Cardno Eppell Olsen
Shaping the Future

Tannum Sands UDA

Transport Masterplanning Report

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1 INTRODUCTION

1.1 BACKGROUND

Cardno has been commissioned by Urban Land Development Authority (ULDA) to provide expert traffic and transport planning advice to assist with the development of the Tannum Sands Urban Development Area (UDA) Structure Plan and Development Scheme.

The UDA adjoins the Tannum Sands State High School to the North and a rural residential subdivision (Pacific Ranch) to the South along Dahl Road. The UDA is bounded by Tannum Sands Road to the east and the Boyne River to the west. This report will examine the following two (2) scenarios:

- 1,500 residential lots, this is the likely development yield; and
- 1,800 residential lots, this is a maximum yield scenario.

1.2 SCOPE OF WORKS

This report has been prepared to document the review and assessment of the development proposal and its likely impacts on the surrounding transport network. As part of the preparation of this report the following tasks have been undertaken:

- An inspection of the site and surrounding areas to evaluate the existing road and transport network and site characteristics
- Collation and review of all existing planning and technical studies to understand whether there are any existing commitments or network constraints that have been previously identified
- Consultation with key stakeholders including the Gladstone Regional Council (GRC), theDepartment of Transport and Main Roads (TMR), and Tannum Sands State High School (TSSHS)
- A road hierarchy plan was developed based upon contemporary planning standards of connectivity and permeability
- A strategic assessment of the impact of the proposed development on the existing road and street network by way of a desktop assessment model which segregates the development into a number of precincts and estimates broad daily and peak hour volumes
- Preparation of a conceptual pedestrian and cycle active transport network plan for the Tannum Sands UDA
- Preparation of a strategic public transport strategy plan, which demonstrates how the UDA may be serviced by public transport in the event of a service being provided.

1.3 REFERENCES

In preparing this report the following background materials/reference documents have been reviewed:

- Austroads: *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*
- Department of Transport and Main Roads: *Guidelines for Assessment of Road Impacts of Developments*
- Road Transport Authority: *Guide to Traffic Engineering Developments.*
- Department of Transport and Main Roads: Road Planning and Design Manual Chapter 13: Intersections at Grade
- Calliope Shire Council: Planning Scheme Policy No. 3 – Developer Contribution Policy – Tannum Sands/Boyne Island Arterial Roads (2009)
- Calliope Shire Council: Roads and Transport Standards (2005)

2 EXISTING SITUATION

2.1 SUBJECT SITE

The proposed development site is located at Tannum Sands and is bound to the east by Tannum Sands Road, to the south by Dahl Road, to the west by Boyne River and to the north by properties around Coronation Drive. The indicative location of the subject site is highlighted on Figure 2.1.

Figure 2.1 Subject Site Locality

Source: www.google.com.au/maps. Site Location is indicative only.

2.2 KEY ROADS

The following outlines the key characteristics of the existing road infrastructure in close proximity to the proposed development.

2.2.1 Tannum Sands Road

Tannum Sands Road is under the jurisdiction of TMR. It connects the Bruce Highway in the south to Hampton Drive and the Tannum Sands Township in the north. Tannum Sands Road is classified as a District Road within TMR's road hierarchy and typically has a two lane undivided rural cross section. Tannum Sands Road has a speed limit of 100kph from the Bruce Highway to approximately 600m north of Dahl Road where the speed limit drops to 80kph and then 60kph prior to the Tannum Sands Road/Coronation Drive intersection. Traffic count data supplied by TMR indicates an AADT of less than 3,000 vehicles per day (vpd) on Tannum Sands Road.

2.2.2 Hampton Drive

Hampton Drive is under the jurisdiction of TMR. It provides a connection from Tannum Sands Road on the eastern side of Boyne River to Malpas Street/Boyne Island Road on the western side of Boyne River, including the John Oxley Bridge. Hampton Drive is classified as a District Road within TMR's road hierarchy and typically has a two lane median divided urban cross section with parking lanes and footpaths on both sides of the road. Hampton Drive has a posted speed limit of 60kph. Traffic count data supplied by TMR indicates an AADT of approximately 5,600vpd on Hampton Drive near Tannum Sands Road and approximately 11,700vpd near the John Oxley Bridge.

2.2.3 John Oxley Bridge

John Oxley Bridge is under the jurisdiction of TMR. It is a two lane bridge which spans approximately 180m across the Boyne River. A segregated pedestrian connection is provided on the north side of the bridge. Traffic count data supplied by TMR indicates an AADT of approximately 11,700vpd on John Oxley Bridge.

2.2.4 Coronation Drive

Coronation Drive is under the jurisdiction of Gladstone Regional Council (GRC). It currently functions as a collector road for the surrounding suburbs. However, it is clear from the geometry that it was designed with a more arterial function in mind. It also provides access to Tannum Sands High School (TSHS). Coronation Drive has a posted speed limit of 60kph. Traffic count data for Coronation Drive has not been sourced at the time of preparing this report; however it is anticipated to carry less than 2,000vpd.

2.2.5 Boyne Island Road/Malpas Street

Boyne Island Road is under the jurisdiction of TMR. It connects the Gladstone-Benaraby Road in the west to Hampton Drive and the Tannum Sands Township in the east. Boyne Island Road is classified as a District Road within TMR's road hierarchy and typically has a two lane undivided rural cross section. Boyne Island Road has a posted speed limit of 100kph from the Gladstone-Benaraby Road to Handley Drive where the speed limit drops to 60kph along the Malpas Street section of the corridor. Traffic count data supplied by TMR indicates an AADT of approximately 9,900vpd on Boyne Island Road.

2.3 EXISTING ROAD CAPACITY

The TMR has supplied 2010 daily traffic count data for various road segments along Tannum Sands Road, Hampton Drive and Boyne Island Road. A copy of the traffic count data is provided at Appendix A.

Table 2.1 illustrates the following for each of these road segments:

- Existing daily traffic volumes along each road segment
- Capacity of each road segment
- A percentage of road capacity used by existing traffic volumes (Volume/Capacity).

Table 2.1 Existing Road Capacity (2010)

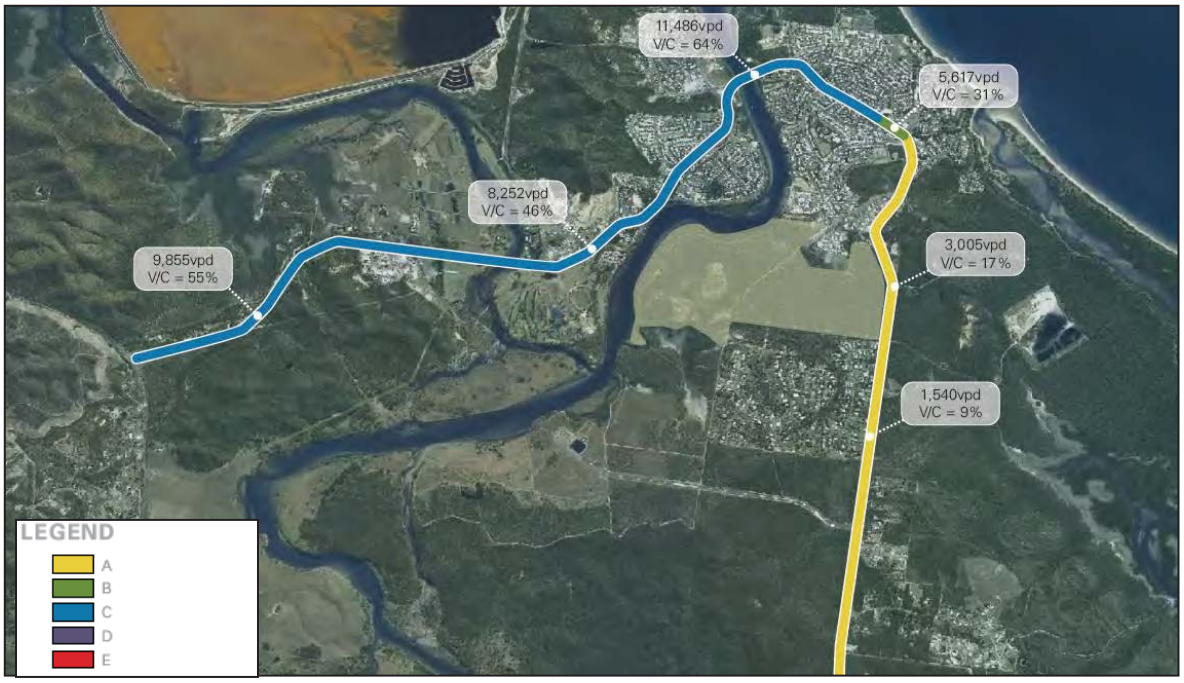
ID	Road	Segment		Volume (vpd)	Capacity (vpd)	V/C (%)
		Start	Finish			
1	Tannum Sands Road	Bruce Highway	Silverton Drive	1,540	18,000	9%
2	Tannum Sands Road	Silverton Drive	Hampton Drive	3,005	18,000	17%
3	Hampton Drive	Tannum Sands Road	Booth Avenue	5,617	18,000	31%
4	John Oxley Bridge	Booth Avenue	Malpas Street	11,486	18,000	64%
5	Boyne Island Road	Malpas Street	Handley Road	8,252	18,000	46%
6	Boyne Island Road	Handley Road	Gladstone-Benaraby Rd	9,855	18,000	55%

Figure 2.2 illustrates the existing level of service (LOS) along the Tannum Sands/Hampton Drive/Boyne Island Road corridor. It should be noted that the LOS criteria has been derived from Table 4.4 of the RTA *Guide to Traffic Generating Developments*, which provides typically hourly flows for various LOS on urban roads. The adopted LOS criteria is summarised in Table 2.2 below.

Table 2.2 Level of Service Criteria

Level of Service (LOS)	Daily Traffic Volumes	Volume/Capacity (V/C)
A	0 to 4,000	0% to 22%
B	4,001 to 7,600	23% to 42%
C	7,601 to 12,000	43% to 67%
D	12,001 to 18,000	68% to 100%
E	>18,000	>100%

Figure 2.2 Road Network LOS – Existing (2010)



2.4 BACKGROUND TRAFFIC GROWTH

The Tannum Sands/Boyne Island road network essentially functions as a closed catchment and as a result, it is considered unlikely that through traffic would travel along the Boyne Island Road/Hampton Drive/Tannum Sands Road corridor. Therefore, it is reasonable to assume that future traffic growth on the external road network would be entirely development related.

There are two (2) significant approved future developments located in the area around the UDA, including:

- Tannum Waters Residential Estate
- Tannum Sands Sand Mining Facility.

These developments are located to the south of the proposed UDA site and are discussed in greater detail in Section 2.7 of this report.

2.5 FUTURE ROAD NETWORK PLANNING

2.5.1 TMR Queensland Transport and Roads Investment Program 2011-12 to 2014-15 (QTRIP)

This document details the transport and road projects which are proposed to be delivered by TMR within the next four (4) years. The document is split up by area, in order that each TMR region can appropriately illustrate its plans for its road and transport requirements.

The appropriate TMR region which accounts for the area around Tannum Sands is the Fitzroy Region. Within the Fitzroy Region there are a number of projects which are planned and ongoing. The following upgrades and improvements are planned for the road network close to Tannum Sands Road:

- Bruce Highway (south of Tannum Sands Road) – Miscellaneous Works – Cost $286,000
- Bruce Highway (north of Tannum Sands Road) – Construction of additional lanes – Cost $4,100,000
- Tannum Sands Road (from south of development site to Elizabeth St, Tannum Sands) –Pavement overlay – Cost $4,040,000 ($309,000 approved);
- Coronation Drive – Application of asphalt resurfacing – Cost $83,000
- Coronation Drive – Drainage improvement – Cost $125,000.

2.5.2 Gladstone Regional Council Adopted Infrastructure Charges Resolutions (No. 1) – 2011

The Gladstone Regional Council Adopted Infrastructure Charges Resolutions (GRCAICR) (No. 1) – 2011 took effect on 2 August 2011. This policy outlines the required transport infrastructure required to support the expected growth in the former Calliope Shire Local Government Area. A copy of this document is included at Appendix B.

A number of key projects have been indentified in within the Boyne Island/Tannum Sands area including:

- Duplication of Boyne Island Road between Gladstone-Benaraby Road and Pioneer Drive
- Extension of Pioneer Drive with a bridge connection over the Boyne River
- Upgrades to Malpas Avenue, Hampton Drive and Tannum Sands Road
- Key intersection upgrades along Malpas Avenue, Hampton Drive and Tannum Sands Road.

According to the figures published in the GRCAICR, the total cost estimate for the required transport infrastructure is approximately $70Million, which equates to a contribution rate per residential lot of $28,000, this would account for all infrastructure works & not only roads.

2.6 NEIGHBOURING DEVELOPMENTS

The Tannum Sands High School is located to the north of the development site. This school is bound to the north west by Coronation Drive, to the north by residential properties of Kurumba Court, to the east by Tannum Sands Road and to the south by the proposed development site. This high school currently has an enrolment of approximately 900 students which is projected to increase to a maximum of approximately 1,300 students.

To the south of the development are the following residential areas:

- Silverton Drive
- Aluminium Drive
- Coal Crescent
- Cobalt Street
- Diamond Crescent
- Golden Avenue
- Selma Street.

A further 42 lots are proposed between Tannum Sands UDA and Silverton Drive, these will take access from Dahl Road and Silverton Drive. These areas are rural residential in nature and from a high level review of traffic data comprise little in the way of traffic generation.

2.7 APPROVED DEVELOPMENT

As discussed previously, there are two (2) approved significant developments located to the south of the proposed UDA site including:

- Tannum Waters Residential Estate
- Tannum Sands Sand Mining.

Tannum Waters is a master planned residential estate which will ultimately consist of approximately 2,000 lots. Access to the external network will be via the Tannum Sands Road/Broadacres Drive intersection which is located approximately 2.5km south of the UDA site. For the purpose of this report, it has been assumed that the Tannum Waters Residential Estate will development at a similar rate to the UDA site (approximately 150 lots per year), and will be completed by 2022. The Tannum Waters estate will generate external traffic demands in the order of 18,000vpd when completed.

Tannum Sands Quarry site is used for sand extraction. It is understood that the Quarry has recently received approval to increase the annual volume of sand extracted. Access to the external network will be via the Tannum Sands Road/Silica Road intersection which is located approximately 4km south of the UDA site. For the purpose of this assessment, it has been assumed that the Tannum Sands Quarry will generate approximately 100vpd, which is based on previous studies undertaken by Cardno.

3 PROPOSED DEVELOPMENT

3.1 LANDOWNERS

The developable land within the UDA site at Tannum Sands comprises three (3) landowners being, Rio Tinto (Boyne Smelters), the Port Curtis Coral Coast people (PCCC) subject to an indigenous land use agreement (ILUA) and the ULDA. The preliminary yield estimate for the development on this land will be in proportion to land ownership, as follows:

- ULDA: 850 lots
- Rio Tinto: 480 lots
- PCCC: 220 lots.
- Total = 1,550

The above equates to a total potential development yield of 1,550 lots, which is the likely development yield for this development. However this report also examines the impact of 1,800 lots, as a potential maximum development yield that could be accommodated on site.

3.2 DEVELOPMENT OVERVIEW AND STAGING

For the purpose of this assessment, two (2) design horizons have been investigated with various levels of development. To determine the level of development at each design horizon, the following assumptions have been made:

- Development to start in 2012
- 150 lots to be constructed each year
- A 1,550 lot Development to be completed by 2022
- A 1,800 lot Development to be completed by 2024.

The Tannum Sands UDA will provide a diversity of housing, including affordable and accessible housing to cater for the broad demographic mix attracted to the area and changes in lifestyle as the community matures. As such approximately 40% of the development lots would be under 350sq.m; these dwelling types are considered to generate less traffic than traditional detached housing.

3.3 CONSTRAINTS

There are a number of precincts within the UDA site which would be difficult to develop as a result of environmental, topographical and hydrological constraints.

3.3.1 Environmental Constraints

There are two main areas of environmental concern within the UDA boundary. These are as follows:

- To the north of the site, bordering Tannum Sands State High School, there is a section of land reserved as part of the native title claim as environmental reserve; and
- Along the western edge of the site, at the boundary of the Boyne River, there is a coastal wetland area, also included as an environmental reserve.

3.3.2 Topographical Constraints

The site has large topographical level differences at several locations within the UDA. There are two main clusters of high ground; one at the north west of the site at the Boyne River and another to the south west of the site.

3.3.3 Hydrological Constraints

The UDA includes several watercourses. The majority of these are minor creeks which are located along the southern boundary of the site. There are also some issues with flooding on the site extremities which have to be taken into consideration when developing the site.

4 DESIGN WORKSHOP

4.1 STAKEHOLDER WORKSHOP

On 30 September 2011 a stakeholder's workshop was held at in the Grand Hotel, Gladstone. This workshop was organised by staff from ULDA, Deicke Richards and Cardno. Key stakeholders who were invited to this work shop included:

- Landowners (ULDA, Rio Tinto and PCCC);
- Representatives from Gladstone Regional Council (Elected members and Council Officers);
- State Agencies;
- The Tannum Sands State High School; and
- ULDA representatives.

The purpose of this exercise was to establish an overall masterplan that would facilitate the most efficient overall design for all users of the site and carefully address the interaction with existing neighbouring areas.

During this process a number of options were examined and a resultant draft masterplan was produced. Copies of the masterplanning drawings are included at Appendix C.

4.2 SCHOOL MASTERPLANNING PROCESS

4.2.1 Key Considerations

During the stakeholder workshop a number of potential options were explored to improve the operational safety and efficiency of the pickup and set down area at the existing Tannum Sands State High School (TSsHS).

To supplement investigations undertaken as part of the workshop, further research was undertaken in relation to design standards for the school facilities. This research included reviewing the Queensland Government document, "Planning for Safe Transport Infrastructure at Schools". The guideline demonstrates best practice principles which were benchmarked against the initial concept layouts.

Additional workshops and meetings resulted in the preparation of the following concept plan for a possible "community hub", including the TSSHS, some potential community facilities (e.g. community hall, child care centre) opposite the TSSHS, existing environmental and road reserves, and a possible neighbourhood centre, to support the emerging and surrounding communities.

Figure 4.1 Concept Plan for a possible "Community Hub"

Source: Deicke Richards

5 DESIGN PRINCIPLES

5.1 ROAD HIERARCHY

Roadways serve a variety of functions including the provision of direct access to properties, pedestrian paths, bus routes and catering for through traffic that is not related to the immediate land uses. Many roads serve more than one function and to varying degrees, particularly in rural areas where arterial roads, for example, could be used for direct property access.

The concept of a hierarchy of roadways is thus used to define the main functional objectives of each roadway type, which can then form the basis of ongoing planning and system management aimed at reducing the mixing of incompatible functions.

A four level road hierarchy has been identified based on the functional objectives of each element within each level of the hierarchy. The four levels are arranged in terms of an increasing degree of detail with respect to functional objectives. These four levels are Purpose, Function, Management, and Design and are defined as follows:-

- **Level 1: Purpose** - relates to the primary objective of the element, whether to carry through traffic or to provide property access;
- **Level 2: Function** - relates to the relationship between the element and the land use it serves. This level of hierarchy is common to traditional road hierarchy concepts;
- **Level 3: Management** - relates to the emplacement of policies to achieve the envisaged role based upon the attributes of the element;
- **Level 4: Design** - relates to specification of the form of the element in order to achieve its functional objectives.

Typical road classifications based on the abovementioned four level road hierarchy principles include:

- Arterial Road
- Sub-Arterial Road
- Trunk Collector Road
- Collector Road
- Local Street.

In addition to the typical functional road hierarchy principles, the Calliope Shire Council – *Roads and Transport Standard (2005)* has also been utilised to provide a framework for developing a high quality structure plan for the proposed development within the UDA.

5.2 DESIGN STANDARDS

Table 4.6.3 of the Calliope Shire Council - *Road and Transport Standard (2005)* provides typical design criteria for various road classifications and has been reproduced and summarised in Table 5.1 below for ease of reference.

Table 5.1 Road Design Criteria

Road Design Criteria	Road Classification			
	Sub-Arterial	Trunk Collector	Minor Collector	Access
Direct property access	No	Yes	Yes	Yes
Reserve width (min)	19.5 – 24m	19.5m	16m	14m
Carriageway Width	14m	11m	7.5m	5.5m
Traffic Catchment	-	300 lots	300 lots	75 lots
Traffic Volume	3,000 to 15,000 vpd	750 to 3,000 vpd	750 to 3,000 vpd	0 to 750 vpd
Design Speed	60kph (min)	50kph (max)	40kph (max)	30kph (max)
On-street Parking	No	0.75 veh/lot	0.75 veh/lot	0.75 veh/lot
Footpath	Both sides	Both sides	One side	No

The recommended road hierarchy for the proposed UDA development is discussed in Section 7 of this report.

5.3 INTERSECTION SPACING

Typical intersection spacing on arterial roads is generally between 500m to 1km. Whilst Tannum Sands Road technically functions as an arterial road, through future urban expansion projects (including the proposed Tannum Sands Residential Development), it is considered likely that the posted speed limit on Tannum Sands Road will be reduced from 100kph (rural default speed limited) to 70kph to 80kph to align with the future urban environment. As a result, intersection spacing between 300m to 500m along Tannum Sands Road may be considered to be more appropriate.

5.4 SIGHT DISTANCE REQUIREMENTS

An additional access intersection to Tannum Sands Roads has been investigated as part of this assessment. It is understood that a key issue for providing an additional access point along Tannum Sands Road will be regarding available sight distance.

TMR's *Road Planning and Design Manual (RPDM) - Chapter 13 Intersections at Grade* provides guidance on required intersection sight distances. Based on the existing design speed limit, approximately 275m Safe Intersection Sight Distance (SISD) is required from the proposed access. Given the topography surrounding the site a study of the levels and vertical sight views was undertaken.

Based on the above sight distance requirement, two (2) sketches have been prepared to illustrate that the potential access can be provided at various points along Tannum Sands Road and still comply with TMR sight distances requirements. A copy of the sketches are included at Appendix D.

6 ROAD NETWORK OPERATIONS

6.1 TRIP GENERATION

As stated previously the report will examine the following two (2) scenarios:

- 1,500 residential lots, this is the likely development yield; and
- 1,800 residential lots, this is the potential maximum yield which could be accommodated.

The Tannum Sands UDA will provide a diversity of housing, including affordable and accessible housing to cater for the broad demographic mix attracted to the area and changes in lifestyle as the community matures. According to the present yield calculations, based on 1,550 lots the split in housing type will be as follows:

- Lots larger than 350sq.m = 59%; and
- Lots smaller than 350sq.m = 41%.

The traffic generation calculations for the lots under 350sqm are based on calculations for a large unit or townhouse. The RTA *Guide to Traffic Engineering Developments* provides typical traffic generation rates for various land uses. For large unit or town houses the RTA predicts that a daily trip rate of between 5 and 6.5 would be suitable. We have utilised a rate of 6.5 trips per day, this would represent a conservative estimate for development traffic.

The remaining 59% of lots within the development are proposed to be classed as residential dwelling houses, the RTA predicts that a daily trip rate of 9 vehicles per dwelling is suitable. Table 4.1 highlights the adopted generation rates for both dwelling types.

Table 6.1 Traffic Generation Rates

Detached Dwelling	Traffic Generation Rate Lots >350sqm GFA	Traffic Generation Rate Lots <350sqm GFA
Peak Hour	0.85 trips/dwelling	0.65 trips/dwelling
Daily	9.00 trips/dwelling	6.50 trips/dwelling

Table 6.2 highlights the estimated peak hour and daily generation of the proposed development for both development scenarios.

Table 6.2 Traffic Generation

Scenario	Scenario	Predicted Completion Date	Number of Lots (accumulative)	Traffic Generation	
				Peak Hour	Daily
Scenario 1	Lots < 350sq.m	2022	635	413	4,128
	Lots > 350sq.m		915	778	8,235
	Total		**1,550**	**1,191**	**12,368**
Scenario 2	Lots < 350sq.m	2024	738	480	4,797
	Lots > 350sq.m		1,062	903	9,558
	Total		**1,800**	**1,383**	**14,355**

6.2 TRAFFIC DISTRIBUTION

To develop a better understanding of the likely origin/destination of trips generated by development in the UDA, the potential traffic generation of the site has been split into four (4) different trip types based on trip purpose including:

- Education
- Employment
- Shopping/Personal Business
- Social/Recreational/Other.

Table 6.3 highlights the adopted trip purpose breakdown which has been based on 1992 SEQ Household Travel Survey Data. Whilst it is acknowledged that the 1992 survey data is dated and represents urban not regional trends, it does provide a reasonable breakdown of trip purpose and is considered appropriate for the purpose of this report. A copy of the 1992 SEQ Household Travel Survey Data is included at Appendix E.

Table 6.3 Trip Purpose

Trip Purpose	% of Traffic Generation
Education	12%
Employment	32%
Shopping/Personal Business	28%
Social/Recreational/Other	28%

The proposed development is located approximately 27km south of the Gladstone CBD. This equates to a travel time of approximately 30 minutes by car. It is envisaged that a high proportion of trips generated by the proposed development will commute to the Gladstone CBD for employment and retail opportunities.

However, it is anticipated that the Boyne Island/Tannum Sands Township will provide some education, employment, retail and recreational opportunities for the proposed UDA development. Figure 6.1 and Table 6.4 below highlight various trip attractors located within the Boyne Island/Tannum Sands Township.

Figure 6.1 Local Trip Attractors

Table 6.4 Local Trip Attractors

Education	Employment	Shopping/Personal Business
Tannum Sands High School Tannum Sands Primary School St Francis Primary School Boyne Island Primary School	Tannum Shopping Centre Boyne Plaza Schools Pioneer Drive Industrial Estate Boyne Smelters	Tannum Shopping Centre Boyne Plaza

Based on the above, it is considered that the vast majority of educational trips (85%) will be contained within the Tannum Sands/Boyne Island Township. It has been assumed that only tertiary educational trips would travel to Gladstone. It additional, it has been assumed that the vast majority of employment (80%) and retail trips (70%) will have an origin or destination in Gladstone. The adopted trip destination by trip purpose has been summarised in Table 6.5 below.

Table 6.5 Trip Destination by Trip Type

Trip Purpose	Destination		TOTAL
	Local	Gladstone	
Education	85%	15%	100%
Employment	20%	80%	100%
Shopping/Personal Business	30%	70%	100%
Social/Recreational/Other	50%	50%	100%

UDA development related trips have been assigned to the external road network based on the location of the local trip attractors, as shown on Figure 6.1, and the adopted 'trip destination by trip type' summarised in Table 6.4. The distribution has been undertaken for two (2) scenarios including:

- Existing Network – no road infrastructure improvements
- Upgraded Network – with planned infrastructure improvements.

The resultant 'traffic distribution by trip type' for both scenarios is summarised in Table 6.6 and Table 6.7 respectively. It should be noted that a similar process was undertaken for the Tannum Waters Residential Estate and the Tannum Sands Sand Quarry. The distribution and resultant traffic volumes for all three (3) developments have been included at Appendix F.

Table 6.6 Traffic Distribution by Trip Type (Existing Network)

ID	Road	Distribution by Trip Purpose			
		Education	Employment	Retail	Other
1	Tannum Sands Road	0%	0%	0%	0%
2	Tannum Sands Road	80%	100%	100%	100%
3	Hampton Drive	80%	100%	85%	100%
4	John Oxley Bridge	35%	95%	85%	75%
5	Boyne Island Road	15%	90%	70%	50%
6	Boyne Island Road	15%	80%	70%	50%

Table 6.7 Traffic Distribution by Trip Type (Upgraded Network)

ID	Road	Distribution by Trip Purpose			
		Education	Employment	Retail	Other
1*	Tannum Sands Road	15%	80%	70%	50%
2	Tannum Sands Road	80%	20%	30%	50%
3	Hampton Drive	80%	20%	15%	50%
4	John Oxley Bridge	35%	15%	15%	25%
5	Boyne Island Road	15%	10%	0%	0%
6	Boyne Island Road	15%	80%	70%	50%
7	New Bridge	15%	80%	70%	50%

* Note: only the road segment between Pioneer Drive and Dahl Road would be impacted on

Based on the abovementioned assumptions, it has been determined that approximately 39% of trips generated by the proposed UDA development will be contained within the existing Boyne Island/Tannum Sands Township. The balance of approximately 61% of trips generated by the proposed UDA development will involve travel to/from the Gladstone CBD, as shown in Table 6.7. This spit is considered reasonable considering the high proportion of employment opportunities expected within the Gladstone CBD and Port areas.

Table 6.8 Traffic Destination Summary

Origin/Destination	Percentage (%)
Local	39%
Gladstone	61%

6.3 POTENTIAL IMPACTS ON EXISTING ROAD NETWORK

6.3.1 Estimated Traffic Volumes (Existing Network)

Table 6.7 highlight the anticipated daily traffic volumes on the external road network at the various design horizons. It is important to note that this assessment has assumed no road network improvements and has included development traffic associated with the Tannum Waters Residential Estate and the Tannum Sands Sand Quarry.

Table 6.9 Estimated Traffic Volumes (Existing Network)

ID	Road	Capacity (vpd)	2022 (1,550 lots)		2024 (1,800 lots)	
			Daily Volume (vpd)	Volume/Capacity Ratio (%)	Daily Volume (vpd)	Volume/Capacity Ratio (%)
1	Tannum Sands Rd	18,000	12,620	70%	12,620	70%
2	Tannum Sands Rd	18,000	22,090	123%	24,035	134%
3	Hampton Dr	18,000	24,182	134%	26,045	145%
4	John Oxley Bridge	18,000	24,100	134%	25,683	143%
5	Boyne Island Rd	18,000	16,188	90%	17,468	97%
6	Boyne Island Rd	18,000	17,395	48%	18,612	52%

Figure 6.2 and Figure 6.3 illustrate the anticipated daily traffic volumes and resultant level of service (LOS) for each road segment during the 2022 and 2024 design horizons.

Figure 6.2 Road Network LOS – 2022 Volumes on Existing Network (1,550 lots)

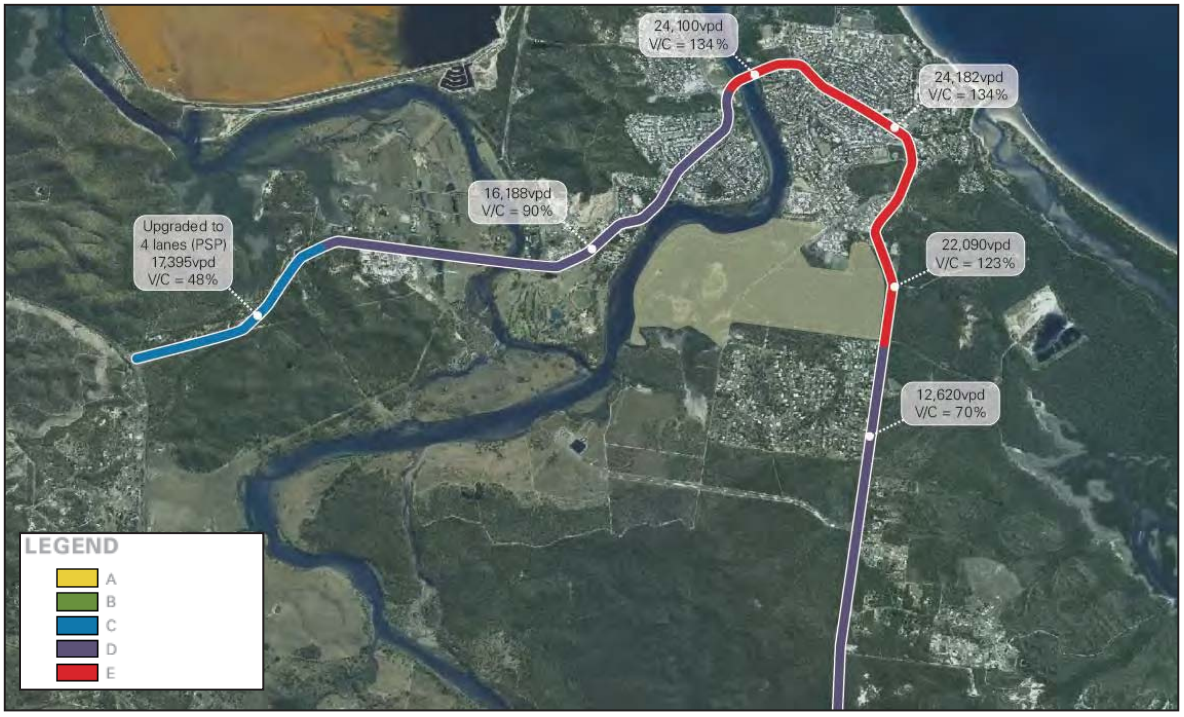


Figure 6.3 Road Network LOS – 2024 Volumes on Existing Network (1,800 lots)

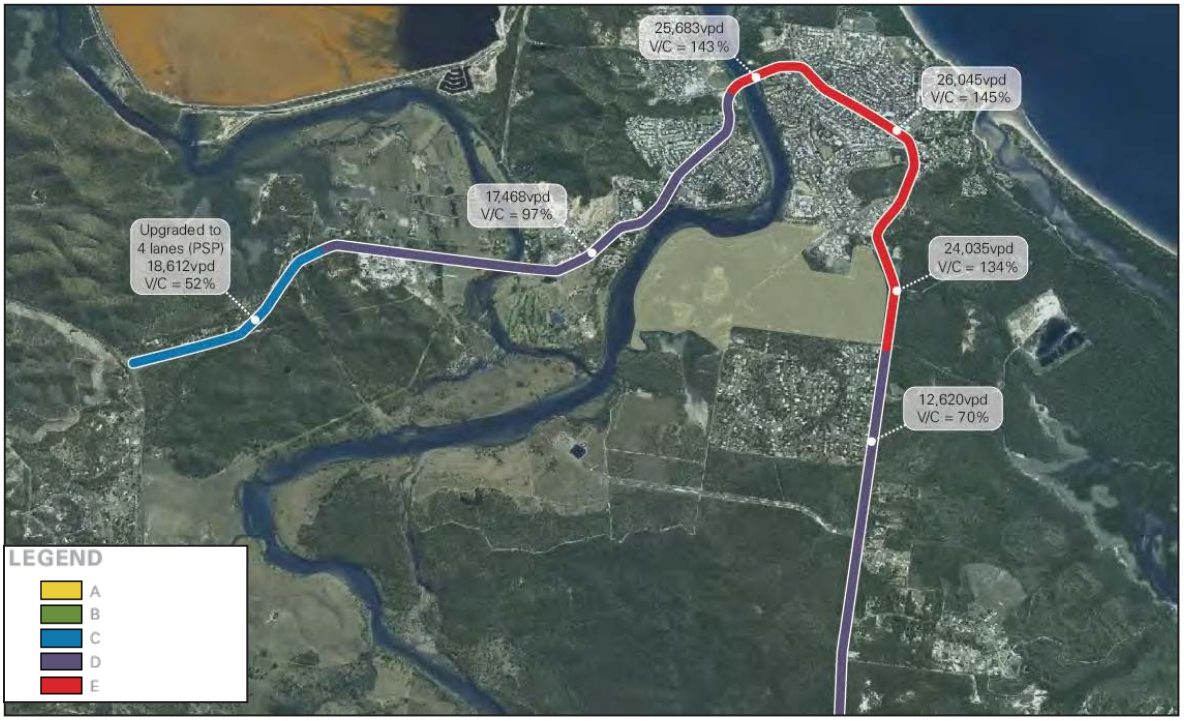


Table 6.7 highlights that each of the road segments, excluding Tannum Sands Road between the Bruce Highway and Silverton Drive and Boyne Island Road between Pioneer Drive and Handley Road, will exceed practical capacity limits prior to the 2024 ultimate design horizon and will need to be upgraded prior to the completion of the approved Tannum Waters Residential Estate and the proposed UDA residential development.

6.3.2 Spare Capacity in Existing Road Network

Further analysis has been undertaken to determine how many UDA lots could be development before the existing road network would reach capacity. This assessment as been undertaken assuming no infrastructure improvements are implemented.

It has been assumed that both the UDA site and the approved Tannum Waters Residential Estate will develop at a rate of 150 lots per year, and that the Tannum Sands Sand Quarry will generate a constant 100vpd. The results are summarised in Table 6.10.

Table 6.10 Existing Road Network Capacity Analysis

ID	Road	Year Capacity is Reached	No. of UDA Lots
1	Tannum Sands Road	n/a	1,800
2	Tannum Sands Road	2020	1,200
3	Hampton Drive	2018	900
4	John Oxley Bridge	2017	750
5	Boyne Island Road	n/a	1,800
6	Boyne Island Road	2023	1,650

Table 6.10 highlights that the John Oxley Bridge would be the first road segment to reach its theoretical capacity threshold. It has been estimated that approximately 750 UDA lots could be developed before the John Oxley Bridge would reach capacity at 2017. However, it is important to note that this assessment has assumed that approximately 1,000 Tannum Waters Residential Estate lots would be constructed by 2017. If the Tannum Waters Residential Estate developments at a slower rate, then it is anticipated that the John Oxley Bridge would continue to operate below capacity for longer and as a result additional UDA lots could potentially be developed within these timeframes.

6.4 POTENTIAL IMPACTS ON UPGRADED ROAD NETWORK

6.4.1 Estimated Traffic Volumes (Upgraded Network)

As stated previously in Section 2.5 of this report, there are future road infrastructure improvements planned for the surrounding road network.

For the purpose of this report, it has been assumed that the following road infrastructure projects, which are listed in GRCAICR, are implemented prior to the 2026 design horizon:

- Duplication of Boyne Island Road between Gladstone-Benaraby Road and Pioneer Drive
- Extension of Pioneer Drive with a bridge connection over the Boyne River (assumed to be a 4 lane connection)
- Upgrades to Malpas Avenue, Hampton Drive and Tannum Sands Road
- Key intersection upgrades along Malpas Avenue, Hampton Drive and Tannum Sands Road.

In additional to the above, it has also been assumed that Tannum Sands Road, between Pioneer Drive and the Broadacres Drive access to the future Tannum Waters Residential Estate will be upgraded to four lanes. This section of Tannum Sands Road is identified as 1a and 1b in Table 6.11 below. It is important to note that the proposed UDA development does not trigger the need to upgrade this section of Tannum Sands Road.

Also included within the GRCAICR proposed works are the extensions of Dahl Road and Coronation Drive. These will be constructed as part of the Tannum Sands UDA and can be considered as creditable works, with regard to infrastructure design.

The estimated ultimate traffic volumes are summarised in Table 6.11 and illustrated on Figure 6.4 and Figure 6.5 below.

Table 6.11 Estimated Traffic Volumes (Updated Network)

ID	Road	Capacity (vpd)	2022 (1,550 lots)		2024 (1,800 lots)	
			Daily Volume (vpd)	Volume/Capacity Ratio (%)	Daily Volume (vpd)	Volume/Capacity Ratio (%)
1	Tannum Sands Rd	18,000	1,640	9%	1,640	9%
1a	Tannum Sands Rd	36,000	19,540	54%	19,540	54%
1b	Tannum Sands Rd	18,000	16,100	89%	17,317	96%
2	Tannum Sands Rd	18,000	14,772	82%	15,537	86%
3	Hampton Dr	18,000	16,865	94%	17,546	97%
4	John Oxley Bridge	18,000	16,755	93%	17,158	95%
5	Boyne Island Rd	18,000	8,870	49%	8,970	50%
6	Boyne Island Rd	36,000	28,375	79%	29,592	82%
7	New Bridge	20,000*	18,520	93%	19,737	99%

** Note: This value is indicative, detailed analysis is provided in section 6.4.2*

Figure 6.4 Road Network LOS – 2022 Volumes on Upgraded Network (1,550 lots)

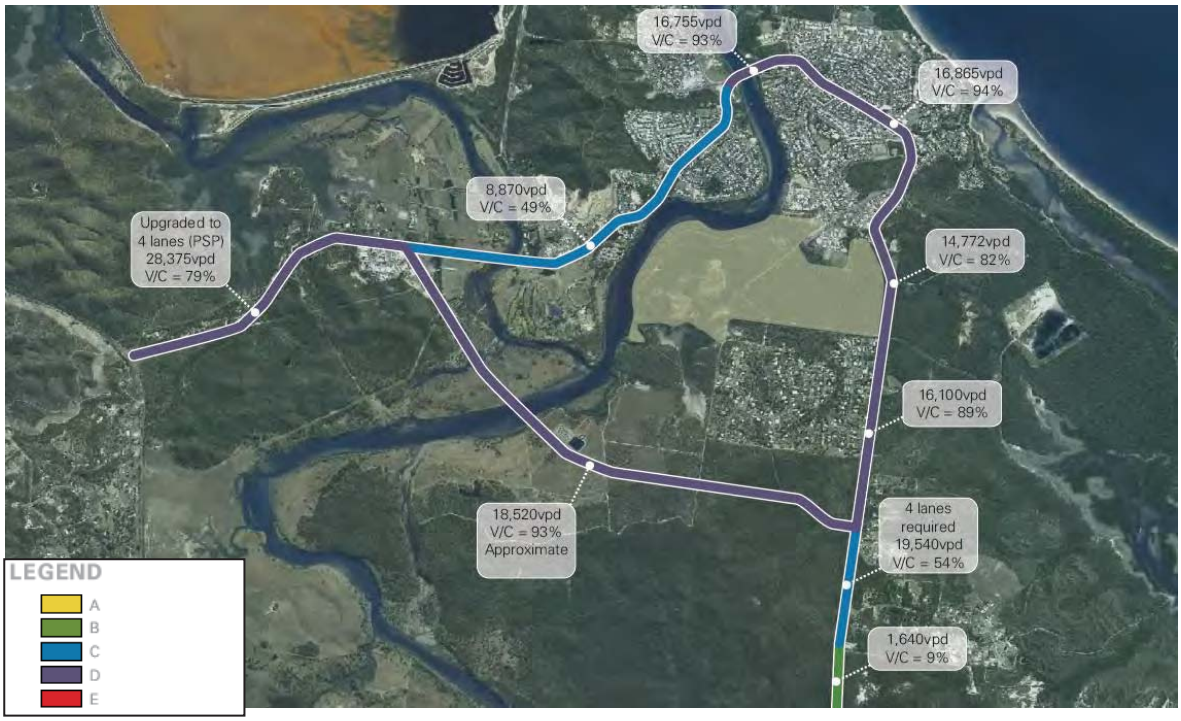


Figure 6.5 Road Network LOS – 2024 Volumes on Upgraded Network (1,800 lots)

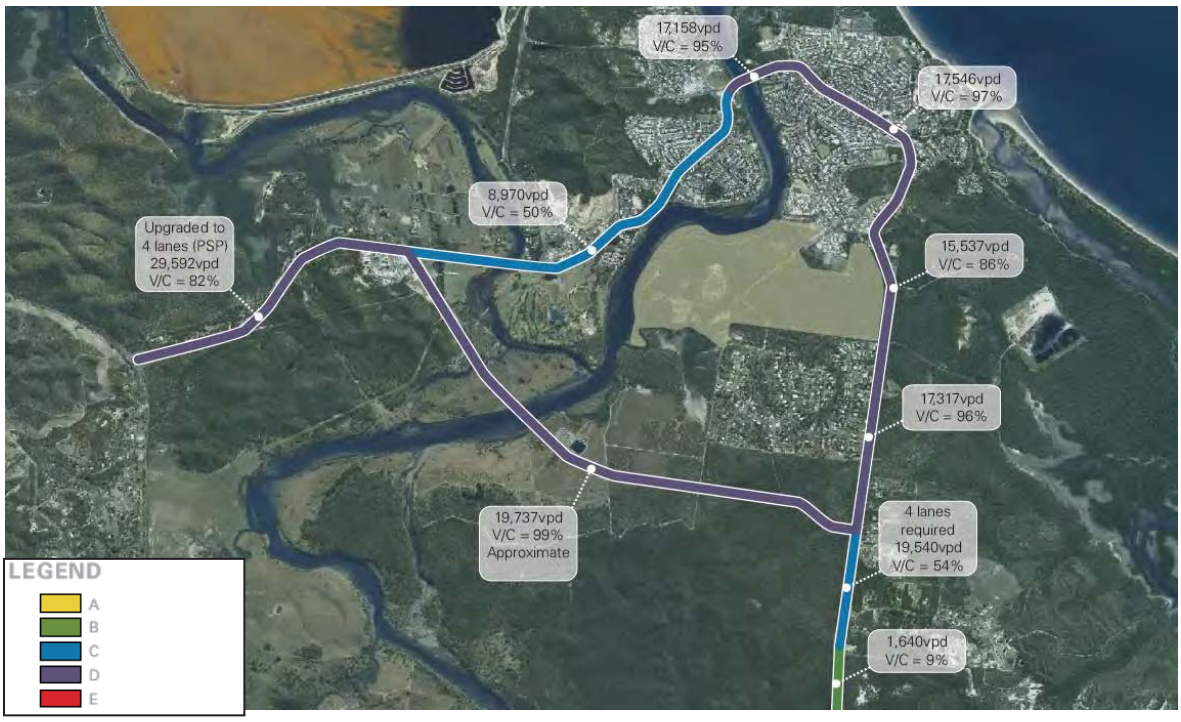


Table 6.11 highlights that

- The new bridge crossing over Boyne River will operate adequately as a two (2) lane cross section(further calculations are included in section 6.4.2)
- Tannum Sands Road between Pioneer Drive and Broadacres Drive will potentially need to have a four (4) lane cross section, however the UDA development does not impact on this section of road
- Hampton Drive and the John Oxley Bridge would be close to capacity by the 2024 ultimate design horizon.

Whilst the analysis suggests that Hampton Drive and John Oxley Bridge will be close to capacity during the ultimate design horizon, in reality it is likely that traffic volumes along this corridor will shift over to the new bridge crossing of Boyne River until travel times on both routes are reasonably balanced. The total demand across both Boyne River crossings has been estimated to be approximately 37,000vpd. The existing John Oxley Bridge and proposed new bridge will provide enough capacity to cater for approximately 38,000vpd which equates to a volume to capacity ratio of 97%. Therefore it is considered unlikely that additional upgrades would be required along the Hampton Drive corridor.

6.4.2 Pioneer Drive/New Boyne Island River Crossing Analysis

The proposed road link from Tannum Sands Road to Boyne Island Road will have a character of a highway due to the limited access points, pavement make up (14m wide pavement, which will likely be 3.5m wide lanes with 1.5m wide shoulders) and potential design speeds. Therefore, the capacity analysis will be different to the general urban type capacity assumptions utilised for the rest of the study network.

Reference has therefore been made to Austroads Guide to Traffic Management: Part 3: Traffic Studies and Analysis. Chapter 4 of this guide relates to uninterrupted flow conditions, on areas such as that described for the section of road between Tannum Sands Road and Boyne Island Road, including the new Boyne River Crossing. Reference is made in this chapter to research within the Highway Capacity Manual 2000, which stated that "the capacity of a two-lane highway is **1,700** pc/h for each direction of travel and is nearly independent of the directional distribution of traffic. For extended lengths of two lane highway, the capacity will not exceed **3,200** pc/h for both directions of flow."

In order to understand how the proposed development would affect the capacity of the proposed road network the maximum hourly traffic flows for the development have been calculated. The peak hour background traffic is assumed to be related to the Tannum Waters development site. A summary of the peak hour traffic data and how this relates to link capacity is illustrated in Table 6.12.

Table 6.12 Pioneer Drive/New Boyne Island River Crossing Traffic

Design Peak	Direction	Percentage %	Tannum Sands UDA (DEV)	Tannum Waters (BG)	Total	V/C
AM Peak	Eastbound	30%	253	311	564	33%
	Westbound	70%	590	726	1,316	77.5%
PM Peak	Eastbound	70%	590	726	1,316	77.5%
	Westbound	30%	253	311	564	33%
TOTAL	**Combined**	**100%**	**843**	**1,037**	**1,880**	**TOTAL**

Table 6.12 illustrates the amount of the road capacity that is predicted to be used by the proposed UDA & background traffic. This table clearly shows that the proposed Pioneer Drive/New Boyne Island River Crossing will have sufficient capacity to accommodate this traffic.

6.4.3 Potential Timing of Future Infrastructure Upgrades

A sensitivity assessment has been undertaken to determine how many UDA lots could be developed before each road segment would need to be upgraded. It has been assumed that both the UDA site and the approved Tannum Waters Residential Estate will develop at a rate of 150 lots per year, and the Tannum Sands Quarry will generate a constant 100vpd.

Table 6.12 provides a summary of:

- When each road segment will exceed capacity
- The number of UDA lots which could be developed prior to triggering an upgrade.

Table 6.13 Infrastructure Timing (Upgraded Network)

ID	Road	Year Upgrade is Required	No. of UDA Lots
1	Tannum Sands Road	No Upgrade Required	1,800
1a	Tannum Sands Road	2021	1,350*
1b	Tannum Sands Road	No Upgrade Required	
2	Tannum Sands Road	No Upgrade Required	1,800
3	Hampton Drive	No Upgrade Required	1,800
4	John Oxley Bridge	No Upgrade Required	1,800
5	Boyne Island Road	No Upgrade Required	1,800
6	Boyne Island Road	2016	600*
7	New	No Upgrade Required	1,800

*Tannum Sands UDA traffic does not impact on this section of road.

Table 6.12 highlights that the Tannum Sands Road, between the Pioneer Drive and Broadacres Drive would need to be duplicated by 2021. However, it is important to note that the proposed UDA development does not impact on this section of the road network.

Table 6.12 also highlights Boyne Island Road, between Gladstone-Benaraby Road and Pioneer Drive, would need to be duplicated by 2016 or after 600 UDA lots are constructed. As stated previously, this road segment is listed in the PSP3 for duplication, therefore this section of road would be included within the existing infrastructure charges.

6.5 SUMMARY OF LINK ANALYSIS

Without a new bridge crossing of the Boyne River, both the proposed UDA development and the approved Tannum Waters Residential Estate development will have significant impacts on the road network through the Tannum Sands/Boyne Island Township. It is likely that without a new bridge over the Boyne River the entire state-controlled network (Tannum Sands Road, Hampton Drive, Malpas Street and Boyne Island Road), excluding the section between the Bruce Highway and Dahl Road, would need to be upgraded to a four (4) lane cross section to cater for the projected ultimate traffic volumes. This includes the duplication of the John Oxley Bridge. This is considered to be an undesirable outcome considering the high proportion of through trips which would travel to/from Gladstone.

Providing a new bridge crossing of Boyne River will significantly reduce the impact on the road network through the Tannum Sands/Boyne Island Township, effectively providing a bypass road for through traffic movements. If a new bridge was provided, it is considered likely that it would operate adequately as a two (2) lane bridge during the ultimate 2024 design horizon. Additional sections of Tannum Sands Road, between Broadacres Drive and Pioneer Drive would need to be duplicated to cater for ultimate traffic volumes. However, the proposed UDA development would not impact on this section of the network.

Whilst the analysis suggests that Hampton Drive and John Oxley Bridge will be close to capacity during the ultimate design horizon, in reality it is likely that traffic volumes along this corridor will shift over to the new bridge crossing of Boyne River until travel times on both routes are reasonably balanced. No works are recommended along this section of the road network.

6.6 INTERSECTION CONFIGURATIONS

6.6.1 Design Traffic Volumes

Ultimate 2024 peak hour traffic volumes have been derived for the proposed New Access Road intersection with Tannum Sands Road. The adopted intersection volumes are summarised at Appendix F.

6.6.2 Turn Warrants

A turn warrant assessment has been undertaken for the proposed New Access Road intersection with Tannum Sands Road. A turn warrant assessment identifies when a turn treatment is required to improve road safety. Austroads *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* provides warrants for turn treatments at priority controlled intersections. The turn warrant assessment was undertaken for the ultimate design horizon (2026). The results of the assessment are summarised in Table 6.14. A copy of the turn warrant calculations is included at Attachment G.

Table 6.14 Turn Warrant Summary (2026)

Intersection	Turn Movement	Design Period		Recommended Treatment
		AM Peak	PM Peak	
Tannum Sands Road/New Access	Left Turn	AUL (s)	CHL	CHL
	Right Turn	CHR	CHR	CHR

Table 6.14 highlights that a channalised left and right turn treatment are warranted on Tannum Sands Road.

6.6.3 Intersection Analysis

The operation of the UDA New Access Intersection with Tannum Sands Road has been analysed with the estimated design traffic volumes using SIDRA Intersection 5.1. This program estimates the operational performance of an intersection based on input parameters, including geometry and traffic volumes. As an output, SIDRA provides estimates for the degree of saturation (DOS), queues and delays. The DOS is a commonly used value, which is essentially a volume-to-capacity ratio.

In the *Guidelines for Assessment of Road Impacts of Development*, TMR defines the following standard DOS thresholds:

- 0.80 (80%) for priority controlled intersections
- 0.85 (85%) for roundabouts
- 0.90 (90%) for signalised intersections.

The TMR guideline notes that a DOS exceeding these values indicates that an intersection is nearing its practical capacity and upgrade works may be required. Above these thresholds, users of an intersection are likely to experience rapidly increasing delays and queuing. The operation of existing intersection forms is discussed in the following sections as well as potential upgrades to mitigate development impacts where appropriate.

The proposed configuration of the Tannum Sands Road/New Access Road intersection is shown on Figure 6.6. It includes the required channalised left and right turn treatment as identified in Section 6.7.2 of this report. The results of the SIDRA intersection analysis are summarised in Table 6.13, with detailed outputs provided at Appendix H.

Figure 6.6 Tannum Sands Road/New Access Road – Proposed Configuration

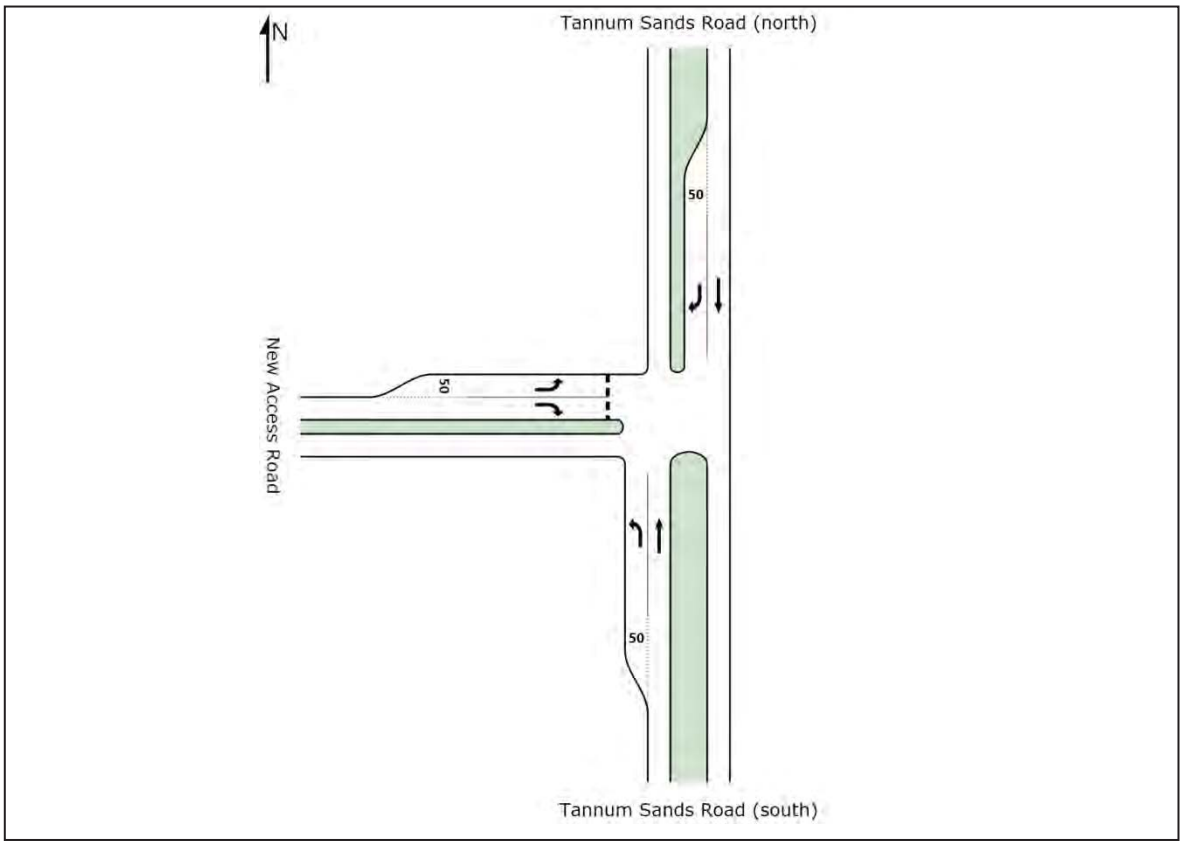


Table 6.15 Tannum Sands Road/New Access Road – Proposed Configuration

Scenarios	AM Peak				PM Peak			
	Demand (vehs)	DOS	Delay (sec)	95th %le Queue (m)	Demand (vehs)	DOS	Delay (sec)	95th %le Queue (m)
2024 Ultimate	1,238	0.53	6	19	1,238	0.29	5	8

Table 6.15 highlights that the proposed configuration for the New Access Road/Tannum Sands Road intersection will adequately cater for the ultimate traffic volumes.

7 URBAN DEVELOPMENT AREA ROAD HIERARCHY

- A potential internal road hierarchy has been developed for the proposed UDA development. As stated in Section 5.1 of this report, the typically functional road hierarchy principles along with the Calliope Shire Council – *Roads and Transport Standard (2005)* have been utilised to provide a framework for developing a high quality structure plan or road hierarchy for the site.

Figure 7.1 illustrates a potential road hierarchy for the proposed UDA development. It should be noted that the potential road hierarchy has been developed for the 'Ultimate Network' scenario which includes a new bridge crossing of Boyne River.

Figure 7.1 Potential Road Hierarchy

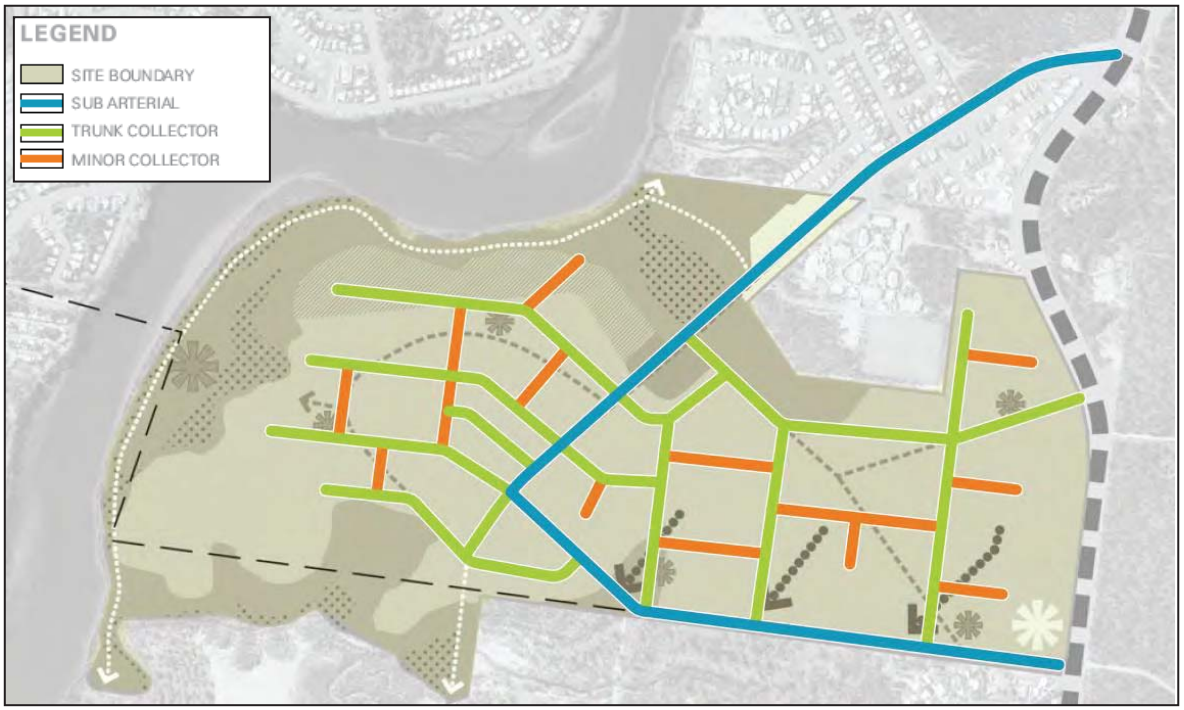


Figure 7.1 highlights that following:

- The Coronation Drive/Dahl Road corridor will ultimately function as a sub-arterial route and will provide the main connections to the external arterial road network (Tannum Sands Road)
- A new east-west connection between Coronation Drive and Tannum Sands Road is recommended to improve accessibility and permeability for all road users. This corridor would ultimate function as a Trunk Collector Road and balance the operational and amenity considerations along Coronation Drive and Dahl Road.

Ultimate link volumes have been estimated for the internal road network, based on the distribution assumptions discussed previously in this report and the potential road hierarchy presented in Figure 7.1. The resultant link volumes are illustrated on Figure 7.2 below.

Figure 7.2 Potential Link Volumes

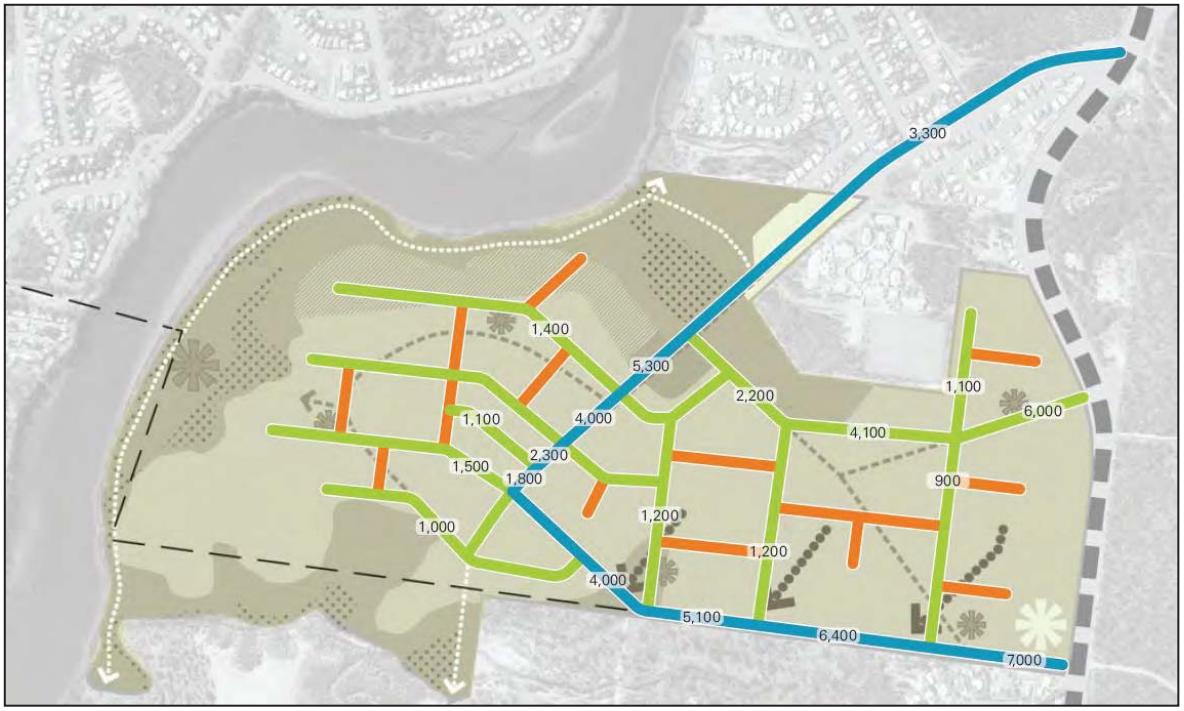


Figure 7.2 highlights the following:

- Traffic volumes along the sub-arterial route are anticipated to be up to 7,000vpd
- Traffic volumes thought the neighbourhood centre (mixed use centre) are anticipated to be up to 5,300pvd
- Traffic volumes along the existing section of Coronation Drive are anticipated to be up to 3,300vpd
- The proposed east-west connection between Coronation Drive and Tannum Sands Road will function as a Trunk Collector Road and will carry up to 6,000vpd

The predicted daily link volumes are within the environmental capacity for each road classification as outlined in Calliope Shire Council *Roads and Transport Standard 2005.*

8 SUSTAINABLE TRANSPORT

8.1 ACTIVE TRANSPORT PLAN

To provide a high quality active transport network, it is recommended that pedestrian footpaths are provided at the following locations:

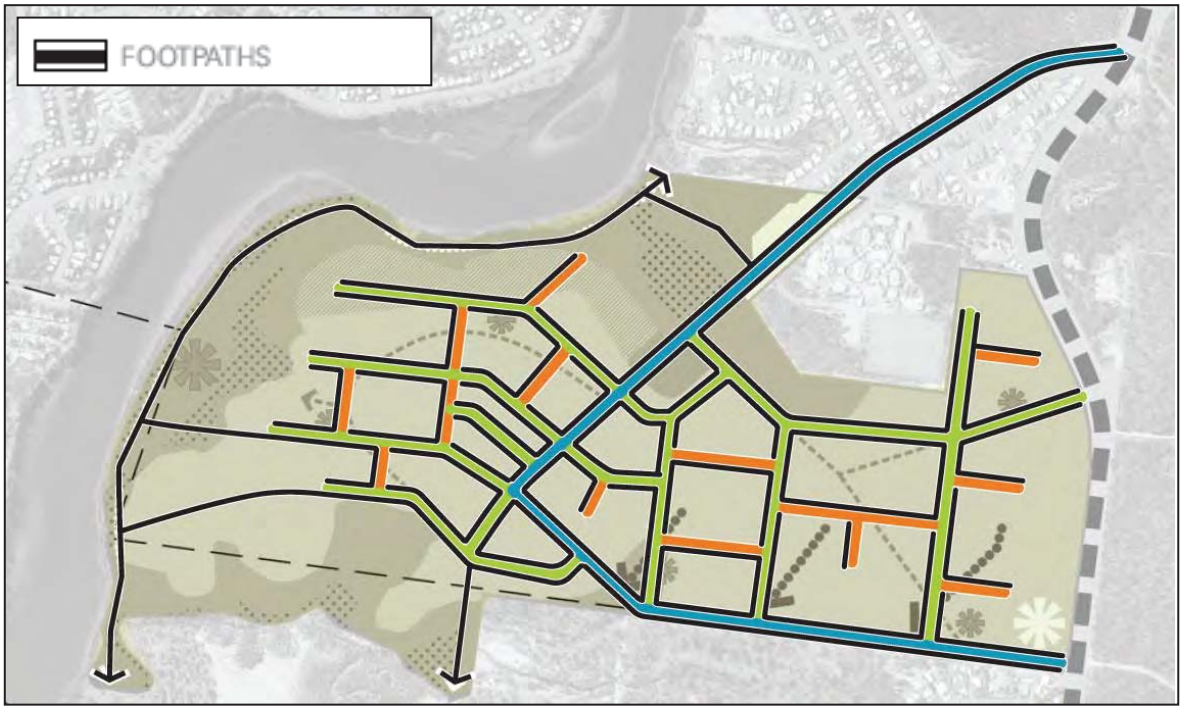
- On both sides of the sub-arterial road network
- On both sides of the trunk collector road network
- On one side of the minor collector road network

In addition, it is recommended that recreational shared paths are provided along the Boyne River and within any parkland corridors.

Dedicated cycle lanes are recommended along the Sub-Arterial network, particularly on the approach to intersections with Tannum Sands Road. Traffic volumes are anticipated to be low enough on the trunk collector and below roads to allow cyclists to bike on road i.e. without dedicated cycle lanes.

A potential active transport network is shown on Figure 8.1 below and included at Appendix I.

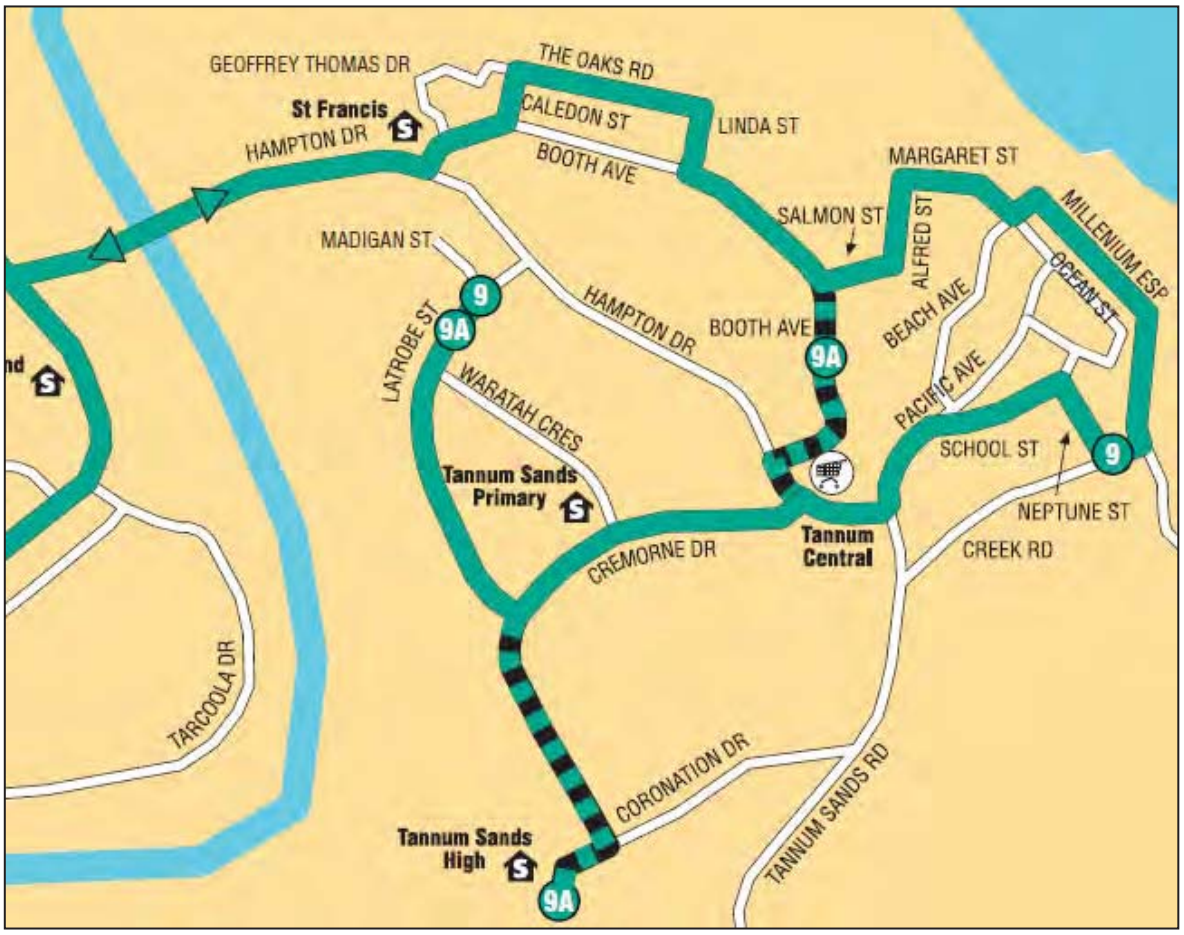
Figure 8.1 Potential Active Transport Network



8.2 PUBLIC TRANSPORT PLAN

Tannum Sands is currently serviced by Bus Route 9/9A which provides connectivity between Tannum Sands/Boyne Island and the Gladstone CBD. The existing route through Tannum Sands is shown on Figure 8.2 below.

Figure 8.2 Existing Bus Route 9/9A



Source: www.qconnect.qld.gov.au

Bus Route 9/9A currently operates Monday to Friday only i.e. no weekend or public holiday services. It provides seven (7) daily services from the Gladstone CBD to Tannum Sands and eight (8) daily services from Tannum Sands to the Gladstone CBD.

Bus Route 9/9A currently terminates at Latrobe Street, Tannum Sands, which is approximately 1.5km north of the UDA site. Given that the UDA site will ultimately contain approximately 5,000 to 6,000 residents and that a high proportion of employment opportunities for this catchment will be located in Gladstone, it is considered that a good quality public transport connection between the UDA site and Gladstone will be highly desirable. It is recommended that Route 9/9A be extended ion the future to service the UDA site.

Ideally, all future residential dwellings located within the UDA site should be within 400m walking distance to a bus stop. To ensure the proposed development is well-serviced by public transport, it is recommended that bus stops be provided along Coronation Drive and Dahl Road at regular intervals. A potential route (extension of Route 9/9A) and bus stop locations are indicatively shown on Figure 8.3 below and included at Appendix J. The delivery of a public transport service would be subject to provision of funding.

Figure 8.3 Potential Public Transport Network

9 SUMMARY

- The Urban Land Development Authority (ULDA) has commissioned Cardno to provide traffic input to the development of the UDA Structure Plan and Development Scheme

- The UDA adjoins the Tannum Sands State High School to the North and a rural residential subdivision (Pacific Ranch) to the South along Dahl Road. The UDA is bounded by Tannum Sands Road to the east and the Boyne River to the west.

- An infrastructure charging policy has been produced by Gladstone Regional Council to accommodate expected growth in the area with traffic infrastructure improvements including a new bridge crossing over the Boyne River. Infrastructure charging will be based on GRC's infrastructure charging policy.

- The development land within Tannum Sands UDA is controlled by three (3) landowners Rio Tinto (Boyne Smelters), Port Curtis Coral Coast People, subject to an ILUA and the ULDA. 1,500 residential lots is the likely development yield; and 1,800 residential lots is a possible maximum yield which could be accommodated.

- The Structure and Zoning Plan has been developed through extensive consultation with community and stakeholder representatives. This allowed the interested parties to play an important role in the development of the Development Scheme and Structure and Zoning Plan for the UDA

- Background traffic growth was calculated using traffic data for approved developments in the local area

- An assessment of development impacts on the local road network illustrates that 750 lots could be developed within the UDA before major upgrades to the surrounding road network would be required

- This development would require the following upgrades to the road network to allow the entire development, and surrounding developments, to be developed:

    - Duplication of Boyne Island Road between Gladstone-Benaraby Road and Pioneer Drive
    - Extension of Pioneer Drive with a bridge connection over the Boyne River
    - Upgrades to Malpas Avenue, Hampton Drive and Tannum Sands Road
    - Key intersection upgrades along Malpas Avenue, Hampton Drive and Tannum Sands Road.

    These infrastructure upgrades are all identified within the Gladstone Regional Council Adopted Infrastructure Charges Resolutions (No. 1) – 2011

- The proposed access strategy for the proposed UDA would allow for two access points onto Tannum Sands Road and a connection to Coronation Drive. The proposed new access junction on Tannum Sands Road would require a Channalised Left Turn and Channalised Right Turn treatment into the site to provide safe and efficient operations

- The internal arrangement of the site should include a network of foot and cycle paths to encourage sustainable travel and provide linkages to from the site to the local area

- There is an existing bus service linking Tannum Sands to Gladstone, which terminates north of the site. Due to the level of development it is conceivable that this service could be extended to incorporate the UDA. With this in mind a potential bus route through the site has been examined with likely bus stops incorporated into the development plan. With this in mind a potential bus route through the site has been examined with potential bus stop locations identified in this report. The delivery of a public transport service is subject to the provision of funding.

Appendix A

Traffic Count Data

Traffic Analysis and Reporting System
AADT Segment Report
Road Section 1805 - Tannum Sands Road
Traffic Year 2010

Road Segments Summary - All Vehicles

Region	Segment Start TDist	Segment End TDist	Site	Site TDist	Description	AADT G	AADT A	AADT B	VKT (Millions) G	VKT (Millions) A	VKT (Millions) B	Data Year	Page
204	0.000 km	6.315 km	60117	0.200 km	Tannum Sands Rd 200m Est of Bruce Hwy	767	786	1,553	1.76792	1.81171	3.57963	2010	2
204	6.315 km	8.490 km	61206	7.000 km	Tannum Sands Rd 200m E of Coronation Dr	1,525	1,480	3,005	1.21066	1.17493	2.38559	2010	3
204	8.490 km	9.110 km	61615	8.750 km	Tannum Sands Rd 250m E Boyne Island Rd	729	624	1,353	0.16497	0.14121	0.30618	2010	4
								Totals	3.14355	3.12786	6.27140		

Road Segments Summary - Heavy Vehicles only
VKT totals are calculated only if traffic class data is available for all sites.

Region	Segment Start TDist	Segment End TDist	Site	Site TDist	Description	HV AADT G AADT	HV AADT G HV %	HV AADT A AADT	HV AADT A HV %	HV AADT B AADT	HV AADT B HV %	HV VKT (Millions) G	HV VKT (Millions) A	HV VKT (Millions) B	Data Year	Page
204	0.000 km	6.315 km	60117	0.200 km	Tannum Sands Rd 200m Est of Bruce Hwy	91	11.86%	88	11.20%	179	11.53%	0.20975	0.20284	0.41259	2010	2
204	6.315 km	8.490 km	61206	7.000 km	Tannum Sands Rd 200m E of Coronation Dr	68	4.46%	66	4.46%	134	4.46%	0.05398	0.05240	0.10638	2010	3
204	8.490 km	9.110 km	61615	8.750 km	Tannum Sands Rd 250m E Boyne Island Rd	32	4.39%	23	3.69%	55	4.07%	0.00724	0.00520	0.01245	2010	4
											Totals	0.27098	0.26044	0.53142		

Traffic Analysis and Reporting System

AADT Segment Report

Region 204 - Fitzroy Road Section 1805 - Tannum Sands Road
Traffic Year 2010 - Data Collection Year 2010

Site 60117. Point 260000207. Tannum Sands Rd 1.3km Est of Bruce Hwy.
0.20 km

The width of each Road Segment is proportional to its AADT.

0.00 km
Start Point 260000208. Tannum Sands Rd @ Bruce Hwy.

6.32 km
End Point 260000209. Tannum Sands Rd to Benaraby @ Silverton.

This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

	Annual Segment Growth		
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	0.52%	1.47%	4.80%
A	1.16%	1.97%	5.04%
B	0.84%	1.70%	4.92%

All Vehicles (00)

G	767	100%
A	786	100%
B	1,553	100%

Light Vehicles (0A)

G	675	88.01%
A	699	88.93%
B	1,374	88.47%

Heavy Vehicles (0B)

G	91	11.86%
A	88	11.20%
B	179	11.53%

Short Vehicles (1A)

G	675	88.01%
A	699	88.93%
B	1,374	88.47%

Trucks and Buses (1B)

G	57	7.43%
A	53	6.74%
B	110	7.08%

Articulated Vehicles (1C)

G	18	2.35%
A	20	2.54%
B	38	2.45%

Road Trains (1D)

G	16	2.09%
A	15	1.91%
B	31	2.00%

Short 2-Axle Vehicles (2A)

G	628	81.88%
A	650	82.70%
B	1,278	82.29%

Short Vehicles Towing (2B)

G	47	6.13%
A	49	6.23%
B	96	6.18%

2-Axle Trucks and Buses (2C)

G	41	5.35%
A	42	5.34%
B	83	5.34%

3-Axle Trucks and Buses (2D)

G	12	1.56%
A	9	1.15%
B	21	1.35%

4-Axle Trucks (2E)

G	4	0.52%
A	2	0.25%
B	6	0.39%

3-Axle Articulated (2F)

G	2	0.26%
A	1	0.13%
B	3	0.19%

4-Axle Articulated (2G)

G	3	0.39%
A	2	0.25%
B	5	0.32%

5-Axle Articulated (2H)

G	1	0.13%
A	2	0.25%
B	3	0.19%

6-Axle Articulated (2I)

G	12	1.56%
A	15	1.91%
B	27	1.74%

B Double (2J)

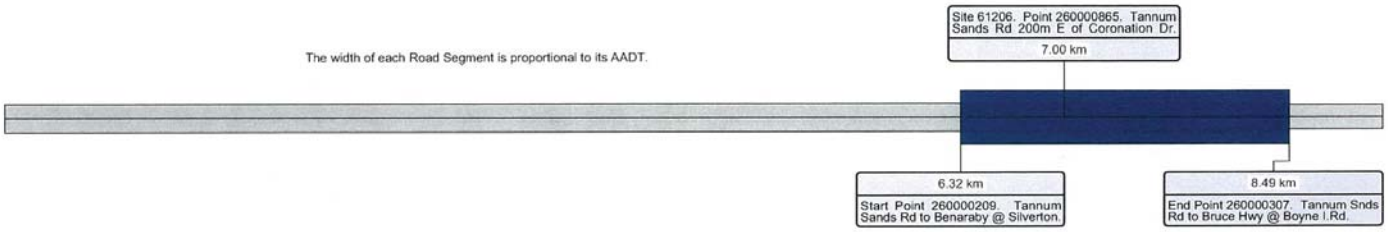
G	16	2.09%
A	15	1.91%
B	31	2.00%

Double Road Trains (2K)

G	0	0%
A	0	0%
B	0	0%

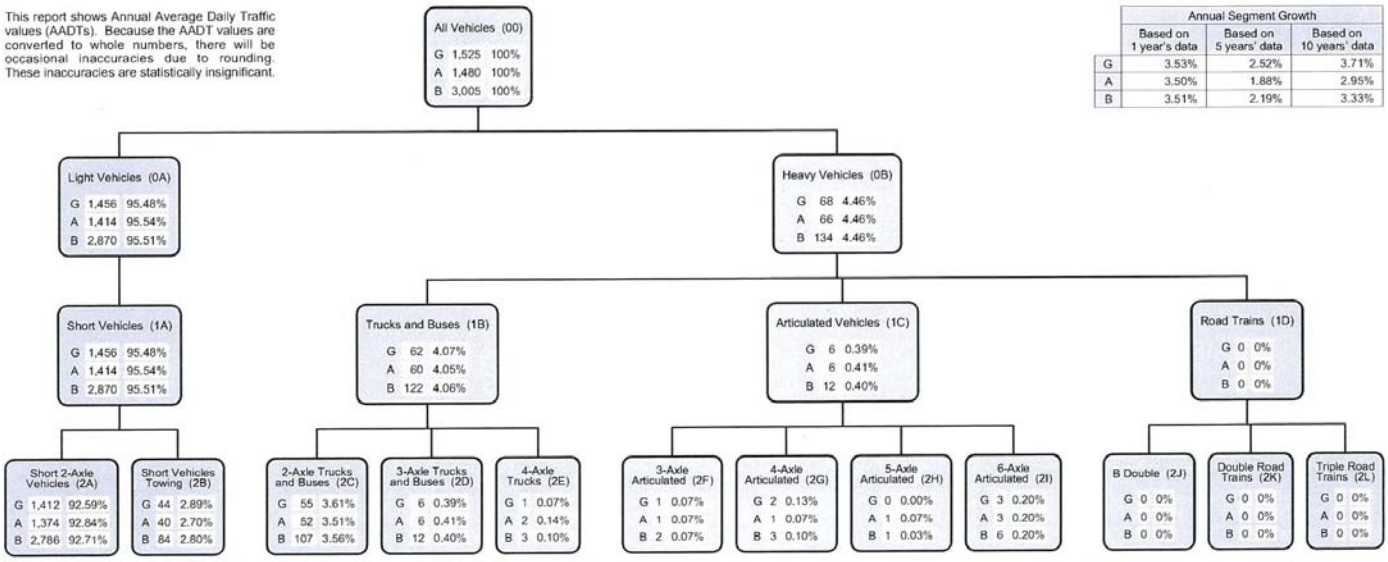
Triple Road Trains (2L)

G	0	0%
A	0	0%
B	0	0%

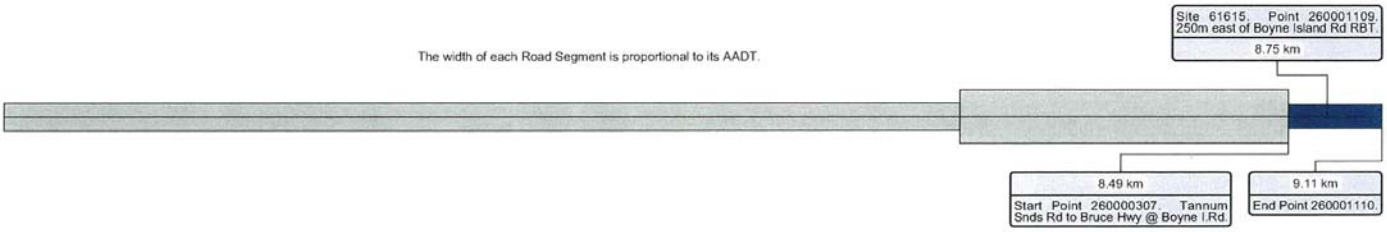


This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

	Annual Segment Growth		
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	3.53%	2.52%	3.71%
A	3.50%	1.88%	2.95%
B	3.51%	2.19%	3.33%

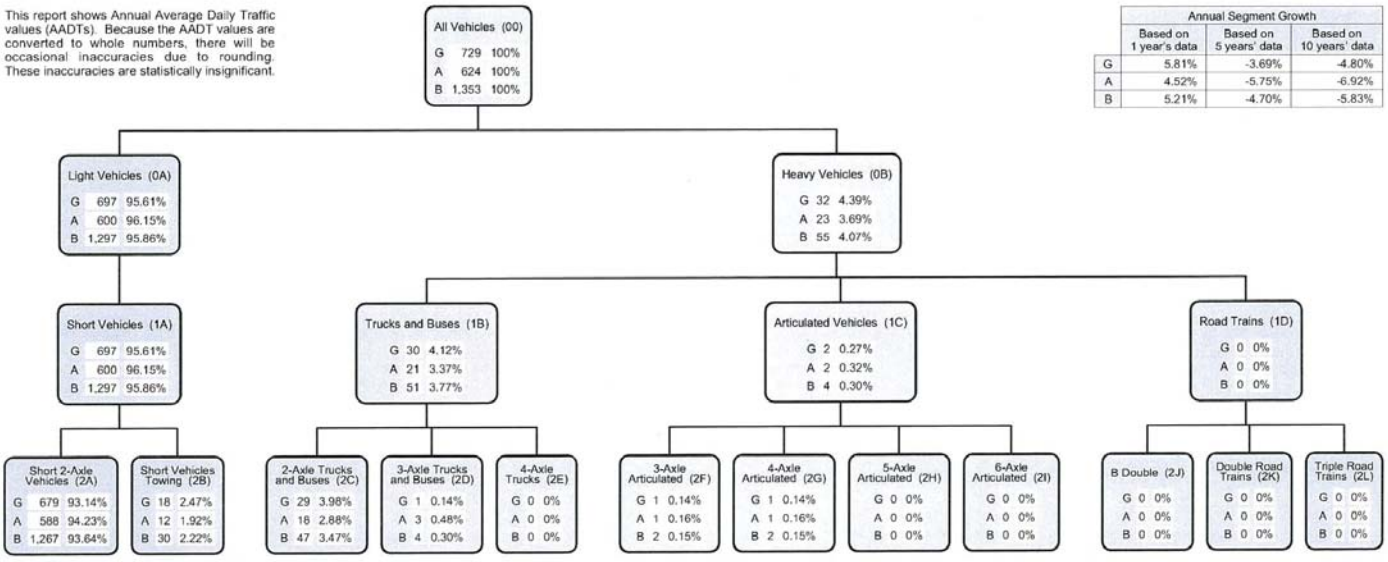


Traffic Analysis and Reporting System
AADT Segment Report
Region 204 - Fitzroy Road Section 1805 - Tannum Sands Road
Traffic Year 2010 - Data Collection Year 2010



This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

	Annual Segment Growth		
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	5.81%	-3.69%	-4.80%
A	4.52%	-5.75%	-6.92%
B	5.21%	-4.70%	-5.83%



Report Notes for AADT Segment Analysis Report (Complete)

AADT Segment Reports (Complete)

This report provides AADT Segment details for a Road Section together with the traffic flow data collected at the related Site. Traffic data is reported by the start and end Through Distance of the AADT Segments on each section of road. The road segments are represented diagrammatically with AADT data including:

- AADT by direction of traffic flow
- VKT Vehicle Kilometres Travelled .
- %VC Percentage Vehicle Class as per the Austroads vehicle classification scheme

Annual Average Daily Traffic (AADT)

The number of vehicles passing a point on a road in a 24 hour period, averaged over a calendar year.

AADT Segments

The start and end Through Distance (TDist) of the Road Section on which the traffic count represents. The distance is measured in kilometers from the start of the road section in gazettal direction.

Annual Segment Growth (when displayed)

A percentage that represents the increase or decrease in AADT for Segment, calculated over a 1, 5 or 10 year period.

Data Year

The most recent year the traffic data was collected for this AADT Segment.

Gazettal Direction

The Gazettal Direction is the direction of the traffic flow. It can be easily recognised by referring to the name of the road eg. Road Section: 10A Brisbane - Gympie denotes that gazettal direction is from Brisbane to Gympie.

- G Traffic flowing in Gazettal Direction
- A Traffic flowing against Gazettal Direction
- B The combined traffic flow in both Directions

Regions

For administration purposes the Department of Transport and Main Roads has divided Queensland into 12 Regions.

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 (eg. A, B, C) for easier data collection and reporting. Road Sections are then broken into AADT Segments which are determined by traffic volume.

Site

The physical location of a traffic counting device. Sites are located at a specified Through Distance along a road. There are two types of sites, Permanent and Coverage. Permanent denotes the traffic counting device is in place 24/7. A Coverage site denotes the traffic counting device is in place for a specified period of time.

Site TDist

The Through Distance in gazettal direction from the start of the Road Section at which the site is located.

Site Description

The description of the physical location of the traffic counting device.

Through Distance

The distance from the beginning of the Road Section, in kilometres.

Traffic Class

The 12 Austroads vehicle categories or classes into which vehicles are placed or binned. Traffic classes are formed in a hierarchical format.

Volume or All Vehicles

00 = 0A + 0B

Light Vehicles

0A = 1A
1A = 2A + 2B

Heavy Vehicles

0B = 1B + 1C + 1D
1B = 2C + 2D + 2E
1C = 2F + 2G + 2H + 2I
1D = 2J + 2K + 2L

The following classes are the categories for which data can be captured:

Volume

00 All vehicles.

2-Bin

0A Light vehicles
0B Heavy vehicles

4-Bin

1A Short vehicles
1B Truck or bus
1C Articulated vehicles
1D Road train

12-Bin

2A Short 2 axle vehicles
2B Short vehicles towing
2C 2 axle truck or bus
2D 3 axle truck or bus
2E 4 axle truck
2F 3 axle articulated vehicle
2G 4 axle articulated vehicle
2H 5 axle articulated vehicle
2I 6 axle articulated vehicle
2J B double
2K Double road train
2L Triple road train

Vehicle Kilometres Travelled (VKT)

Daily VKT is a measure of traffic demand and is the length of a section of road in kilometres multiplied by the AADT on it. The yearly VKT is the daily VKT multiplied by 365 days. The VKT is this report is the yearly VKT.

AADT Segment Summary - All Vehicles

The Total VKT can be used to gauge the demand on an entire Road Section.

AADT Segment Summary - Heavy Vehicles only

A blank field indicates that vehicle classification data was not collected for this AADT Segment.

Traffic Analysis and Reporting System
AADT Segment Report
Road Section 1806 - Boyne Island Road
Traffic Year 2010

Road Segments Summary - All Vehicles

Region	Segment Start TDist	Segment End TDist	Site	Site TDist	Description	AADT			VKT (Millions)			Data Year	Page
						G	A	B	G	A	B		
204	0.000 km	3.825 km	60118	3.240 km	Boyne Island Rd 130 W(South Trees Inlet)	4,952	4,903	9,855	6.91361	6.84520	13.75881	2010	2
204	3.825 km	6.420 km	61087	4.861 km	Boyne Island Rd 100m S Mangrove Place	4,109	4,143	8,252	3.89194	3.92415	7.81609	2010	3
204	6.420 km	8.195 km	61207	6.821 km	Boyne Island Rd 10m E Boyne River	5,660	5,826	11,486	3.66697	3.77452	7.44149	2010	4
204	8.195 km	8.370 km	61614	8.350 km	Boyne Island Rd 400m S Booth Ave	2,759	2,858	5,617	0.17623	0.18255	0.35879	2010	5
								Totals	14.64876	14.72642	29.37518		

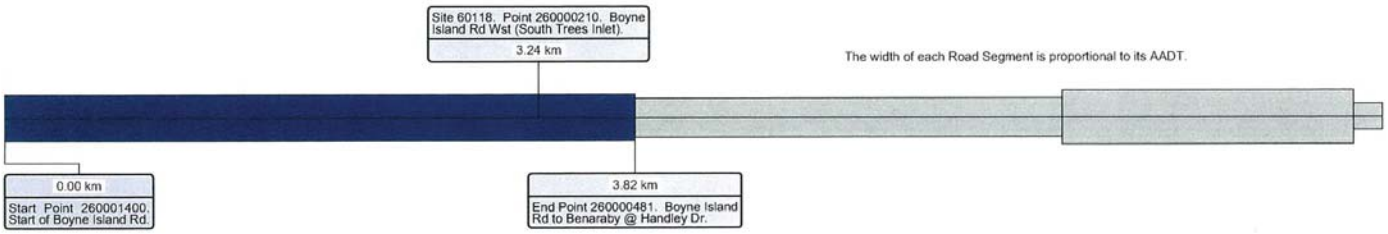
Road Segments Summary - Heavy Vehicles only
VKT totals are calculated only if traffic class data is available for all sites.

Region	Segment Start TDist	Segment End TDist	Site	Site TDist	Description	HV AADT						HV VKT (Millions)			Data Year	Page
						G		A		B						
						AADT	HV %	AADT	HV %	AADT	HV %	G	A	B		
204	0.000 km	3.825 km	60118	3.240 km	Boyne Island Rd 130 W(South Trees Inlet)	254	5.13%	267	5.45%	521	5.29%	0.35462	0.37277	0.72738	2010	2
204	3.825 km	6.420 km	61087	4.861 km	Boyne Island Rd 100m S Mangrove Place	167	4.06%	193	4.66%	360	4.36%	0.15818	0.18280	0.34098	2010	3
204	6.420 km	8.195 km	61207	6.821 km	Boyne Island Rd 10m E Boyne River	131	2.31%	145	2.49%	276	2.40%	0.08487	0.09394	0.17881	2010	4
204	8.195 km	8.370 km	61614	8.350 km	Boyne Island Rd 400m S Booth Ave	155	5.62%	86	3.01%	241	4.29%	0.00990	0.00549	0.01539	2010	5
											Totals	0.60757	0.65501	1.26257		

Traffic Analysis and Reporting System

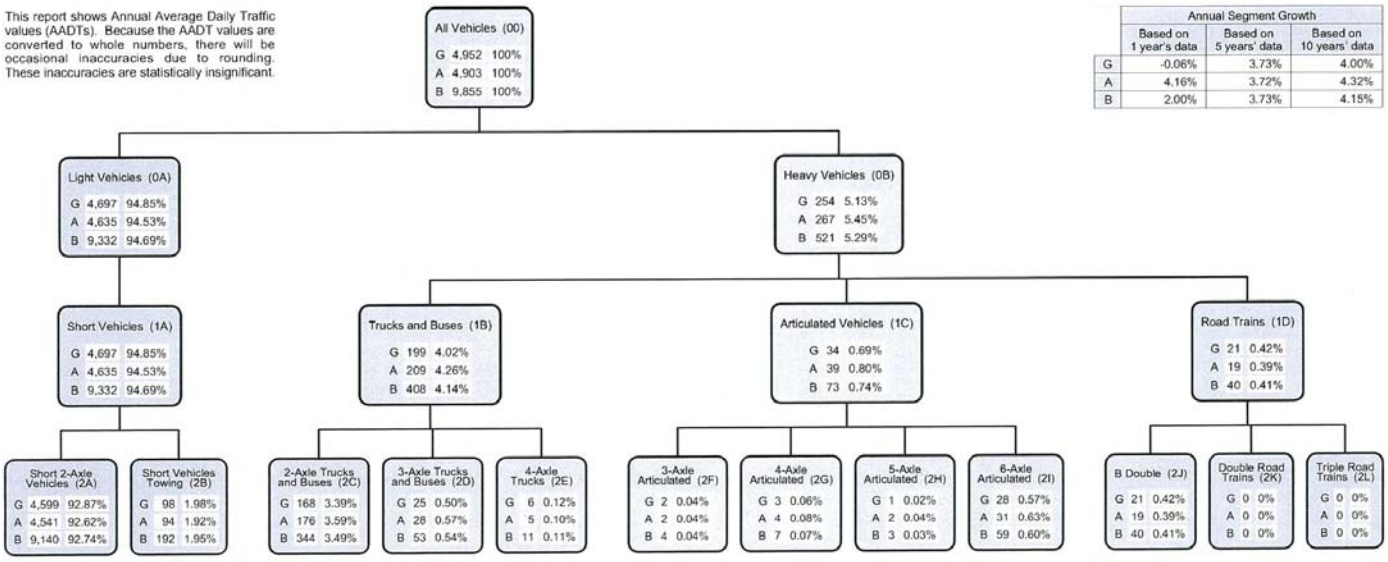
AADT Segment Report

Region 204 - Fitzroy Road Section 1806 - Boyne Island Road
Traffic Year 2010 - Data Collection Year 2010

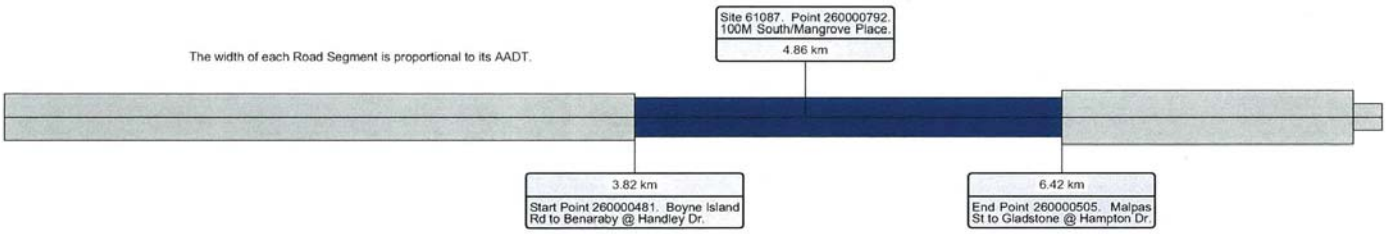


This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

	Annual Segment Growth		
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	-0.06%	3.73%	4.00%
A	4.16%	3.72%	4.32%
B	2.00%	3.73%	4.15%

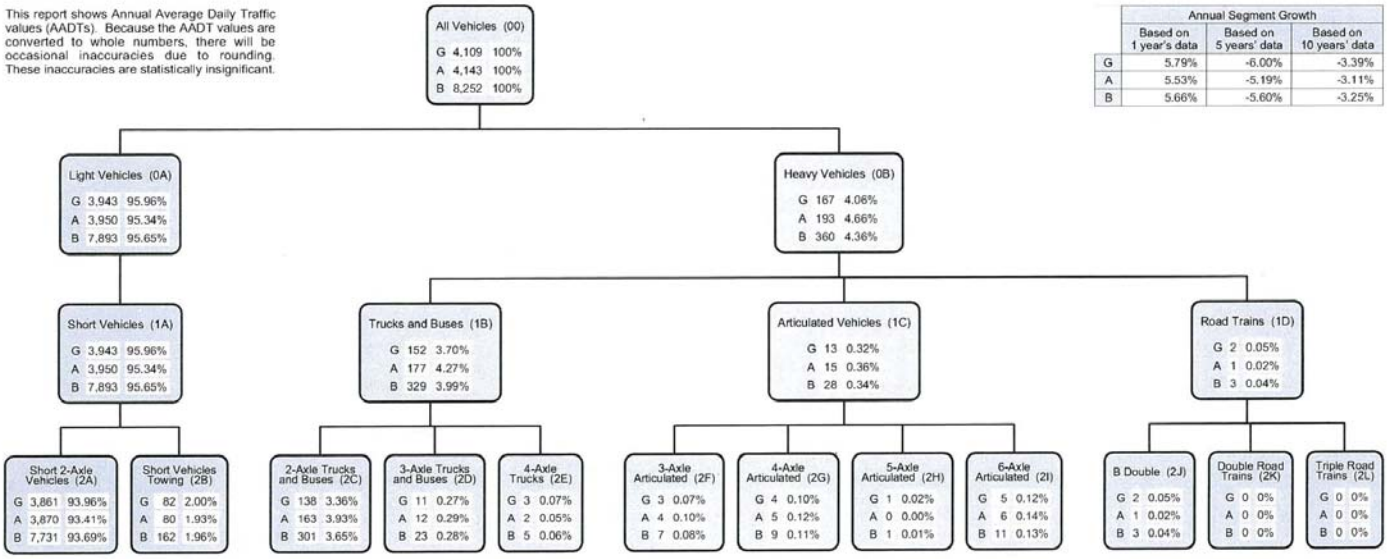


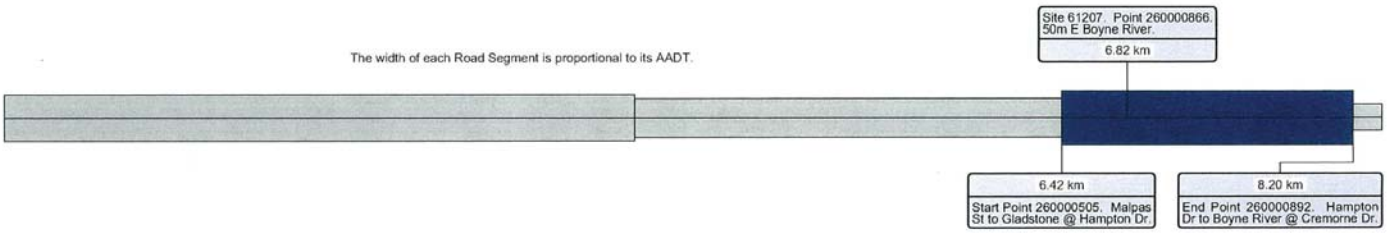
Traffic Analysis and Reporting System
AADT Segment Report
Region 204 - Fitzroy Road Section 1806 - Boyne Island Road
Traffic Year 2010 - Data Collection Year 2010



This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

	Annual Segment Growth		
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	5.79%	-6.00%	-3.39%
A	5.53%	-5.19%	-3.11%
B	5.66%	-5.60%	-3.25%





This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

	Annual Segment Growth		
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	0.62%	0.44%	0.82%
A	3.54%	2.12%	1.46%
B	2.08%	1.27%	1.14%

All Vehicles (00)

G	5,660	100%
A	5,826	100%
B	11,486	100%

Light Vehicles (0A)

G	5,529	97.69%
A	5,682	97.53%
B	11,211	97.61%

Heavy Vehicles (0B)

G	131	2.31%
A	145	2.49%
B	276	2.40%

Short Vehicles (1A)

G	5,529	97.69%
A	5,682	97.53%
B	11,211	97.61%

Trucks and Buses (1B)

G	120	2.12%
A	132	2.27%
B	252	2.19%

Articulated Vehicles (1C)

G	10	0.18%
A	12	0.21%
B	22	0.19%

Road Trains (1D)

G	1	0.02%
A	1	0.02%
B	2	0.02%

Short 2-Axle Vehicles (2A)

G	5,429	95.92%
A	5,579	95.76%
B	11,008	95.84%

Short Vehicles Towing (2B)

G	100	1.77%
A	103	1.77%
B	203	1.77%

2-Axle Trucks and Buses (2C)

G	105	1.86%
A	119	2.04%
B	224	1.95%

3-Axle Trucks and Buses (2D)

G	12	0.21%
A	11	0.19%
B	23	0.20%

4-Axle Trucks (2E)

G	3	0.05%
A	2	0.03%
B	5	0.04%

3-Axle Articulated (2F)

G	2	0.04%
A	2	0.03%
B	4	0.03%

4-Axle Articulated (2G)

G	3	0.05%
A	4	0.07%
B	7	0.06%

5-Axle Articulated (2H)

G	1	0.02%
A	1	0.02%
B	2	0.02%

6-Axle Articulated (2I)

G	4	0.07%
A	5	0.09%
B	9	0.08%

B Double (2J)

G	1	0.02%
A	1	0.02%
B	2	0.02%

Double Road Trains (2K)

G	0	0%
A	0	0%
B	0	0%

Triple Road Trains (2L)

G	0	0%
A	0	0%
B	0	0%

Traffic Analysis and Reporting System
AADT Segment Report
Region 204 - Fitzroy Road Section 1806 - Boyne Island Road
Traffic Year 2010 - Data Collection Year 2010

Site 61614. Point 260001108. 400m South of Booth Avenue.
8.35 km

The width of each Road Segment is proportional to its AADT.

8.20 km
Start Point 260000892. Hampton Dr to Boyne River @ Cremorne Dr.

8.37 km
End Point 260000309. Boyne I.Rd to Bnrby Rd @ Tannum Snds Rd.

This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

	Annual Segment Growth		
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	7.61%	-4.32%	-7.08%
A	8.42%	-3.55%	-6.55%
B	8.02%	-3.94%	-6.81%

All Vehicles (00)
G 2,759 100%
A 2,858 100%
B 5,617 100%

Light Vehicles (0A)
G 2,604 94.38%
A 2,772 96.99%
B 5,376 95.71%

Heavy Vehicles (0B)
G 155 5.62%
A 86 3.01%
B 241 4.29%

Short Vehicles (1A)
G 2,604 94.38%
A 2,772 96.99%
B 5,376 95.71%

Trucks and Buses (1B)
G 146 5.29%
A 80 2.80%
B 226 4.02%

Articulated Vehicles (1C)
G 9 0.33%
A 6 0.21%
B 15 0.27%

Road Trains (1D)
G 0 0%
A 0 0%
B 0 0%

Short 2-Axle Vehicles (2A)
G 2,554 92.57%
A 2,713 94.93%
B 5,267 93.77%

Short Vehicles Towing (2B)
G 50 1.81%
A 59 2.06%
B 109 1.94%

2-Axle Trucks and Buses (2C)
G 132 4.78%
A 69 2.41%
B 201 3.58%

3-Axle Trucks and Buses (2D)
G 11 0.40%
A 9 0.31%
B 20 0.36%

4-Axle Trucks (2E)
G 3 0.11%
A 2 0.07%
B 5 0.09%

3-Axle Articulated (2F)
G 4 0.14%
A 1 0.03%
B 5 0.09%

4-Axle Articulated (2G)
G 2 0.07%
A 2 0.07%
B 4 0.07%

5-Axle Articulated (2H)
G 1 0.04%
A 1 0.03%
B 2 0.04%

6-Axle Articulated (2I)
G 2 0.07%
A 2 0.07%
B 4 0.07%

B Double (2J)
G 0 0%
A 0 0%
B 0 0%

Double Road Trains (2K)
G 0 0%
A 0 0%
B 0 0%

Triple Road Trains (2L)
G 0 0%
A 0 0%
B 0 0%

Report Notes for AADT Segment Analysis Report (Complete)

AADT Segment Reports (Complete)

This report provides AADT Segment details for a Road Section together with the traffic flow data collected at the related Site. Traffic data is reported by the start and end Through Distance of the AADT Segments on each section of road. The road segments are represented diagrammatically with AADT data including:

AADT	by direction of traffic flow
VKT	Vehicle Kilometres Travelled
%VC	Percentage Vehicle Class as per the Austroads vehicle classification scheme

Annual Average Daily Traffic (AADT)

The number of vehicles passing a point on a road in a 24 hour period, averaged over a calendar year.

AADT Segments

The start and end Through Distance (TDist) of the Road Section on which the traffic count represents. The distance is measured in kilometers from the start of the road section in gazettal direction.

Annual Segment Growth (when displayed)

A percentage that represents the increase or decrease in AADT for Segment, calculated over a 1, 5 or 10 year period.

Data Year

The most recent year the traffic data was collected for this AADT Segment.

Gazettal Direction

The Gazettal Direction is the direction of the traffic flow. It can be easily recognised by referring to the name of the road eg. Road Section: 10A Brisbane - Gympie denotes that gazettal direction is from Brisbane to Gympie.

G	Traffic flowing in Gazettal Direction
A	Traffic flowing against Gazettal Direction
B	The combined traffic flow in both Directions

Regions

For administration purposes the Department of Transport and Main Roads has divided Queensland into 12 Regions.

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 (eg. A, B, C) for easier data collection and reporting. Road Sections are then broken into AADT Segments which are determined by traffic volume.

Site

The physical location of a traffic counting device. Sites are located at a specified Through Distance along a road. There are two types of sites, Permanent and Coverage. Permanent denotes the traffic counting device is in place 24/7. A Coverage site denotes the traffic counting device is in place for a specified period of time.

Site TDist

The Through Distance in gazettal direction from the start of the Road Section at which the site is located.

Site Description

The description of the physical location of the traffic counting device.

Through Distance

The distance from the beginning of the Road Section, in kilometres.

Traffic Class

The 12 Austroads vehicle categories or classes into which vehicles are placed or binned. Traffic classes are formed in a hierarchical format.

Volume or All Vehicles

00 = 0A + 0B

Light Vehicles

0A = 1A
1A = 2A + 2B

Heavy Vehicles

0B = 1B + 1C + 1D
1B = 2C + 2D + 2E
1C = 2F + 2G + 2H + 2I
1D = 2J + 2K + 2L

The following classes are the categories for which data can be captured:

Volume

00 All vehicles.

2-Bin

0A Light vehicles
0B Heavy vehicles

4-Bin

1A Short vehicles
1B Truck or bus
1C Articulated vehicles
1D Road train

12-Bin

2A Short 2 axle vehicles
2B Short vehicles towing
2C 2 axle truck or bus
2D 3 axle truck or bus
2E 4 axle truck
2F 3 axle articulated vehicle
2G 4 axle articulated vehicle
2H 5 axle articulated vehicle
2I 6 axle articulated vehicle
2J B double
2K Double road train
2L Triple road train

Vehicle Kilometres Travelled (VKT)

Daily VKT is a measure of traffic demand and is the length of a section of road in kilometres multiplied by the AADT on it. The yearly VKT is the daily VKT multiplied by 365 days. The VKT is this report is the yearly VKT.

AADT Segment Summary - All Vehicles

The Total VKT can be used to gauge the demand on an entire Road Section.

AADT Segment Summary - Heavy Vehicles only

A blank field indicates that vehicle classification data was not collected for this AADT Segment.

Appendix B

Planning Scheme Policy No.3

GLADSTONE
REGIONAL COUNCIL

Gladstone Regional Council Adopted Infrastructure Charges Resolution (No. 1) - 2011

Former Calliope Shire Local Government area

Amended: 2 August 2011

This is to certify that this is a true and correct copy of the amended Adopted Infrastructure Charge Resolution (pages 1-21 + maps 1-21) for the former Calliope Shire local government area adopted on 2 August 2011 and took effect on 4 August 2011.

Signed:

_____

Chief Executive Officer

2 August 2011

Part 1 - Introduction

1.1 Sustainable Planning Act 2009

(i) The resolution is made pursuant to Section 648D of the *Sustainable Planning Act 2009*.

(ii) The resolution is to be read in conjunction with the State Planning Regulatory Provision (Adopted Charges).

(iii) The resolution is attached to the Calliope Shire Planning Scheme 2007 but does not form part of the Planning Scheme.

1.2 Effect

The resolution has effect on and from Wednesday 6 July 2011 and applies to development application decisions made on or after this date. Amendment No. 1 has effect on and from Wednesday 3 August 2011.

1.3 Purpose of the Resolution

The purpose of the resolution is to establish an *adopted infrastructure charge* for the following trunk infrastructure networks:

(i) transport network;
(ii) parks network;
(iii) stormwater network;
(iv) water network;
(v) sewer network

1.4 Interpretation

dwelling unit has the same meaning as that defined in the Calliope Shire Planning Scheme 2007.

GFA is as per the definition in the Queensland Planning Provisions.

impervious area means an area within a site which does not allow natural infiltration of rainfall to the underlying soil and the majority of rainfall would become runoff e.g. roadways, car parks, footpaths, roofs, hardstand areas (natural and sealed), compacted etc.

local government means Gladstone Regional Council

local government area means the former Calliope Local Government area

maximum adopted charge means the charge limit set out in the maximum charging framework established in the *Sustainable Planning Act 2009* and *SPRP*.

planning scheme uses (as detailed in Column 1, Table 1) have the same definition as per Part 12, Schedule 1 - Dictionary.

residential zone means the planning scheme zones as stated in Section 1.5.

SPRP means the State Planning Regulatory Provision (adopted charges) or the draft State Planning Regulatory Provision

1.5 Residential Zone

For the purposes of calculating an adopted infrastructure charge for reconfiguring a lot, the residential zones applicable are "Village", "Residential", "Urban Expansion" and "Rural Residential".

Part 2 - Application of the Resolution

2.1 Application to the local government area

(i) The adopted infrastructure charges contained within this resolution apply to development on land within the former Calliope Shire Local Government area except as detailed in (ii) below.

(ii) The adopted infrastructure charges do not apply to the following areas:

- Work or use of land authorised under the *Mineral Resources Act 1989,* the *Petroleum Act 1923,* the *Petroleum and Gas (Production and Safety) Act 2004* or the *Greenhouse Gas Storage Act 2009*; or
- Development in an *urban development area* under the *Urban Land Development Authority Act 2007*; or
- Development in a declared *master planned area* within the former Calliope Shire Local Government area, except where an *adopted infrastructure charges resolution* states otherwise.

2.2 Application to particular development

(i) This resolution adopts a charge for particular development that is equal to or less than the *maximum adopted charge* and adopts different charges for particular development in different parts of the *local government area.*

(ii) To enable the *adopted infrastructure charges schedule* identified in the SPRP to be applied to existing development use types, **Table 1** identifies the relationship between existing planning scheme use types and the classes of development to which the *adopted infrastructure charges schedule* apply.

Table 1 Planning scheme use types to which *adopted infrastructure charges schedule* apply.

Planning Scheme Uses	Adopted Infrastructure charges schedule uses
Caretakers Residence, Duplex, Display Home, Dwelling House, Multiple Unit Residential, Relative's Apartment	Residential (3 or more bedroom dwelling) Residential (1 or 2 bedroom dwelling)
Bed & Breakfast, Host Farm, Motel, Resort, Workers Accommodation	Accommodation (Short term)
Accommodation Building, Aged Persons Accommodation, Caravan and Relocatable Home Park	Accommodation (Long term)
Community Facilities, Place of Worship	Places of Assembly
Bulk Store, Produce Store, Retail Plant Nursery, Showrooms, Warehouse	Commercial (Bulk Goods)
Food Premises, Funeral Premises, Market, Service Station, Service Trade, Shop, Shopping Centre, Vehicle & Machinery Sales & Hire	Commercial (Retail)
Commercial Premises, Estate Sales Office, Office	Commercial (Office)
Child Care Centre, Educational Establishment	Education Facility
Cinema, Licensed Premises, Gaming Premises	Entertainment
Indoor Entertainment	Indoor Sport and Recreational Facility
Contractors Depot, Fuel Depot, Local Industry, Machinery & Transport Depot, Minor Infrastructure, Storage Depot, Vehicle Repair Station, Waterfront Industry	Industry
Concrete Batching Plant, Extractive Industry, Major Industry, Major Infrastructure, Mining, Noxious Offensive or Hazardous Industry	High Impact Industry
Agriculture, Animal Husbandry, Rural Pursuits, Rural Industry, Rural Workers Accommodation	Low Impact Rural
Aquaculture, Intensive Agriculture, Intensive Animal Husbandry	High Impact Rural
Hospital, Institution, Local Surgery, Medical Centre, Public Purpose, Veterinary Clinic, Veterinary Hospital	Essential Services
Airport & Aviation Facilities, Brothel, Carpark, Marina, Port Facilities, Sport & Recreation, Tourist Attraction, Home Business	Specialised uses
Advertising Sign, Cemetery, Family Day Care Home, Home Occupation, Park, Telecommunications Facility, Temporary Use, Roadside Stall	Minor uses

2.3 Application to trunk infrastructure networks

The adopted infrastructure charge partially funds the establishment cost of the identified trunk infrastructure networks.

2.4 Priority Infrastructure area

The priority infrastructure area (PIA) is the area identified on Map 1, which can be found in Part 8 - Schedule of Maps. A priority infrastructure area identifies the areas within the *local government area* that is intended to accommodate urban growth.

2.5 Charge Areas

The charge areas for the calculation of an adopted infrastructure charge are identified on Maps 2, 3 & 4, which can be found in Part 8 - Schedule of Maps.

Part 3 - Trunk Infrastructure Networks

3.1 Trunk Infrastructure Identification and Establishment Cost

Until a priority infrastructure plan is adopted, this resolution identifies trunk infrastructure for the *local government area* and the establishment cost of the identified trunk infrastructure. Details regarding the trunk infrastructure can be found in Part 9 - Schedule of Plans for Trunk Infrastructure and Part 10 - Schedule of Works for Trunk Infrastructure.

Note: For clarification, trunk infrastructure does not include local parks, open space or reserves or similar land types.

Part 4 - Adopted Infrastructure Charge

4.1 Purpose

This section states the application of the adopted infrastructure charge to be levied by Gladstone Regional Council under section 648F of the *Sustainable Planning Act 2009* for the transport, parks, stormwater, water and sewer networks.

4.2 Adopted Charge

The adopted charge for:

(i) reconfiguring a lot, is stated in Table 2, Adopted charge for reconfiguring a lot; and

(ii) a material change of use or building work for:
  (a) residential development is stated in Table 3, Adopted charge for residential development
  (b) non-residential development other then a specialised use as stated in Table 1, is stated in Table 4, Adopted charge for non-residential development

(iii) specialised uses or other development not otherwise identified in Table 1 is to be determined by the *local government* on an assessment of use and demand at time of assessment.

(iv) The adopted charge will be calculated on the approved use and at the time the decision is made, and will be recalculated at the time of payment.

4.3 Indexation

Under section 648C of the *Sustainable Planning Act 2009*, the Minister may change the amount of the *maximum adopted charge*. The change must be no more than the *maximum adopted charge* at the start of the financial year multiplied by the three year moving average annual percentage increase in the Queensland road and bride index for the period of three years ending at the start of the financial year.

The change to the *maximum adopted charge* will be published in the Government Gazette and take effect the day the notice is gazetted.

Table 2 - Adopted charge for reconfiguring a lot

Column 1 Charge Area	Column 2 Infrastructure Charge in a residential zone	Column 3 Infrastructure Charge in a zone other than a residential zone
Charge area 1	$28,000/lot	$16,000/lot
Charge area 2	$26,000/lot	$16,000/lot
Charge area 3	$18,000/lot	$16,000/lot
Charge area 4	$16,000/lot	$16,000/lot

Table 3 - Adopted charge for residential development

Use Schedule	Charge Area	Adopted infrastructure charge for residential development ($/dwelling unit)	
		1 or 2 bedroom dwelling	3 or more bedroom dwelling
Residential	Area 1	20,000	28,000
	Area 2	18,600	26,000
	Area 3	12,900	18,000
	Area 4	11,500	16,000
Accommodation (Short term)	Area 1	10,000	14,000
	Area 2	9,300	13,000
	Area 3	6,500	9,000
	Area 4	5,800	8,000
Accommodation (Long term)	Area 1	20,000	28,000
	Area 2	18,600	26,000
	Area 3	12,900	18,000
	Area 4	11,500	16,000

Table 4 - Adopted charge for non-residential development

Use Schedule	Charge Area	Adopted infrastructure charge $/m2 of GFA	Adopted infrastructure charge for stormwater network $/m2 of impervious area
Places of Assembly	Areas 1-4	70	10
Commercial (Bulk Goods)	Areas 1-4	140	10
Commercial (Retail)	Areas 1-4	180	10
Commercial (Office)	Areas 1-4	140	10
Education Facility	Areas 1-4	140	10
Entertainment	Areas 1-4	200	10
Indoor Sport & Recreational Facility	Areas 1-4	200, court areas at 20	10
Industry	Areas 1-4	50	10
High Impact Industry	Areas 1-4	70	10
High Impact Rural	Areas 1-4	20	N/A
Essential Services	Areas 1-4	140	10
Minor Uses	Areas 1-4	Nil charge	
Low Impact Rural	Areas 1-4	Nil charge	

Part 5 - Administration of adopted infrastructure charge

5.1 Purpose

States how an adopted infrastructure charge levied by the *local government* is to be administered.

5.2 Calculation

An adopted infrastructure charge that may be levied by the *local government* is calculated as follows:-

TAIC = [(AIC x U) - (C)] x I

TAIC is the total adopted infrastructure charge that may be levied by the *local government*

AIC is the adopted infrastructure charge as identified in tables 2, 3 & 4.

U is the unit of calculation as identified in tables 2, 3 & 4.

C is the agreed credit as set out in Part 6.

I is the indexation rate as advertised in the Government Gazette (s4.3).

5.3 Development subject to adopted infrastructure charge

(i) The *local government* may levy an adopted infrastructure charge on the following development:

(a) reconfiguring a lot
(b) a material change of use of premises
(c) carrying out building works

(ii) If a development is subject to more than one use, the *local government* may levy an adopted infrastructure charge for development on the basis of the use with the highest potential demand.

(iii) For an existing lawful use to which a development application is seeking to expand the gross floor area of the facility, the *adopted infrastructure charge* is only to be applied on the part of the development which is subject of the intensification or extension.

5.4 Method of notification of an adopted infrastructure charge

(i) The *local government* is required to issue an adopted infrastructure charges notice stating:

(a) the amount of the charge;
(b) the land to which the charge applies;
(c) the person to whom the charge must be paid;
(d) when the charge is payable

(ii) The adopted infrastructure charges notice may be given only in relation to a development approval or compliance permit.

5.5 Time of payment of an adopted infrastructure charge

An adopted infrastructure charge is payable at the following time:

(i) if the charge applies to reconfiguring a lot that is assessable development or development requiring compliance assessment - before the *local government* approves the plan of subdivision for the reconfiguration; or

(ii) if the charge applies to building work that is assessable development or development requiring compliance assessment - before the certificate of classification for the building work is issued; or

(iii) if the charge applies to a material change of use - before the change happens; or

(iv) otherwise - on the day stated in the adopted infrastructure charges notice or negotiated adopted infrastructure charges notice.

5.6 Alternatives to paying an adopted infrastructure charge

(i) The *local government* may enter into a written agreement about:

(a) whether the charge may be paid at a different time from that stated in the adopted infrastructure charge notice or negotiated adopted infrastructure charges notice;
(b) whether the charge may be paid by instalments;
(c) whether infrastructure may be supplied instead of paying all or part of the charge.

(ii) The *local government* may, for development infrastructure that is land, give a notice in addition to, or instead of an adopted infrastructure charges notice requiring:

(a) part of the land the subject of the development application or compliance assessment, to be given to the *local government* in fee simple; or

(b) part of the land the subject of the development application or compliance assessment, to be given to the *local government* in fee simple and part of an adopted infrastructure charge.

5.7 Recording adopted infrastructure charges

Local Government must record all levied adopted infrastructure charges in a publicly available adopted infrastructure charges register.

Part 6 - Credits

6.1 Definition of a Credit

(i) A credit means the amount to be applied for the purpose of calculating an adopted infrastructure charge which takes into account existing land usage of the premises/site.

(ii) The maximum value of a credit for each site will not exceed the adopted infrastructure charge for the approved land use of the existing site.

6.2 Application of a credit

(i) A credit will only be applied in respect of an existing lawful use in existence at the time the development application is made. This means an existing lawful use has to be established (up and running) at the time the development application is made.

(ii) A credit will not be applied under any circumstance for unapproved use of the land.

(iii) For non-residential land use if a credit is higher than the Adopted Infrastructure Charge of the approved use a refund will not occur.

Part 7 - Offsets

7.1 Purpose

This section states the *local government's* policy for an infrastructure offset for a trunk infrastructure contribution (refer section 3.1).

7.2 Application of section

This section applies where for a development, the *local government* has for a trunk infrastructure network:

(i) required the following (*trunk infrastructure contribution*):

(a) the supply of work for trunk infrastructure in a condition of a development approval under section 649 (Conditions local governments may impose for necessary trunk infrastructure) of the *Sustainable Planning Act 2009*;

(b) the giving of part of the land the subject of a development application or request for compliance assessment in a notice given under section 648K(2) (Agreements about, and alternatives to, paying adopted infrastructure charge) of the *Sustainable Planning Act 2009* (*land dedication notice*); and

(ii) levied an adopted infrastructure charge in an adopted infrastructure charges notice or a negotiated adopted infrastructure charges notice for the same premises under section 648F (Adopted infrastructure charges notice) of the *Sustainable Planning Act 2009.*

7.3 Claim for an infrastructure offset

(1) The person bound to provide the trunk infrastructure contribution and the adopted infrastructure charge for the development under the *Sustainable Planning Act 2009* (*claimant*) may give a notice in the prescribed form to the *local government* which states the following:

(i) that the claimant proposes to supply the trunk infrastructure contribution;

(ii) that the claimant seeks an offset for the supply of the trunk infrastructure contribution against an adopted infrastructure charge (*infrastructure offset*);

(iii) the claimant's estimate of the following:

(a) the market estimate of the infrastructure required by the development (Er);
(b) the market estimate of the trunk infrastructure specified by the *local government* (Es);
(c) the value of the infrastructure offset for the trunk infrastructure contribution.

(2) The *local government* is to give a notice in the prescribed form to the claimant which states the following:

(i) whether an infrastructure offset is applicable or not;

(ii) if an infrastructure offset is not applicable, the reason;

(iii) if an infrastructure offset is applicable, the value of the infrastructure offset.

7.4 Calculation of an infrastructure offset

(1) The value of an infrastructure offset for trunk infrastructure which is:

(i) predeveloped land, is the undeveloped valuation of the land; and

(ii) work, is (Es-Er):

(2) The market estimate of the infrastructure required by the development is the estimate expressed in dollars of the design and construction of the work required to service the development:

(i) including the following:

(a) the cost of planning and designing the work;
(b) the cost of survey and site investigation for the work;
(c) a cost under a construction contract for the work;
(d) a portable long service leave payment for a construction contract;
(e) an insurance premium for the work;
(f) a local government inspection fee for the commencement and end of the maintenance period for the work;
(g) the cost of an approval for the work;

(ii) excluding the following:

(a) a cost of carrying out temporary infrastructure;
(b) a cost of carrying out non trunk infrastructure;
(c) a cost of the decommissioning, removal and rehabilitation of infrastructure identified in paragraphs (a) and (b);
(d) a part of the trunk infrastructure contribution provided by the local government or a person other than the person seeking the infrastructure offset;
(e) a cost to the extent that GST is payable and an input tax credit can be claimed for the work.

(3) The market estimate of the trunk infrastructure specified by the *local government* is the estimate expressed in dollars of the design and construction of the trunk works:

(i) including the following:

(a) the cost of planning and designing the work;
(b) the cost of survey and site investigation for the work;
(c) a cost under a construction contract for the work;
(d) a portable long service leave payment for a construction contract;
(e) an insurance premium for the work;
(f) a local government inspection fee for the commencement and end of the maintenance period for the work;
(g) the cost of an approval for the work;

(ii) excluding the following:

(a) a cost of carrying out temporary infrastructure;
(b) a cost of carrying out non trunk infrastructure;
(c) a cost of the decommissioning, removal and rehabilitation of infrastructure identified in paragraphs (a) and (b);
(d) a part of the trunk infrastructure contribution provided by the local government or a person other than the person seeking the infrastructure offset;

(e) a cost to the extent that GST is payable and an input tax credit can be claimed for the work.

(5) The *local government* is to calculate the amount of the value of the infrastructure offset by indexing the value of the infrastructure offset from the date of the notice given under section 7.3(2) (Claim for an infrastructure offset) to the date that the infrastructure offset is to be offset against an infrastructure charge in accordance with the indexing as stated in section 4.3.

7.5 Application of an infrastructure offset

The *local government* is to offset the amount of the value of an infrastructure offset against an adopted infrastructure charge for the trunk infrastructure network to which the trunk infrastructure contribution relates if the trunk infrastructure contribution is supplied for the development by the claimant in accordance with the applicable development approval and land dedication notice.

PART 8 - SCHEDULE OF MAPS

Map 1	Calliope Priority Infrastructure Area	29 June 2011
Map 2	Calliope Infrastructure Charge Areas	6 July 2011
Map 3	Calliope Infrastructure Charge Areas *Areas of Calliope, Beecher, Tannum Sands, Boyne Island, Benaraby, Wurdong Heights*	6 July 2011
Map 4	Calliope Infrastructure Charge Areas *Areas of Mount Larcom & Yarwun Industrial Area*	6 July 2011

PART 9 - SCHEDULE OF PLANS FOR TRUNK INFRASTRUCTURE

Map 5	Calliope Existing Trunk Road Network	29 June 2011
Map 6	Calliope Proposed Future Trunk Road Network	29 June 2011
Map 7	BITS Proposed Future Trunk Road Network	29 June 2011
Map 8	Calliope Proposed Future Footpath Network	29 June 2011
Map 9	Calliope Existing Trunk Water Network	29 June 2011
Map 10	Calliope Proposed Future Trunk Water Mains	29 June 2011
Map 11	T/B/B/W Existing Trunk Water Network	29 June 2011
Map 12	Tannum Boyne Benaraby Wurdong Proposed Future Trunk Infrastructure	29 June 2011
Map 13	Tannum Boyne Benaraby Wurdong Proposed Future Trunk	29 June 2011
Map 14	Mount Larcom Existing Trunk Water Network	29 June 2011
Map 15	Mount Larcom Future Trunk Water Network	29 June 2011
Map 16	Calliope Existing Trunk Sewer Network	29 June 2011
Map 17	Calliope Proposed Future Sewer Trunk Infrastructure	29 June 2011
Map 18	BI/TS Existing Trunk Sewer Network	29 June 2011
Map 19	BI/TS Proposed Future Trunk Sewer Network	29 June 2011
Map 20	Calliope Existing Parks and Reserves Network	20 July 2011
Map 21	BI/TS & Calliope Existing Parks and Reserves Network	20 July 2011

PART 10 - SCHEDULE OF WORKS FOR TRUNK INFRASTRUCTURE

- **Roads**

Identifier	Description	External Useage	Indicative Construction Date	CRC	Adj CRC
	CALLIOPE				
1 - 15	Footpaths	15%	2021	$ 3,431,995	$ 2,917,196
4 - 19	Roads	15%	2021	$ 13,114,030	$ 11,146,926
i - xii	Intersections: Council intersections	15%	2021	$ 2,923,800	$ 2,485,230
	BEECHER AREA				
	Wyndham Rd/Schulze Rd	15%	2021	$ 4,252,800	$ 3,614,880
	Jefferis Rd	15%	2021	$ 1,807,440	$ 1,536,324
	Siding Rd (from Jefferis Rd to Devils Elbow)	15%	2021	$ 1,488,480	$ 1,265,208
	Upgrade of Wyndham Rd, Dawson Hwy Intersection from an Auxiliary passing lane to a protected right turn lane	15%	2021	$ 95,700	$ 81,345
	Provide Culverts along Wyndham Rd to at least a 1in 10 yr ARI immunity for a 6.3m bitumen seal (7m wide travel lane)	15%	2021	$ 112,000	$ 95,200
	UPTON RD				
	Estimated Cost of Road "A to B"	15%	2021	$ 1,275,840	$ 1,084,464
	Widening of Upton Rd - Highway to intersection "A"	15%	2021	$ 79,740	$ 67,779
	Upton Rd intersection w Dawson Highway	15%	2021	$ 706,000	$ 600,100
	Engineering Design/Concpets, Legals	15%	2021	$ 164,926	$ 140,187
	BOYNE TANNUM				
	Bridges				
B1	Boyne River	15%	2021	$ 15,383,000	$ 13,075,550
B2	Floodway	15%	2021	$ 5,809,000	$ 4,937,650
B3	Cattle Creek	15%	2021	$ 3,087,000	$ 2,623,950
	Roads				
R1	Boyne Road	15%	2021	$ 2,100,000	$ 1,785,000
R2	Malpas Street	15%	2021	$ 1,980,000	$ 1,683,000
R3	Hampton Drive - Malspas to Latrobe	15%	2021	$ 490,000	$ 416,500
R4	Tannum Sands - Hampton to Silverton	15%	2021	$ 3,450,000	$ 2,932,500
R5	Pioneer Drive Bypass	15%	2021	$ 7,480,000	$ 6,358,000
R6	Western ByPass	15%	2021	$ 2,950,000	$ 2,507,500
R7	Coronation Drive Extension	15%	2021	$ 3,810,000	$ 3,238,500
R8	Dahl Road Extension	15%	2021	$ 780,000	$ 663,000
	Intersections				
I1	Malpas / Beltana	15%	2021	$ 510,000	$ 433,500
I2	Malpas / Tarcoola	15%	2021	$ 460,000	$ 391,000
I3	Malpas / Centernay / Hampton	15%	2021	$ 770,000	$ 654,500
I4	Hampton / Booth (W)	15%	2021	$ 370,000	$ 314,500
I5	Hampton / Latrobe	15%	2021	$ 380,000	$ 323,000
I6	Hampton / Garnet	15%	2021	$ 390,000	$ 331,500
I7	Hampton / Booth (E)	15%	2021	$ 370,000	$ 314,500
I8	Hampton / Cremorne	15%	2021	$ 380,000	$ 323,000
I9	Tannum Sands / Hampton	15%	2021	$ 970,000	$ 824,500
I10	Tannum Sands / Coronation	15%	2021	$ 510,000	$ 433,500
I11	Coronation / Cremorne	15%	2021	$ 410,000	$ 348,500
	Future Trunk Transport Establishment Cost				**$ 69,948,000**
	Existing Trunk Road Establishment Cost				**$ 83,307,000**

- **Sewer**

Identifier	Asset Type	Description	Subsidy	Indicative Construction Date	CRC	Adj CRC
	Calliope Sewer					
1	Plant Augmentation	Increase Plant capacity to 6,000EP □Construction	0%	2,008	$ 4,000,000	$ 4,800,000
2	Silverdale	Increase Size of Main to suit development, up to 4	0%	2,008	$ 625,000	$ 750,000
1	Buffer Area Acquisition	Purchase property of Saw which is inside the dect	0%	2,008	$ 1,100,000	$ 1,320,000
1	Effluent Reuse Schemes	Supply of water to construction site □Site to treat a	0%	2,009	$ 560,000	$ 672,000
5	PS #1, Stage 1	Upgrade Storage capacity of site (emergency and	0%	2,009	$ 424,000	$ 508,800
6	PS #4, Stage 1	Upgrade Storage capacity of site (emergency and	0%	2,009	$ 205,000	$ 246,000
7	PS #5, Stage 1	Reroute Rising Main due to Main Roads Flyover□	0%	2,009	$ 289,000	$ 346,800
8	PS #6, Stage 1	Relocate Pump Station and Rising Main due to de	0%	2,009	$ 401,000	$ 481,200
9	RET 6.1	New 225NB main entering new PS	0%	2,009	$ 109,000	$ 130,800
10	RET 7.1	New 375NB trunk main in Catchment 7	0%	2,009	$ 300,000	$ 360,000
11	RET 7.2	New 300NB trunk main in Catchment 7	0%	2,009	$ 412,000	$ 494,400
12	RET 7.3	New 225NB trunk main in Catchment 7	0%	2,009	$ 131,000	$ 157,200
13	PS #3, Stage 1	Development of Construction Camp	0%	2,009	$ 472,000	$ 566,400
1	Effluent Reuse Schemes	This is some of the area currently being irrigated	0%	2,010	$ 800,000	$ 960,000
15	PS #2, Stage 1	Upgrade Emergency Storage to 61m3	0%	2,010	$ 240,000	$ 288,000
16	PS #9, Stage 1	Pump Effluent to STP via Don Cameron Drive Pu	0%	2,010	$ 896,000	$ 1,075,200
17	RET 1.3	New 225NB main from Herbertson Rd to Muirhead	0%	2,010	$ 171,000	$ 205,200
1	Wet Weather Storage	Construct 30ML storage in addition to existing	0%	2,010	$ 1,100,000	$ 1,320,000
19	RET 7.4	Regrade existing 'flat' main to gain additional flow	0%	2,010	$ 58,000	$ 69,600
20	RET 1	Increase main from 225NB to service all of Catchr	0%	2,011	$ 5,000	$ 6,000
21	RET 1.6	Increase Main from 225NB to service Catchments	0%	2,011	$ 91,000	$ 109,200
22	RET 1.5	New 225NB main servicing Catchment 1D and 1E	0%	2,012	$ 120,000	$ 144,000
1	Sludge Lagoons	Commission Mechanical Dewatering	0%	2,013	$ 510,000	$ 637,500
24	STP Main	Upgrade STP Trunk Main from 300/375NB	0%	2,013	$ 107,000	$ 133,750
25	STP Main - A	Increase Main size from 375	0%	2,013	$ 110,000	$ 137,500
1	Effluent Reuse Schemes	Requires increase of treatment Capacity to Class	0%	2,014	$ 4,590,000	$ 5,737,500
1	Effluent Reuse Schemes	Augment Irrigation system to cover entire site	0%	2,015	$ 400,000	$ 500,000
28	MISC1	Possible Council Contributions to 9" mains	0%	2,015	$ 175,000	$ 218,750
15	PS #2, Stage 2	Reroute Station to #9□Downsize pumps to 7KW (	0%	2,016	$ 270,000	$ 337,500
16	PS #9, Stage 2	Pump Effluent to Tannum Sands STP□New Well	0%	2,016	$ 6,868,000	$ 8,585,000
31	RET 1.7	Increase Main from 150NB to service Catchments	0%	2,016	$ 41,000	$ 51,250
32	Purchase Capacity of TS Plant	Contribute pro-rata cost of TS STP site, in order to	0%	2,016	$ 4,295,000	$ 5,368,750
33	PS #10, Stage 1	Construct New Station□Divert #5 into Catchment	0%	PS #10, Stage	$ 615,000	$ 799,500
32	Additional Clarifiers	Duplicate Clarifiers to bring plant capacity to 15,00	0%	2,018	$ 594,000	$ 742,500
7	PS #5, Stage 2	Re-Route Rising Main to PS10□Smaller pumps ca	0%	2,018	$ 148,000	$ 185,000
28	MISC2	Possible Council Contributions to 9" mains	0%	2,019	$ 175,000	$ 218,750
37	QAL Effluent Line	Augment Effluent Reuse Line to QAL	0%	2,022	$ 1,619,000	$ 2,023,750
38	RET 1.1	Realignment and upsizing of 225NB main from M	0%	2,025	$ 228,000	$ 296,400
39	RET 1.2	Decommission 225NB Main, as part of Realignme	0%	2,025	$ 60,000	$ 78,000
5	PS #1, Stage 2	Install Jockey Pumps to well Pumpset of 39l/s @	0%	2,028	$ 490,000	$ 637,000
32	New Bioreactor and Clarifiers	Duplicate Bioreactor and Clarifiers to bring plant c	0%	2,032	$ 4,560,000	$ 5,928,000
16	PS #9, Stage 3	Pump Pump Effluent to TS STP, via new Well Ne	0%	2,032	$ 10,826,000	$ 14,073,800
43	RET 8.2	Increase size of main from 225NB	0%	2,032	$ 48,000	$ 62,400
8	PS #6, Stage 2	Relocate the Rising Main due to Calliope STP cap	0%	2,033	$ 881,000	$ 1,145,300
5	PS #1, Stage 3	Remove Jockey Pumps	0%	2,035	$ 20,000	$ 26,000
46	RET 9.1	New 525NB centre trunk main entering new PS	0%	2,036	$ 10,000	$ 13,000
47	RET 1.4	New/Realinged 225NB main from Morcom St to T	0%	2,037	$ 266,000	$ 345,800
48	RET 9.2	New 525NB centre trunk main servicing all except	0%	2,037	$ 38,000	$ 49,400
49	RET 9.3	New 450NB trunk main servicing all except 9A & B	0%	2,037	$ 578,000	$ 751,400
50	RET 8.1	Increase size of main from 300NB	0%	2,038	$ 228,000	$ 296,400
51	RET 9.11	New 300NB main Servicing Catchment 9A	0%	2,039	$ 39,000	$ 50,700
52	RET 9.4	New 450NB trunk main servicing all except 9A, B,	0%	2,043	$ 90,000	$ 117,000
53	RET 9.5	New 450NB trunk main servicing all except 9A, B,	0%	2,044	$ 237,000	$ 308,100
16	PS #9, Stage 4	Utilise both stage 2 and 3 wells for ultimate capac	0%	2,045	$ 1,818,000	$ 2,363,400
32	Full Duplication of Plant	Full Duplication of Plant to bring total treatment ca	0%	2,047	$ 16,782,000	$ 21,816,600
56	RET 9.6	New 450NB trunk main servicing 9H, I, J, K, L, &	0%	2,047	$ 114,000	$ 148,200
57	RET 9.7	New 375NB trunk main servicing 9H, J, K, L, & M	0%	2,047	$ 205,000	$ 266,500
58	RET 9.8	New 375NB trunk main servicing 9J, K, L, & M	0%	2,048	$ 103,000	$ 133,900
59	RET 9.9	New 375NB trunk main servicing 9K, L, & M	0%	2,049	$ 164,000	$ 213,200
60	RET 9.10	New 375NB trunk main servicing 9K & M	0%	2,050	$ 171,000	$ 222,300

- **Sewer continued**

Identifier	Asset Type	Description	Subsidy	Indicative Construction Date	CRC	Adj CRC
	ADDITIONAL CALLIOPE ASSETS					
61	RET 1.9	New 225NB trunk main servicing catchment 1H				$ -
62	RET 1.10	New 225NB trunk main servicing catchment 1H				$ -
63	RET 7.5	New 225NB trunk main servicing catchment 7A				$ -
64	Silverdale	375 silverdale Main				$ -
65	PS #11	Pump station 11				$ -
	Boyne Sewer					
66	Boyne Island Pump Station No. 2 upgrade			2,012	**$ 200,000**	$ 240,000
67	Boyne Island Treatment Plant, Grit Chamber				**incl below**	
68	Construct Tannum Sands Sewerage Treatment Plant (7500EP)				**incl below**	
69	Pump Station No 4 Boyne Island Rising Main				**incl below**	
70	Pump Station No 3 Boyne Island Rising Main				**incl below**	
67	Boyne Island Sewerage Treatment Plant Upgrade				**incl below**	
67	Boyne Island Sewerage Treatment Plant Upgrade				**incl below**	
71	Provisional oversizing of developer facilities				**incl below**	
	Total Expenditure		0%	2,013	**$ 23,121,000**	$ 28,901,250
67	BI Aeration Improvement and Control		0%	2,010	**$ 300,000**	$ 360,000
67	Effluent Reuse Lines to QAL		0%	2,010	**$ 2,500,000**	$ 3,000,000
67	BI Improve Lagoon Capacity (lining)		0%	2,011	**$ 150,000**	$ 180,000
67	BI Lagoon Algal Control (increase reuse)		0%	2,011	**$ 50,000**	$ 60,000
66	BI PS#2 Upgrade		0%	2,012	**$ 200,000**	$ 240,000
67	BI Remove Sludge Lagoons		0%	2,016	**$ 75,000**	$ 93,750
67	BI Improve Pumped Disposal Capacity (new pumps and station)		0%	2,018	**$ 300,000**	$ 375,000
32	TS New Clarifier after Calliope comes into system (75% of $2.66M actual cost)		0%	2,018	**$ 1,998,000**	$ 2,497,500
67	BI Improve Site storage capacity (lagoon North east corner)		0%	2,020	**$ 400,000**	$ 500,000
32	Augment Effluent Reuse Lines (after Calliope comes into system) (65.4% of $4.678M a		0%	2,022	**$ 3,060,000**	$ 3,825,000
32	TS New Bioreactor and Clarifiers (30,000EP). 65.4% of Total cost $13,174,000		0%	2,032	**$ 8,616,000**	$ 11,200,800
	Future Trunk Sewer Establishment Cost					**$ 141,504,000**
	Existing Trunk Sewer Establishment Cost					**$ 64,141,000**

- **Water**

Identifier	Asset Description	Subsidy	Indicative Construction Date	CRC	Adj CRC
CW1	Beecher 200mm Upg Mt Eliz takeoff to Williams Rd	0%	2008		$ -
CW4	150NB Pujola Street Loop	0%	2008	$ 30,000	$ 36,000
CW5	Archer Street Valving Alterations	0%	2008		$ -
CW2	375NB Dawson Hwy main Extension A	0%	2009		$ -
CW7	375NB Dawson Hwy Main Extension B	0%	2009		$ -
CW10	300NB Don Cameron drive Upgrade from Walker Dr	0%	2012	$ 460,000	$ 552,000
CW6	300NB Main - Silverdale Res to Stowe Rd Stage 1	0%	2014	$ 280,000	$ 350,000
CW3	150NB Herbertson Rd Main	0%	2020	$ 170,000	$ 212,500
CW11	6ML No 2 Reservoir - Mt Elizabeth	0%	2021	$ 2,180,000	$ 2,725,000
CW12.1	Acquire New Reservoir Site on L5 SP190794	0%	2021	$ 500,000	$ 625,000
CW13.1	New Calliope Booster PS (120 l/s)	0%	2021	$ 900,000	$ 1,125,000
CW14	New South Gladstone Booster PS (120 l/s)	0%	2021	$ 770,000	$ 962,500
CW15	600NB Parallel Trunk Main - Mt Elizabeth to X-Roads	0%	2024	$ 1,950,000	$ 2,535,000
CW17	300NB Main - Silverdale Res to Stowe Rd Stage 2	0%	2025	$ 280,000	$ 364,000
CW18	Beecher 200mm Upg Williams Rd to Wyndham Rd	0%	2029	$ 360,000	$ 468,000
CW16	375NB Dawson Hwy Main Extension C	0%	2035	$ 570,000	$ 741,000
CW20	300NB Main - Silverdale Res to Stowe Rd Stage 3	0%	2035	$ 280,000	$ 364,000
CW19	450NB Zone 2 Reticulation Main A	0%	2037	$ 1,680,000	$ 2,184,000
CW12.2	12 ML No 1 Reservoir Res Site 2 (L5 SP190794)	0%	2045	$ 3,320,000	$ 4,316,000
CW21	375 NB RM New PS to new Res Site (350 m)	0%	2045	$ 240,000	$ 312,000
CW22	450 NB Retic main From Reservoir (600m)	0%	2045	$ 440,000	$ 572,000
CW8	300NB Don Cameron Drive Upgrade to Walker Dr	0%	2050	$ 230,000	$ 299,000
CW9	200NB Farmer Street Link to Brown Street	0%	2050	$ 30,000	$ 39,000
CW13.2	Upgrade Calliope PS pumping capacity - 170 l/s	0%	2051	$ 330,000	$ 429,000
CW24	450NB RM Sth Gladstone to Calliope Stg 1 (10 km)	0%	2051	$ 7,280,000	$ 9,464,000
CW23	450NB Zone 2 Reticulation Main B	0%	2053	$ 240,000	$ 312,000
CW13.3	Pumps to Reservoir Site 2 Upgraded to 220 l/s	0%	2064	$ 650,000	$ 845,000
CW25	450NB RM Sth Gladstone to Calliope Stg 2 (3.2 km)	0%	2064	$ 2,330,000	$ 3,029,000
CW26	Purchase of 375NB Sth Gladstone to Calliope Main	0%	2064	$ 3,850,000	$ 5,005,000
CW	**SOURCE: Tannum Boyne Cap Program (update dated 2 June)**	0%			$ -
CW27.1	• Isolate the GAWB 300NB main from 450/375/600 main. GAWB Works	0%	2007	$ -	$ -
CW28	• 200NB Curtis Ave link main.	0%	2008	$ 120,000	$ 144,000
CW29	• 150NB main from existing Leferink Rd along full length of Ronald Crs.	0%	2008	$ 224,000	$ 268,800
CW30	• 200NB upgrade of existing O'Connor Road main.	0%	2008	$ 59,000	$ 70,800
CW31	• 200NB loop main Harbottle Rd to Boyne River Bridge.	0%	2009	$ 679,000	$ 814,800
CW120	• 150NB Yalkarra Crs upgrade.	0%	2009	$ 78,000	$ 93,600
CW32	• 150NB Kanangra Rd upgrade.	0%	2009	$ 52,000	$ 62,400
CW33	• 150NB Kanangra Rd upgrade.	0%	2009	$ 37,000	$ 44,400
CW121	• 150NB Illoura Rd upgrade.	0%	2009	$ 68,000	$ 81,600
CW122	• 150NB Yalkarra Crs upgrade.	0%	2009	$ 73,000	$ 87,600
CW	• Upgrade Golegumma Main & Install 300NB metered tee for Benaraby Feed.	0%	2009	$ 2,554,000	$ 3,064,800
CW34	• Decommission GAWB main - Golegumma line to Awoonga Dam Road. GAWB Works.	0%	2009	$ -	$ -
CW35	• Alter Benaraby Booster - South Gladstone to Wurdong Reservoir.	0%	2009	$ 30,000	$ 36,000
CW36.1	• New 300NB trunk retic. main .Golegumma Main to Awoonga Dam Road.	0%	2009	$ 667,000	$ 800,400
CW27.2	• Utilize the 450/375/600 main with Glen Eden Booster. GAWB Works.	0%	2009	$ -	$ -
CW27.3	• Re-commission Glen Eden Booster Pumps. GAWB Works.	0%	2009	$ -	$ -
CW37	• 375NB rising main from GAWB Main to BITS Club.	0%	2009	$ 2,222,000	$ -
CW38	• 450NB rising main from BITS Club to Broadacres Reservoir.	0%	2009	$ 4,800,000	$ -
CW39	• Remove Coronation Drive pump station.	0%	2009	$ 40,000	$ 48,000
CW40.1	• Remove NRV's.	0%	2009	$ 30,000	$ 36,000
CW40.2	• Remove zone separation in Tannum Sands.	0%	2009	$ 6,000	$ 7,200
CW41	• 450NB main linkage from Broadacres Res. to Tannum Road	0%	2010	$ 1,223,000	$ 1,467,600
CW42	• 450NB main extension Tannum Sands Road from Res. access to Silverton Dr.	0%	2010	$ 1,847,000	$ 2,216,400
CW43	• 300NB main from Benaraby booster to current connection in Helen Cres.	0%	2010	$ 593,000	$ 711,600
CW44.1	• Acquisition of reservoir site on Lilly Hills.	0%	2010	$ 225,000	$ 270,000
CW44.2	• New 3ML Lilly Hills Reservoir.	0%	2010	$ 1,410,000	$ 1,692,000
CW45	• 300NB Rising Main from Handley Drive to Lilly Hills Reservoir.	0%	2010	$ 407,000	$ 488,400
CW46	• 300NB Retic. Main from Lilly Hills Reservoir to 300NB main on Boyne Island Road.	0%	2010	$ 615,000	$ 738,000
CW47	• 200NB main from Tannum Rd 450NB main along Dahl Rd.	0%	2011	$ 392,000	$ 470,400
CW48	• 200NB main link to Tannum Waters from Applin Pl.	0%	2011	$ 246,000	$ 295,200
CW49	• 200NB Turich Distribution Main.	0%	2011	$ 1,027,000	$ 1,232,400
CW50	• 200NB main linkage Hampton Dr b/w Pacific Ave and Cremorne Dr.	0%	2012	$ 68,000	$ 81,600

- **Water continued**

Identifier	Asset Description	Subsidy	Indicative Construction Date	CRC	Adj CRC
CW51	• 300NB main linkage Tannum Rd b/w Coronation Dr and Hampton Dr.	0%	2013	$ 220,000	$ 275,000
CW52	• 300NB main from Boyne Road to Pioneer Dr via Dennis Park.	0%	2014	$ 277,000	$ 346,250
CW53	• 200NB main extension on Coronation Drive to Dahl Rd.	0%	2014	$ 366,000	$ 457,500
CW54.1	• Acquire land for 6ML Benaraby Reservoir.	0%	2014	$ 225,000	$ 281,250
CW54.2	• New 6ML Benaraby Reservoir.	0%	2014	$ 2,171,000	$ 2,713,750
CW55	• Extend 300NB Rising Main - Awoonga Dam Road to new Reservoir.	0%	2014	$ 377,000	$ 471,250
CW36.2	• Decommission 300NB connection into 200NB Awoonga Dam Road main.	0%	2014	$ 19,000	$ 23,750
CW56	• New 300NB retic. main - Benaraby Reservoir to 200NB main Awoonga Dam Road	0%	2014	$ 423,000	$ 528,750
CW57	• New 300NB retic. main - Benaraby Reservoir to Leferink Road	0%	2014	$ 157,000	$ 196,250
CW58	• 375NB main feed to Tannum Waters from Res.	0%	2016	$ 196,000	$ 245,000
CW59	• 200NB main joining existing and [BB15] along Leferink Rd.	0%	2016	$ 626,000	$ 782,500
CW60	• 300NB extension of main toward Cemetrery boundary.	0%	2017	$ 312,000	$ 390,000
CW61.1	• Acquire 'Heidelberg' Reservoir site land.	0%	2017	$ 450,000	$ 562,500
CW61.2	• New 10ML "Heidelberg" Reservoir.	0%	2017	$ 3,000,000	$ 3,750,000
CW62.1	• Recommission 200NB rising main South Trees Inlet to Gladstone-Benaraby Road.	0%	2017	$ 75,000	$ 93,750
CW63	• Construct Temporary Pump Station at BITS.	0%	2017	$ 507,000	$ 633,750
CW64	• New 200NB rising main Reservoir to [BT20].	0%	2017	$ 165,000	$ 206,250
CW65	• New 450NB reticulation trunk main. Reservoir to general retic.	0%	2017	$ 176,000	$ 220,000
CW66	• 300NB Heidelberg Distribution main.	0%	2018	$ 554,000	$ 692,500
CW67	• Upgrading and re-aligning the 375NB main passing adjacent the red mud dam. GAWB Works.	0%	2020	$ -	$ -
CW27.4	• Upgrade Glen Eden booster pumps from 175 l/s to 200 l/s. GAWB works.	0%	2020	$ -	$ -
CW68	• 375NB Heidelberg Distribution main.	0%	2020	$ 986,000	$ 1,232,500
CW69	• Install 300NB metered tee for 'Low Level' Reservoir Feed. GAWB Works.	0%	2022	$ -	$ -
CW70.1	• Acquire land for 2ML low Level Reservoir.	0%	2022	$ 150,000	$ 187,500
CW70.2	• New 2ML low level Reservoir.	0%	2022	$ 790,000	$ 987,500
CW71	• New 300NB main, from tee to 'Low Level' Reservoir.	0%	2022	$ 20,000	$ 25,000
CW72	• Connection of Reservoir to Township Reticulation.	0%	2022	$ 5,869,000	$ 7,336,250
CW73	• 300NB Heidelberg Distribution main.	0%	2025	$ 895,000	$ 1,163,500
CW74	• 200NB main Leferink to Awoonga via "Owbridge" property.	0%	2025	$ 451,000	$ 586,300
CW75	• 200NB main from Awoonga Dam Rd existing main to main [3E].	0%	2025	$ 106,000	$ 137,800
CW27.5	• Decommission Glen Eden Booster. GAWB works.	0%	2027	$ -	$ -
CW76.1	• New Toolooa Booster Pump Station. GAWB works.	0%	2027	$ -	$ -
CW77	• Additional 15 ML Reservoir at Broadacres.	0%	2027	$ 3,800,000	$ 4,940,000
CW78	• Extend 450NB rising main to new reservoir.	0%	2027	$ 224,000	$ 291,200
CW79	• 600NB retic. main linking 15ML & 6 ML Broadacres reservoirs	0%	2027	$ 265,000	$ 344,500
CW76.2	• New PS at Toolooa Bends. GAWB works.	0%	2028	$ -	$ -
CW77	• Upgrade feed main to Benaraby Booster to 120l/s capacity. GAWB Works.	0%	2028	$ -	$ -
CW78	• 200NB Heidelberg Distribution main.	0%	2030	$ 839,000	$ 1,090,700
CW79	• 600NB main along Broadacres Access Rd.	0%	2033	$ 1,090,000	$ 1,417,000
CW80	• 300NB Heidelberg Distribution main.	0%	2037	$ 401,000	$ 521,300
CW81	• 600NB Turich Distribution Main.	0%	2037	$ 450,000	$ 585,000
CW82	• 200NB Turich Distribution Main.	0%	2038	$ 664,000	$ 863,200
CW83	• Upgrade South Gladstone to Toolooa main (300) to a 600NB main. GAWB Works.	0%	2038	$ -	$ -
CW76.3	• Additional pump set - Toolooa Pump Station to 'Heidelberg' Reservoir. GAWB Works.	0%	2038	$ -	$ -
CW84.1	• Install 600NB tee at Hughs Road for 'Heidelberg' Feed. GAWB Works.	0%	2038	$ -	$ -
CW84.2	• New 600NB rising main Toolooa Bends to 'Heidelberg' Reservoir.	0%	2038	$ 8,920,000	$ 11,596,000
CW62.2	• Decommission rising main [BT20] and 'BITS' pump station [BT21].	0%	2038	$ 30,000	$ 39,000
CW85	• 250NB Heidelberg Distribution main.	0%	2040	$ 375,000	$ 487,500
CW86	• 300NB main from [BB7] to Northern section.	0%	2040	$ 637,000	$ 828,100
CW87	• 450NB Turich Distribution Main.	0%	2041	$ 1,946,000	$ 2,529,800
CW88	• 450NB Turich Distribution Main.	0%	2043	$ 355,000	$ 461,500
CW89	• 300NB Turich Distribution Main.	0%	2043	$ 279,000	$ 362,700
CW90	• 200NB main from [4L1] to Western section (under railway)	0%	2043	$ 65,000	$ 84,500
CW91.1	• Acquire land for 1.5ML 'Dahl' High Level Reservoir.	0%	2043	$ 375,000	$ 487,500
CW91.2	• New 1.5 ML high level reservoir.	0%	2043	$ 950,000	$ 1,235,000
CW92	• New PS at 2ML low level reservoir.	0%	2043	$ 395,000	$ 513,500
CW93	• New 200NB rising main to new Reservoir.	0%	2043	$ 300,000	$ 390,000
CW94	• Separate the high and low level zones at Yalkarra Cres / Wakooka Drive.	0%	2043	$ 20,000	$ 26,000
CW95	• New 150NB retic. main from High Level Reservoir to Yalkarra Cresent.	0%	2043	$ 108,000	$ 140,400
CW96	• New 300NB retic. main from High Level Reservoir to high level network.	0%	2043	$ 138,000	$ 179,400
CW97	• 300NB Turich Distribution Main.	0%	2044	$ 283,000	$ 367,900
CW98	• 300NB Turich Distribution Main.	0%	2044	$ 965,000	$ 1,254,500
CW99	• 300NB Turich Distribution Main.	0%	2045	$ 646,000	$ 839,800

- **Water continued**

Identifier	Asset Description	Subsidy	Indicative Construction Date	CRC	Adj CRC
CW100	• 300NB Turich Distribution Main	0%	2046	$ 1,297,000	$ 1,686,100
CW101	• 200NB Turich Distribution Main	0%	2048	$ 281,000	$ 365,300
CW102	• 200NB main from High Level Res to 'Northern' Area	0%	2048	$ 287,000	$ 373,100
CW103	• 200NB Turich Distribution Main	0%	2049	$ 1,156,000	$ 1,502,800
CW104	• New 600NB rising main 'Heidelberg' to 450NB Broadacres rising main	0%	2049	$ 5,902,000	$ 7,672,600
CW105	• New Pump Station 'Heidelberg' reservoir to Broadacres and Lilly Hills reservoirs	0%	2049	$ 1,509,000	$ 1,961,700
CW106	• Additional 15ML reservoir at Broadacres site	0%	2049	$ 3,800,000	$ 4,940,000
CW107	• Extend 450NB rising main to new Reservoir [BT30]	0%	2049	$ 222,000	$ 288,600
CW108	• Extend 600NB reticulation main to link all 3 Broadacres Reservoirs	0%	2049	$ 237,000	$ 308,100
CW109	• 200NB Turich Distribution Main	0%	2050	$ 158,000	$ 205,400
CW110	• 200NB main from [4H1] towards 'looping' section [Int42]	0%	2050	$ 258,000	$ 335,400
CW111	• 200NB Turich Distribution Main	0%	2051	$ 132,000	$ 171,600
CW112	• 200NB Turich Distribution Main	0%	2051	$ 1,282,000	$ 1,666,600
CW113	• 200NB main [4H1] to Western section (under railway)	0%	2052	$ 316,000	$ 410,800
CW114	• 200NB Turich Distribution Main	0%	2054	$ 489,000	$ 635,700
CW76.4	• Increase pumping capacity at Toolooa booster station. GAWB Works	0%	2054	$ -	$ -
CW115	• 200NB Turich Distribution Main	0%	2055	$ 682,000	$ 886,600
CW116	• 200NB Turich Distribution Main	0%	2056	$ 754,000	$ 980,200
CW117	• 200NB Turich Distribution Main	0%	2058	$ 670,000	$ 871,000
CW118	Oversizing of Minor mains 150NB to 200NB	0%	2058	$ 400,000	$ 520,000
CW119	Installation of Minor mains 150NB	0%	2058	$ 520,000	$ 676,000
	Future Trunk Water Establishment Cost				**$ 136,050,000**
	Existing Trunk Water Establishment Cost				**$ 48,695,000**

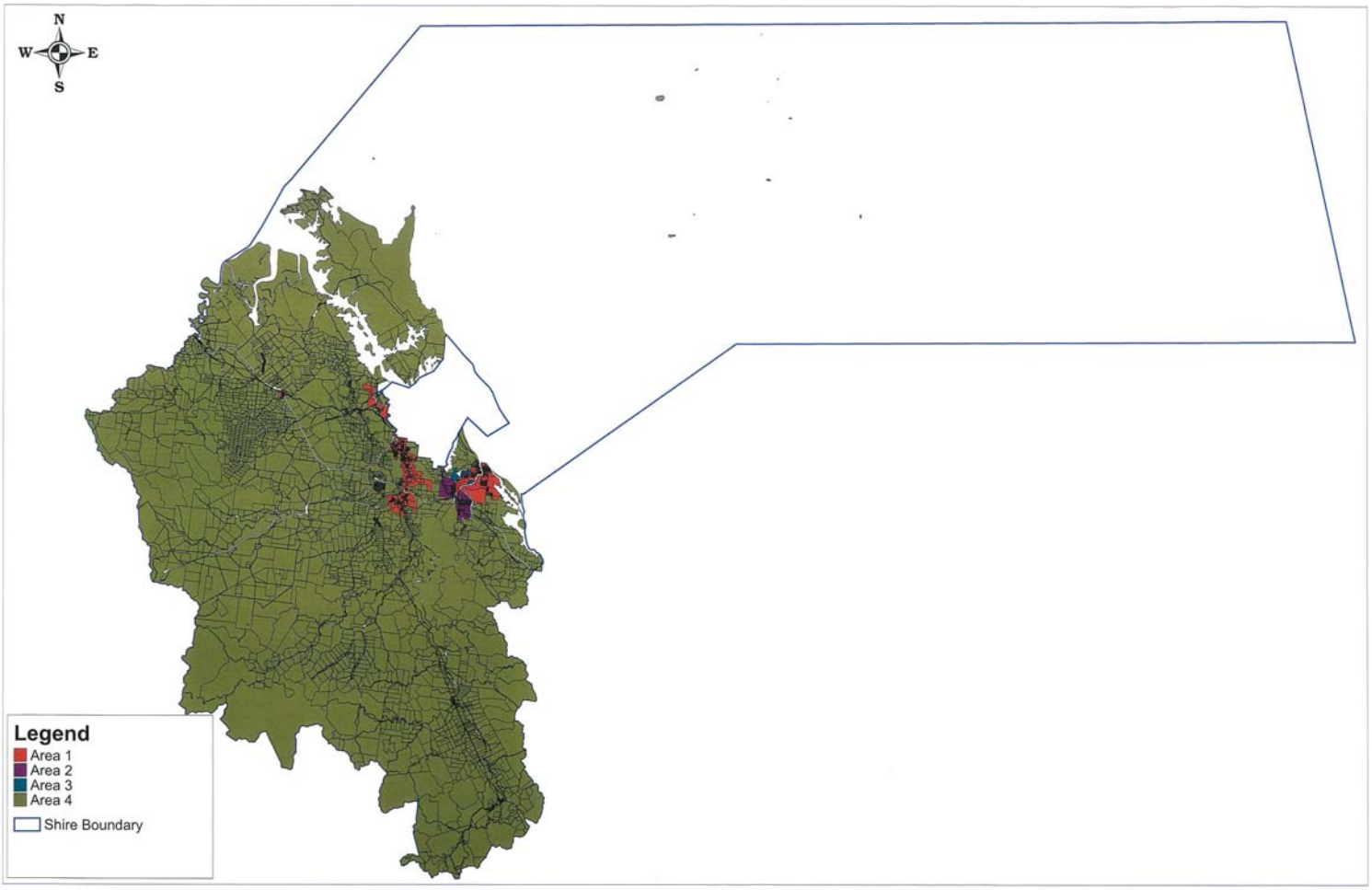
- **Parks**

Identifier	Asset Type	Subsidy	Indicative Construction Date	CRC	Adj CRC
	Signature - Regional Parks				
	Memorial Park	0%	2021	$ 850,000	$ 850,000
	Bunting Park	0%	2021	$ 58,000	$ 58,000
	Canoe Point	0%	2021	$ 350,000	$ 350,000
	Regional and FS				
	Wyndham Park	0%	2021	$ 205,000	$ 205,000
	Calliope Day Use Area (Southern)	0%	2021	$ 395,000	$ 395,000
	Curtis Island	0%	2021	$ 140,000	$ 140,000
	Future Trunk Parks Establishment Cost				**$ 1,998,000**
	Existing Trunk Parks Establishment Cost				**$ 16,518,000**

FIRST ADOPTED: 5th July 2011 and took effect 6th July 2011

AMENDMENT TABLE

AMENDMENT DESCRIPTION	ADOPTED DATE	EFFECTIVE DATE
Amendment No. 1 1. Added "Urban Expansion" to Section 1.5. 2. Amended Section 2.5 Charge Areas - added reference to Map 4. 3. Section 3.1 amended to include statement that trunk infrastructure does not include local parks, open space, reserves or similar land types. 4. Added statement to Section 4.2 (iv). 5. Amended Table 2 revising reconfiguring charge for non-residential. 6. Include definition of indexation to Section 5.2. 7. Section 7.1 amended to include reference to Section 3.1. 8. Amended Maps 2,3,4 - Charge Areas - to take into consideration the state held land as well as freehold land. 9. Added Maps 20 & 21 - Calliope Existing Parks and Reserves Network and BI/TS & Calliope Existing Parks and Reserves Network.	**2 August 2011**	**4 August 2011**



GLADSTONE REGIONAL COUNCIL

Gladstone Regional Council

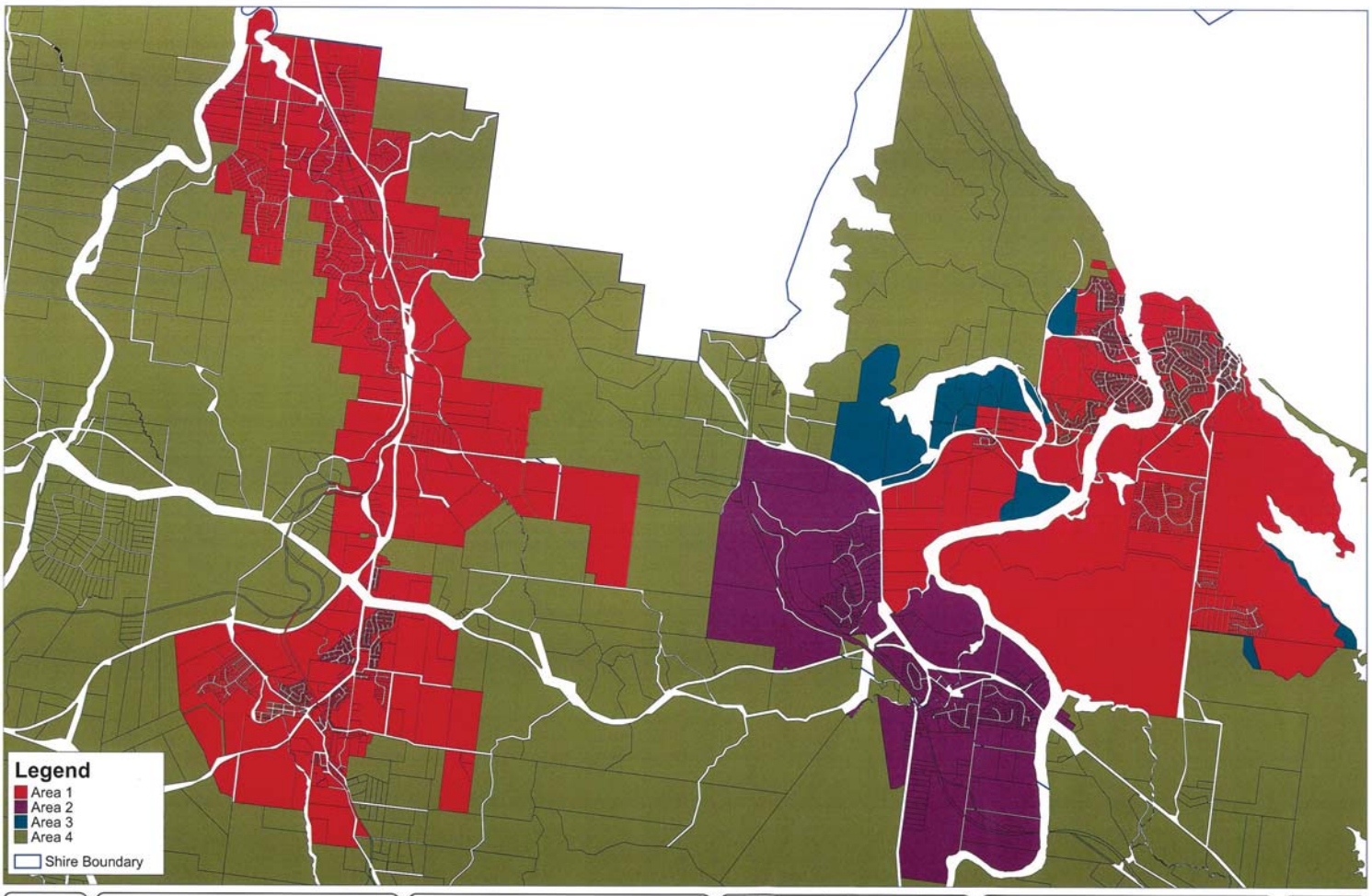
Infrastructure Planning
Calliope Office

Calliope Infrastructure Charge Areas

Map 2

Map Produced: 6th July 2011

GDA



GLADSTONE REGIONAL COUNCIL

Gladstone Regional Council

Infrastructure Planning
Calliope Office

Calliope Infrastructure Charge Areas

Areas of
Calliope, Beecher, Tannum Sands, Boyne Island, Benaraby, Wurdong Heights

Map 3

Map Produced: 6th July 2011

GDA

GLADSTONE REGIONAL COUNCIL

Gladstone Regional Council

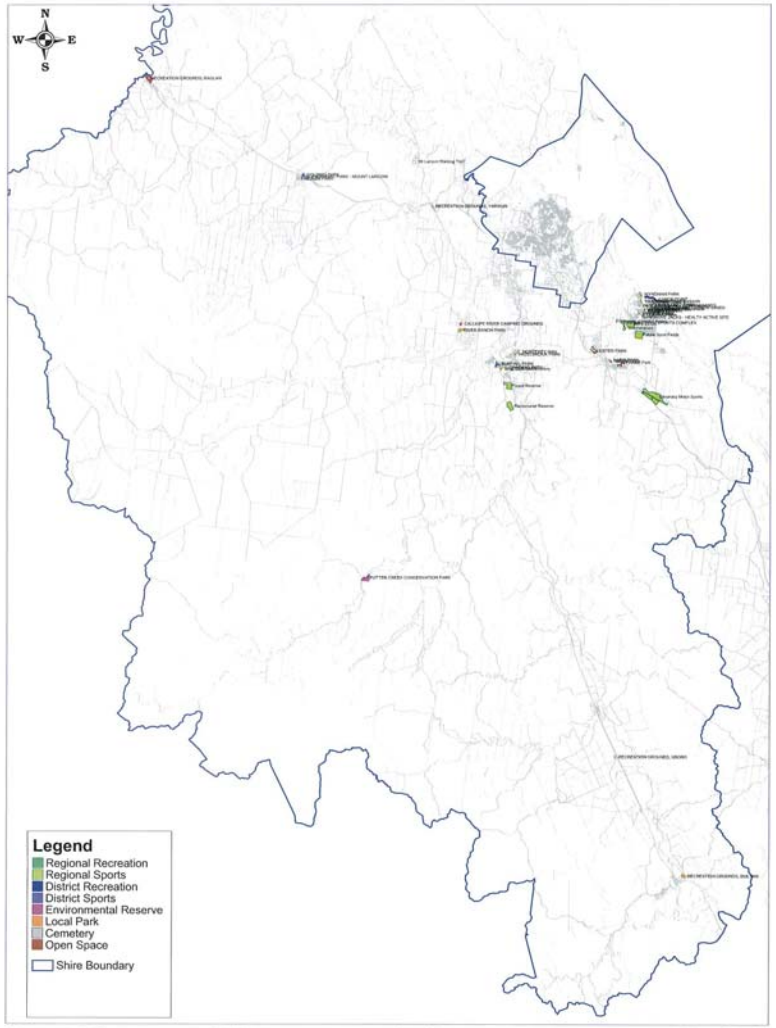
Infrastructure Planning
Calliope Office

Calliope Infrastructure Charge Areas
Areas of
Mount Larcom &
Yarwun Industrial Area

Map 4

Map Produced: 6th July 2011

GDA



GLADSTONE REGIONAL COUNCIL

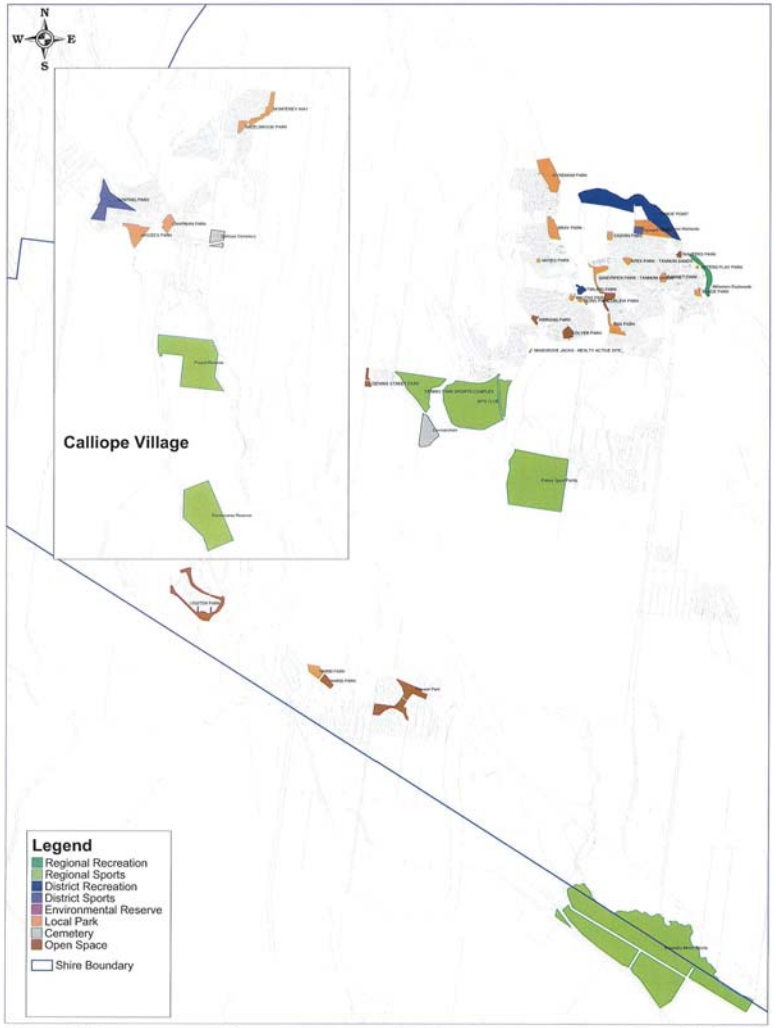
Gladstone Regional Council

Infrastructure Planning
Calliope Office

Map 20 **Calliope Existing Parks and Reserves Network**

Map Produced: 20th July 2011

GDA



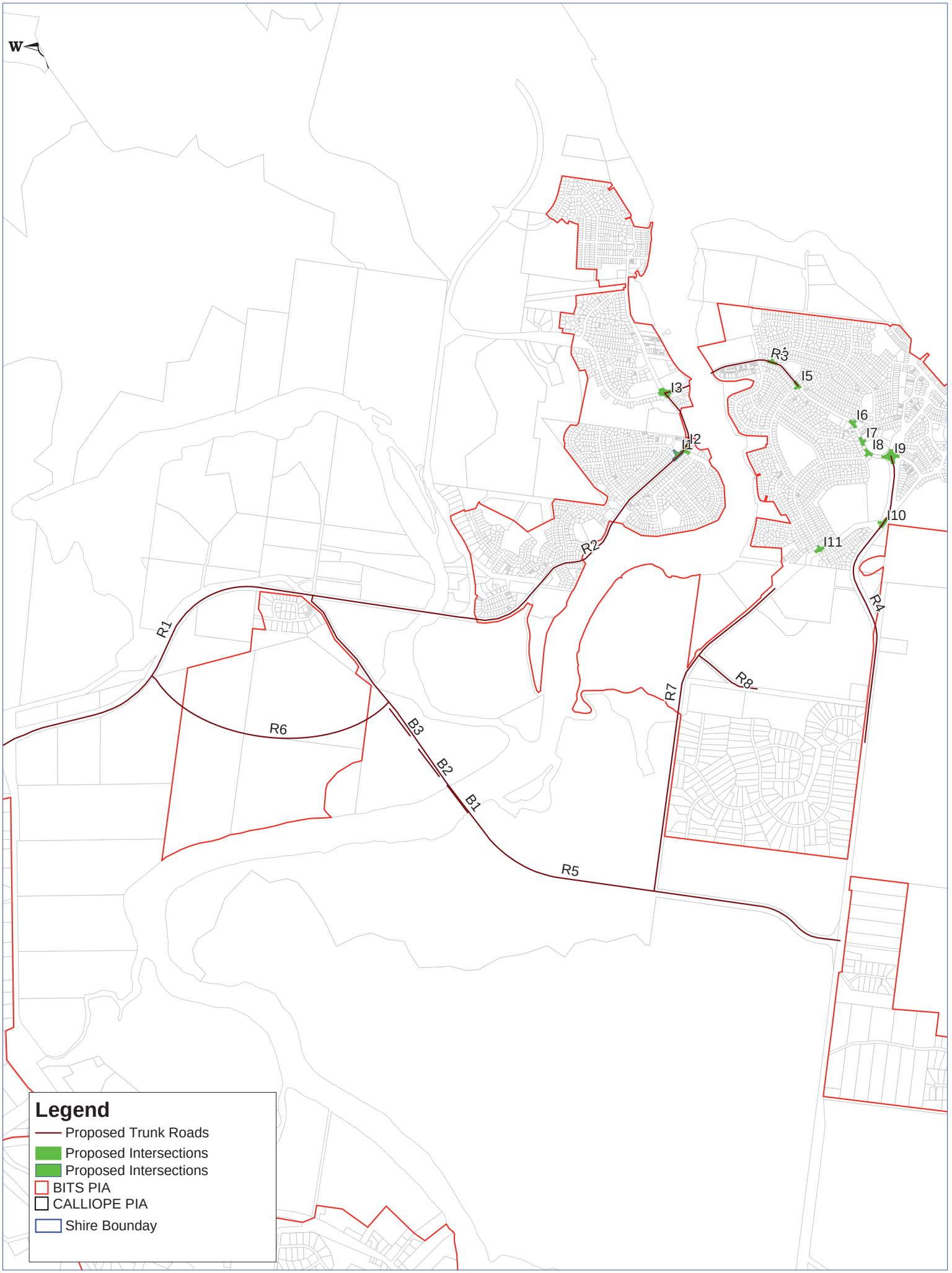
Gladstone Regional Council

Infrastructure Planning
Calliope Office

BI/TS & Calliope Existing Parks and Reserves Network

Map 21

Map Produced: 20th July 2011



GLADSTONE REGIONAL COUNCIL

Gladstone Regional Council

Infrastructure Planning
Calliope Office

Map 7

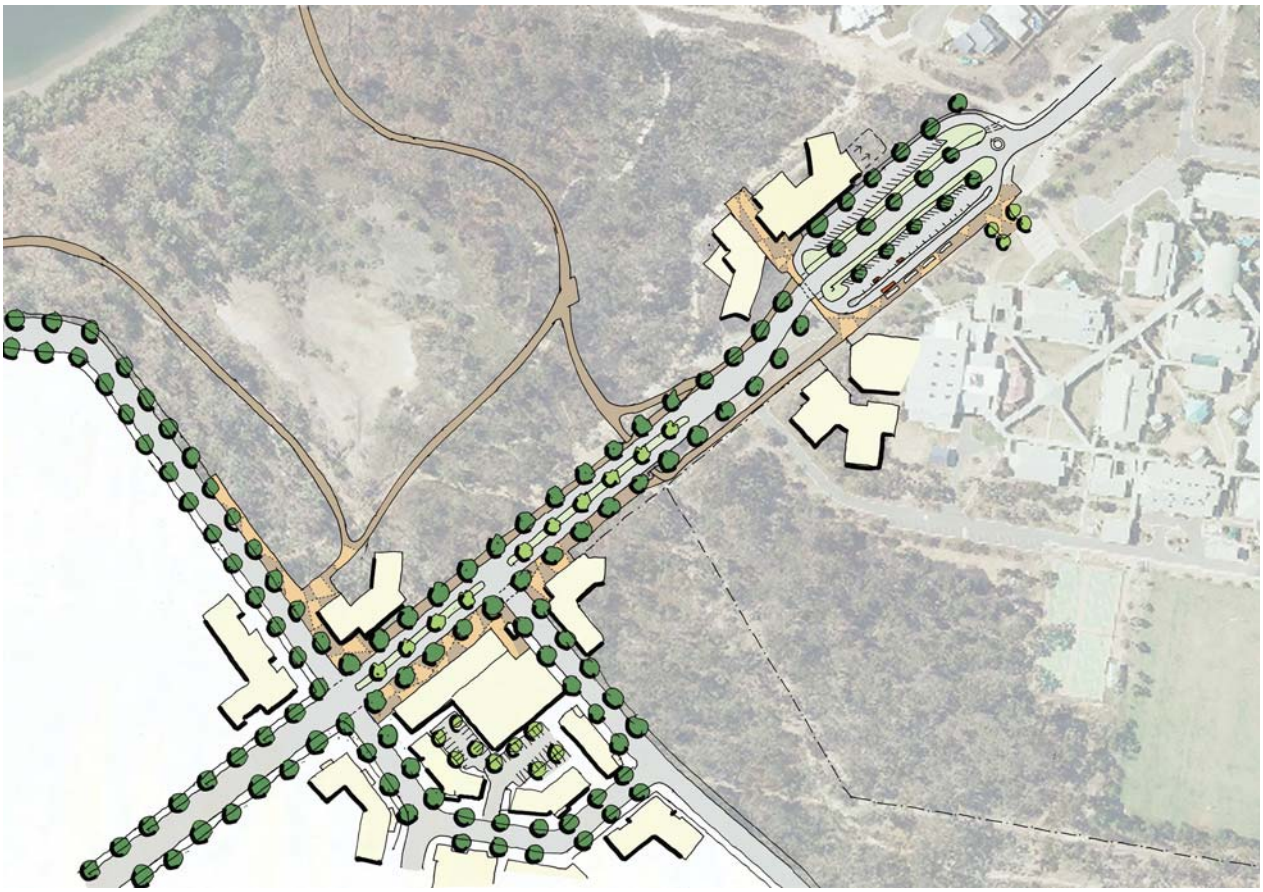
BITS Proposed Future Trunk Road Network

Map Produced: 29th June 2011

GDA

Appendix C

Design Workshop Sketches



Tannum Sands UDA Design Workshop

Draft Tannum Neighbourhood Centre Plan
110102_UD08A
1:2000@ A3
02.11.2011

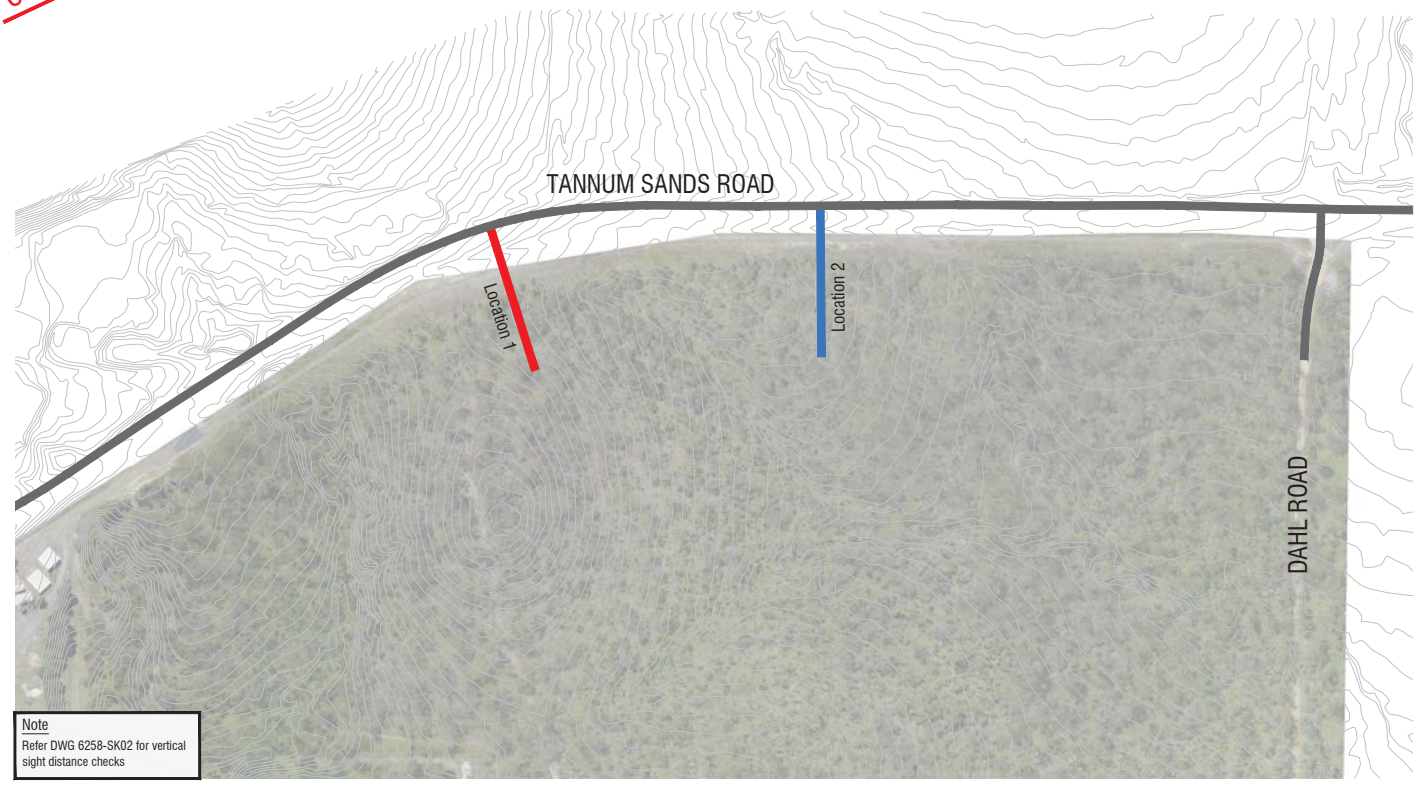
Deicke Richards

urban land development authority

Appendix D

Potential Access Location

CONCEPT ONLY



Note
Refer DWG 6258-SK02 for vertical sight distance checks

Scale 1:2500 @ A3

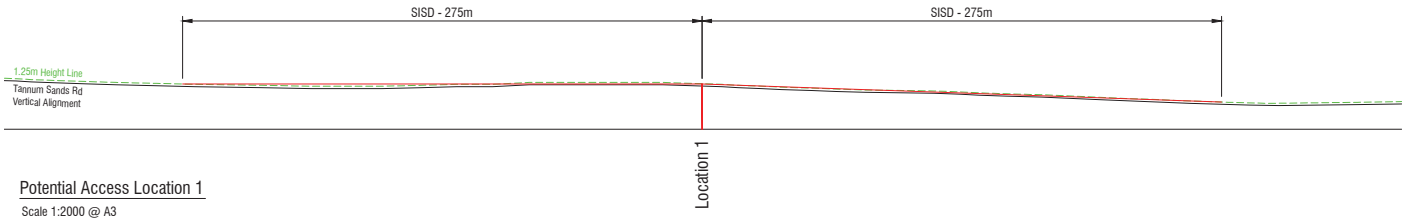
Tannum Sands UDLA Structure Plan
Potential Access Locations

SK01 | Project No: CEB06258 | Date: 28/09/2011

Cardno Eppell Olsen

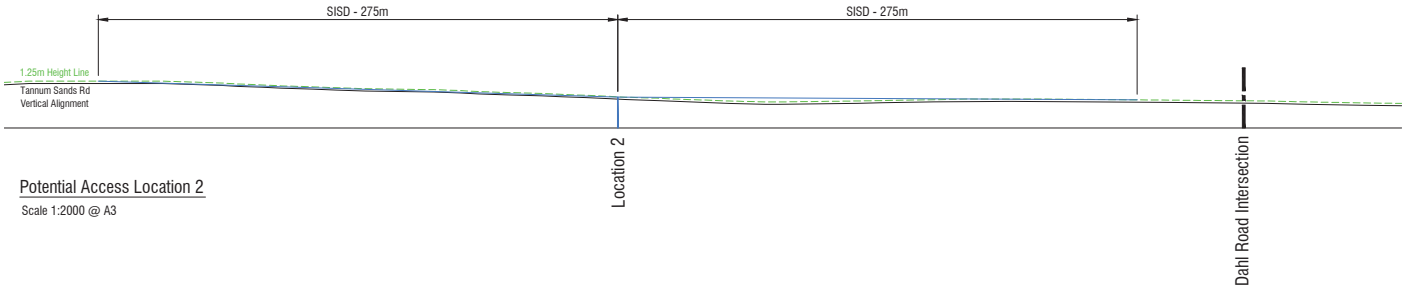
FILE NAME: G:\CEB06258 TANNUM SANDS\CEB06258 ACAD\6258-SK01-SK02.DWG

CONCEPT ONLY



Potential Access Location 1

Scale 1:2000 @ A3



Potential Access Location 2

Scale 1:2000 @ A3

Notes

- SISD distance determined as per Austroads Part 4A Table 3.2 and Table 3.3 (100km/h, 2.5 second reaction time)
- 1.1m drivers eye height assumed at potential access locations

Tannum Sands UDLA Structure Plan
Potential Access Locations
Vertical Sight Distance Checks

SK02 | Project No: CEB06258 | Date: 28/09/2011

Cardno Eppell Olsen

FILE NAME: G:\CEB06258 TANNUM SANDS\CEB06258 ACAD\6258-SK01-SK02.DWG

Appendix E

1992 SEQ Household Travel Survey Data

HOUSEHOLD TRIP GENERATION DATA **Source: 1992 SEQ Household Travel Survey Data**

Trip Rate per Person by Mode and Purpose

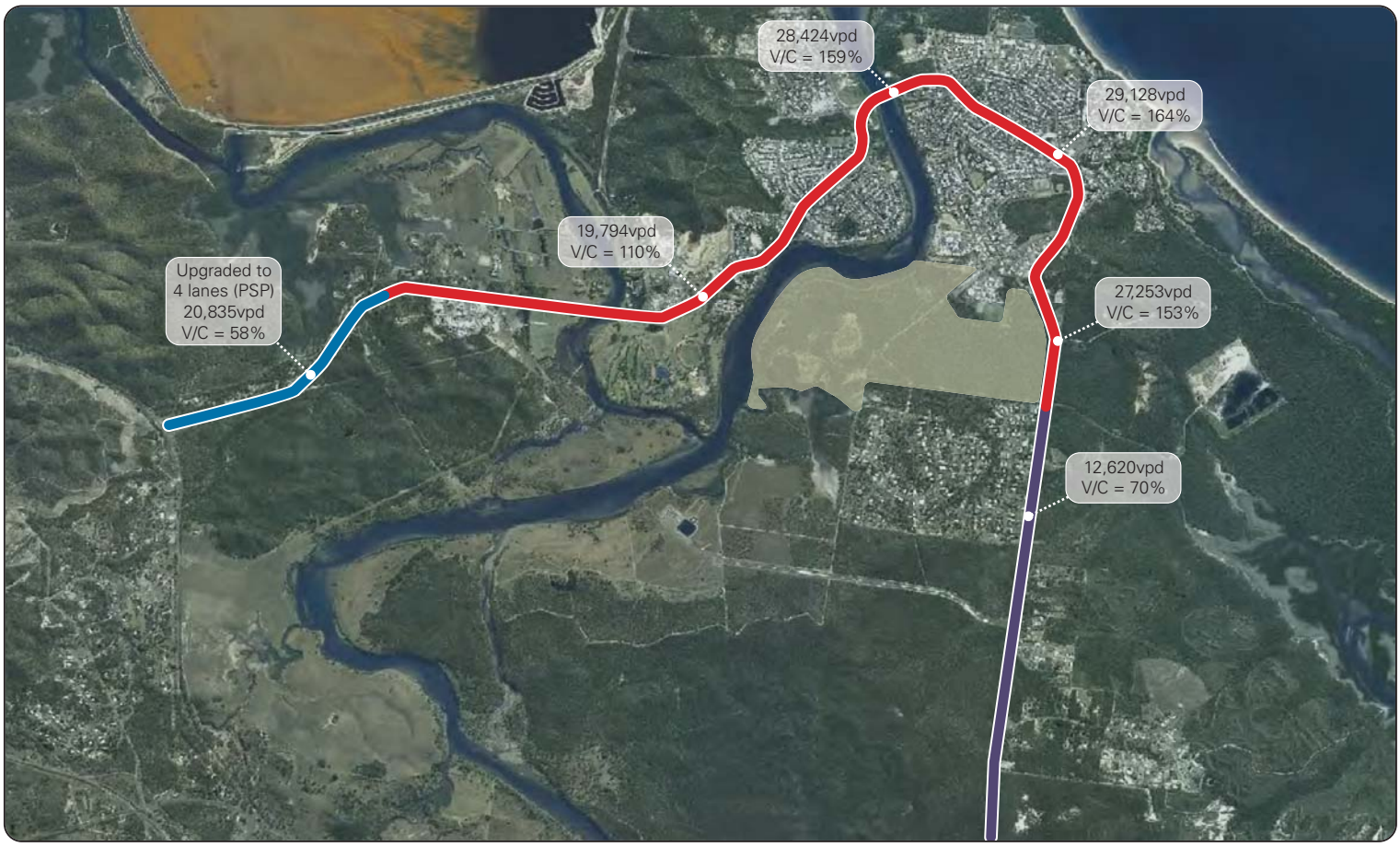
Trip Purpose	Mode of Transport									
	Walk	Cycle	Bus	Car Driver	Car Passenger	Train	Other	TOTAL	Car Based Trips	%
Home Based Employment	0.05	0.01	0.00	0.40	0.07	0.00	0.01	0.56	**0.47**	85%
Home Based Education	0.11	0.03	0.02	0.15	0.17	0.00	0.00	0.49	**0.32**	65%
Home Based Shopping/Personal Business	0.10	0.01	0.00	0.36	0.16	0.00	0.01	0.65	**0.52**	80%
Home Based Social/Recreation	0.05	0.01	0.00	0.13	0.09	0.00	0.00	0.29	**0.22**	77%
Home Based Other	0.05	0.01	0.00	0.22	0.12	0.00	0.01	0.40	**0.34**	84%
Non Home Based	0.19	0.01	0.02	0.71	0.28	0.00	0.05	1.25	**0.99**	79%
TOTAL	**0.56**	**0.09**	**0.05**	**1.96**	**0.90**	**0.00**	**0.09**	**3.63**	**2.86**	

Vehicle Trip Percentages by Car Driver

Trip Purpose	Trip Rate	Normalised
Home Based Employment	0.40	32%
Home Based Education	0.15	12%
Home Based Shopping/Personal Business	0.36	28%
Home Based Social/Recreation	0.13	10%
Home Based Other	0.22	17%
HOME BASED TOTAL	**1.25**	**100%**

Appendix F

Design Traffic Volumes



LEGEND

- A
- B
- C
- D
- E

6.2 | ROAD NETWORK LOS - 2026 VOLUMES ON EXISTING NETWORK

TANNUM SANDS MASTERPLAN
Job Number: CEB06258 | 19-10-2011

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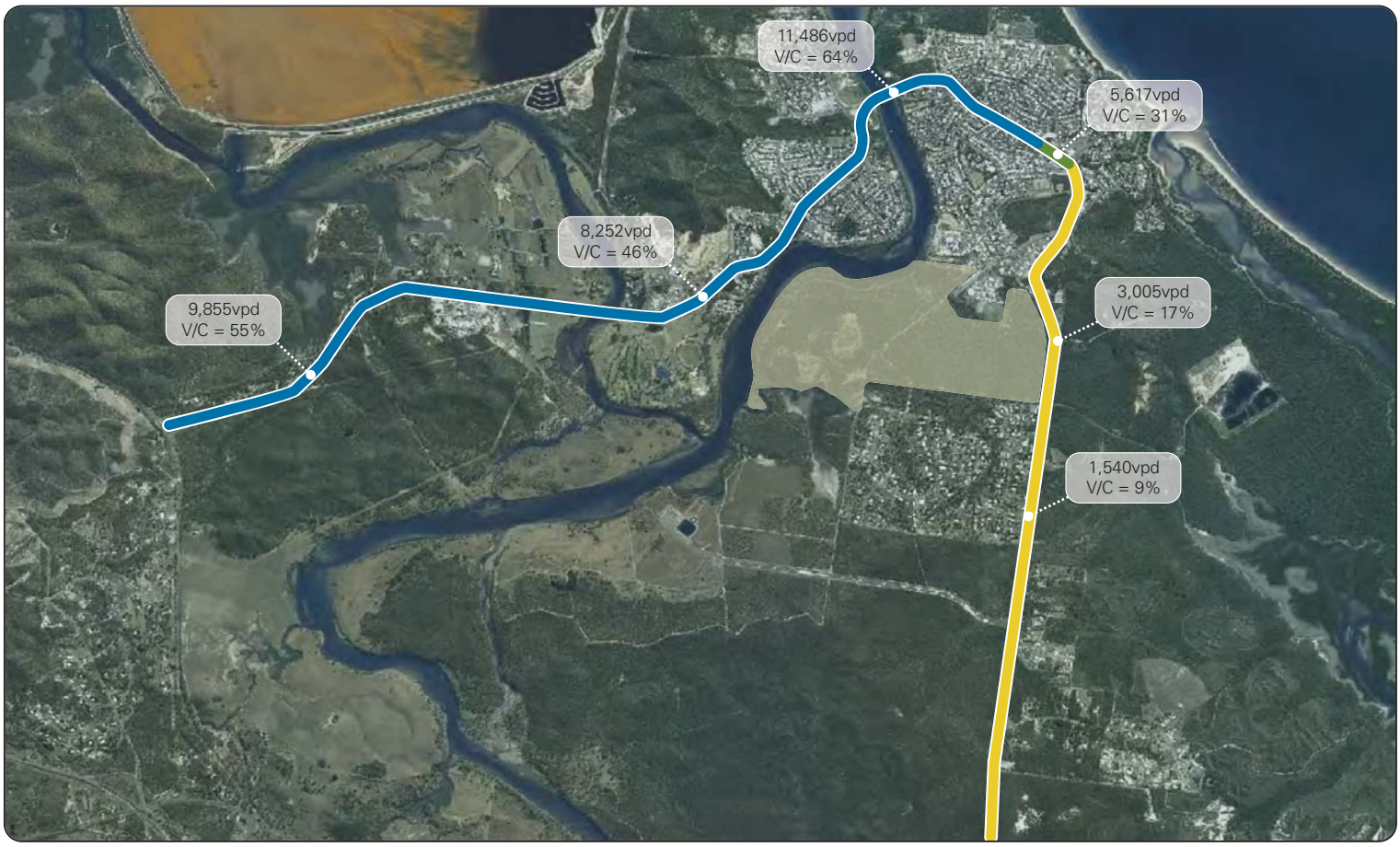
Shaping the Future ®



LEGEND

- A
- B
- C
- D
- E

2.2 | ROAD NETWORK LOS - EXISTING

TANNUM SANDS MASTERPLAN
Job Number: CEB06258 | 19-10-2011

Cardno
Shaping the Future ®

Job Number: CEB06258
Job Name: Tannum Sands UDA
Prepared By: Damien Scutt
Date: 17-Oct-11

Table 1: Proposed UDA Development Staging

Staging	Design Horizon	Lots
Stage 1	2015	450
Stage 2	2018	900
Stage 3	2022	1,500
Ultimate	2026	2,000

Table 2: Traffic Generation Rates

As per RTA Guide to Traffic Generating Developments

Land Use	Rate	Units
Peak Hour Generation	0.85	trips/dwelling
Daily Generation	9.00	trips/dwelling

Table 3: Proposed UDA Traffic Generation (Trips)

Parcel / Catchment	Traffic Generation	
	Peak Hour	Daily
Stage 1	383	4,050
Stage 2	765	8,100
Stage 3	1,275	13,500
Ultimate	1,700	18,000

Table 4: Trip Generation by Trip Purpose

Trip Type	%
Education	12%
Employment	32%
Retail	28%
Other	28%
TOTAL	**100%**

Table 5: Trip Destination by Trip Purpose (%)

Trip Type	Local	Gladstone	Total %
	%	%	
Education	85%	15%	**100%**
Employment	20%	80%	**100%**
Retail	30%	70%	**100%**
Other	50%	50%	**100%**

Table 6: Trip Destination by Trip Type (Trips)

Trip Type	Stage 1		Stage 2		Stage 3		Ultimate	
	Local	Gladstone	Local	Gladstone	Local	Gladstone	Local	Gladstone
Education	413	73	826	146	1,377	243	1,836	324
Employment	259	1,037	518	2,074	864	3,456	1,152	4,608
Retail	340	794	680	1,588	1,134	2,646	1,512	3,528
Other	567	567	1,134	1,134	1,890	1,890	2,520	2,520
TOTAL	**1,580**	**2,471**	**3,159**	**4,941**	**5,265**	**8,235**	**7,020**	**10,980**
STAGE TOTAL	**4,050**		**8,100**		**13,500**		**18,000**	

Table 7: Trip Destination Summary

Destination	%
Local	39%
Gladstone	61%
TOTAL	**100%**

Table 8: Distribution By Trip Purpose

ID	Road	Chainage		Distribution By Trip Purpose			
		Start	Finish	Education	Employment	Retail	Other
1	Tannum Sands Rd	Bruce Hwy	Broadacres Dr	0%	0%	0%	0%
1a	Tannum Sands Rd	Broadacres Dr	Pioneer Dr	0%	0%	0%	0%
1b	Tannum Sands Rd	Pioneer Dr	Silverton Dr	0%	0%	0%	0%
2	Tannum Sands Rd	Silverton Dr	Hampton Dr	80%	100%	100%	100%
3	Hampton Drive	Tannum Sands Rd	Booth Ave	80%	100%	85%	100%
4	John Oxley Bridge	Booth Ave	Malpas St	35%	95%	85%	75%
5	Boyne Island Road	Malpas St	Handley Rd	15%	90%	70%	50%
6	Boyne Island Road	Handley Rd	Gladstone Benaraby Rd	15%	80%	70%	50%

Table 9: UDA Development Link Volumes (Stage 1) - No New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	0	0	0	0	**0**
1b	0	0	0	0	**0**
2	389	1,296	1,134	1,134	**3,953**
3	389	1,296	964	1,134	**3,783**
4	170	1,231	964	851	**3,216**
5	73	1,166	794	567	**2,600**
6	73	1,037	794	567	**2,471**

Table 10: UDA Development Link Volumes (Stage 2) - No New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	0	0	0	0	**0**
1b	0	0	0	0	**0**
2	778	2,592	2,268	2,268	**7,906**
3	778	2,592	1,928	2,268	**7,565**
4	340	2,462	1,928	1,701	**6,431**
5	146	2,333	1,588	1,134	**5,200**
6	146	2,074	1,588	1,134	**4,941**

Table 11: UDA Development Link Volumes (Stage 3) - No New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	0	0	0	0	**0**
1b	0	0	0	0	**0**
2	1,296	4,320	3,780	3,780	**13,176**
3	1,296	4,320	3,213	3,780	**12,609**
4	567	4,104	3,213	2,835	**10,719**
5	243	3,888	2,646	1,890	**8,667**
6	243	3,456	2,646	1,890	**8,235**

Table 12: UDA Development Link Volumes (Ultimate) - No New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	0	0	0	0	**0**
1b	0	0	0	0	**0**
2	1,728	5,760	5,040	5,040	**17,568**
3	1,728	5,760	4,284	5,040	**16,812**
4	756	5,472	4,284	3,780	**14,292**
5	324	5,184	3,528	2,520	**11,556**
6	324	4,608	3,528	2,520	**10,980**

Job Number: CEB06258
Job Name: Tannum Sands UDA
Prepared By: Damien Scutt
Date: 17-Oct-11

Table 13: Proposed UDA Development Staging

Staging	Design Horizon	Lots
Stage 1	2015	450
Stage 2	2018	900
Stage 3	2022	1,500
Ultimate	2026	2,000

Table 14: Traffic Generation Rates

As per RTA Guide to Traffic Generating Developments

Land Use	Rate	Units
Peak Hour Generation	0.85	trips/dwelling
Daily Generation	9.00	trips/dwelling

Table 15: Proposed UDA Traffic Generation (Trips)

Parcel / Catchment	Traffic Generation	
	Peak Hour	Daily
Stage 1	383	4,050
Stage 2	765	8,100
Stage 3	1,275	13,500
Ultimate	1,700	18,000

Table 16: Trip Generation by Trip Purpose

Trip Type	%
Education	12%
Employment	32%
Retail	28%
Other	28%
TOTAL	**100%**

Table 17: Trip Destination by Trip Purpose (%)

Trip Type	Local	Gladstone	Total %
	%	%	
Education	85%	15%	**100%**
Employment	20%	80%	**100%**
Retail	30%	70%	**100%**
Other	50%	50%	**100%**

Table 18: Trip Destination by Trip Type (Trips)

Trip Type	Stage 1		Stage 2		Stage 3		Ultimate	
	Local	Gladstone	Local	Gladstone	Local	Gladstone	Local	Gladstone
Education	413	73	826	146	1,377	243	1,836	324
Employment	259	1,037	518	2,074	864	3,456	1,152	4,608
Retail	340	794	680	1,588	1,134	2,646	1,512	3,528
Other	567	567	1,134	1,134	1,890	1,890	2,520	2,520
TOTAL	**1,580**	**2,471**	**3,159**	**4,941**	**5,265**	**8,235**	**7,020**	**10,980**
STAGE TOTAL	**4,050**		**8,100**		**13,500**		**18,000**	

Table 19: Trip Destination Summary

Destination	%
Local	39%
Gladstone	61%
TOTAL	**100%**

Table 20: Distribution By Trip Purpose

ID	Road	Chainage		Distribution By Trip Purpose			
		Start	Finish	Education	Employment	Retail	Other
1	Tannum Sands Rd	Bruce Hwy	Broadacres Dr	0%	0%	0%	0%
1a	Tannum Sands Rd	Broadacres Dr	Pioneer Dr	0%	0%	0%	0%
1b	Tannum Sands Rd	Pioneer Dr	Silverton Dr	15%	80%	70%	50%
2	Tannum Sands Rd	Silverton Dr	Hampton Dr	80%	20%	30%	50%
3	Hampton Drive	Tannum Sands Rd	Booth Ave	80%	20%	15%	50%
4	John Oxley Bridge	Booth Ave	Malpas St	35%	15%	15%	25%
5	Boyne Island Road	Malpas St	Handley Rd	15%	10%	0%	0%
6	Boyne Island Road	Handley Rd	Gladstone Benaraby Rd	15%	80%	70%	50%
7	New Bridge	Tannum Sands Rd	Boyne Island Rd	15%	80%	70%	50%

Table 21: UDA Development Link Volumes (Stage 1) - With New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	0	0	0	0	**0**
1b	73	1,037	794	567	**2,471**
2	389	259	340	567	**1,555**
3	389	259	170	567	**1,385**
4	170	194	170	284	**818**
5	73	130	0	0	**203**
6	73	1,037	794	567	**2,471**
7	73	1,037	794	567	**2,471**

Table 22: UDA Development Link Volumes (Stage 2) - With New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	0	0	0	0	**0**
1b	146	2,074	1,588	1,134	**4,941**
2	778	518	680	1,134	**3,110**
3	778	518	340	1,134	**2,770**
4	340	389	340	567	**1,636**
5	146	259	0	0	**405**
6	146	2,074	1,588	1,134	**4,941**
7	146	2,074	1,588	1,134	**4,941**

Table 23: UDA Development Link Volumes (Stage 3) - With New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	0	0	0	0	**0**
1b	243	3,456	2,646	1,890	**8,235**
2	1,296	864	1,134	1,890	**5,184**
3	1,296	864	567	1,890	**4,617**
4	567	648	567	945	**2,727**
5	243	432	0	0	**675**
6	243	3,456	2,646	1,890	**8,235**
7	243	3,456	2,646	1,890	**8,235**

Table 24: UDA Development Link Volumes (Ultimate) - With New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	0	0	0	0	**0**
1b	324	4,608	3,528	2,520	**10,980**
2	1,728	1,152	1,512	2,520	**6,912**
3	1,728	1,152	756	2,520	**6,156**
4	756	864	756	1,260	**3,636**
5	324	576	0	0	**900**
6	324	4,608	3,528	2,520	**10,980**
7	324	4,608	3,528	2,520	**10,980**

Job Number: CEB06258
Job Name: Tannum Sands UDA
Prepared By: Damien Scutt
Date: 17-Oct-11

Table 25: Proposed Tannum Waters Development Staging

Staging	Design Horizon	Lots
Stage 1	2015	450
Stage 2	2018	900
Stage 3	2022	1,500
Ultimate	2026	2,000

Table 26: Traffic Generation Rates

As per RTA Guide to Traffic Generating Developments

Land Use	Rate	Units
Peak Hour Generation	0.85	trips/dwelling
Daily Generation	9.00	trips/dwelling

Table 27: Proposed Tannum Waters Traffic Generation (Trips)

Parcel / Catchment	Traffic Generation	
	Peak Hour	Daily
Stage 1	383	4,050
Stage 2	765	8,100
Stage 3	1,275	13,500
Ultimate	1,700	18,000

Table 28: Trip Generation by Trip Purpose

Trip Type	%
Education	12%
Employment	32%
Retail	28%
Other	28%
TOTAL	**100%**

Table 29: Trip Destination by Trip Purpose (%)

Trip Type	Local	Gladstone	Total %
	%	%	
Education	85%	15%	**100%**
Employment	20%	80%	**100%**
Retail	30%	70%	**100%**
Other	50%	50%	**100%**

Table 30: Trip Destination by Trip Type (Trips)

Trip Type	Stage 1		Stage 2		Stage 3		Ultimate	
	Local	Gladstone	Local	Gladstone	Local	Gladstone	Local	Gladstone
Education	413	73	826	146	1,377	243	1,836	324
Employment	259	1,037	518	2,074	864	3,456	1,152	4,608
Retail	340	794	680	1,588	1,134	2,646	1,512	3,528
Other	567	567	1,134	1,134	1,890	1,890	2,520	2,520
TOTAL	**1,580**	**2,471**	**3,159**	**4,941**	**5,265**	**8,235**	**7,020**	**10,980**
STAGE TOTAL	**4,050**		**8,100**		**13,500**		**18,000**	

Table 31: Trip Destination Summary

Destination	%
Local	39%
Gladstone	61%
TOTAL	**100%**

Table 32: Distribution By Trip Purpose

ID	Road	Chainage		Distribution By Trip Purpose			
		Start	Finish	Education	Employment	Retail	Other
1	Tannum Sands Rd	Bruce Hwy	Broadacres Dr	15%	80%	70%	50%
1a	Tannum Sands Rd	Broadacres Dr	Pioneer Dr	15%	80%	70%	50%
1b	Tannum Sands Rd	Pioneer Dr	Silverton Dr	15%	80%	70%	50%
2	Tannum Sands Rd	Silverton Dr	Hampton Dr	85%	20%	30%	50%
3	Hampton Drive	Tannum Sands Rd	Booth Ave	85%	20%	30%	50%
4	John Oxley Bridge	Booth Ave	Malpas St	21%	10%	15%	20%
5	Boyne Island Road	Malpas St	Handley Rd	0%	0%	0%	0%
6	Boyne Island Road	Handley Rd	Gladstone Benaraby Rd	0%	0%	0%	0%

Table 33: Tannum Waters Development Link Volumes (Stage 1) - No New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	73	1,037	794	567	**2,471**
1a	73	1,037	794	567	**2,471**
1b	73	1,037	794	567	**2,471**
2	413	259	340	567	**1,580**
3	413	259	340	567	**1,580**
4	103	130	170	227	**630**
5	0	0	0	0	**0**
6	0	0	0	0	**0**

Table 34: Tannum Waters Development Link Volumes (Stage 2) - No New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	146	2,074	1,588	1,134	**4,941**
1a	146	2,074	1,588	1,134	**4,941**
1b	146	2,074	1,588	1,134	**4,941**
2	826	518	680	1,134	**3,159**
3	826	518	680	1,134	**3,159**
4	207	259	340	454	**1,260**
5	0	0	0	0	**0**
6	0	0	0	0	**0**

Table 35: Tannum Waters Development Link Volumes (Stage 3) - No New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	243	3,456	2,646	1,890	**8,235**
1a	243	3,456	2,646	1,890	**8,235**
1b	243	3,456	2,646	1,890	**8,235**
2	1,377	864	1,134	1,890	**5,265**
3	1,377	864	1,134	1,890	**5,265**
4	344	432	567	756	**2,099**
5	0	0	0	0	**0**
6	0	0	0	0	**0**

Table 36: Tannum Waters Development Link Volumes (Ultimate) - No New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	324	4,608	3,528	2,520	**10,980**
1a	324	4,608	3,528	2,520	**10,980**
1b	324	4,608	3,528	2,520	**10,980**
2	1,836	1,152	1,512	2,520	**7,020**
3	1,836	1,152	1,512	2,520	**7,020**
4	459	576	756	1,008	**2,799**
5	0	0	0	0	**0**
6	0	0	0	0	**0**

Job Number: CEB06258
Job Name: Tannum Sands UDA
Prepared By: Damien Scutt
Date: 17-Oct-11

Table 37: Proposed Tannum Waters Development Staging

Staging	Design Horizon	Lots
Stage 1	2015	450
Stage 2	2018	900
Stage 3	2022	1,500
Ultimate	2026	2,000

Table 38: Traffic Generation Rates

As per RTA Guide to Traffic Generating Developments

Land Use	Rate	Units
Peak Hour Generation	0.85	trips/dwelling
Daily Generation	9.00	trips/dwelling

Table 39: Proposed Tannum Waters Traffic Generation (Trips)

Parcel / Catchment	Traffic Generation	
	Peak Hour	Daily
Stage 1	383	4,050
Stage 2	765	8,100
Stage 3	1,275	13,500
Ultimate	1,700	18,000

Table 34: Trip Generation by Trip Purpose

Trip Type	%
Education	12%
Employment	32%
Retail	28%
Other	28%
TOTAL	**100%**

Table 35: Trip Destination by Trip Purpose (%)

Trip Type	Local	Gladstone	Total %
	%	%	
Education	85%	15%	**100%**
Employment	20%	80%	**100%**
Retail	30%	70%	**100%**
Other	50%	50%	**100%**

Table 36: Trip Destination by Trip Type (Trips)

Trip Type	Stage 1		Stage 2		Stage 3		Ultimate	
	Local	Gladstone	Local	Gladstone	Local	Gladstone	Local	Gladstone
Education	413	73	826	146	1,377	243	1,836	324
Employment	259	1,037	518	2,074	864	3,456	1,152	4,608
Retail	340	794	680	1,588	1,134	2,646	1,512	3,528
Other	567	567	1,134	1,134	1,890	1,890	2,520	2,520
TOTAL	**1,580**	**2,471**	**3,159**	**4,941**	**5,265**	**8,235**	**7,020**	**10,980**
STAGE TOTAL	**4,050**		**8,100**		**13,500**		**18,000**	

Table 37: Trip Destination Summary

Destination	%
Local	39%
Gladstone	61%
TOTAL	**100%**

Table 38: Distribution By Trip Purpose

ID	Road	Chainage		Distribution By Trip Purpose			
		Start	Finish	Education	Employment	Retail	Other
1	Tannum Sands Rd	Bruce Hwy	Broadacres Dr	0%	0%	0%	0%
1a	Tannum Sands Rd	Broadacres Dr	Pioneer Dr	100%	100%	100%	100%
1b	Tannum Sands Rd	Pioneer Dr	Silverton Dr	85%	20%	30%	50%
2	Tannum Sands Rd	Silverton Dr	Hampton Dr	85%	20%	30%	50%
3	Hampton Drive	Tannum Sands Rd	Booth Ave	85%	20%	30%	50%
4	John Oxley Bridge	Booth Ave	Malpas St	20%	10%	15%	20%
5	Boyne Island Road	Malpas St	Handley Rd	0%	0%	0%	0%
6	Boyne Island Road	Handley Rd	Gladstone Benaraby Rd	0%	0%	0%	0%
7	New Bridge	Tannum Sands Rd	Boyne Island Rd	15%	80%	70%	50%

Table 39: Tannum Waters Development Link Volumes (Stage 1) - With New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	486	1,296	1,134	1,134	**4,050**
1b	413	259	340	567	**1,580**
2	413	259	340	567	**1,580**
3	413	259	340	567	**1,580**
4	97	130	170	227	**624**
5	0	0	0	0	**0**
6	0	0	0	0	**0**
7	73	1,037	794	567	**2,471**

Table 40: Tannum Waters Development Link Volumes (Stage 2) - With New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	972	2,592	2,268	2,268	**8,100**
1b	826	518	680	1,134	**3,159**
2	826	518	680	1,134	**3,159**
3	826	518	680	1,134	**3,159**
4	194	259	340	454	**1,247**
5	0	0	0	0	**0**
6	0	0	0	0	**0**
7	146	2,074	1,588	1,134	**4,941**

Table 41: Tannum Waters Development Link Volumes (Stage 3) - With New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	1,620	4,320	3,780	3,780	**13,500**
1b	1,377	864	1,134	1,890	**5,265**
2	1,377	864	1,134	1,890	**5,265**
3	1,377	864	1,134	1,890	**5,265**
4	324	432	567	756	**2,079**
5	0	0	0	0	**0**
6	0	0	0	0	**0**
7	243	3,456	2,646	1,890	**8,235**

Table 42: Tannum Waters Development Link Volumes (Ultimate) - With New Bridge

ID	Distribution By Trip Purpose				TOTAL
	Education	Employment	Retail	Other	
1	0	0	0	0	**0**
1a	2,160	5,760	5,040	5,040	**18,000**
1b	1,836	1,152	1,512	2,520	**7,020**
2	1,836	1,152	1,512	2,520	**7,020**
3	1,836	1,152	1,512	2,520	**7,020**
4	432	576	756	1,008	**2,772**
5	0	0	0	0	**0**

Job Number: CEB06258
Job Name: Tannum Sands UDA
Prepared By: Damien Scutt
Date: 17-Oct-11

Table 1: UDA - Traffic Generation Summary (Trips) - No New Bridge

ID	Stage 1	Stage 2	Stage 3	Ultimate
	2015	2018	2022	2026
1	0	0	0	0
1a	0	0	0	0
1b	0	0	0	0
2	3,953	7,906	13,176	17,568
3	3,783	7,565	12,609	16,812
4	3,216	6,431	10,719	14,292
5	2,600	5,200	8,667	11,556
6	2,471	4,941	8,235	10,980

Table 2: Tannum Waters - Traffic Generation Summary (Trips) - No New Bridge

ID	Stage 1	Stage 2	Stage 3	Ultimate
	2015	2018	2022	2026
1	2,471	4,941	8,235	10,980
1a	2,471	4,941	8,235	10,980
1b	2,471	4,941	8,235	10,980
2	1,580	3,159	5,265	7,020
3	1,580	3,159	5,265	7,020
4	630	1,260	2,099	2,799
5	0	0	0	0
6	0	0	0	0

Table 3: Tannum Sand Quarry - Traffic Generation Summary (Trips) - No New Bridge

ID	Tannum Sand Quarry			
	2015	2018	2022	2026
1	100	100	100	100
1a	0	0	0	0
1b	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0

Table 4: BG Traffic (Existing + Tannum Waters + Tannum Sand Quarry) - No New Bridge

ID	Existing	BG Traffic				V/C
	2010	2015	2018	2022	2026	
1	1,540	4,111	6,581	9,875	12,620	70%
1a	1,540	4,011	6,481	9,775	12,520	70%
1b	1,540	4,011	6,481	9,775	12,520	70%
2	3,005	4,585	6,164	8,270	10,025	56%
3	5,617	7,197	8,776	10,882	12,637	70%
4	11,486	12,116	12,746	13,585	14,285	79%
5	8,252	8,252	8,252	8,252	8,252	46%
6	9,855	9,855	9,855	9,855	9,855	55%

Table 5: BG Traffic + Development (Existing + Tannum Waters + Tannum Sand Quarry + UDA) - No New Bridge

ID	Existing	Stage 1	Stage 2	Stage 3	Ultimate	V/C
	2010	2015	2018	2022	2026	
1	1,540	4,111	6,581	9,875	12,620	70%
1a	1,540	4,011	6,481	9,775	12,520	70%
1b	1,540	4,011	6,481	9,775	12,520	70%
2	3,005	8,537	14,070	21,446	27,593	153%
3	5,617	10,979	16,341	23,491	29,449	164%
4	11,486	15,331	19,177	24,304	28,577	
5	8,252	10,852	13,452	16,919	19,808	
6	9,855	12,326	14,796	18,090	20,835	

Table 6: 2026 Traffic Composition - No New Bridge

ID	Traffic Composition			TOTAL
	Existing	BG Development	Development	
1	12%	88%	0%	100%
1a	12%	88%	0%	100%
1b	12%	88%	0%	100%
2	11%	25%	64%	100%
3	19%	24%	57%	100%
4	40%	10%	50%	100%
5	42%	0%	58%	100%
6	47%	0%	53%	100%

Job Number: CEB06258
Job Name: Tannum Sands UDA
Prepared By: Damien Scutt
Date: 17-Oct-11

Table 7: UDA - Traffic Generation Summary (Trips) - With New Bridge

ID	Stage 1	Stage 2	Stage 3	Ultimate
	2015	2018	2022	2026
1	0	0	0	0
1a	0	0	0	0
1b	2,471	4,941	8,235	10,980
2	1,555	3,110	5,184	6,912
3	1,385	2,770	4,617	6,156
4	818	1,636	2,727	3,636
5	203	405	675	900
6	2,471	4,941	8,235	10,980
7	2,471	4,941	8,235	10,980

Table 8: BG Tannum Waters - Traffic Generation Summary (Trips) - With New Bridge

ID	Stage 1	Stage 2	Stage 3	Ultimate
	2015	2018	2022	2026
1	0	0	0	0
1a	4,050	8,100	13,500	18,000
1b	1,580	3,159	5,265	7,020
2	1,580	3,159	5,265	7,020
3	1,580	3,159	5,265	7,020
4	624	1,247	2,079	2,772
5	0	0	0	0
6	0	0	0	0
7	2,471	4,941	8,235	10,980

Table 9: BG Tannum Sand Quarry - Traffic Generation Summary (Trips) - With New Bridge

ID	Tannum Sand Quarry			
	2015	2018	2022	2026
1	100	100	100	100
1a	0	0	0	0
1b	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0

Table 10: BG Traffic (Existing + Tannum Waters + Tannum Sand Quarry) - With New Bridge

ID	Existing	BG Traffic				V/C
	2010	2015	2018	2022	2026	
1	1,540	1,640	1,640	1,640	1,640	9%
1a	1,540	5,590	9,640	15,040	19,540	109%
1b	1,540	3,120	4,699	6,805	8,560	48%
2	3,005	4,585	6,164	8,270	10,025	56%
3	5,617	7,197	8,776	10,882	12,637	70%
4	11,486	12,110	12,733	13,565	14,258	79%
5	8,252	8,252	8,252	8,252	8,252	46%
6	9,855	9,855	9,855	9,855	9,855	55%
7	0	2,471	4,941	8,235	10,980	61%

Table 11: BG Traffic + Development (Existing + Tannum Waters + Tannum Sand Quarry + UDA) - With New Bridge

ID	Existing	Stage 1				V/C
	2010	2015	2018	2022	2026	
1	1,540	1,640	1,640	1,640	1,640	9%
1a	1,540	5,590	9,640	15,040	19,540	
1b	1,540	5,590	9,640	15,040	19,540	
2	3,005	6,140	9,274	13,454	16,937	
3	5,617	8,582	11,546	15,499	18,793	
4	11,486	12,928	14,370	16,292	17,894	
5	8,252	8,455	8,657	8,927	9,152	51%
6	9,855	12,326	14,796	18,090	20,835	58%
7	0	4,941	9,882	16,470	21,960	61%

Table 12: 2026 Traffic Composition - With New Bridge

ID	Traffic Composition			TOTAL
	Existing	BG Development	Development	
1	94%	6%	0%	100%
1a	8%	92%	0%	100%
1b	8%	36%	56%	100%
2	18%	41%	41%	100%
3	30%	37%	33%	100%
4	64%	15%	20%	100%
5	90%	0%	10%	100%
6	47%	0%	53%	100%
7	0%	50%	50%	100%

Job Number: CE806258
Job Name: Tannum Sands UDA
Prepared By: Damien Scutt
Date: 17-Oct-11

Table 1: BG Traffic + Development (Existing + Tannum Waters + Tannum Sand Quarry + UDA) - No New Bridge

ID	Existing	Stage 1	Stage 2	Stage 3	Ultimate
	2010	2015	2018	2022	2026
1	1,540	4,111	6,581	9,875	12,620
2	3,005	8,537	14,070	21,446	27,593
3	5,617	10,979	16,341	23,491	29,449
4	11,486	15,331	19,177	24,304	28,577
5	8,252	10,852	13,452	16,919	19,808
6	9,855	12,326	14,796	18,090	20,835

Table 2: Distribution Summary

ID	Tannum Waters (BG)	Sand Quarry (BG)	UDA (Dev)
1	61%	100%	0%
2	39%	0%	98%
3	39%	0%	93%
4	16%	0%	79%
5	0%	0%	64%
6	0%	0%	61%

Table 3: Development Rate

Development	Rate	Unit
Tannum Waters	150	lots/year
UDA	150	lots/year
Sand Quarry	100	trips/day

Table 4: Traffic Generation Rates
As per RTA Guide to Traffic Generating Developments

Land Use	Rate	Units
Peak Hour Generation	0.85	trips/dwelling
Daily Generation	9.00	trips/dwelling

Table 5:Traffic Generation Per Year (vpd)

ID	UDA	Tannum Waters	Tannum Waters
1	0	824	100
2	1,318	527	0
3	1,261	527	0
4	1,072	210	0
5	867	0	0
6	824	0	0

Table 6: Upgrade Trigger

ID	Existing	Existing + Quarry	Existing + Quarry	+150 lots + BG	+300 lots + BG	+450 lots + BG	+600 lots + BG	+750 lots + BG	+900 lots + BG	+1050 lots + BG	+1200 lots + BG	+1350 lots + BG	+1500 lots + BG	+1650 lots + BG	+1800 lots + BG	+1950 lots + BG	+2000 lots + BG
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
1	1,540	1,640	1,640	2,464	3,287	4,111	4,934	5,758	6,581	7,405	8,228	9,052	9,875	10,699	11,522	12,346	12,620
2	3,005	3,005	3,005	4,849	6,693	8,537	10,381	12,226	14,070	15,914	17,758	19,602	21,446	23,290	25,134	26,978	27,253
3	5,617	5,617	5,617	7,404	9,192	10,979	12,767	14,554	16,341	18,129	19,916	21,704	23,491	25,278	27,066	28,853	29,128
4	11,486	11,486	11,486	12,768	14,050	15,331	16,613	17,895	19,177	20,459	21,741	23,022	24,304	25,586	26,868	28,150	28,424
5	8,252	8,252	8,252	9,119	9,985	10,852	11,719	12,586	13,452	14,319	15,186	16,052	16,919	17,786	18,652	19,519	19,794
6	9,855	9,855	9,855	10,679	11,502	12,326	13,149	13,973	14,796	15,620	16,443	17,267	18,090	18,914	19,737	20,561	20,835

Table 6: Upgrade Trigger

ID	Year of Upgrade	No. of UDA Lots
1	-	2,000
2	2020	1,200
3	2018	900
4	2017	750
5	2023	1,650
6	2021	1,350

Job Number: CE806258
Job Name: Tannum Sands UDA
Prepared By: Damien Scutt
Date: 17-Oct-11

Table 1: BG Traffic + Development (Existing + Tannum Waters + Tannum Sand Quarry + UDA) - No New Bridge

ID	Existing	Stage 1	Stage 2	Stage 3	Ultimate
	2010	2015	2018	2022	2026
1	1,540	1,640	1,640	1,640	1,640
1a	1,540	5,590	9,640	15,040	19,540
1b	1,540	5,590	9,640	15,040	19,540
2	3,005	6,140	9,274	13,454	16,937
3	5,617	8,582	11,546	15,499	18,793
4	11,486	12,928	14,370	16,292	17,894
5	8,252	8,455	8,657	8,927	9,152
6	9,855	12,326	14,796	18,090	20,835
7	0	4,941	9,882	16,470	21,960

Table 2: Distribution Summary

ID	Tannum Waters (BG)	Sand Quarry (BG)	UDA (Dev)
1	0%	100%	0%
1a	100%	0%	0%
1b	39%	0%	61%
2	39%	0%	38%
3	39%	0%	34%
4	15%	0%	20%
5	0%	0%	5%
6	0%	0%	61%
7	61%	0%	61%

Table 3: Development Rate

Development	Rate	Unit
Tannum Waters	150	lots/year
UDA	150	lots/year
Sand Quarry	100	trips/day

Table 4: Traffic Generation Rates
As per RTA Guide to Traffic Generating Developments

Land Use	Rate	Units
Peak Hour Generation	0.85	trips/dwelling
Daily Generation	9.00	trips/dwelling

Table 5:Traffic Generation Per Year (vpd)

ID	UDA	Tannum Waters	Tannum Waters
1	0	0	100
1a	0	1,350	0
1b	824	527	0
2	518	527	0
3	462	527	0
4	273	208	0
5	68	0	0
6	824	0	0
7	824	824	0

Table 6: Upgrade Trigger

ID	Existing	Existing + Quarry	Existing + Quarry	+150 lots + BG	+300 lots + BG	+450 lots + BG	+600 lots + BG	+750 lots + BG	+900 lots + BG	+1050 lots + BG	+1200 lots + BG	+1350 lots + BG	+1500 lots + BG	+1650 lots + BG	+1800 lots + BG	+1950 lots + BG	+2000 lots + BG
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
1	1,540	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640
1a	1,540	1,540	1,540	2,890	4,240	5,590	6,940	8,290	9,640	10,990	12,340	13,690	15,040	16,390	17,740	19,090	19,540
1b	1,540	1,540	1,540	2,890	4,240	5,590	6,940	8,290	9,640	10,990	12,340	13,690	15,040	16,390	17,740	19,090	19,540
2	3,005	3,005	3,005	4,050	5,095	6,140	7,185	8,230	9,274	10,319	11,364	12,409	13,454	14,499	15,544	16,589	16,937
3	5,617	5,617	5,617	6,605	7,593	8,582	9,570	10,558	11,546	12,534	13,523	14,511	15,499	16,487	17,475	18,464	18,793
4	11,486	11,486	11,486	11,967	12,447	12,928	13,408	13,889	14,370	14,850	15,331	15,811	16,292	16,773	17,253	17,734	17,894
5	8,252	8,252	8,252	8,320	8,387	8,455	8,522	8,590	8,657	8,725	8,792	8,860	8,927	8,995	9,062	9,130	9,152
6	9,855	9,855	9,855	10,679	11,502	12,326	13,149	13,973	14,796	15,620	16,443	17,267	18,090	18,914	19,737	20,561	20,835
7	0	0	0	1,647	3,294	4,941	6,588	8,235	9,882	11,529	13,176	14,823	16,470	18,117	19,764	21,411	21,960

Table 6: Upgrade Trigger

ID	Year of Upgrade	No. of UDA Lots
1		2,000
1a	2024	1,800
1b	2024	1,800
2		2,000
3	2024	1,800
4	-	2,000
5		2,000
6	2021	1,350
7	2022	1,500

Job Number: CEB06258
Job Name: Tannum Sands UDA
Prepared By: Damien Scutt
Date: 17-Oct-11

Table 1: UDA Access Intersection Distrubtion Summary (Trips)
From Road Hierarchy Tab

Direction	Access Intersection			TOTAL
	1	2	3	
Northbound	3,629	3,271	300	7,200
Southbound	0	3,342	7,458	10,800
TOTAL	**3,629**	**6,613**	**7,758**	**18,000**

Table 2: UDA Peak Hour Volumes (Intersection 2)

Direction	Daily Volume	Peak Hour	IN	OUT
			30%	70%
Northbound	3,271	309	93	216
Southbound	3,342	316	95	221
TOTAL	**6,613**	**625**	**187**	**437**

Table 3: UDA Peak Hour Volumes (Intersection 3)

Direction	Daily Volume	Peak Hour	IN	OUT
			30%	70%
Northbound	300	28	8	20
TOTAL	**300**	**28**	**8**	**20**

Table 4: Background Trips on Tannum Sands Road (ID 2)

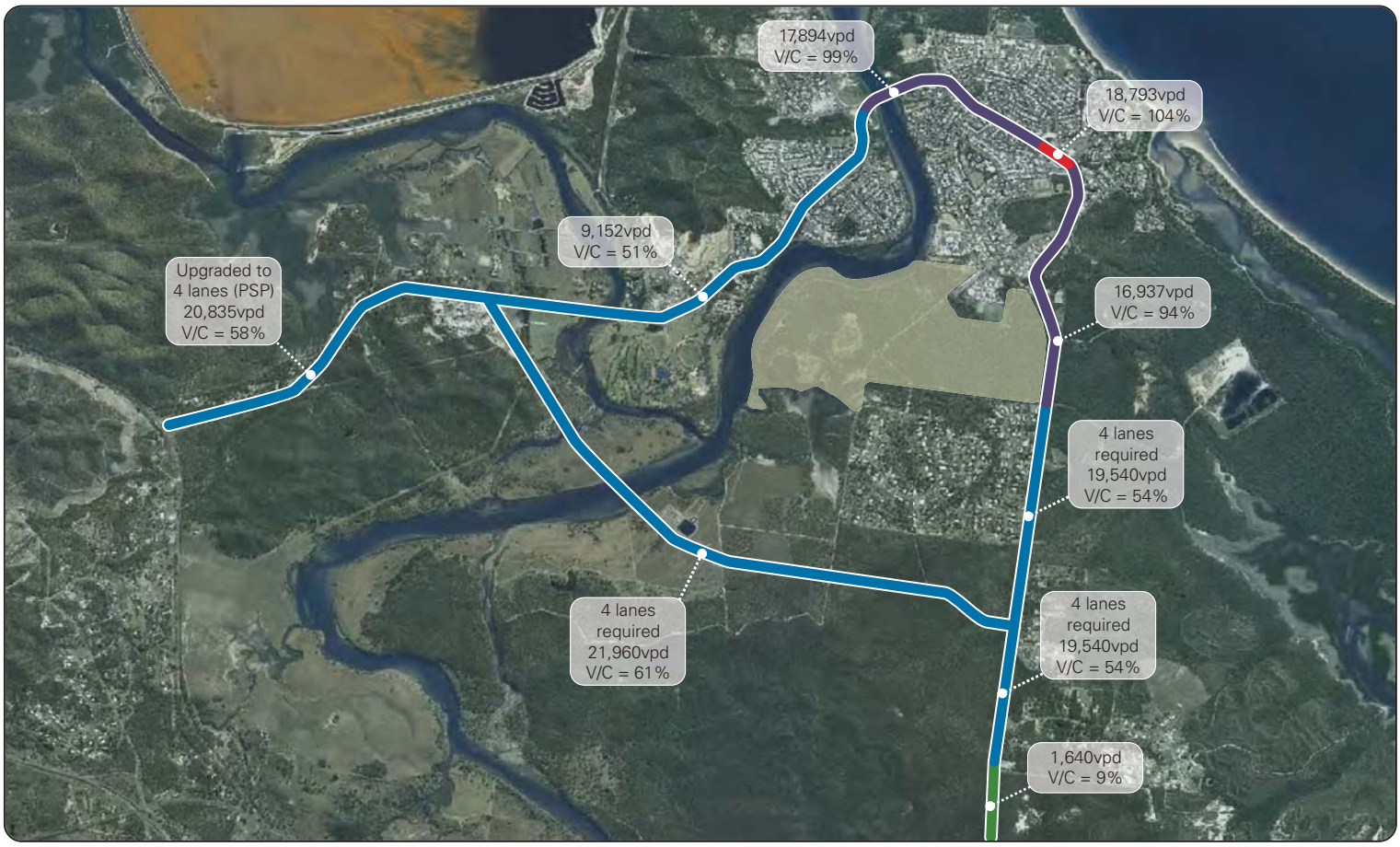
Data Source	Daily Volume	Peak Hour	Northbound	Southbound
			50%	50%
TMR (2010)	3,005	301	150	150

Table 5: Tannum Waters on Tannum Sands Road (ID 2)

Scenario	Daily Volume	Peak Hour	Northbound	Southbound
			30%	70%
2026	7,020	663	199	139

Figure 1: 2026 Design Volumes - Tannum Sands Road/New Access Road

			(216)	**(309)**
(93)	216	**L**	93	358
(95)	221	**R**	**R**	**T**
	L	**T**		
	95	309		
	(221)	**(358)**		



LEGEND

- A
- B
- C
- D
- E

6.3 | ROAD NETWORK LOS - 2026 VOLUMES ON ULTIMATE NETWORK

TANNUM SANDS MASTERPLAN
Job Number: CEB06258 | 19-10-2011

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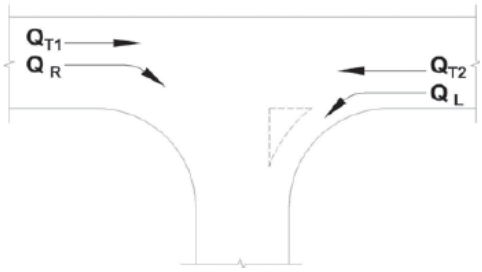
Appendix G

Turn Warrants

Tannum Sands Road/New Access

2026 Ultimate Volumes (AM Peak)

Q_{T1}=	357
Q_R=	85

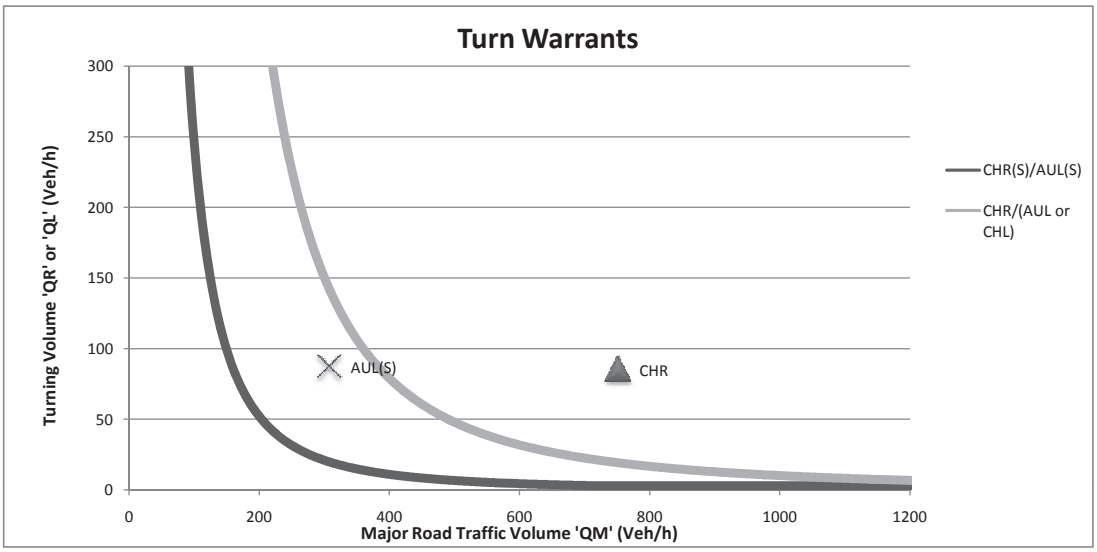


Q_{T2}=	308
Q_L=	87

Splitter Island?	No
Speed Limit?	<100km/h

	Q_M	Q_R/Q_L
Right	752	85
Left	308	87

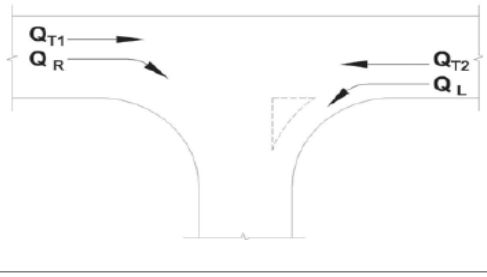
Righ Turn Treatment Required	CHR
Left Turn Treatment Required	AUL(S)



Tannum Sands Road/New Access

2026 Ultimate Volumes (PM Peak)

Q_{T1}=	308
Q_R=	198

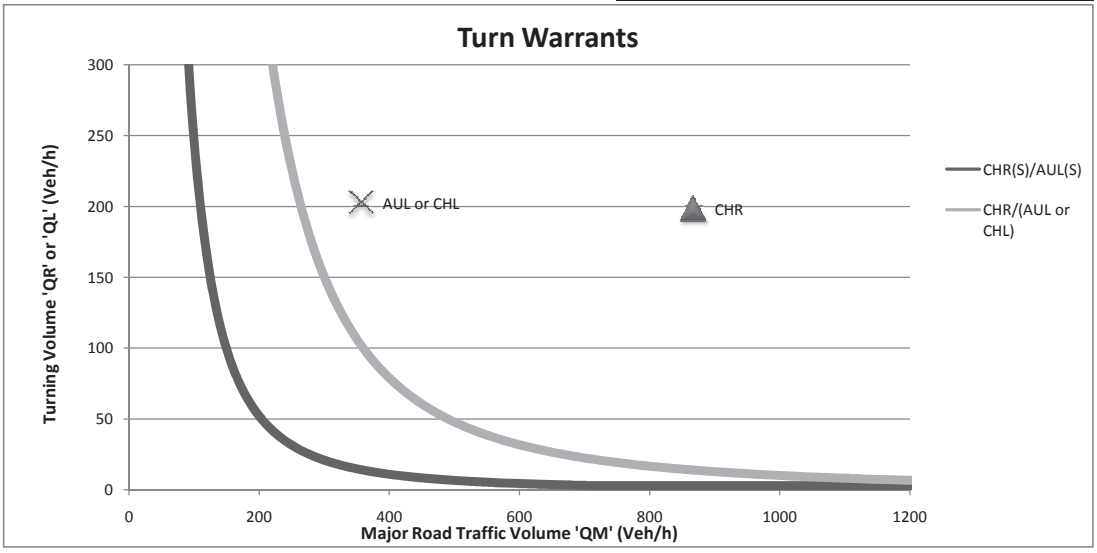


Q_{T2}=	357
Q_L=	203

Splitter Island?	No
Speed Limit?	<100km/h

	Q_M	Q_R/Q_L
Right	867	198
Left	357	203

Righ Turn Treatment Required	CHR
Left Turn Treatment Required	AUL or CHL



Appendix H

SIDRA Output

MOVEMENT SUMMARY

Site: 2024AM

Job Number: CEB06258
Job Title: Tannum Sands UDA
Intersection: Tannum Sands Road/New Access Intersection
Configuration: Proposed Ultimate
Scenario: 2024 AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tannum Sands Road (south)											
1	L	87	3.0	0.048	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	308	3.0	0.161	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		395	3.0	0.161	1.8	NA	0.0	0.0	0.00	0.15	57.2
North: Tannum Sands Road (north)											
8	T	357	3.0	0.187	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	85	3.0	0.088	10.0	LOS B	0.3	2.5	0.44	0.70	47.1
Approach		442	3.0	0.187	1.9	NA	0.3	2.5	0.08	0.14	57.0
West: New Access Road											
10	L	198	3.0	0.195	10.0	LOS A	0.8	6.0	0.45	0.72	47.0
12	R	203	3.0	0.525	20.2	LOS C	2.6	18.9	0.78	1.05	38.6
Approach		401	3.0	0.525	15.1	LOS C	2.6	18.9	0.61	0.89	42.4
All Vehicles		1238	3.0	0.525	6.2	NA	2.6	18.9	0.23	0.38	51.3

Level of Service (LOS) Method: Delay (HCM 2000).
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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: 2024PM

Job Number: CEB06258
Job Title: Tannum Sands UDA
Intersection: Tannum Sands Road/New Access Intersection
Configuration: Proposed Ultimate
Scenario: 2024 AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tannum Sands Road (south)											
1	L	203	3.0	0.112	8.3	LOS A	0.0	0.0	0.00	0.67	49.0
2	T	357	3.0	0.187	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		560	3.0	0.187	3.0	NA	0.0	0.0	0.00	0.24	55.5
North: Tannum Sands Road (north)											
8	T	308	3.0	0.161	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	198	3.0	0.247	11.5	LOS B	1.0	7.4	0.57	0.83	45.7
Approach		506	3.0	0.247	4.5	NA	1.0	7.4	0.22	0.32	53.5
West: New Access Road											
10	L	85	3.0	0.094	10.4	LOS B	0.4	2.6	0.48	0.73	46.7
12	R	87	3.0	0.290	20.4	LOS C	1.1	7.6	0.77	0.96	38.5
Approach		172	3.0	0.290	15.5	LOS C	1.1	7.6	0.63	0.85	42.1
All Vehicles		1238	3.0	0.290	5.3	NA	1.1	7.6	0.18	0.36	52.4

Level of Service (LOS) Method: Delay (HCM 2000).
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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model used.

Appendix I

Proposed Active Transport Network

LEGEND

- SITE BOUNDARY
- SUB ARTERIAL
- TRUNK COLLECTOR
- MINOR COLLECTOR
- FOOTPATHS

7.3 | PROPOSED ACTIVE TRANSPORT NETWORK

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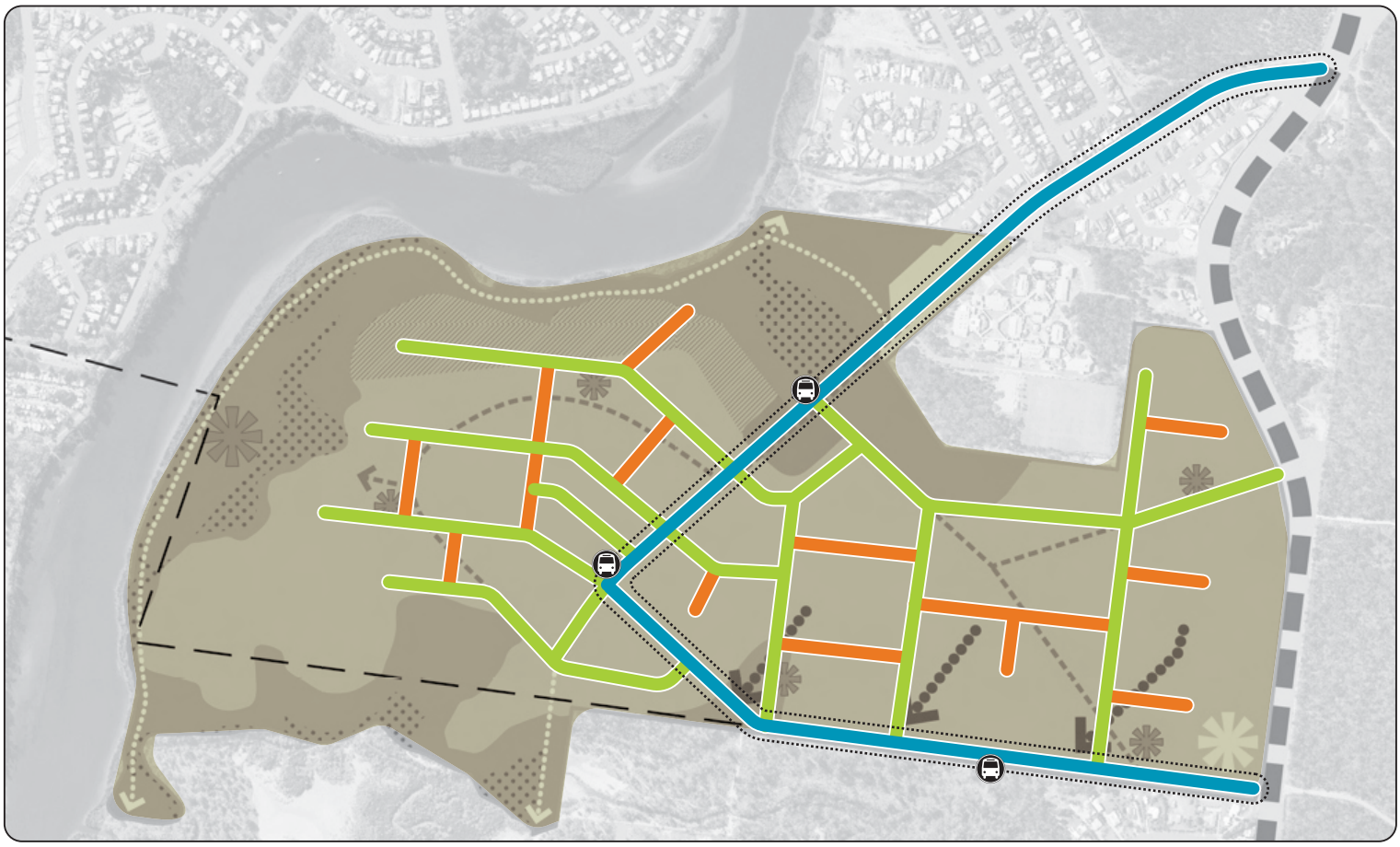
Appendix J

Proposed Public Transport Network



LEGEND

- SITE BOUNDARY
- SUB ARTERIAL
- TRUNK COLLECTOR
- MINOR COLLECTOR
- BUS ROUTE
- POTENTIAL BUS STOPS

8.3 | PROPOSED PUBLIC TRANSPORT NETWORK

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