LARCOM	181	1	1	18	18.1	0.1	sealed	GN	3.23
GLADSTONE - MOUNT LARCOM	181	1	1	18.1	18.2	0.1	sealed	GN	4.38
GLADSTONE - MOUNT LARCOM	181	1	1	18.2	18.3	0.1	sealed	GN	2.97
GLADSTONE - MOUNT LARCOM	181	1	1	18.3	18.4	0.1	sealed	GN	2.95
GLADSTONE - MOUNT LARCOM	181	1	2	7.8	7.9	0.1	sealed	GN	4.93
GLADSTONE - MOUNT LARCOM	181	3	3	7.8	7.9	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	7.9	8	0.1	sealed	GN	4.87
GLADSTONE - MOUNT LARCOM	181	3	3	7.9	8	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	8	8.1	0.1	sealed	GN	4.84
GLADSTONE - MOUNT LARCOM	181	3	3	8	8.1	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	8.1	8.2	0.1	sealed	GN	5.2
GLADSTONE - MOUNT LARCOM	181	3	3	8.1	8.2	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	8.2	8.3	0.1	sealed	GN	5.04
GLADSTONE - MOUNT LARCOM	181	3	3	8.2	8.3	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	8.3	8.4	0.1	sealed	GN	5.07
GLADSTONE - MOUNT LARCOM	181	3	3	8.3	8.4	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	8.4	8.5	0.1	sealed	GN	5.09
GLADSTONE - MOUNT LARCOM	181	3	3	8.4	8.5	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	8.5	8.6	0.1	sealed	GN	5.19
GLADSTONE - MOUNT LARCOM	181	3	3	8.5	8.6	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	8.6	8.7	0.1	sealed	GN	5.2
GLADSTONE - MOUNT LARCOM	181	3	3	8.6	8.7	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	8.7	8.8	0.1	sealed	GN	5.21
GLADSTONE - MOUNT LARCOM	181	3	3	8.7	8.8	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	8.8	8.9	0.1	sealed	GN	5.13
GLADSTONE - MOUNT LARCOM	181	3	3	8.8	8.9	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	8.9	9	0.1	sealed	GN	4.97
GLADSTONE - MOUNT LARCOM	181	3	3	8.9	9	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	9	9.1	0.1	sealed	GN	5.16
GLADSTONE - MOUNT LARCOM	181	3	3	9	9.1	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	9.1	9.2	0.1	sealed	GN	5.13
GLADSTONE - MOUNT LARCOM	181	3	3	9.1	9.2	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	9.2	9.3	0.1	sealed	GN	5.23
GLADSTONE - MOUNT LARCOM	181	3	3	9.2	9.3	0.1	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	2	9.3	9.325	0.025	sealed	GN	4.18
GLADSTONE - MOUNT LARCOM	181	3	3	9.3	9.325	0.025	sealed	GN	15.67
GLADSTONE - MOUNT LARCOM	181	1	1	9.325	9.4	0.075	sealed	GN	4.18
GLADSTONE - MOUNT LARCOM	181	1	1	9.4	9.5	0.1	sealed	GN	4.68
GLADSTONE - MOUNT LARCOM	181	1	1	9.5	9.6	0.1	sealed	GN	3.38
GLADSTONE - MOUNT LARCOM	181	1	1	9.6	9.7	0.1	sealed	GN	3.86
GLADSTONE - MOUNT LARCOM	181	1	1	9.7	9.8	0.1	sealed	AC	4.67
GLADSTONE - MOUNT LARCOM	181	1	1	9.8	9.9	0.1	sealed	GN	4.97
GLADSTONE - MOUNT LARCOM	181	1	1	9.9	10	0.1	sealed	GN	4.87
GLADSTONE - MOUNT LARCOM	181	1	1	10	10.1	0.1	sealed	GN	3.93
GLADSTONE - MOUNT LARCOM	181	1	1	10.1	10.2	0.1	sealed	GN	3.13
GLADSTONE - MOUNT LARCOM	181	1	1	10.2	10.3	0.1	sealed	GN	3.16
GLADSTONE - MOUNT LARCOM	181	1	1	10.3	10.4	0.1	sealed	GN	3.05
GLADSTONE - MOUNT LARCOM	181	1	1	10.4	10.5	0.1	sealed	GN	3.07
GLADSTONE - MOUNT LARCOM	181	1	1	10.5	10.6	0.1	sealed	GN	3.16
GLADSTONE - MOUNT LARCOM	181	1	1	10.6	10.7	0.1	sealed	GN	3.07
GLADSTONE - MOUNT LARCOM	181	1	1	10.7	10.8	0.1	sealed	GN	3.12
GLADSTONE - MOUNT LARCOM	181	1	1	10.8	10.9	0.1	sealed	GN	3.11
GLADSTONE - MOUNT LARCOM	181	1	1	10.9	11	0.1	sealed	GN	3.09
GLADSTONE - MOUNT LARCOM	181	1	1	11	11.1	0.1	sealed	GN	3.12
GLADSTONE - MOUNT LARCOM	181	1	1	11.1	11.2	0.1	sealed	GN	3.07
GLADSTONE - MOUNT LARCOM	181	1	1	11.2	11.3	0.1	sealed	GN	3.09
GLADSTONE - MOUNT LARCOM	181	1	1	11.3	11.4	0.1	sealed	GN	3.01
GLADSTONE - MOUNT LARCOM	181	1	1	11.4	11.5	0.1	sealed	GN	3.11
GLADSTONE - MOUNT LARCOM	181	1	1	11.5	11.6	0.1	sealed	AC	3.67
GLADSTONE - MOUNT LARCOM	181	1	1	11.6	11.7	0.1	sealed	AC	4.78
GLADSTONE - MOUNT LARCOM	181	1	1	11.7	11.8	0.1	sealed	AC	4.96
GLADSTONE - MOUNT LARCOM	181	1	1	11.8	11.9	0.1	sealed	AC	5.18
GLADSTONE - MOUNT LARCOM	181	1	1	11.9	12	0.1	sealed	GN	4.2
GLADSTONE - MOUNT LARCOM	181	1	1	12	12.1	0.1	sealed	AC	3.44
GLADSTONE - MOUNT LARCOM	181	1	1	12.1	12.2	0.1	sealed	AC	3.29
GLADSTONE - MOUNT LARCOM	181	1	1	12.2	12.3	0.1	sealed	AC	4.9

GLADSTONE - MOUNT LARCOM	181	1	1	18.4	18.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	18.5	18.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	18.6	18.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	18.7	18.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	18.8	18.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	18.9	19	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	19	19.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	19.1	19.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	19.2	19.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	19.3	19.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	19.4	19.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	19.5	19.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	19.6	19.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	19.7	19.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	19.8	19.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	19.9	20	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	20	20.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	20.1	20.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	20.2	20.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	20.3	20.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	20.4	20.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	20.5	20.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	20.6	20.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	20.7	20.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	20.8	20.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	20.9	21	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	21	21.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	21.1	21.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	21.2	21.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	21.3	21.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	21.4	21.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	21.5	21.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	21.6	21.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	21.7	21.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	21.8	21.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	21.9	22	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	22	22.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	22.1	22.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	22.2	22.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	22.3	22.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	22.4	22.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	22.5	22.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	22.6	22.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	22.7	22.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	22.8	22.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	22.9	23	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	23	23.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	23.1	23.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	23.2	23.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	23.3	23.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	23.4	23.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	23.5	23.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	23.6	23.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	23.7	23.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	23.8	23.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	23.9	24	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	24	24.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	24.1	24.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	24.2	24.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	24.3	24.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	24.4	24.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	24.5	24.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	24.6	24.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	24.7	24.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	24.8	24.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	24.9	25	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	25	25.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	25.1	25.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	25.2	25.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	25.3	25.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	25.4	25.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	25.5	25.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	25.6	25.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	25.7	25.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	25.8	25.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	25.9	26	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	26	26.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	26.1	26.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	26.2	26.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	26.3	26.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	26.4	26.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	26.5	26.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	26.6	26.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	26.7	26.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	26.8	26.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	26.9	27	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	27	27.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	27.1	27.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	27.2	27.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	27.3	27.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	27.4	27.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	27.5	27.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	27.6	27.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	27.7	27.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	27.8	27.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	27.9	28	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	28	28.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	28.1	28.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	28.2	28.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	28.3	28.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	28.4	28.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	28.5	28.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	28.6	28.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	28.7	28.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	28.8	28.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	28.9	29	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	29	29.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	29.1	29.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	29.2	29.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	29.3	29.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	29.4	29.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	29.5	29.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	29.6	29.7	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	29.7	29.8	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	29.8	29.9	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	29.9	30	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	30	30.1	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	30.1	30.2	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	30.2	30.3	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	30.3	30.4	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	30.4	30.5	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	30.5	30.6	0.1	sealed
GLADSTONE - MOUNT LARCOM	181	1	1	30.6	30.7	0.1	sealed

GLADSTONE - MOUNT LARCOM	181	1	30.7	30.8	0.1	sealed	GN		3.09
GLADSTONE - MOUNT LARCOM	181	1	30.8	30.9	0.1	sealed	GN		3.6
GLADSTONE - MOUNT LARCOM	181	1	30.9	31	0.1	sealed	GN		3.82
GLADSTONE - MOUNT LARCOM	181	1	31	31.1	0.1	sealed	GN		4.03
GLADSTONE - MOUNT LARCOM	181	1	31.1	31.2	0.1	sealed	GN		4.12
GLADSTONE - MOUNT LARCOM	181	1	31.2	31.3	0.1	sealed	GN		4.16
GLADSTONE - MOUNT LARCOM	181	1	31.3	31.4	0.1	sealed	GN		4.18
GLADSTONE - MOUNT LARCOM	181	1	31.4	31.5	0.1	sealed	GN		4.21
GLADSTONE - MOUNT LARCOM	181	1	31.5	31.6	0.1	sealed	GN		4.19
GLADSTONE - MOUNT LARCOM	181	1	31.6	31.7	0.1	sealed	GN		4.15
GLADSTONE - MOUNT LARCOM	181	1	31.7	31.8	0.1	sealed	GN		4.13
GLADSTONE - MOUNT LARCOM	181	1	31.8	31.9	0.1	sealed	GN		3.98
GLADSTONE - MOUNT LARCOM	181	1	31.9	32	0.1	sealed	GN		3.11
GLADSTONE - MOUNT LARCOM	181	1	32	32.1	0.1	sealed	AC		2.96
GLADSTONE - MOUNT LARCOM	181	1	32.1	32.14	0.04	sealed	AC		3.96

Notes
Disclaimers

Table 5
Annual average daily traffic data for sealed segments of the selected road sections

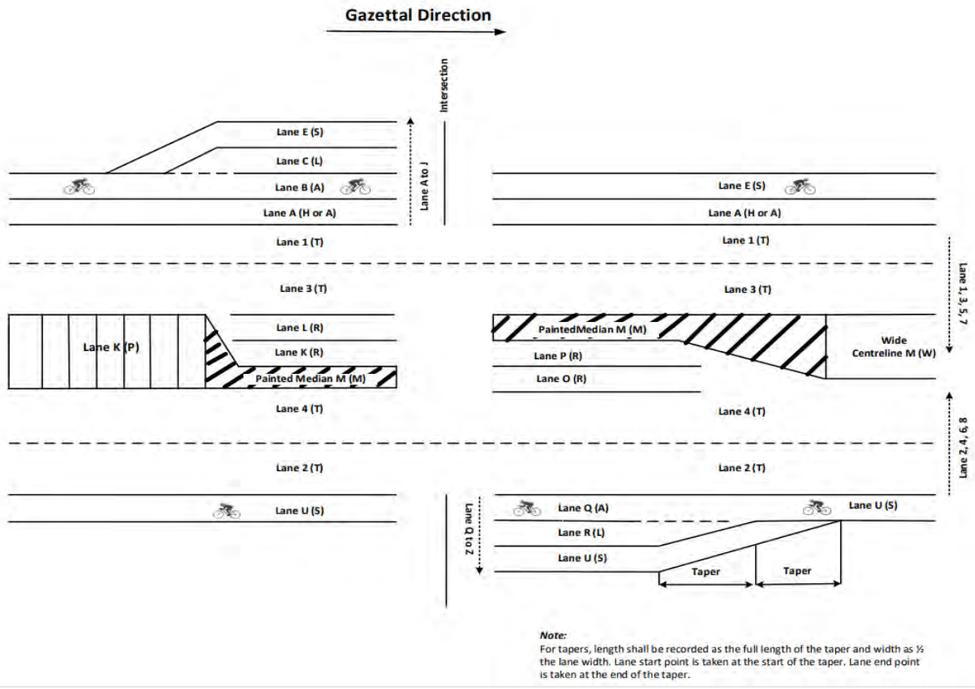
RoadName	ROAD_SECTION_ID	SUPERSET_CWAY	Direction	TdistStart	TdistEnd	SURFACE_TYPE_LABEL	AADT	AADT_YEAR	GROWTH_PC_5YR	AADT_NONHV	PERCENT_NONHV	AADT_HV	PERCENT_HV	ExistingSAR
GLADSTONE - MOUNT LARCOM RC	181	1	A	0	0.175	SEALED	5948	2024	12.29	5436	91.4	512	8.6	1638.4
GLADSTONE - MOUNT LARCOM RC	181	1	G	0	0.175	SEALED	5650	2024	8.7	5150	91.15	500	8.85	1600
GLADSTONE - MOUNT LARCOM RC	181	1	A	0.175	0.675	SEALED	6043	2024	12.27	5008	82.87	1035	17.13	3312
GLADSTONE - MOUNT LARCOM RC	181	1	G	0.175	0.675	SEALED	5316	2024	8.02	4539	85.39	777	14.61	2486.4
GLADSTONE - MOUNT LARCOM RC	181	1	A	0.675	1.4	SEALED	3574	2024	2.96	2955	82.68	619	17.32	1980.8
GLADSTONE - MOUNT LARCOM RC	181	1	G	0.675	1.4	SEALED	3900	2024	1.58	3363	86.23	537	13.77	1718.4
GLADSTONE - MOUNT LARCOM RC	181	1	A	1.4	2.277	SEALED	3657	2024	4.79	3206	87.67	451	12.33	1443.2
GLADSTONE - MOUNT LARCOM RC	181	1	G	1.4	2.277	SEALED	3737	2024	5.28	3173	84.91	564	15.09	1804.8
GLADSTONE - MOUNT LARCOM RC	181	1	A	2.277	3.2	SEALED	3657	2024	4.79	3206	87.67	451	12.33	1443.2
GLADSTONE - MOUNT LARCOM RC	181	1	G	2.277	3.2	SEALED	3737	2024	5.28	3173	84.91	564	15.09	1804.8
GLADSTONE - MOUNT LARCOM RC	181	1	A	3.2	3.26	SEALED	3657	2024	4.79	3206	87.67	451	12.33	1443.2
GLADSTONE - MOUNT LARCOM RC	181	1	G	3.2	3.26	SEALED	3737	2024	5.28	3173	84.91	564	15.09	1804.8
GLADSTONE - MOUNT LARCOM RC	181	1	A	3.26	3.37	SEALED	5144	2024	3.4	4127	80.22	1017	19.78	3254.4
GLADSTONE - MOUNT LARCOM RC	181	1	G	3.26	3.37	SEALED	4186	2024	-2.57	3520	84.08	666	15.92	2131.2
GLADSTONE - MOUNT LARCOM RC	181	1	A	3.37	3.756	SEALED	5144	2024	3.4	4127	80.22	1017	19.78	3254.4
GLADSTONE - MOUNT LARCOM RC	181	1	G	3.37	3.756	SEALED	4186	2024	-2.57	3520	84.08	666	15.92	2131.2
GLADSTONE - MOUNT LARCOM RC	181	1	A	3.756	3.892	SEALED	5144	2024	3.4	4127	80.22	1017	19.78	3254.4
GLADSTONE - MOUNT LARCOM RC	181	1	G	3.756	3.892	SEALED	4186	2024	-2.57	3520	84.08	666	15.92	2131.2
GLADSTONE - MOUNT LARCOM RC	181	1	A	3.892	4.625	SEALED	5144	2024	3.4	4127	80.22	1017	19.78	3254.4
GLADSTONE - MOUNT LARCOM RC	181	1	G	3.892	4.625	SEALED	4186	2024	-2.57	3520	84.08	666	15.92	2131.2
GLADSTONE - MOUNT LARCOM RC	181	1	A	4.625	7.063	SEALED	3230	2024	0.58	2559	79.24	671	20.76	2147.2
GLADSTONE - MOUNT LARCOM RC	181	1	G	4.625	7.063	SEALED	3207	2024	-0.12	2592	80.83	615	19.17	1968
GLADSTONE - MOUNT LARCOM RC	181	1	A	7.063	9.325	SEALED	3230	2024	0.58	2559	79.24	671	20.76	2147.2
GLADSTONE - MOUNT LARCOM RC	181	1	G	7.063	9.325	SEALED	3207	2024	-0.12	2592	80.83	615	19.17	1968
GLADSTONE - MOUNT LARCOM RC	181	1	A	9.325	12.29	SEALED	3230	2024	0.58	2559	79.24	671	20.76	2147.2
GLADSTONE - MOUNT LARCOM RC	181	1	G	9.325	12.29	SEALED	3207	2024	-0.12	2592	80.83	615	19.17	1968
GLADSTONE - MOUNT LARCOM RC	181	1	A	12.29	32.14	SEALED	2106	2024	8.81	1723	81.83	383	18.17	1225.6
GLADSTONE - MOUNT LARCOM RC	181	1	G	12.29	32.14	SEALED	2307	2024	10.94	1908	82.69	399	17.31	1276.8

Notes
Disclaimers

Table 7
Carriageway code description

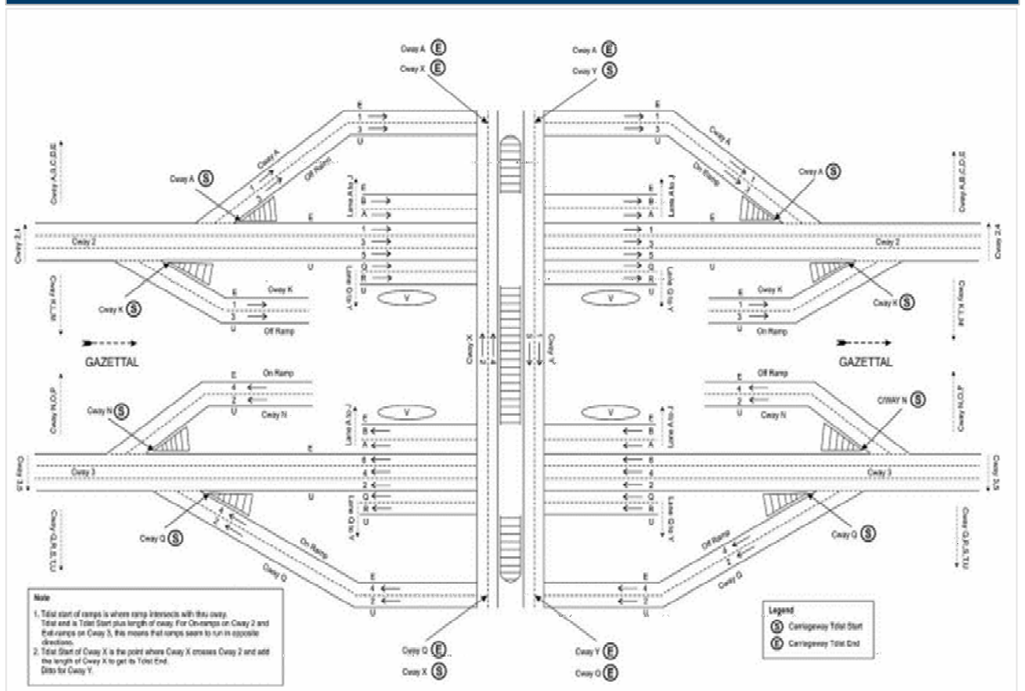
CARRIAGEWAY_CODE	SUPERSET_CWAY	CARRIAGEWAY_CODE_LABEL
1	1	Primary through undivided
2	1	Primary through divided in gazettal
3	3	Primary through divided against gazettal

Figure 1
Single carriageway



Note:
For tapers, length shall be recorded as the full length of the taper and width as ½ the lane width. Lane start point is taken at the start of the taper. Lane end point is taken at the end of the taper.

Figure 2
Dual/Divided carriageway



Notes
Disclaimers

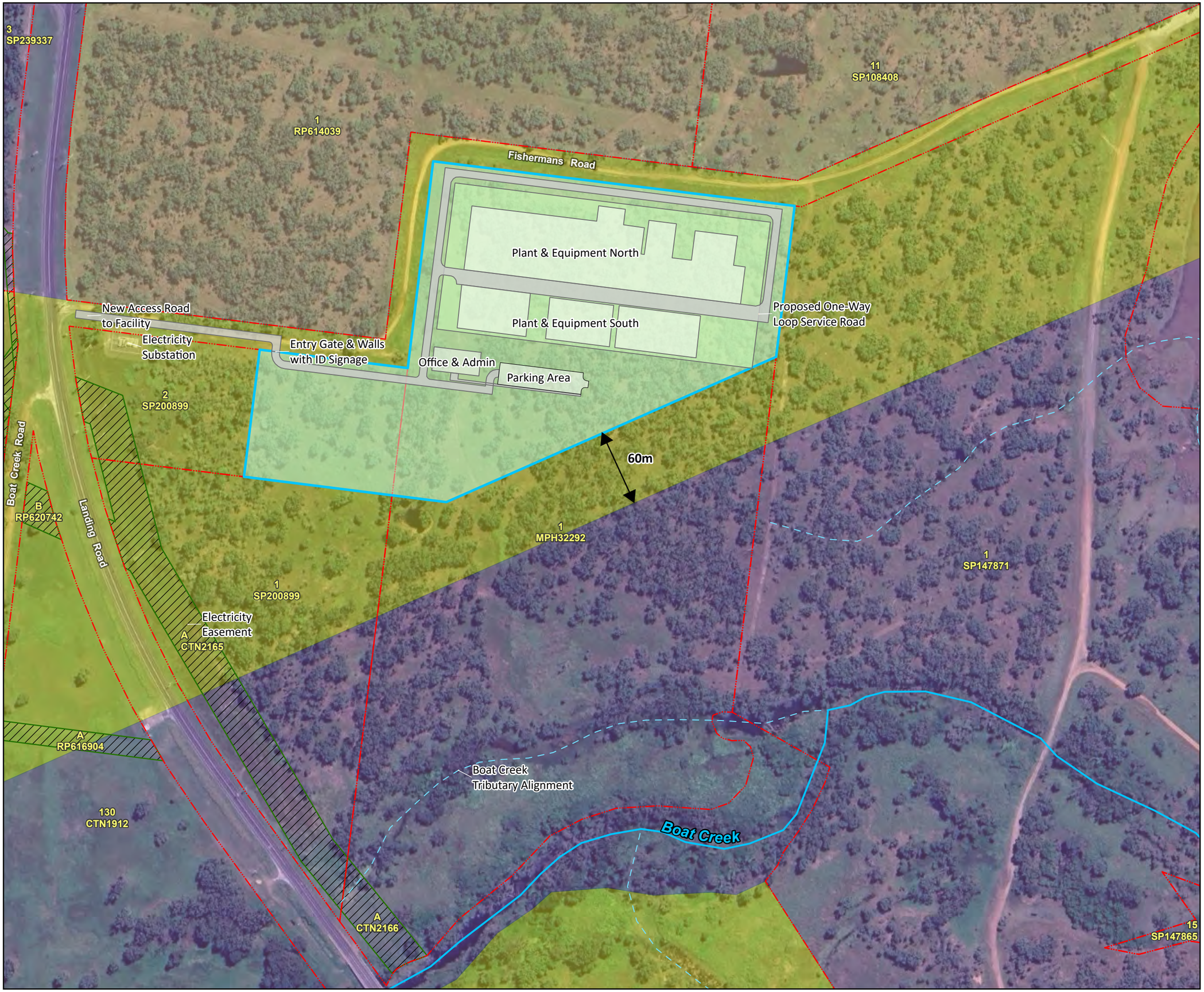
Table 8
Pavement type description

ARMIS-derived TMR pavement type	FAMLIT pavement type	Load damage exponent
Sprayed seal over flexible pavement, including cement modified and lime stabilised layer types C4 and C5	GN	4
Sprayed seal or Asphalt over flexible pavement with bitumen stabilised pavement	AC	5
Asphalt over flexible pavement, including cement modified and lime stabilised layer types C4 and C5	AC	5
Sprayed seal over semi rigid/semi rigid composite pavement	CS	12
Asphalt over semi rigid/semi rigid composite pavement	CS	12

Note meaning of other possible values of MC_COSTING_PAVEMENT_TYPE in marginal cost data:
MC - marginal cost not available
UN - unknown pavement type.

APPENDIX F

DEVELOPMENT SITE PLAN



Legend

- Project Area (Stage 1)
- Easement
- Lot Type Parcel
- Named Waterways
- Unnamed waterways

Gladstone SDA Precinct

- Port Related Industry Precinct
- Industry Investigation Precinct
- Materials Transportation and Services Corridor Precinct (MTSC)

Disclaimer:
Subject to Major Hazard Facility (MHF) and bushfire assessment.
CQG has relied upon data obtained from QSpatial and other public sources, as well as the client (Grenof)

N

Scale 1:2,750 (A3)

0 41 83 124

Metres

Coordinate System: GDA2020 MGA Zone 56

Project Halogen

Stage 1 Conceptual Plan
(MCU Submission)

DRAFT for Discussion

GRENOF

Project No: 25054
Map No: 25054-02
Revision: Rev0
12 August 2025

APPENDIX G

TURN WARRANT ASSESSMENT

Fishermans Road Access
Morning Peak Hour

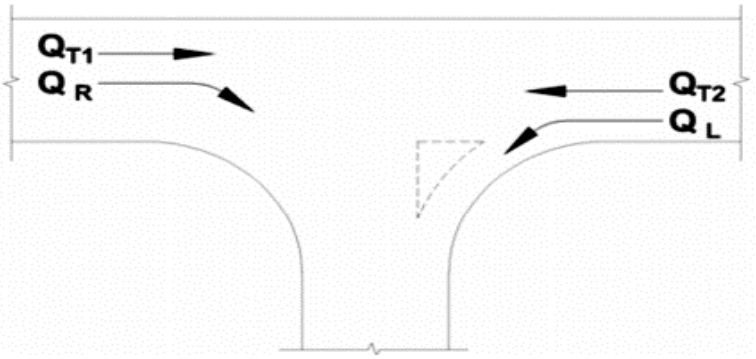
Parameters

Design Speed:	V ≥ 100km/h
Road Type:	2L2W
Splitter Island:	No
Design Domain:	Normal Design Domain
Axis Zoom:	No
Design Life:	10
High Volume Period:	10
$Q_{i(normal)}$:	25

Only blue boxes should require changing.
Values can be manually entered into "E25:F26" to assess intersections with more legs.

Traffic Volumes

Q_{T1} =	3
Q_R =	15

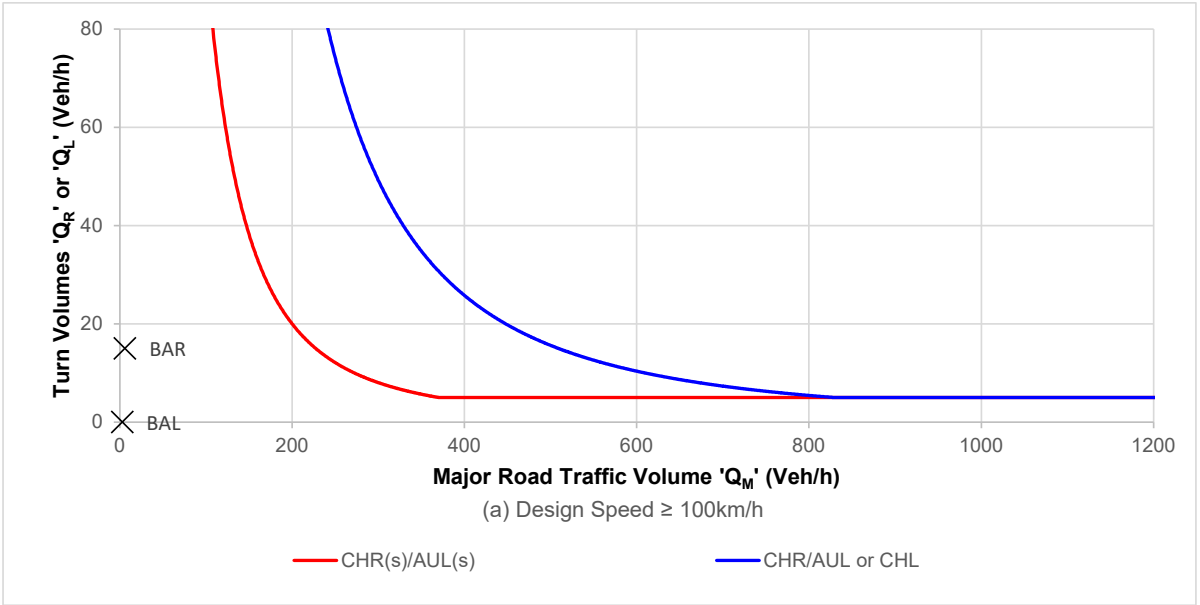


Q_{T2} =	3
Q_L =	0

Assessment

	Q_M	Q_R / Q_L	Required Treatment
Right	6	15	BAR
Left	3	0	BAL

Update Figure Axis



Landing Road / Fishermans Road Intersection
Morning Peak Hour

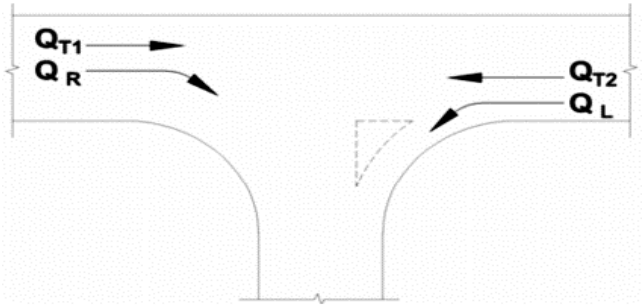
Parameters

Design Speed:	70 km/h < V < 100km/h
Road Type:	2L2W
Splitter Island:	No
Design Domain:	Normal Design Domain
Axis Zoom:	No
Design Life:	10
High Volume Period:	10
$Q_{i(normal)}$:	25

Only blue boxes should require changing.
Values can be manually entered into "E25:F26" to assess intersections with more legs.

Traffic Volumes

Q_{T1} =	224
Q_R =	16

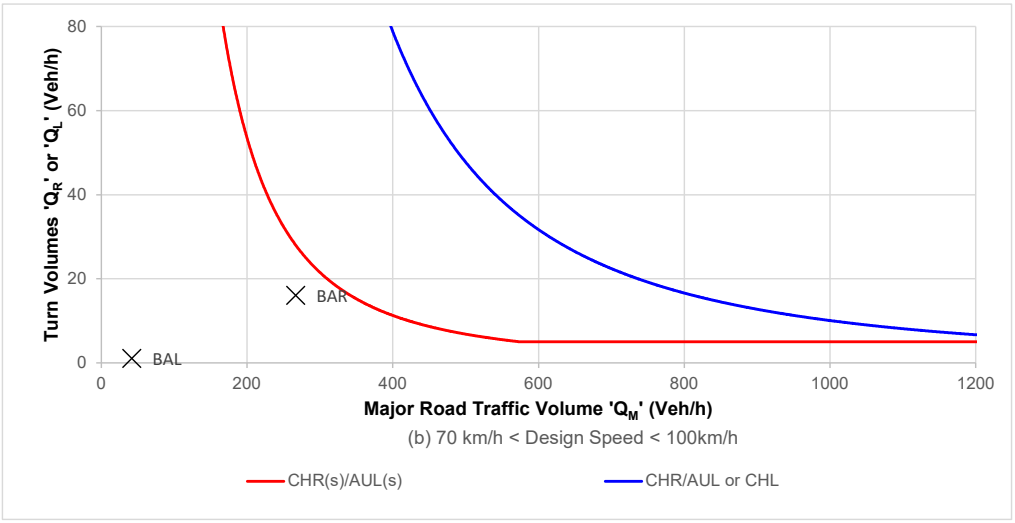


Q_{T2} =	42
Q_L =	1

Assessment

	Q_M	Q_R / Q_L	Required Treatment
Right	267	16	BAR
Left	42	1	BAL

Update Figure Axis



Landing Road / Fishermans Road Intersection
Afternoon Peak Hour

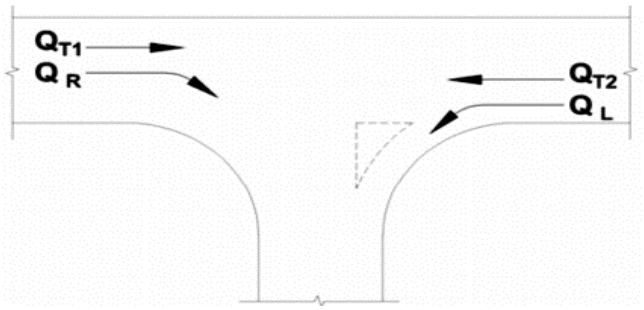
Parameters

Design Speed:	70 km/h < V < 100km/h
Road Type:	2L2W
Splitter Island:	No
Design Domain:	Normal Design Domain
Axis Zoom:	No
Design Life:	10
High Volume Period:	10
$Q_{i(normal)}$:	25

Only blue boxes should require changing.
Values can be manually entered into "E25:F26" to assess intersections with more legs.

Traffic Volumes

Q_{T1} =	38
Q_R =	7

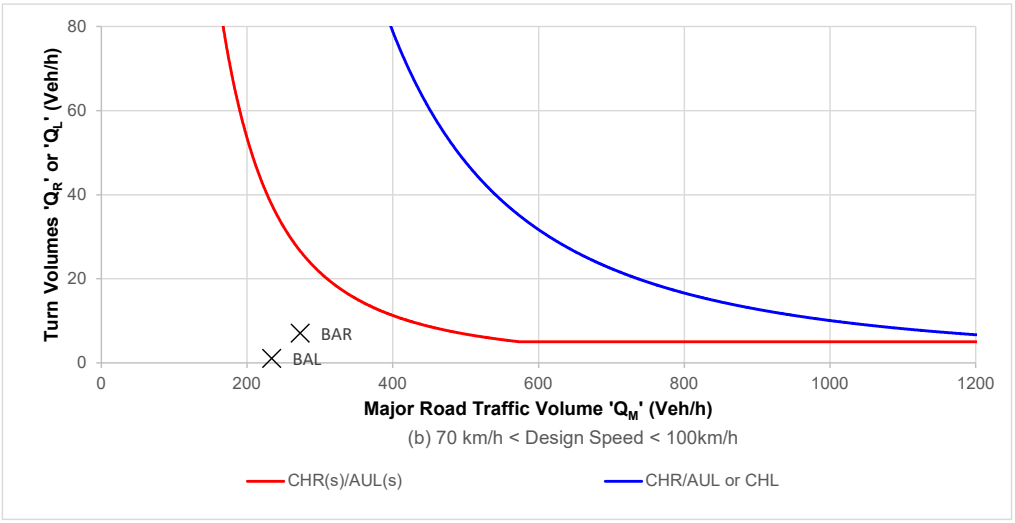


Q_{T2} =	234
Q_L =	1

Assessment

	Q_M	Q_R / Q_L	Required Treatment
Right	273	7	BAR
Left	234	1	BAL

Update Figure Axis



Gladstone - Mount Larcom Road (Hanson Road) / Landing Road Intersection
Morning Peak Hour

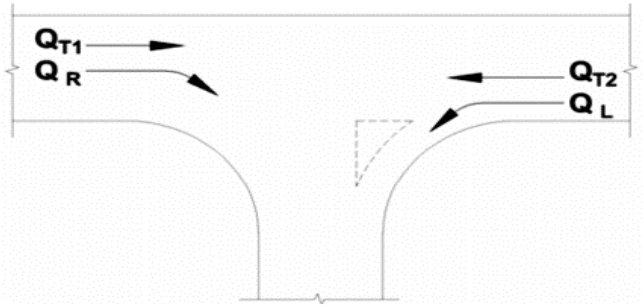
Parameters

Design Speed:	70 km/h < V < 100km/h
Road Type:	2L2W
Splitter Island:	No
Design Domain:	Normal Design Domain
Axis Zoom:	No
Design Life:	10
High Volume Period:	10
$Q_{i(normal)}$:	25

Only blue boxes should require changing.
Values can be manually entered into "E25:F26" to assess intersections with more legs.

Traffic Volumes

Q_{T1} =	179
Q_R =	188

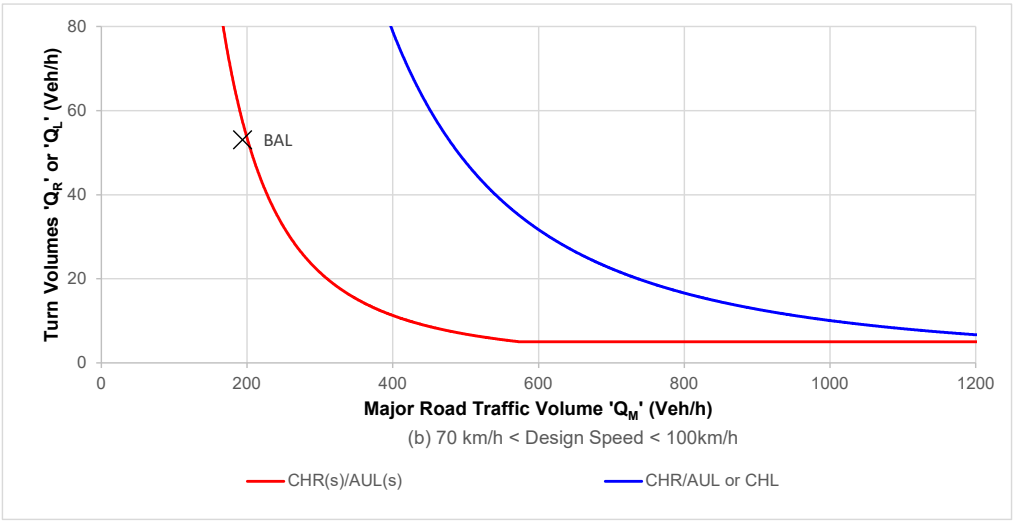


Q_{T2} =	194
Q_L =	53

Assessment

	Q_M	Q_R / Q_L	Required Treatment
Right	426	188	CHR
Left	194	53	BAL

Update Figure Axis



Gladstone - Mount Larcom Road (Hanson Road) / Landing Road Intersection
Afternoon Peak Hour

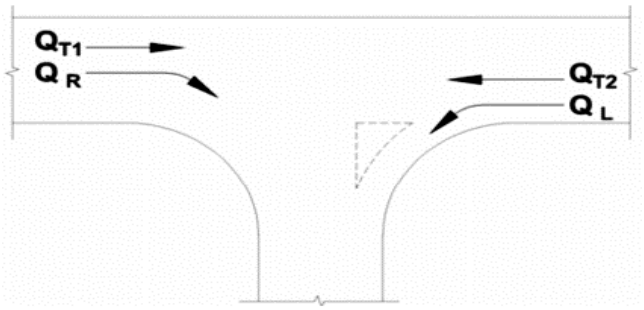
Parameters

Design Speed:	70 km/h < V < 100km/h
Road Type:	2L2W
Splitter Island:	No
Design Domain:	Normal Design Domain
Axis Zoom:	No
Design Life:	10
High Volume Period:	10
$Q_{i(normal)}$:	25

Only blue boxes should require changing.
Values can be manually entered into "E25:F26" to assess intersections with more legs.

Traffic Volumes

Q_{T1} =	290
Q_R =	24

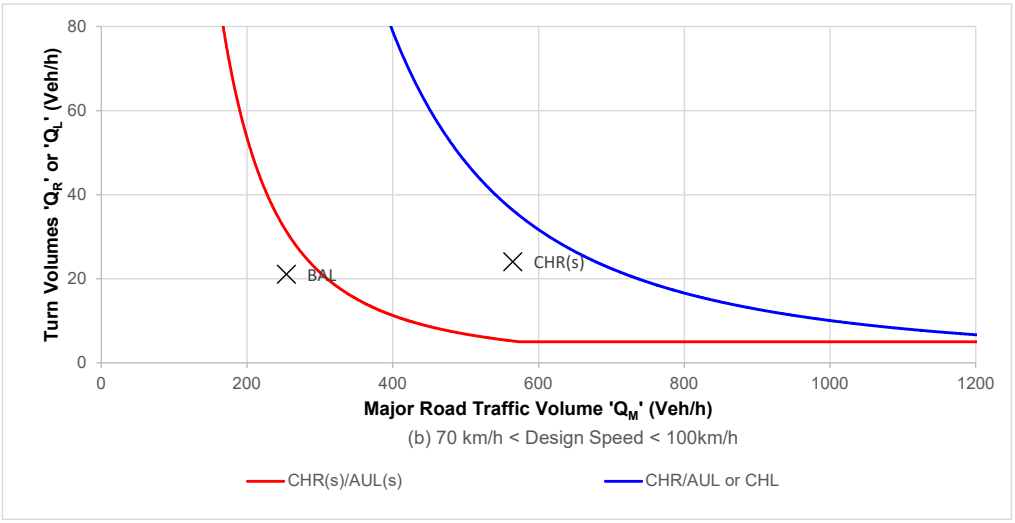


Q_{T2} =	254
Q_L =	21

Assessment

	Q_M	Q_R / Q_L	Required Treatment
Right	565	24	CHR(s)
Left	254	21	BAL

Update Figure Axis



APPENDIX H

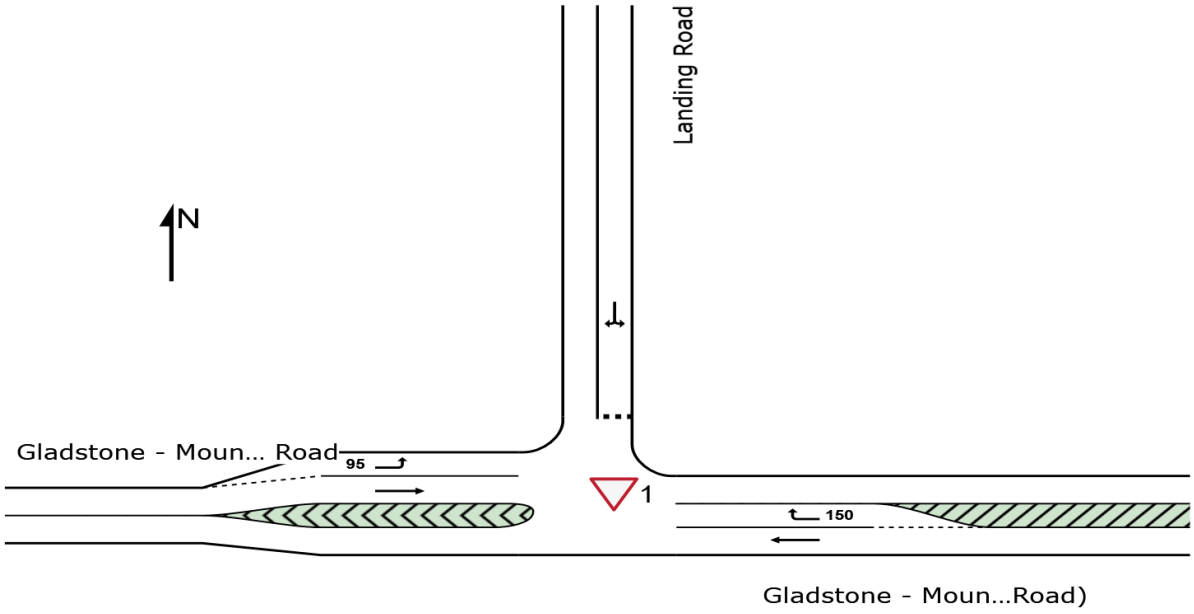
GLADSTONE – MOUNT LARCOM ROAD (HANSON ROAD) / LANDING ROAD INTERSECTION ANALYSIS

SITE LAYOUT

Site: [1] Hanson/Landing (General)

Gladstone - Mount Larcom Road (Hanson Road) / Landing Road T-intersection
Existing AUL/CHR priroity arrangement
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Design Year (2038), Morning Peak Hour, With Development

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



MOVEMENT SUMMARY

Site: [1] Hanson/Landing (General)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Gladstone - Mount Larcom Road (Hanson Road) / Landing Road T-intersection
Existing AUL/CHR priroity arrangement
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Design Year (2038), Morning Peak Hour, With Development

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
East: Gladstone - Mount Larcom Road (Hanson Road)															
5	T1	All MCs	188	33.0	188	33.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	All MCs	198	33.0	198	33.0	0.232	9.6	LOS A	1.0	9.0	0.46	0.71	0.46	54.7
Approach			386	33.0	386	33.0	0.232	4.9	NA	1.0	9.0	0.24	0.36	0.24	64.6
North: Landing Road															
7	L2	All MCs	32	33.0	32	33.0	0.127	7.4	LOS A	0.4	3.9	0.56	0.72	0.56	46.3
9	R2	All MCs	25	33.0	25	33.0	0.127	18.1	LOS C	0.4	3.9	0.56	0.72	0.56	46.4
Approach			57	33.0	57	33.0	0.127	12.1	LOS B	0.4	3.9	0.56	0.72	0.56	46.4
West: Gladstone - Mount Larcom Road															
10	L2	All MCs	56	33.0	56	33.0	0.038	7.6	LOS A	0.0	0.0	0.00	0.63	0.00	55.1
11	T1	All MCs	204	33.0	204	33.0	0.126	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
Approach			260	33.0	260	33.0	0.126	1.6	NA	0.0	0.0	0.00	0.13	0.00	72.8
All Vehicles			703	33.0	703	33.0	0.232	4.3	NA	1.0	9.0	0.18	0.31	0.18	65.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Organisation: PREMISE GROUP SERVICES PTY LTD | Licence: PLUS / 1PC | Processed: Monday, 13 October 2025 10:42:37 AM
Project: C:\12dS\data\12dSynergy\P003805 Grenof Halogen, Yarwun_19685\14. Engineering - Traffic\02. SIDRA\P003805-R01.sipx

MOVEMENT SUMMARY

Site: [1] Hanson/Landing (General)

Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Gladstone - Mount Larcom Road (Hanson Road) / Landing Road T-intersection
Existing AUL/CHR priroity arrangement
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 2 | Design Year (2038), Afternoon Peak Hour, With Development

Vehicle Movement Performance

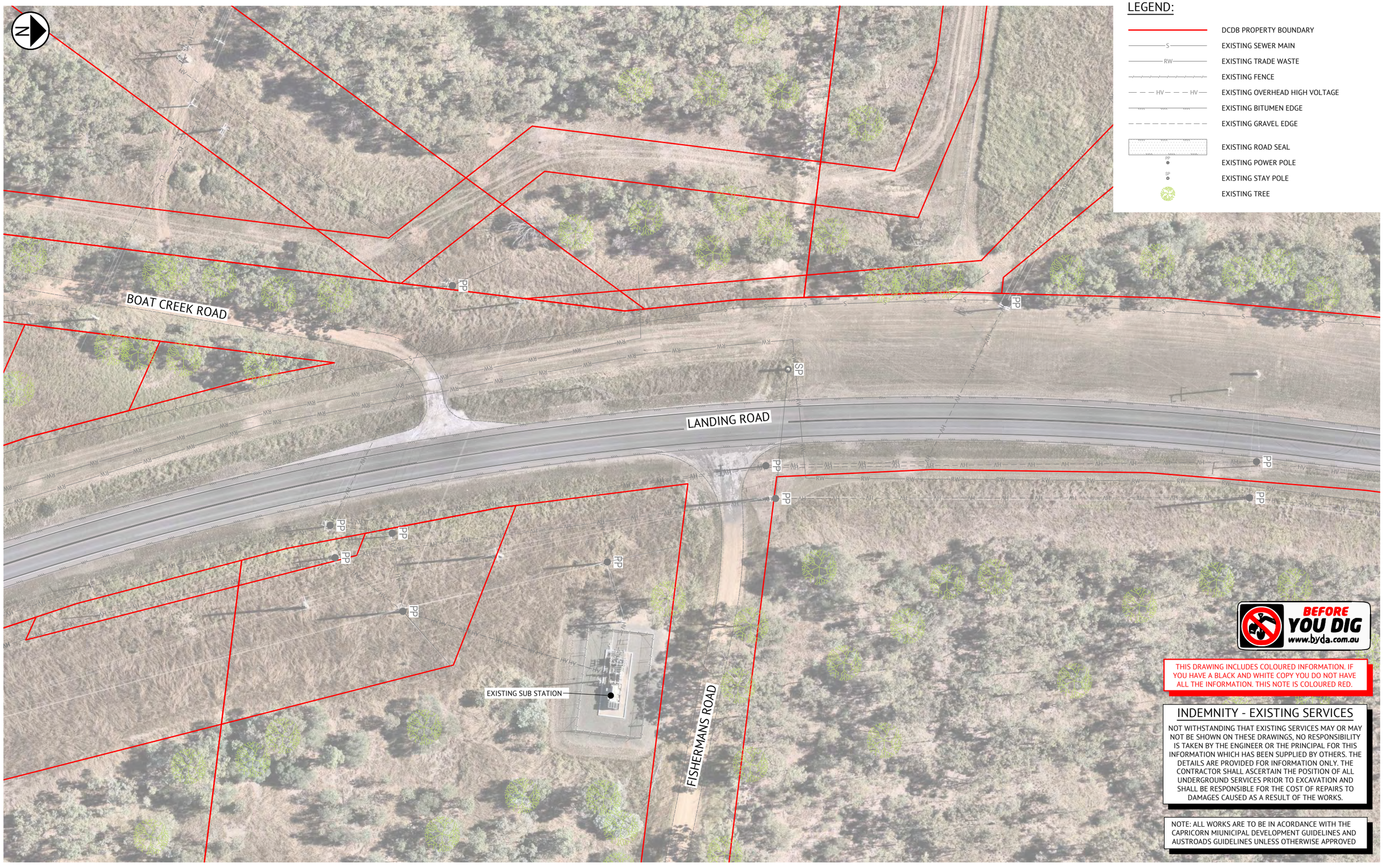
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
East: Gladstone - Mount Larcom Road (Hanson Road)															
5	T1	All MCs	305	33.0	305	33.0	0.188	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	All MCs	25	33.0	25	33.0	0.031	9.5	LOS A	0.1	1.0	0.43	0.67	0.43	54.8
Approach			331	33.0	331	33.0	0.188	0.8	NA	0.1	1.0	0.03	0.05	0.03	77.2
North: Landing Road															
7	L2	All MCs	218	33.0	218	33.0	0.431	9.9	LOS A	2.5	22.2	0.61	0.83	0.83	46.4
9	R2	All MCs	41	33.0	41	33.0	0.431	23.8	LOS C	2.5	22.2	0.61	0.83	0.83	46.4
Approach			259	33.0	259	33.0	0.431	12.1	LOS B	2.5	22.2	0.61	0.83	0.83	46.4
West: Gladstone - Mount Larcom Road															
10	L2	All MCs	22	33.0	22	33.0	0.015	7.5	LOS A	0.0	0.0	0.00	0.63	0.00	55.1
11	T1	All MCs	267	33.0	267	33.0	0.165	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
Approach			289	33.0	289	33.0	0.165	0.6	NA	0.0	0.0	0.00	0.05	0.00	77.2
All Vehicles			879	33.0	879	33.0	0.431	4.0	NA	2.5	22.2	0.19	0.28	0.26	64.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

APPENDIX I

LANDING ROAD / FISHERMANS ROAD INTERSETION LAYOUT

P003805-SKC001-rev3
P003805-SKC002-rev3
P003805-SKC003-rev3
P003805-SKC004-rev3
P003805-SKC005-rev3



LEGEND:

- DCDB PROPERTY BOUNDARY
- EXISTING SEWER MAIN
- EXISTING TRADE WASTE
- EXISTING FENCE
- EXISTING OVERHEAD HIGH VOLTAGE
- EXISTING BITUMEN EDGE
- EXISTING GRAVEL EDGE
- EXISTING ROAD SEAL
- EXISTING POWER POLE
- EXISTING STAY POLE
- EXISTING TREE

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10/10/2025	2	PRELIMINARY - NOT FOR CONSTRUCTION	AB	BJ
09/10/2025	1	PRELIMINARY - NOT FOR CONSTRUCTION	AB	BJ

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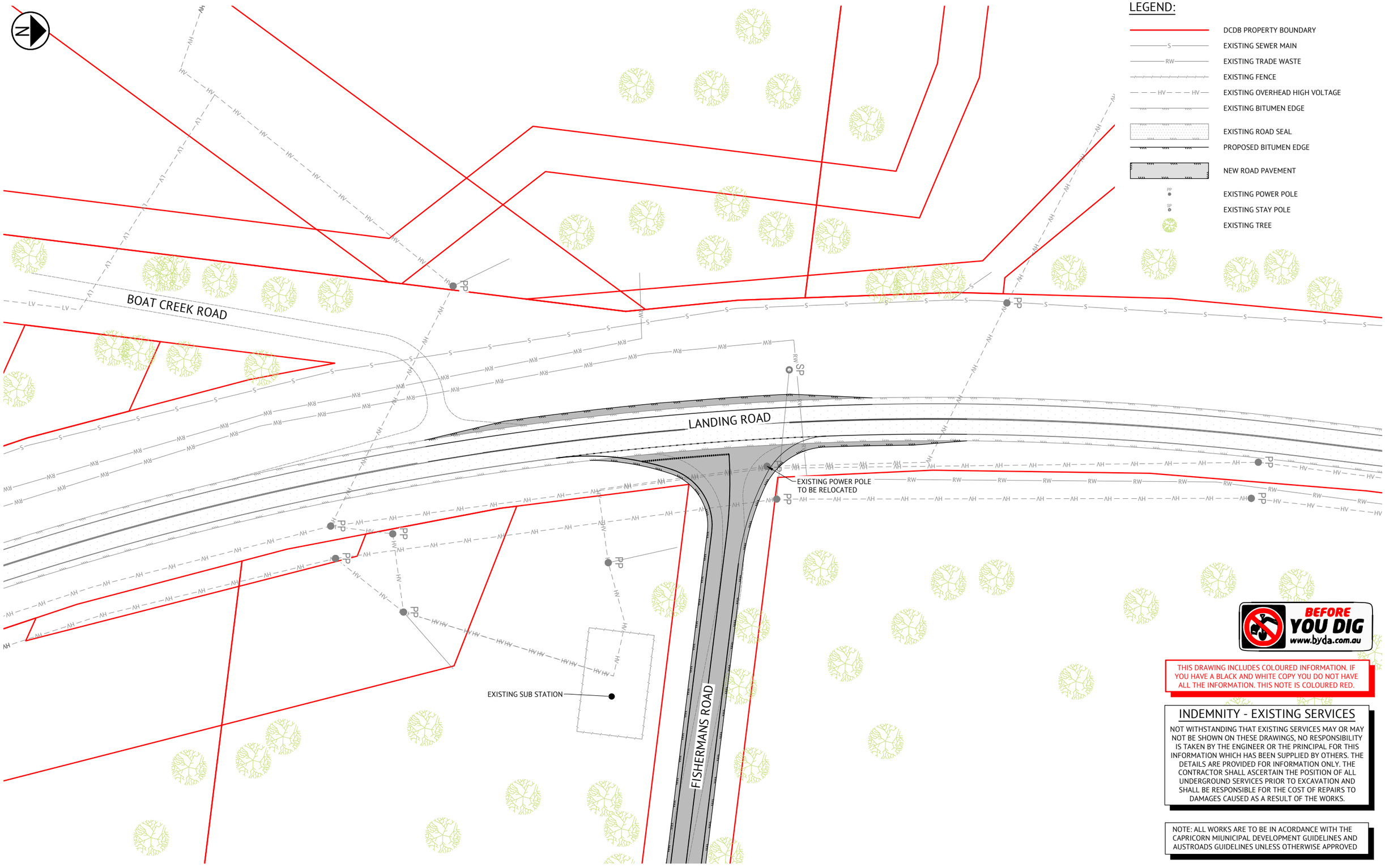
DESIGNED: ASHLEY BURGGRAAFF
CHECKED:
PROJECT MANAGER: BRADLEY JONES
ENGINEERING CERTIFICATION: BRADLEY JONES RPEQ 19986

SCALE
0 8 16 24m
SCALE 1:400 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: CQG CONSULTING
PROJECT: PROJECT HALOGEN
LOCATION: FISHERMANS ROAD, YARWUN
SHEET TITLE: EXISTING SITE PLAN

JOB CODE: P003805
SHEET NUMBER: SKC001
REV: 3



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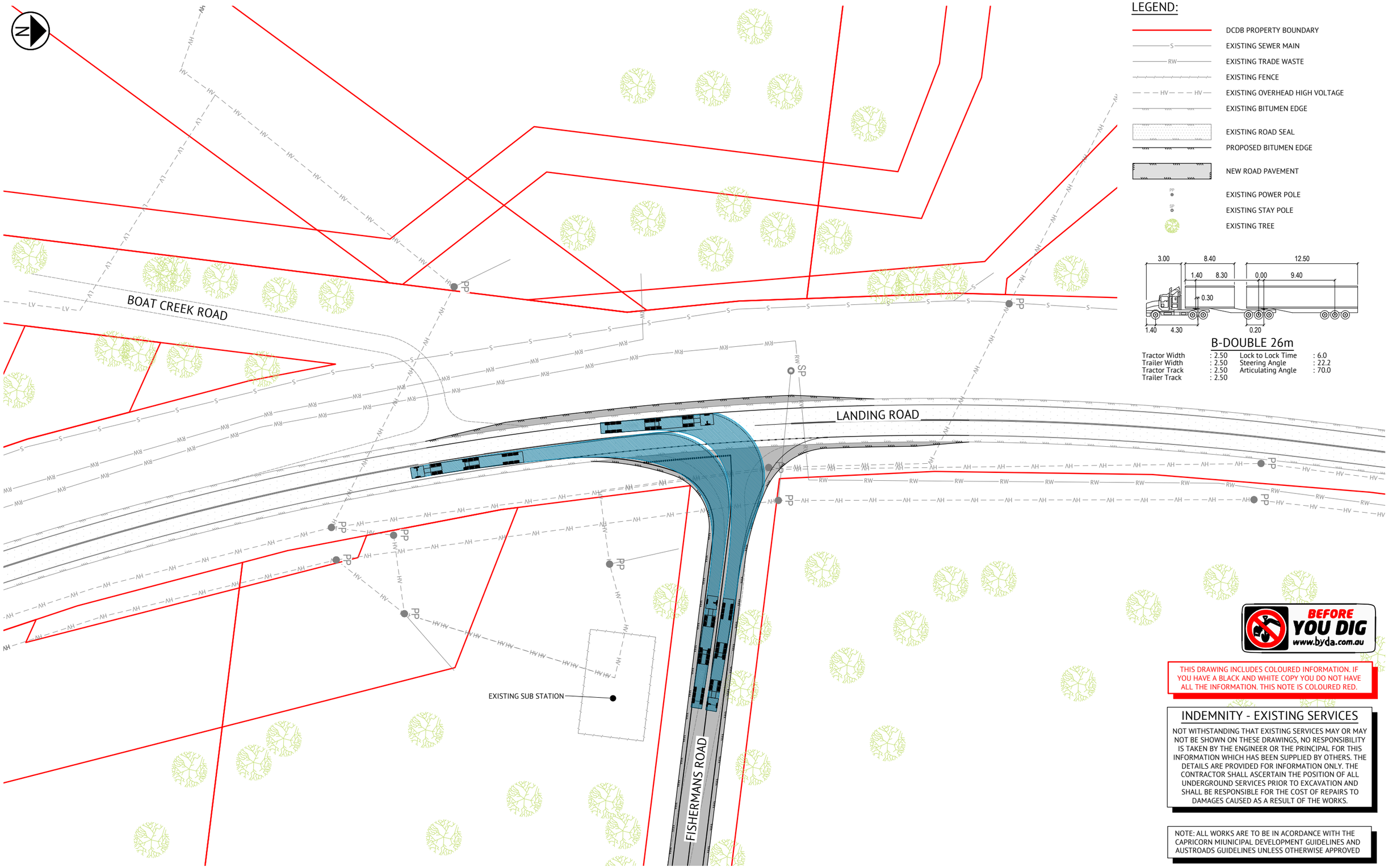
PROJECT MANAGER: BRADLEY JONES
ENGINEERING CERTIFICATION:
BRADLEY JONES RPEQ 19986

SCALE
0 8 16 24m
SCALE 1:400 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: CQG CONSULTING
PROJECT: PROJECT HALOGEN
LOCATION: FISHERMANS ROAD, YARWUN
SHEET TITLE: PROPOSED SITE PLAN

JOB CODE: P003805
SHEET NUMBER: SKC002
REV: 3



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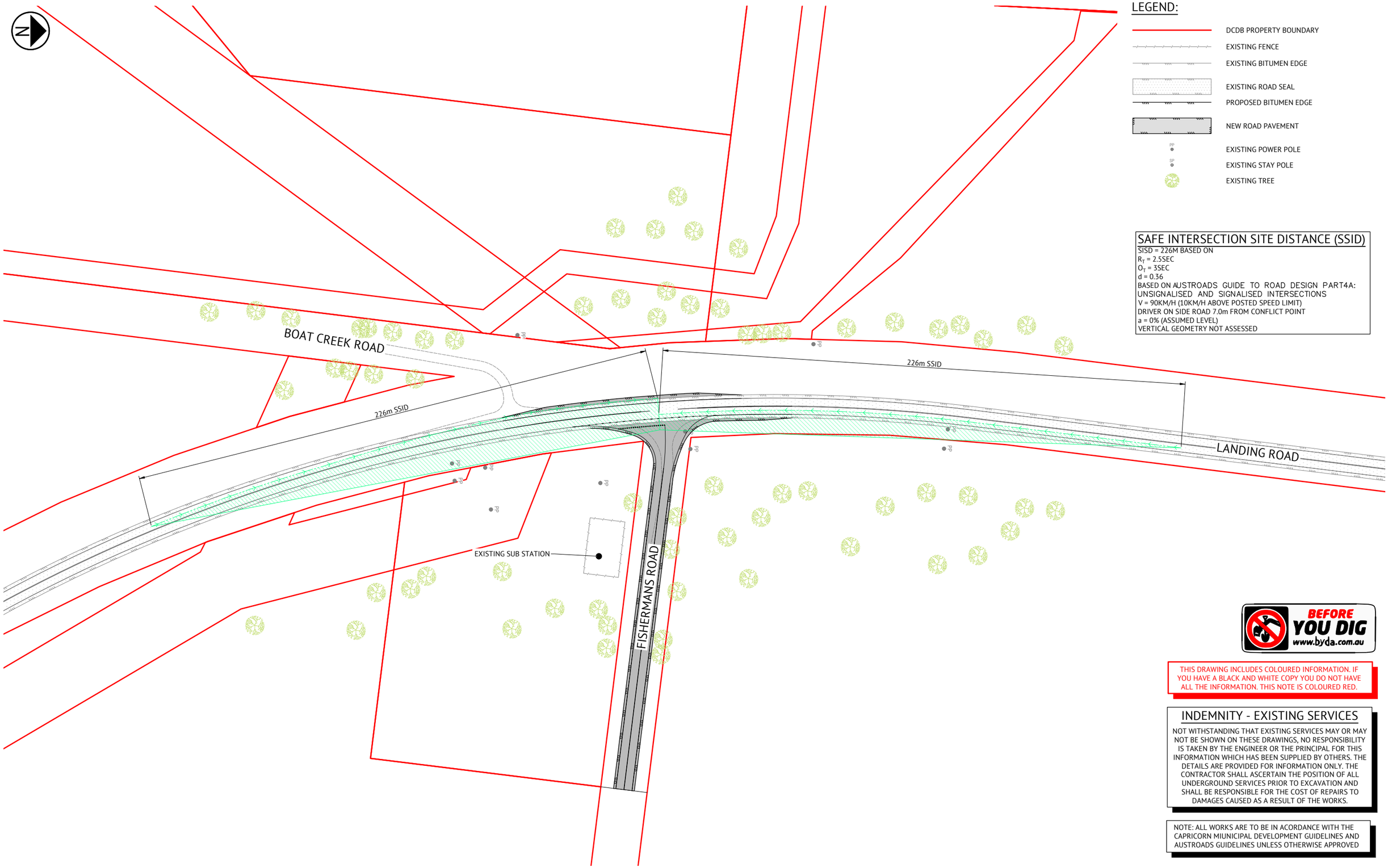
SCALE
0 8 16 24m
SCALE 1:400 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: CQG CONSULTING
PROJECT: PROJECT HALOGEN
LOCATION: FISHERMANS ROAD, YARWUN
SHEET TITLE: VEHICLE SWEPT PATHS

JOB CODE: P003805
SHEET NUMBER: SKC003
REV: 3



LEGEND:

- DCDB PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING BITUMEN EDGE
- EXISTING ROAD SEAL
- PROPOSED BITUMEN EDGE
- NEW ROAD PAVEMENT
- EXISTING POWER POLE
- EXISTING STAY POLE
- EXISTING TREE

SAFE INTERSECTION SITE DISTANCE (SSID)

SISD = 226M BASED ON
R_T = 2.5SEC
O_T = 3SEC
d = 0.36
BASED ON AUSTROADS GUIDE TO ROAD DESIGN PART4A: UNSIGNALISED AND SIGNALISED INTERSECTIONS
V = 90KM/H (10KM/H ABOVE POSTED SPEED LIMIT)
DRIVER ON SIDE ROAD 7.0m FROM CONFLICT POINT
a = 0% (ASSUMED LEVEL)
VERTICAL GEOMETRY NOT ASSESSED

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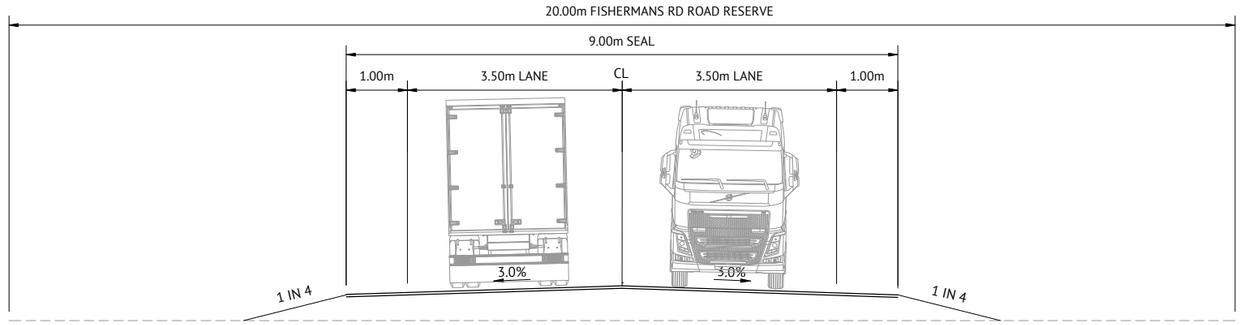
DESIGNED: ASHLEY BURGGRAAFF
CHECKED:
PROJECT MANAGER: BRADLEY JONES
ENGINEERING CERTIFICATION:
BRADLEY JONES RPEQ 19986

SCALE
0 15 30 45m
SCALE 1:750 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: CQG CONSULTING
PROJECT: PROJECT HALOGEN
LOCATION: FISHERMANS ROAD, YARWUN
SHEET TITLE: SAFE INTERSECTION SITE DISTANCE PLAN

JOB CODE: P003805
SHEET NUMBER: SKC004
REV: 3



FISHERMANS ROAD - TYPICAL SECTION

SCALE 1:50

LEGEND:

- DCDB PROPERTY BOUNDARY
- EXISTING SEWER MAIN
- EXISTING TRADE WASTE
- EXISTING FENCE
- EXISTING OVERHEAD HIGH VOLTAGE
- EXISTING BITUMEN EDGE
- EXISTING ROAD SEAL
- PROPOSED BITUMEN EDGE
- NEW ROAD PAVEMENT
- EXISTING POWER POLE
- EXISTING STAY POLE
- EXISTING TREE

BOAT CREEK ROAD

20.00m RESERVE

40.00m ROAD RESERVE

10.00m

18.75m

10.00m

26.00m

15.00m

15.00m

18.75m

9.50m

3.50m THROUGH LANE

3.50m THROUGH LANE

3.50m

LANDING ROAD

20.00m

12.50m

2.50m

R16.00m

R60.00m

R13.50m

R60.00m

EXISTING POWER POLE TO BE RELOCATED

20.00m RESERVE

9.00m

FISHERMANS ROAD

EXISTING SUB STATION

PP

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CHECKED:
PROJECT MANAGER: BRADLEY JONES
ENGINEERING CERTIFICATION:
BRADLEY JONES RPEQ 19986

SCALE
0 8 16 24m
SCALE 1:400 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: CQG CONSULTING
PROJECT: PROJECT HALOGEN
LOCATION: FISHERMANS ROAD, YARWUN
SHEET TITLE: ROADWORKS DETAILS

JOB CODE: P003805
SHEET NUMBER: SKC005
REV: 3

APPENDIX J

DEVELOPMENT PAVEMENT IMPACT

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1													Pavement Impact (SAR4s / ESAs one-way)													Pavement Impact (SAR5s one-way)			
2																	Gladstone - Mt Larcom Rd									Gladstone - Mt Larcom Rd			
3													Fishermans Road		Landing Road		East of Landing Road		West of Landing Road							West of Landing Road			
4		Loading (t)					Pavement Impact (SAR4s / ESAs per vehicle)					One-way Volume (vpd)	Eastbound	Westbound	Northboun	Southboun	Westbound	Eastbound	Westbound	Eastbound	Pavement Impact (SAR5s per vehicle)					Westbound			
5	**B-doubles**																												
6	Axles	Single	Tandem	Tri	Tri		Single	Tandem	Tri	Tri											Single	Tandem	Tri	Tri					
7	Tyres	Single	Dual	Dual	Dual	**TOTAL**	Single	Dual	Dual	Dual	**TOTAL**										Single	Dual	Dual	Dual	**TOTAL**				
8	Legal Loading	6.0	16.5	20.0	20.0	**62.5**	1.524	2.044	1.366	1.366	**6.300**										1.694	2.444	1.477	1.477	**7.090**				
9	Base Load per ESA	5.4	13.8	18.5	18.5																								
10	Unloaded Axle Group Load	4.5	5.0	6.5	6.5	**22.5**	0.482	0.017	0.015	0.015	**0.530**										0.402	0.006	0.005	0.005	**0.419**				
11	Payload	1.5	11.5	13.5	13.5	**40.0**																							
12	Inbound																												
13	NaCl	6.0	16.5	20.0	20.0	**62.5**	1.524	2.044	1.366	1.366	**6.300**	3.7	23.309		23.309					23.309	1.694	2.444	1.477	1.477	**7.090**				
14	NaOH	4.5	5.0	6.5	6.5	**22.5**	0.482	0.017	0.015	0.015	**0.530**	1.7	0.901		0.901		0.901				0.402	0.006	0.005	0.005	**0.419**				
15	NaOCl	4.5	5.0	6.5	6.5	**22.5**	0.482	0.017	0.015	0.015	**0.530**	3.4	1.802		1.802					1.802	0.402	0.006	0.005	0.005	**0.419**				
16	Outbound																												
17	NaCl	4.5	5.0	6.5	6.5	**22.5**	0.482	0.017	0.015	0.015	**0.530**	3.7		1.961		1.961			1.961		0.402	0.006	0.005	0.005	**0.419**	1.550			
18	NaOH	6.0	16.5	20.0	20.0	**62.5**	1.524	2.044	1.366	1.366	**6.300**	1.7		10.710		10.710		10.710			1.694	2.444	1.477	1.477	**7.090**				
19	NaOCl	6.0	16.5	20.0	20.0	**62.5**	1.524	2.044	1.366	1.366	**6.300**	3.4		21.419		21.419			21.419		1.694	2.444	1.477	1.477	**7.090**	24.108			
20	**Semi-trailers**																												
21	Axles	Single	Tandem	Tri			Single	Tandem	Tri												Single	Tandem	Tri						
22	Tyres	Single	Dual	Dual		**TOTAL**	Single	Dual	Dual		**TOTAL**										Single	Dual	Dual		**TOTAL**				
23	Legal Loading	6.0	16.5	20.0		**42.5**	1.524	2.044	1.366		**4.934**										1.694	2.444	1.477		**5.614**				
24	Base Load per ESA	5.4	13.8	18.5																									
25	Unloaded Axle Group Load	4.5	5.0	6.5		**16.0**	0.482	0.017	0.015		**0.515**										0.402	0.006	0.005		**0.413**				
26	Payload	1.5	11.5	13.5		**26.5**																							
27	Inbound																												
28	Cl_2 1,000kg-drum	5.2	10.2	12.6		**27.9**	0.843	0.294	0.213		**1.349**	2.4	3.239		3.239					3.239	0.807	0.217	0.144		**1.168**				
29	Cl_2 70kg-drum	5.0	8.5	10.6		**24.0**	0.708	0.142	0.107		**0.956**	0.6	0.574		0.574					0.574	0.649	0.087	0.061		**0.797**				
30	IBCs	4.6	6.0	7.7		**18.4**	0.543	0.037	0.030		**0.610**	1.6	0.976		0.976					0.976	0.466	0.016	0.013		**0.495**				
31	Outbound																												
32	Cl_2 1,000kg-drum	6.0	16.2	19.7		**41.9**	1.490	1.918	1.284		**4.692**	2.4		11.261		11.261			11.261		1.646	2.257	1.367		**5.270**	12.648			
33	Cl_2 70kg-drum	6.0	16.5	20.0		**42.5**	1.524	2.044	1.366		**4.934**	0.6		2.960		2.960			2.960		1.694	2.444	1.477		**5.614**	3.368			
34	IBCs	4.5	5.0	6.5		**16.0**	0.482	0.017	0.015		**0.515**	1.6		0.824		0.824			0.824		0.402	0.006	0.005		**0.413**	0.662			
35	**Four (4) axle trucks**																												
36	Axles	Tandem	Tandem				Single	Tandem													Single	Tandem							
37	Tyres	Single	Dual			**TOTAL**	Single	Dual			**TOTAL**										Single	Dual			**TOTAL**				
38	Legal Loading	11.0	16.5			**27.5**	2.044	2.044			**4.087**										2.444	2.444			**4.887**				
39	Base Load per ESA	9.2	13.8																										
40	Unloaded Axle Group Load	7.5	5.0			**12.5**	0.442	0.017			**0.459**										0.360	0.006			**0.366**				
41	Payload	3.5	11.5			**15.0**																							
42	Inbound																												
43	NaOH	7.5	5.0			**12.5**	0.442	0.017			**0.459**	0.9	0.413		0.413					0.413	0.360	0.006			**0.366**				
44	NaOCl bulk	7.5	5.0			**12.5**	0.442	0.017			**0.459**	2.6	1.193		1.193					1.193	0.360	0.006			**0.366**				
45	NaOCl IBC	7.5	5.0			**12.5**	0.442	0.017			**0.459**	1.4	0.642		0.642					0.642	0.360	0.006			**0.366**				
46	HCl bulk	7.5	5.0			**12.5**	0.442	0.017			**0.459**	2.6	1.193		1.193					1.193	0.360	0.006			**0.366**				
47	HCl IBC	7.5	5.0			**12.5**	0.442	0.017			**0.459**	4.1	1.881		1.881					1.881	0.360	0.006			**0.366**				
48	Outbound																												
49	NaOH	10.8	15.8			**26.6**	1.892	1.723			**3.615**	0.9		3.253		3.253			3.253		2.219	1.974			**4.193**	3.773			
50	NaOCl bulk	11.0	16.5			**27.5**	2.044	2.044			**4.087**	2.6		10.627		10.627			10.627		2.444	2.444			**4.887**	12.707			
51	NaOCl IBC	11.0	16.5			**27.5**	2.044	2.044			**4.087**	1.4		5.722		5.722			5.722		2.444	2.444			**4.887**	6.842			
52	HCl bulk	11.0	16.5			**27.5**	2.044	2.044			**4.087**	2.6		10.627		10.627			10.627		2.444	2.444			**4.887**	12.707			
53	HCl IBC	10.9	16.0			**26.9**	1.942	1.825			**3.767**	4.1		15.444		15.444			15.444		2.292	2.121			**4.413**	18.095			
54	**Two (2) axle truck**																												
55	Axles	Single	Single				Single	Single													Single	Single							
56	Tyres	Single	Dual			**TOTAL**	Single	Dual			**TOTAL**										Single	Dual			**TOTAL**				
57	Legal Loading	6.0	9.0			**15.0**	1.524	1.451			**2.975**										1.694	1.593			**3.286**				
58	Base Load per ESA	5.4	8.2																										
59	Unloaded Axle Group Load	4.5	4.0			**8.5**	0.482	0.057			**0.539**										0.402	0.028			**0.429**				
60	Payload	1.5	5.0			**6.5**																							
61	Inbound																												
62	Waste	4.5	4.0			**8.5**	0.482	0.057			**0.539**	0.3	0.162		0.162		0.162				0.402	0.028			**0.429**				
63	Outbound																												
64	Waste	6.0	9.0			**15.0**	1.524	1.451			**2.975**	0.3		0.893		0.893		0.893			1.694	1.593			**3.286**				
65	**TOTAL**											**50.6**	**36.286**	**95.701**	**36.286**	**95.701**	**1.063**	**11.602**	**84.099**	**35.223**						**96.459**			
66	Existing SAR4s / ESAs														803.2	803.2	1968	2147.5	1276.8	1225.6									
67	% background														4.5%	11.9%	0.1%	0.5%	6.6%	2.9%									

APPENDIX K

STATE-CONTROLLED ROADS DEVELOPMENT CONTRIBUTION CALCULATION

Table 3
Marginal cost data for sealed segments of the selected road sections

RoadName	ROAD_SECTION_ID	SUPERSET_CWAY	CARRIAGEWAY_CODE	TDIST_START	TDIST_END	Length	SEAL_FLAG	MC_COSTING_PAVEMENT_TYPE	MarginalCost	Development SAR PER DAY	DEVELOPMENT SAR PER YEAR	Development contribution ($)
GLADSTONE - MOUNT LARCOM	181	1	1	12.1	12.2	0.1	sealed	AC	3.29	96.459	35208	$ 115.83
GLADSTONE - MOUNT LARCOM	181	1	1	12.2	12.3	0.1	sealed	AC	4.9	96.459	35208	$ 172.52
GLADSTONE - MOUNT LARCOM	181	1	1	12.3	12.4	0.1	sealed	AC	3.14	96.459	35208	$ 110.55
GLADSTONE - MOUNT LARCOM	181	1	1	12.4	12.5	0.1	sealed	AC	3	96.459	35208	$ 105.62
GLADSTONE - MOUNT LARCOM	181	1	1	12.5	12.6	0.1	sealed	GN	3.02	84.099	30696	$ 92.70
GLADSTONE - MOUNT LARCOM	181	1	1	12.6	12.7	0.1	sealed	GN	2.86	84.099	30696	$ 87.79
GLADSTONE - MOUNT LARCOM	181	1	1	12.7	12.8	0.1	sealed	GN	3.02	84.099	30696	$ 92.70
GLADSTONE - MOUNT LARCOM	181	1	1	12.8	12.9	0.1	sealed	GN	2.99	84.099	30696	$ 91.78
GLADSTONE - MOUNT LARCOM	181	1	1	12.9	13	0.1	sealed	GN	3.9	84.099	30696	$ 119.71
GLADSTONE - MOUNT LARCOM	181	1	1	13	13.1	0.1	sealed	GN	3.25	84.099	30696	$ 99.76
GLADSTONE - MOUNT LARCOM	181	1	1	13.1	13.2	0.1	sealed	GN	2.95	84.099	30696	$ 90.55
GLADSTONE - MOUNT LARCOM	181	1	1	13.2	13.3	0.1	sealed	GN	2.82	84.099	30696	$ 86.56
GLADSTONE - MOUNT LARCOM	181	1	1	13.3	13.4	0.1	sealed	GN	3.33	84.099	30696	$ 102.22
GLADSTONE - MOUNT LARCOM	181	1	1	13.4	13.5	0.1	sealed	GN	4.23	84.099	30696	$ 129.84
GLADSTONE - MOUNT LARCOM	181	1	1	13.5	13.6	0.1	sealed	GN	4.35	84.099	30696	$ 133.53
GLADSTONE - MOUNT LARCOM	181	1	1	13.6	13.7	0.1	sealed	GN	4.25	84.099	30696	$ 130.46
GLADSTONE - MOUNT LARCOM	181	1	1	13.7	13.8	0.1	sealed	GN	4.08	84.099	30696	$ 125.24
GLADSTONE - MOUNT LARCOM	181	1	1	13.8	13.9	0.1	sealed	GN	4.13	84.099	30696	$ 126.78
GLADSTONE - MOUNT LARCOM	181	1	1	13.9	14	0.1	sealed	GN	4.58	84.099	30696	$ 140.59
GLADSTONE - MOUNT LARCOM	181	1	1	14	14.1	0.1	sealed	GN	5.23	84.099	30696	$ 160.54
GLADSTONE - MOUNT LARCOM	181	1	1	14.1	14.2	0.1	sealed	GN	4	84.099	30696	$ 122.78
GLADSTONE - MOUNT LARCOM	181	1	1	14.2	14.3	0.1	sealed	GN	4.01	84.099	30696	$ 123.09
GLADSTONE - MOUNT LARCOM	181	1	1	14.3	14.4	0.1	sealed	GN	4.71	84.099	30696	$ 144.58
GLADSTONE - MOUNT LARCOM	181	1	1	14.4	14.5	0.1	sealed	GN	4.4	84.099	30696	$ 135.06
GLADSTONE - MOUNT LARCOM	181	1	1	14.5	14.6	0.1	sealed	GN	4.17	84.099	30696	$ 128.00
GLADSTONE - MOUNT LARCOM	181	1	1	14.6	14.7	0.1	sealed	GN	4.03	84.099	30696	$ 123.71
GLADSTONE - MOUNT LARCOM	181	1	1	14.7	14.8	0.1	sealed	GN	4.15	84.099	30696	$ 127.39
GLADSTONE - MOUNT LARCOM	181	1	1	14.8	14.9	0.1	sealed	GN	4.03	84.099	30696	$ 123.71
GLADSTONE - MOUNT LARCOM	181	1	1	14.9	15	0.1	sealed	GN	4.05	84.099	30696	$ 124.32
GLADSTONE - MOUNT LARCOM	181	1	1	15	15.1	0.1	sealed	GN	4.13	84.099	30696	$ 126.78
GLADSTONE - MOUNT LARCOM	181	1	1	15.1	15.2	0.1	sealed	GN	4.2	84.099	30696	$ 128.92
GLADSTONE - MOUNT LARCOM	181	1	1	15.2	15.3	0.1	sealed	GN	3.45	84.099	30696	$ 105.90
GLADSTONE - MOUNT LARCOM	181	1	1	15.3	15.4	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	15.4	15.5	0.1	sealed	GN	3.08	84.099	30696	$ 94.54
GLADSTONE - MOUNT LARCOM	181	1	1	15.5	15.6	0.1	sealed	GN	3.01	84.099	30696	$ 92.40
GLADSTONE - MOUNT LARCOM	181	1	1	15.6	15.7	0.1	sealed	GN	2.99	84.099	30696	$ 91.78
GLADSTONE - MOUNT LARCOM	181	1	1	15.7	15.8	0.1	sealed	GN	3.05	84.099	30696	$ 93.62
GLADSTONE - MOUNT LARCOM	181	1	1	15.8	15.9	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	15.9	16	0.1	sealed	GN	2.98	84.099	30696	$ 91.47
GLADSTONE - MOUNT LARCOM	181	1	1	16	16.1	0.1	sealed	GN	3.04	84.099	30696	$ 93.32
GLADSTONE - MOUNT LARCOM	181	1	1	16.1	16.2	0.1	sealed	GN	3.67	84.099	30696	$ 112.65
GLADSTONE - MOUNT LARCOM	181	1	1	16.2	16.3	0.1	sealed	AC	4.79	96.459	35208	$ 168.64
GLADSTONE - MOUNT LARCOM	181	1	1	16.3	16.4	0.1	sealed	GN	4.4	84.099	30696	$ 135.06
GLADSTONE - MOUNT LARCOM	181	1	1	16.4	16.5	0.1	sealed	GN	3.77	84.099	30696	$ 115.72
GLADSTONE - MOUNT LARCOM	181	1	1	16.5	16.6	0.1	sealed	GN	3.1	84.099	30696	$ 95.16
GLADSTONE - MOUNT LARCOM	181	1	1	16.6	16.7	0.1	sealed	GN	3	84.099	30696	$ 92.09
GLADSTONE - MOUNT LARCOM	181	1	1	16.7	16.8	0.1	sealed	GN	2.95	84.099	30696	$ 90.55
GLADSTONE - MOUNT LARCOM	181	1	1	16.8	16.9	0.1	sealed	GN	2.99	84.099	30696	$ 91.78
GLADSTONE - MOUNT LARCOM	181	1	1	16.9	17	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	17	17.1	0.1	sealed	GN	2.99	84.099	30696	$ 91.78
GLADSTONE - MOUNT LARCOM	181	1	1	17.1	17.2	0.1	sealed	GN	4.18	84.099	30696	$ 128.31
GLADSTONE - MOUNT LARCOM	181	1	1	17.2	17.3	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	17.3	17.4	0.1	sealed	GN	2.99	84.099	30696	$ 91.78
GLADSTONE - MOUNT LARCOM	181	1	1	17.4	17.5	0.1	sealed	GN	2.96	84.099	30696	$ 90.86
GLADSTONE - MOUNT LARCOM	181	1	1	17.5	17.6	0.1	sealed	GN	3	84.099	30696	$ 92.09
GLADSTONE - MOUNT LARCOM	181	1	1	17.6	17.7	0.1	sealed	GN	3.01	84.099	30696	$ 92.40
GLADSTONE - MOUNT LARCOM	181	1	1	17.7	17.8	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	17.8	17.9	0.1	sealed	GN	3.19	84.099	30696	$ 97.92
GLADSTONE - MOUNT LARCOM	181	1	1	17.9	18	0.1	sealed	GN	4.29	84.099	30696	$ 131.69
GLADSTONE - MOUNT LARCOM	181	1	1	18	18.1	0.1	sealed	GN	3.23	84.099	30696	$ 99.15
GLADSTONE - MOUNT LARCOM	181	1	1	18.1	18.2	0.1	sealed	GN	4.38	84.099	30696	$ 134.45
GLADSTONE - MOUNT LARCOM	181	1	1	18.2	18.3	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	18.3	18.4	0.1	sealed	GN	2.95	84.099	30696	$ 90.55
GLADSTONE - MOUNT LARCOM	181	1	1	18.4	18.5	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	18.5	18.6	0.1	sealed	AC	3	96.459	35208	$ 105.62
GLADSTONE - MOUNT LARCOM	181	1	1	18.6	18.7	0.1	sealed	GN	2.75	84.099	30696	$ 84.41
GLADSTONE - MOUNT LARCOM	181	1	1	18.7	18.8	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	18.8	18.9	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	18.9	19	0.1	sealed	AC	3.02	96.459	35208	$ 106.33
GLADSTONE - MOUNT LARCOM	181	1	1	19	19.1	0.1	sealed	AC	2.99	96.459	35208	$ 105.27
GLADSTONE - MOUNT LARCOM	181	1	1	19.1	19.2	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	19.2	19.3	0.1	sealed	GN	2.96	84.099	30696	$ 90.86
GLADSTONE - MOUNT LARCOM	181	1	1	19.3	19.4	0.1	sealed	GN	3.01	84.099	30696	$ 92.40
GLADSTONE - MOUNT LARCOM	181	1	1	19.4	19.5	0.1	sealed	GN	2.93	84.099	30696	$ 89.94
GLADSTONE - MOUNT LARCOM	181	1	1	19.5	19.6	0.1	sealed	GN	2.97	84.099	30696	$ 91.17

Table 3
Marginal cost data for sealed segments of the selected road sections

RoadName	ROAD_SECTION_ID	SUPERSET_CWAY	CARRIAGEWAY_CODE	TDIST_START	TDIST_END	Length	SEAL_FLAG	MC_COSTING_PAVEMENT_TYPE	MarginalCost	Development SAR PER DAY	DEVELOPMENT SAR PER YEAR	Development contribution ($)
GLADSTONE - MOUNT LARCOM	181	1	1	19.6	19.7	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	19.7	19.8	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	19.8	19.9	0.1	sealed	GN	3.73	84.099	30696	$ 114.50
GLADSTONE - MOUNT LARCOM	181	1	1	19.9	20	0.1	sealed	AC	3.95	96.459	35208	$ 139.07
GLADSTONE - MOUNT LARCOM	181	1	1	20	20.1	0.1	sealed	GN	4.69	84.099	30696	$ 143.96
GLADSTONE - MOUNT LARCOM	181	1	1	20.1	20.2	0.1	sealed	GN	4.24	84.099	30696	$ 130.15
GLADSTONE - MOUNT LARCOM	181	1	1	20.2	20.3	0.1	sealed	GN	3.63	84.099	30696	$ 111.43
GLADSTONE - MOUNT LARCOM	181	1	1	20.3	20.4	0.1	sealed	GN	2.95	84.099	30696	$ 90.55
GLADSTONE - MOUNT LARCOM	181	1	1	20.4	20.5	0.1	sealed	GN	3.08	84.099	30696	$ 94.54
GLADSTONE - MOUNT LARCOM	181	1	1	20.5	20.6	0.1	sealed	GN	2.93	84.099	30696	$ 89.94
GLADSTONE - MOUNT LARCOM	181	1	1	20.6	20.7	0.1	sealed	GN	3.08	84.099	30696	$ 94.54
GLADSTONE - MOUNT LARCOM	181	1	1	20.7	20.8	0.1	sealed	GN	3.68	84.099	30696	$ 112.96
GLADSTONE - MOUNT LARCOM	181	1	1	20.8	20.9	0.1	sealed	GN	3.69	84.099	30696	$ 113.27
GLADSTONE - MOUNT LARCOM	181	1	1	20.9	21	0.1	sealed	GN	3.7	84.099	30696	$ 113.58
GLADSTONE - MOUNT LARCOM	181	1	1	21	21.1	0.1	sealed	GN	3.82	84.099	30696	$ 117.26
GLADSTONE - MOUNT LARCOM	181	1	1	21.1	21.2	0.1	sealed	GN	3.92	84.099	30696	$ 120.33
GLADSTONE - MOUNT LARCOM	181	1	1	21.2	21.3	0.1	sealed	GN	4.3	84.099	30696	$ 131.99
GLADSTONE - MOUNT LARCOM	181	1	1	21.3	21.4	0.1	sealed	GN	4.31	84.099	30696	$ 132.30
GLADSTONE - MOUNT LARCOM	181	1	1	21.4	21.5	0.1	sealed	GN	3.62	84.099	30696	$ 111.12
GLADSTONE - MOUNT LARCOM	181	1	1	21.5	21.6	0.1	sealed	GN	2.95	84.099	30696	$ 90.55
GLADSTONE - MOUNT LARCOM	181	1	1	21.6	21.7	0.1	sealed	GN	3.02	84.099	30696	$ 92.70
GLADSTONE - MOUNT LARCOM	181	1	1	21.7	21.8	0.1	sealed	GN	2.67	84.099	30696	$ 81.96
GLADSTONE - MOUNT LARCOM	181	1	1	21.8	21.9	0.1	sealed	GN	2.91	84.099	30696	$ 89.33
GLADSTONE - MOUNT LARCOM	181	1	1	21.9	22	0.1	sealed	GN	2.96	84.099	30696	$ 90.86
GLADSTONE - MOUNT LARCOM	181	1	1	22	22.1	0.1	sealed	GN	2.94	84.099	30696	$ 90.25
GLADSTONE - MOUNT LARCOM	181	1	1	22.1	22.2	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	22.2	22.3	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	22.3	22.4	0.1	sealed	GN	3	84.099	30696	$ 92.09
GLADSTONE - MOUNT LARCOM	181	1	1	22.4	22.5	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	22.5	22.6	0.1	sealed	GN	2.98	84.099	30696	$ 91.47
GLADSTONE - MOUNT LARCOM	181	1	1	22.6	22.7	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	22.7	22.8	0.1	sealed	GN	3.35	84.099	30696	$ 102.83
GLADSTONE - MOUNT LARCOM	181	1	1	22.8	22.9	0.1	sealed	GN	5.01	84.099	30696	$ 153.79
GLADSTONE - MOUNT LARCOM	181	1	1	22.9	23	0.1	sealed	GN	4.69	84.099	30696	$ 143.96
GLADSTONE - MOUNT LARCOM	181	1	1	23	23.1	0.1	sealed	GN	3.13	84.099	30696	$ 96.08
GLADSTONE - MOUNT LARCOM	181	1	1	23.1	23.2	0.1	sealed	GN	3.02	84.099	30696	$ 92.70
GLADSTONE - MOUNT LARCOM	181	1	1	23.2	23.3	0.1	sealed	GN	3	84.099	30696	$ 92.09
GLADSTONE - MOUNT LARCOM	181	1	1	23.3	23.4	0.1	sealed	GN	3	84.099	30696	$ 92.09
GLADSTONE - MOUNT LARCOM	181	1	1	23.4	23.5	0.1	sealed	GN	3.02	84.099	30696	$ 92.70
GLADSTONE - MOUNT LARCOM	181	1	1	23.5	23.6	0.1	sealed	GN	3	84.099	30696	$ 92.09
GLADSTONE - MOUNT LARCOM	181	1	1	23.6	23.7	0.1	sealed	GN	2.95	84.099	30696	$ 90.55
GLADSTONE - MOUNT LARCOM	181	1	1	23.7	23.8	0.1	sealed	GN	2.95	84.099	30696	$ 90.55
GLADSTONE - MOUNT LARCOM	181	1	1	23.8	23.9	0.1	sealed	GN	2.98	84.099	30696	$ 91.47
GLADSTONE - MOUNT LARCOM	181	1	1	23.9	24	0.1	sealed	GN	2.98	84.099	30696	$ 91.47
GLADSTONE - MOUNT LARCOM	181	1	1	24	24.1	0.1	sealed	GN	2.9	84.099	30696	$ 89.02
GLADSTONE - MOUNT LARCOM	181	1	1	24.1	24.2	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	24.2	24.3	0.1	sealed	GN	3.02	84.099	30696	$ 92.70
GLADSTONE - MOUNT LARCOM	181	1	1	24.3	24.4	0.1	sealed	GN	2.99	84.099	30696	$ 91.78
GLADSTONE - MOUNT LARCOM	181	1	1	24.4	24.5	0.1	sealed	GN	3.01	84.099	30696	$ 92.40
GLADSTONE - MOUNT LARCOM	181	1	1	24.5	24.6	0.1	sealed	GN	2.99	84.099	30696	$ 91.78
GLADSTONE - MOUNT LARCOM	181	1	1	24.6	24.7	0.1	sealed	GN	3.02	84.099	30696	$ 92.70
GLADSTONE - MOUNT LARCOM	181	1	1	24.7	24.8	0.1	sealed	GN	2.98	84.099	30696	$ 91.47
GLADSTONE - MOUNT LARCOM	181	1	1	24.8	24.9	0.1	sealed	GN	3.48	84.099	30696	$ 106.82
GLADSTONE - MOUNT LARCOM	181	1	1	24.9	25	0.1	sealed	GN	3.57	84.099	30696	$ 109.59
GLADSTONE - MOUNT LARCOM	181	1	1	25	25.1	0.1	sealed	GN	3.61	84.099	30696	$ 110.81
GLADSTONE - MOUNT LARCOM	181	1	1	25.1	25.2	0.1	sealed	GN	3.61	84.099	30696	$ 110.81
GLADSTONE - MOUNT LARCOM	181	1	1	25.2	25.3	0.1	sealed	GN	3.32	84.099	30696	$ 101.91
GLADSTONE - MOUNT LARCOM	181	1	1	25.3	25.4	0.1	sealed	GN	3.59	84.099	30696	$ 110.20
GLADSTONE - MOUNT LARCOM	181	1	1	25.4	25.5	0.1	sealed	GN	3.54	84.099	30696	$ 108.66
GLADSTONE - MOUNT LARCOM	181	1	1	25.5	25.6	0.1	sealed	GN	3.45	84.099	30696	$ 105.90
GLADSTONE - MOUNT LARCOM	181	1	1	25.6	25.7	0.1	sealed	GN	3.33	84.099	30696	$ 102.22
GLADSTONE - MOUNT LARCOM	181	1	1	25.7	25.8	0.1	sealed	GN	3.05	84.099	30696	$ 93.62
GLADSTONE - MOUNT LARCOM	181	1	1	25.8	25.9	0.1	sealed	GN	2.75	84.099	30696	$ 84.41
GLADSTONE - MOUNT LARCOM	181	1	1	25.9	26	0.1	sealed	GN	2.92	84.099	30696	$ 89.63
GLADSTONE - MOUNT LARCOM	181	1	1	26	26.1	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	26.1	26.2	0.1	sealed	GN	2.98	84.099	30696	$ 91.47
GLADSTONE - MOUNT LARCOM	181	1	1	26.2	26.3	0.1	sealed	GN	2.94	84.099	30696	$ 90.25
GLADSTONE - MOUNT LARCOM	181	1	1	26.3	26.4	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	26.4	26.5	0.1	sealed	GN	3.06	84.099	30696	$ 93.93
GLADSTONE - MOUNT LARCOM	181	1	1	26.5	26.6	0.1	sealed	GN	2.96	84.099	30696	$ 90.86
GLADSTONE - MOUNT LARCOM	181	1	1	26.6	26.7	0.1	sealed	GN	3.41	84.099	30696	$ 104.67
GLADSTONE - MOUNT LARCOM	181	1	1	26.7	26.8	0.1	sealed	GN	4.42	84.099	30696	$ 135.68
GLADSTONE - MOUNT LARCOM	181	1	1	26.8	26.9	0.1	sealed	GN	3.05	84.099	30696	$ 93.62
GLADSTONE - MOUNT LARCOM	181	1	1	26.9	27	0.1	sealed	GN	2.94	84.099	30696	$ 90.25
GLADSTONE - MOUNT LARCOM	181	1	1	27	27.1	0.1	sealed	GN	3.73	84.099	30696	$ 114.50

Table 3
Marginal cost data for sealed segments of the selected road sections

RoadName	ROAD_SECTION_ID	SUPERSET_CWAY	CARRIAGEWAY_CODE	TDIST_START	TDIST_END	Length	SEAL_FLAG	MC_COSTING_PAVEMENT_TYPE	MarginalCost	Development SAR PER DAY	DEVELOPMENT SAR PER YEAR	Development contribution ($)
GLADSTONE - MOUNT LARCOM	181	1	1	27.1	27.2	0.1	sealed	GN	4.24	84.099	30696	$ 130.15
GLADSTONE - MOUNT LARCOM	181	1	1	27.2	27.3	0.1	sealed	GN	3	84.099	30696	$ 92.09
GLADSTONE - MOUNT LARCOM	181	1	1	27.3	27.4	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	27.4	27.5	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	27.5	27.6	0.1	sealed	GN	3.01	84.099	30696	$ 92.40
GLADSTONE - MOUNT LARCOM	181	1	1	27.6	27.7	0.1	sealed	GN	3	84.099	30696	$ 92.09
GLADSTONE - MOUNT LARCOM	181	1	1	27.7	27.8	0.1	sealed	GN	3.04	84.099	30696	$ 93.32
GLADSTONE - MOUNT LARCOM	181	1	1	27.8	27.9	0.1	sealed	GN	2.96	84.099	30696	$ 90.86
GLADSTONE - MOUNT LARCOM	181	1	1	27.9	28	0.1	sealed	GN	3.04	84.099	30696	$ 93.32
GLADSTONE - MOUNT LARCOM	181	1	1	28	28.1	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	28.1	28.2	0.1	sealed	GN	3.06	84.099	30696	$ 93.93
GLADSTONE - MOUNT LARCOM	181	1	1	28.2	28.3	0.1	sealed	GN	3.04	84.099	30696	$ 93.32
GLADSTONE - MOUNT LARCOM	181	1	1	28.3	28.4	0.1	sealed	GN	3.04	84.099	30696	$ 93.32
GLADSTONE - MOUNT LARCOM	181	1	1	28.4	28.5	0.1	sealed	GN	2.98	84.099	30696	$ 91.47
GLADSTONE - MOUNT LARCOM	181	1	1	28.5	28.6	0.1	sealed	GN	3.06	84.099	30696	$ 93.93
GLADSTONE - MOUNT LARCOM	181	1	1	28.6	28.7	0.1	sealed	GN	3.04	84.099	30696	$ 93.32
GLADSTONE - MOUNT LARCOM	181	1	1	28.7	28.8	0.1	sealed	GN	3.04	84.099	30696	$ 93.32
GLADSTONE - MOUNT LARCOM	181	1	1	28.8	28.9	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	28.9	29	0.1	sealed	GN	2.98	84.099	30696	$ 91.47
GLADSTONE - MOUNT LARCOM	181	1	1	29	29.1	0.1	sealed	GN	3.06	84.099	30696	$ 93.93
GLADSTONE - MOUNT LARCOM	181	1	1	29.1	29.2	0.1	sealed	GN	2.98	84.099	30696	$ 91.47
GLADSTONE - MOUNT LARCOM	181	1	1	29.2	29.3	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	29.3	29.4	0.1	sealed	GN	3.05	84.099	30696	$ 93.62
GLADSTONE - MOUNT LARCOM	181	1	1	29.4	29.5	0.1	sealed	GN	3.05	84.099	30696	$ 93.62
GLADSTONE - MOUNT LARCOM	181	1	1	29.5	29.6	0.1	sealed	GN	2.98	84.099	30696	$ 91.47
GLADSTONE - MOUNT LARCOM	181	1	1	29.6	29.7	0.1	sealed	GN	3.04	84.099	30696	$ 93.32
GLADSTONE - MOUNT LARCOM	181	1	1	29.7	29.8	0.1	sealed	GN	2.96	84.099	30696	$ 90.86
GLADSTONE - MOUNT LARCOM	181	1	1	29.8	29.9	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	29.9	30	0.1	sealed	GN	3.01	84.099	30696	$ 92.40
GLADSTONE - MOUNT LARCOM	181	1	1	30	30.1	0.1	sealed	GN	3.05	84.099	30696	$ 93.62
GLADSTONE - MOUNT LARCOM	181	1	1	30.1	30.2	0.1	sealed	GN	3.03	84.099	30696	$ 93.01
GLADSTONE - MOUNT LARCOM	181	1	1	30.2	30.3	0.1	sealed	GN	2.97	84.099	30696	$ 91.17
GLADSTONE - MOUNT LARCOM	181	1	1	30.3	30.4	0.1	sealed	GN	3.04	84.099	30696	$ 93.32
GLADSTONE - MOUNT LARCOM	181	1	1	30.4	30.5	0.1	sealed	GN	2.96	84.099	30696	$ 90.86
GLADSTONE - MOUNT LARCOM	181	1	1	30.5	30.6	0.1	sealed	GN	2.96	84.099	30696	$ 90.86
GLADSTONE - MOUNT LARCOM	181	1	1	30.6	30.7	0.1	sealed	GN	2.96	84.099	30696	$ 90.86
GLADSTONE - MOUNT LARCOM	181	1	1	30.7	30.8	0.1	sealed	GN	3.09	84.099	30696	$ 94.85
GLADSTONE - MOUNT LARCOM	181	1	1	30.8	30.9	0.1	sealed	GN	3.6	84.099	30696	$ 110.51
GLADSTONE - MOUNT LARCOM	181	1	1	30.9	31	0.1	sealed	GN	3.82	84.099	30696	$ 117.26
GLADSTONE - MOUNT LARCOM	181	1	1	31	31.1	0.1	sealed	GN	4.03	84.099	30696	$ 123.71
GLADSTONE - MOUNT LARCOM	181	1	1	31.1	31.2	0.1	sealed	GN	4.12	84.099	30696	$ 126.47
GLADSTONE - MOUNT LARCOM	181	1	1	31.2	31.3	0.1	sealed	GN	4.16	84.099	30696	$ 127.70
GLADSTONE - MOUNT LARCOM	181	1	1	31.3	31.4	0.1	sealed	GN	4.18	84.099	30696	$ 128.31
GLADSTONE - MOUNT LARCOM	181	1	1	31.4	31.5	0.1	sealed	GN	4.21	84.099	30696	$ 129.23
GLADSTONE - MOUNT LARCOM	181	1	1	31.5	31.6	0.1	sealed	GN	4.19	84.099	30696	$ 128.62
GLADSTONE - MOUNT LARCOM	181	1	1	31.6	31.7	0.1	sealed	GN	4.15	84.099	30696	$ 127.39
GLADSTONE - MOUNT LARCOM	181	1	1	31.7	31.8	0.1	sealed	GN	4.13	84.099	30696	$ 126.78
GLADSTONE - MOUNT LARCOM	181	1	1	31.8	31.9	0.1	sealed	GN	3.98	84.099	30696	$ 122.17
GLADSTONE - MOUNT LARCOM	181	1	1	31.9	32	0.1	sealed	GN	3.11	84.099	30696	$ 95.46
GLADSTONE - MOUNT LARCOM	181	1	1	32	32.1	0.1	sealed	AC	2.96	96.459	35208	$ 104.21
GLADSTONE - MOUNT LARCOM	181	1	1	32.1	32.14	0.04	sealed	AC	3.96	96.459	35208	$ 55.77
Total						**20.04**						**$ 20,818.01**

APPENDIX L

TRAFFIC IMPACT ASSESSMENT CERTIFICATION

TRAFFIC IMPACT ASSESSMENT CERTIFICATION

CERTIFICATION OF TRAFFIC IMPACT ASSESSMENT REPORT REGISTERED PROFESSIONAL ENGINEER QUEENSLAND

FOR

Project Title	Project Halogen Traffic Impact Assessment

As a professional engineer registered by the Board of Professional Engineers of Queensland pursuant to the *Professional Engineers Act 2002* as competent in my areas of nominated expertise, I understand and recognise:

- The significant role of engineering as a profession; and that
- The community has a legitimate expectation that my certification affixed to this engineering work can be trusted; and that
- I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary practice.

As the responsible RPEQ, I certify:

i. I am satisfied that all submitted components comprising this traffic impact assessment, listed in the following table, have been completed in accordance with the Guide to Traffic Impact Assessment published by the Queensland Department of Transport and Main Roads and using sound engineering principles; and

ii. Where specialised areas of work have not been under my direct supervision, I have reviewed the outcomes of the work and consider the work and its outcomes as suitable for the purposes of this traffic impact assessment; and that

iii. The outcomes of this traffic impact assessment are a true reflection of results of assessment; and that

iv. I believe the strategies recommended for mitigating impacts by this traffic impact assessment, embrace contemporary practice initiatives and will deliver the desired outcomes.

Name	Bradley Jones	**RPEQ No.**	19986
RPEQ Competencies		Civil	
Signature		**Date**	3 November 2025
Postal Address	PO Box 1110, Townsville QLD 4810		
Email	Bradley.Jones@premise.com.au		

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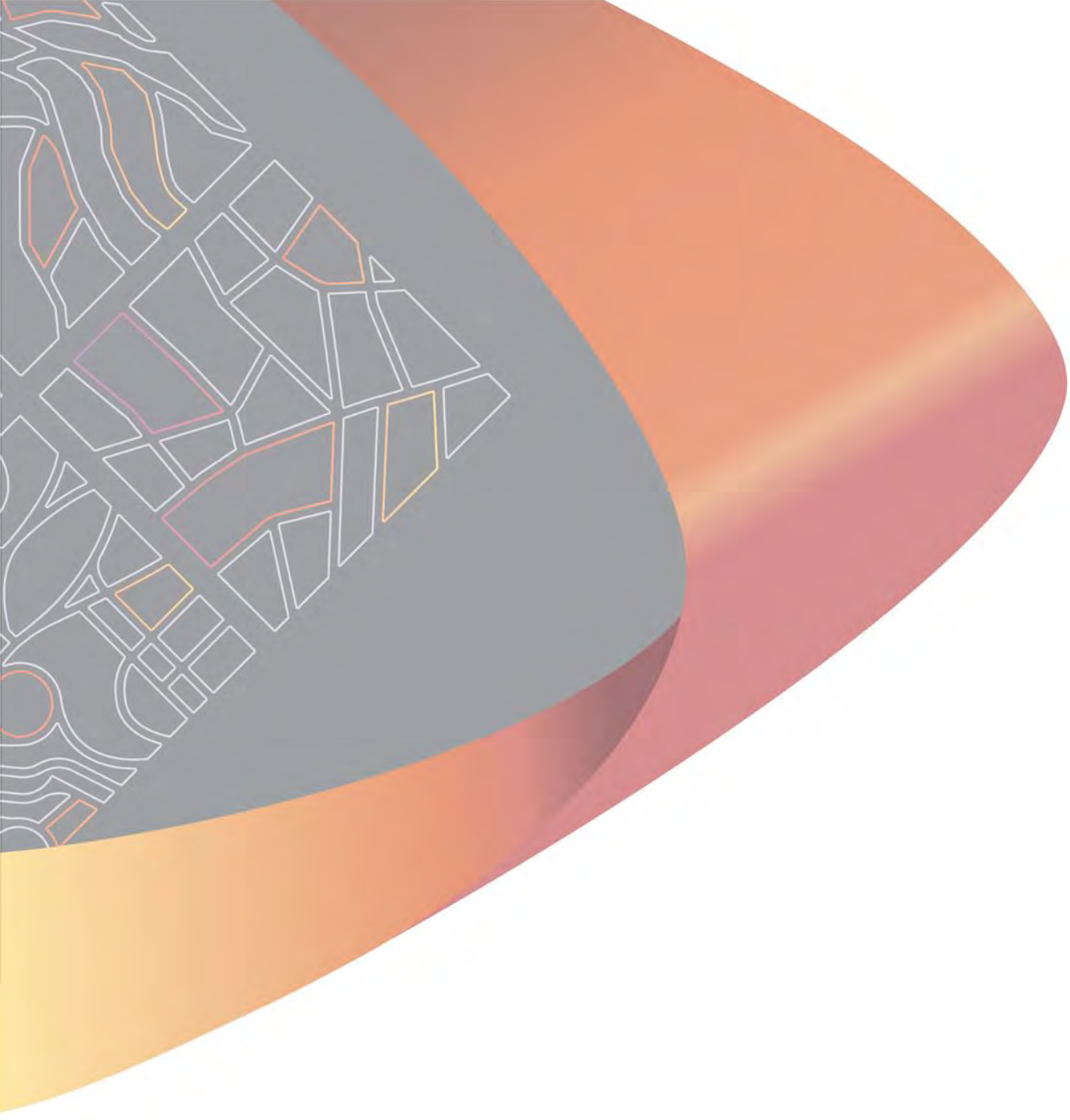
Traffic impact assessment components to which this certification applies	☒
1. Introduction	
Background	☐
Scope and study area	☒
Pre-lodgement meeting notes	☒
2. Existing Conditions	
Land use and zoning	☒
Adjacent land uses / approvals	☒
Surrounding road network details	☒
Traffic volumes	☒
Intersection and network performance	☐
Road safety issues	☒
Site access	☐
Public transport (if applicable)	☐
Active transport (if applicable)	☐
Parking (if applicable)	☐
Pavement (if applicable)	☒
Transport infrastructure (if applicable)	☒
3. Proposed Development Details	
Development site plan	☒
Operational details (including year of opening each stage and any relevant catchment / market analysis)	☒
Proposed access and parking	☒
4. Development Traffic	
Traffic generation (by development stage if relevant and considering light and heavy vehicle trips)	☒
Trip distribution	☒
Development traffic volumes on the network	☒
5. Impact Assessment and Mitigation	
With and without development traffic volumes	☒
Construction traffic impact assessment and mitigation (if applicable)	☒
Road safety impact assessment and mitigation	☒
Access and frontage impact assessment and mitigation	☒
Intersection delay impact assessment and mitigation	☐
Road link capacity assessment and mitigation	☒
Pavement impact assessment and mitigation	☒
Transport infrastructure impact assessment and mitigation	☒
Other impacts assessment relevant to the specific development type / location (if applicable)	☐
6. Conclusions and Recommendations	
Summary of impacts and mitigation measures proposed	☒
Certification statement and authorisation	☒



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