Local Government Infrastructure Plan (LGIP)

Planning Assumptions Report

August 2017

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1. Background

1.1 Overview

As required under the Sustainable Planning Act (SPA), Gladstone Regional Council has developed a draft **Local Government Infrastructure Plan (LGIP),** the purpose of which is to:

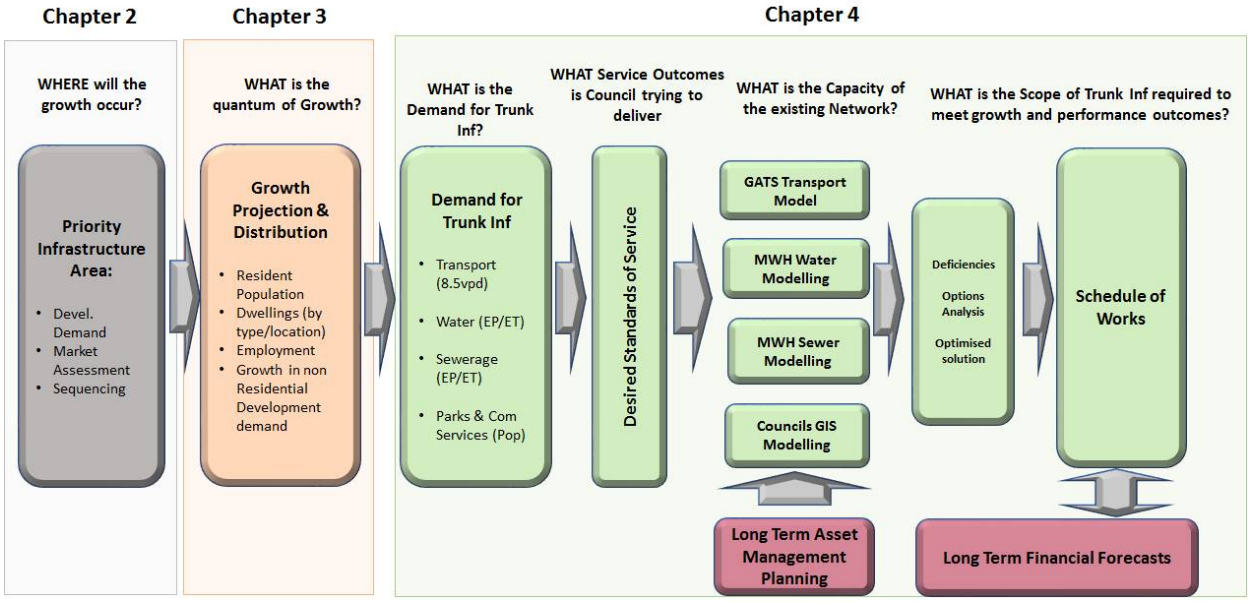
- Identify the Councils **projections of growth** for the region (both in absolute terms as well as its distribution);
- Identify the **desired standards of service** that Council intends to provide for each infrastructure type;
- Outline Councils preferred (most cost effective) pattern for development over the next 10-15 years (as defined in the **Priority Infrastructure Area (PIA)**); and
- Clearly identify the **scope and timing of trunk infrastructure** necessary to serve development within the PIA.

In developing its LGIP the Council needs to make a wide range of assumptions regarding the location, scope and timing of individual items within the trunk infrastructure network. Section 2.5.6 of the States Guideline (03/14) suggests that a Local Government may develop a report which documents the preparation of these planning assumptions.

The purpose of this brief report is to provide a succinct overview of the key planning assumptions that underpin the development of Gladstone Regional Councils Local Government Infrastructure Plan (LGIP)

Conceptually, the report will step through the processes applied in understanding the scope of the growth (quantum and timing), distribution of growth, Councils service outcomes, assessment of the existing trunk network to deliver those outcomes and the scope of augmentation required. This process is illustrated schematically in Figure 1.1

Figure 1 – Process Overview



1.2 Structure of this document

This document has been developed to succinctly outline the processes that have been applied in the development of Gladstone Regional Councils Local Government Infrastructure Plan (LGIP). This includes the following

- Chapter 2 provides a summary of the process followed in establishing the **Priority Infrastructure Area (PIA);**

- Chapter 3 outlines the process for development of population, dwelling, employment and Non-residential **growth projections**;

- Chapter 4 provides a detailed summary of the **planning for trunk infrastructure** necessary to serve the projected growth. This includes an overview of the Schedule of Works (SOW) that accompany the LGIP; and

2. Establishment of the Priority Infrastructure Area (PIA)

2.1 The Priority Infrastructure Area

The **Priority Infrastructure Area** (PIA) is that part of the **Planning Scheme** which identifies the areas within the region that the Council will support for development. The PIA is typically intended to accommodate between ten (10) and fifteen (15) years anticipated urban growth. The benefit of the PIA is to enable improved coordination of development and focus Council's capital program on supporting a development pattern which is efficient and represents least cost to the community

The PIA does not prevent development from occurring but those proposals which are inconsistent with the PIA (i.e. "out of sequence") may trigger the provisions of the Act that require an assessment of the impact which such inconsistent development may have on the cost, timing and scope of trunk infrastructure.

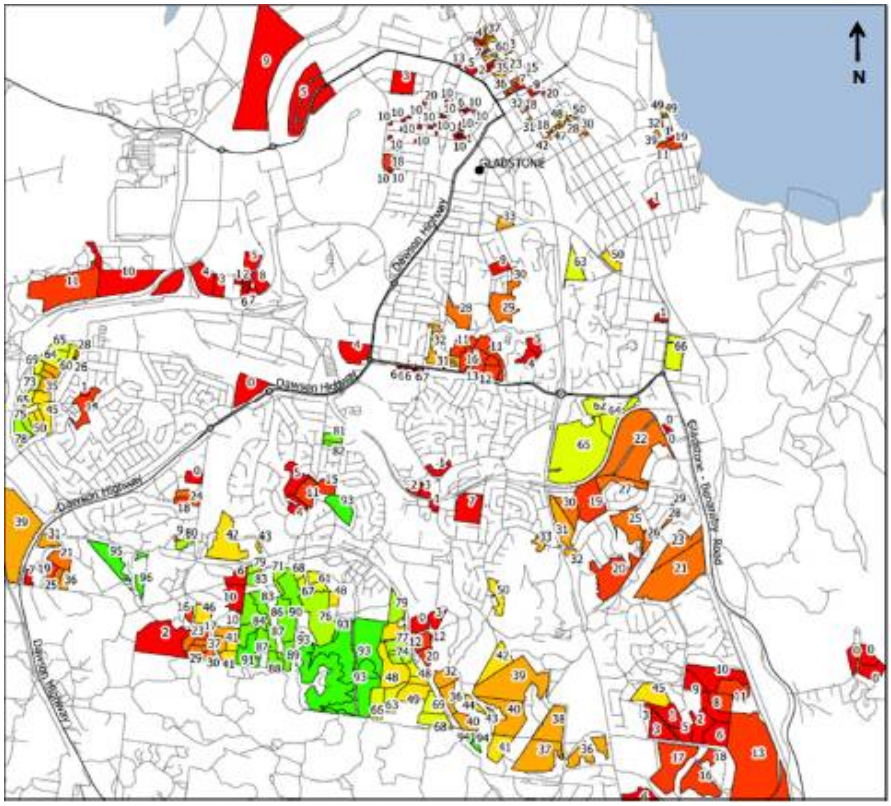
The **Priority Infrastructure Area** for Gladstone Regional Council is illustrated on Figures 2.3-2.6. This PIA has been determined as the area that can accommodate the required 10-15 years of urban growth and for which Council intends to support through the provision of trunk infrastructure.

2.2 PIA rationale

Development of the Priority Infrastructure Plan included a staged series of steps that led to the creation of the PIA that is included in the LGIP. These steps could be summarised as follows:

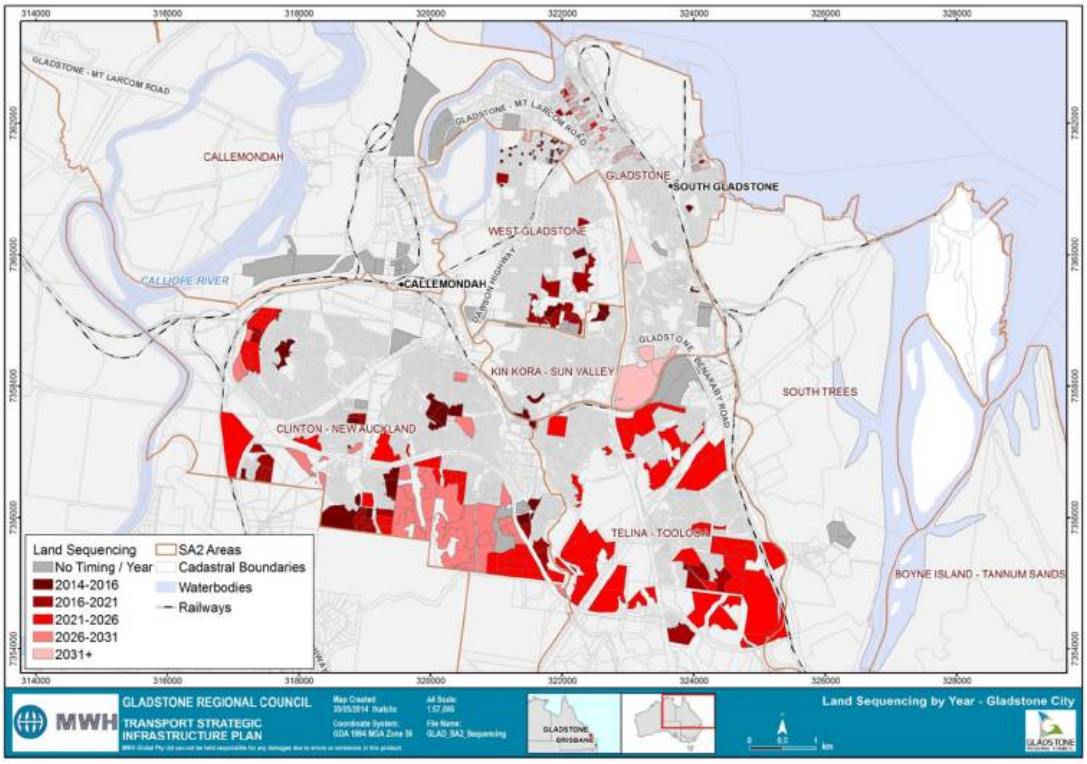
- An initial draft of the Priority Infrastructure Area had been developed as an integral part of the Council's Draft Priority Infrastructure Plans (PIPS). These PIPS were collated shortly after amalgamation and, on 16th March 2010, the Council signed off on an initial Priority Infrastructure Area. This document provided an initial starting point for discussion and development of a more updated version of the PIA;
- Following workshops held in March 2014 involving internal and external stakeholders, the Council proposed that the PIA be created by reviewing those areas which met the following criteria:
    - Areas which are currently available for urban development (as defined under the Planning Scheme);
    - Areas serviced by all (or most) of the five (5) key trunk infrastructure types; and
    - Areas that are currently known to be likely development sites.
- Applying this criterion, Council officers developed an initial assessment of each individual lot that met these criteria. This process included an internal workshop held in early April 2014 which discussed and further developed the likelihood of development proceeding across a wide range of sites. Using this approach, development proposed within each SA2 zone were categorised from Priority 1 (developments that were immediately ready to proceed) onwards in a sequential manner. Where officers were unable to assign a priority to a development, the category assigned was null. Using this process, Council was able to establish a series of maps that identified the likely sequencing of development across the entire region. Figure 2.1 provides an example of the mapping established from this process.

Figure 2.1: Likely Sequencing of individual developments - Gladstone



This initial development sequence provided valuable market intelligence on the likely timing and form of development across the region. Areas were grouped together into five (5) year cohorts from which the final PIA would be developed. An example of this land sequencing planning is provided in Figure 2.2. This information was then used to inform the likely timing of trunk infrastructure.

Figure 2.2 – Land Sequencing - Gladstone



The initial development sequencing plan was subject to independent review (as part of the LGIP assessment process) to ensure that the area contained within the PIA had the capacity to accommodate the expected urban growth over the next ten (10) to fifteen (15) years. The process informed (and was informed by) the estimation of population and employment projections within the LGIP;

The final Priority Infrastructure Area (PIA) was then developed which clearly identifies those areas that were included within the Councils preferred development areas. A copy of the PIA is provided in Figures 2.3, 2.4, 2.5 and 2.6.

Figure 2.3 – Priority Infrastructure Area – Gladstone

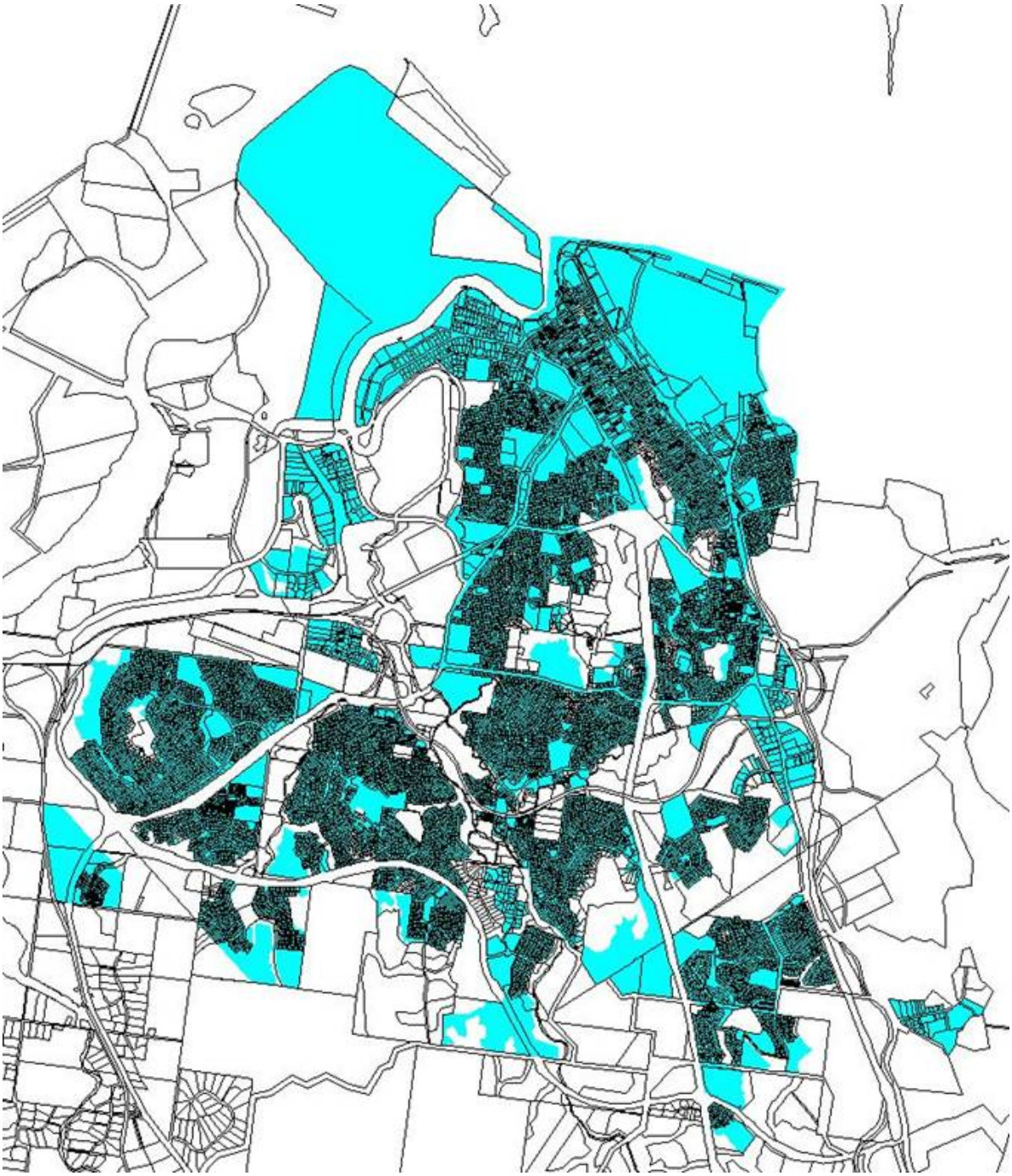


Figure 2.4 – Priority Infrastructure Area – Calliope

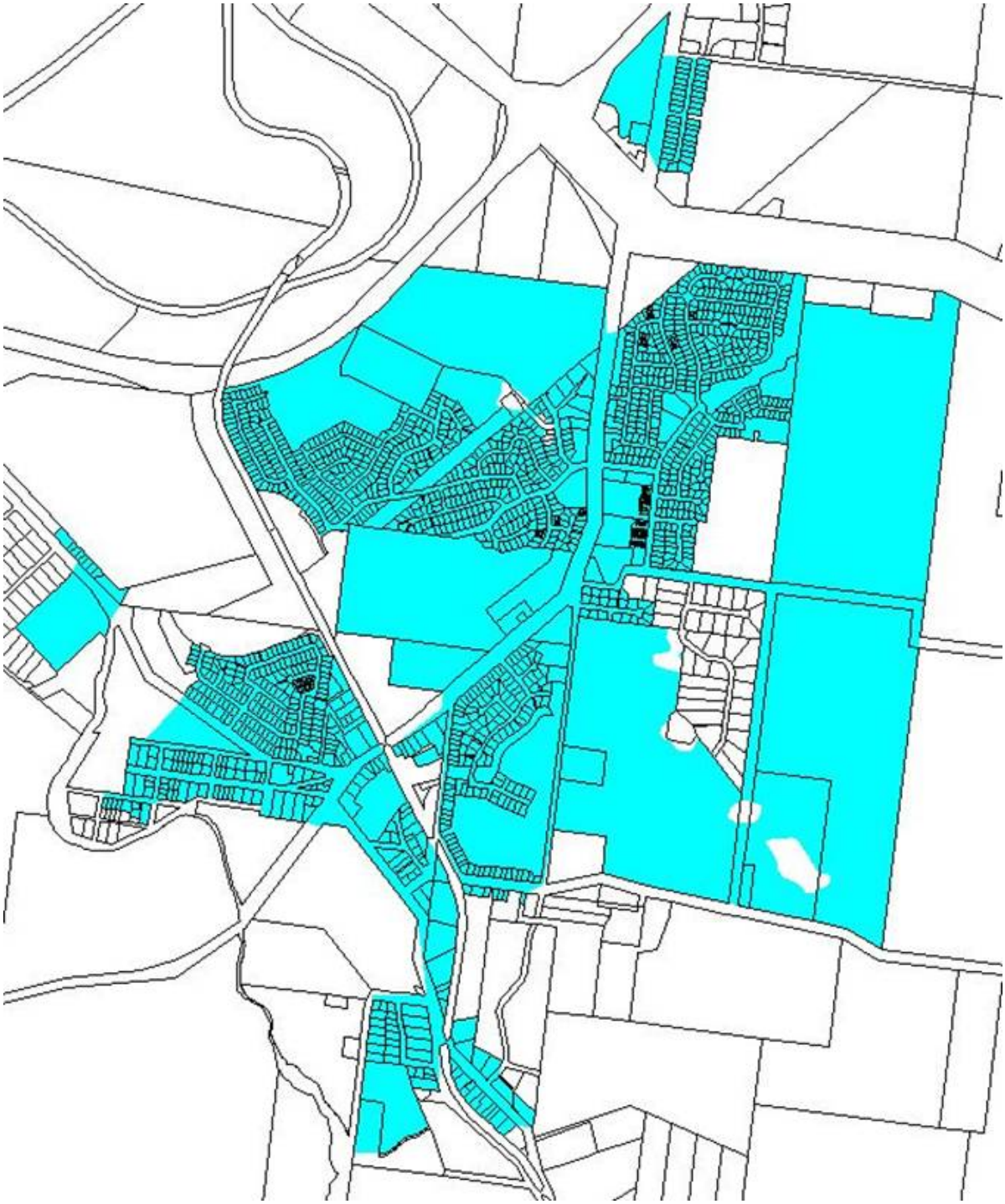
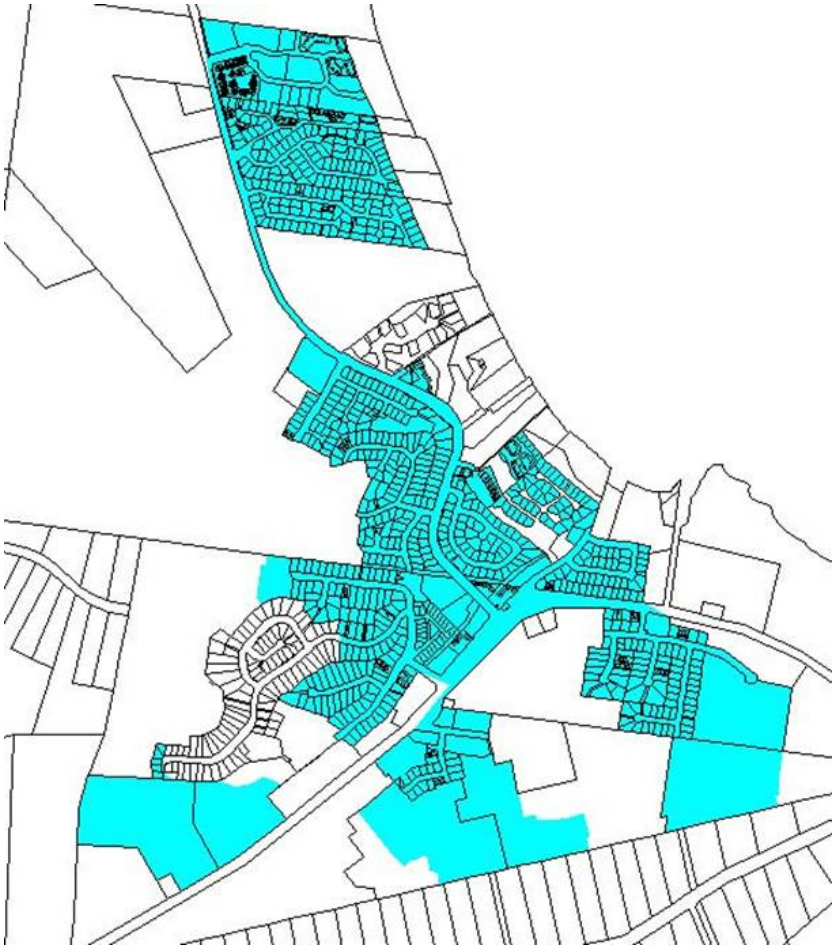


Figure 2.5 – Priority Infrastructure Area – Boyne Tannum

Figure 2.6 – Priority Infrastructure Area – Agnes Water



3. Population and Employment Projections

3.1 Overview:

The objective of this section of the report is to provide a succinct summary of how key planning assumptions have been developed and applied within the **Local Government Infrastructure Plan**. As outlined schematically in Figure 1.1, development of the growth projections (and their allocation across the region) is a key input into the infrastructure planning and subsequent development of a schedule of trunk infrastructure works (which are developed in further detail in Chapter 4).

3.2 Population projections

On 11th March 2014, the Queensland Government Statistician's Office (QGSO) provided a series of SA_2 population projections for the entire Gladstone Region. Table 3.1 provides a copy of the data provided by QGSO.

Table 3.1 - Projected population (medium series), by statistical area level 2 (SA2), SA3 and SA4, Queensland, 2011 to 2036

SA4 code (a)	SA3 code (a)	SA2 code (a)		At 30 June					
				2011 (b)	2016	2021	2026	2031	2036
308 - Fitzroy	30802 - Gladstone - Biloela	308021193	Agnes Water - Miriam Vale	5,673	6,252	6,791	7,333	7,887	8,449
		308021194	Banana	8,779	8,725	8,549	8,310	8,064	7,824
		308021195	Biloela	6,033	6,344	6,552	6,711	6,853	6,980
		308021196	Boyne Island - Tannum Sands	9,950	12,341	17,978	22,901	27,485	32,095
		308021197	Callemondah	52	45	45	45	45	45
		308021198	Clinton - New Auckland	11,363	13,950	14,580	16,659	18,910	19,886
		308021199	Gladstone	6,497	7,560	8,933	9,624	10,451	12,157
		308021200	Gladstone Hinterland	10,623	12,737	15,584	17,802	20,055	23,559
		308021201	Kin Kora - Sun Valley	4,252	4,540	5,075	6,492	7,924	8,488
		308021202	South Trees	0	0	0	0	0	0
		308021203	Telina - Toolooa	5,701	6,581	6,992	7,007	7,031	7,188
		308021204	West Gladstone	5,350	6,091	7,447	8,244	8,795	9,399
			Totals	**59,461**	**70,098**	**83,424**	**96,107**	**108,582**	**121,266**

These projections provided a detailed estimate of the entire population across the region and therefore relevant to Table 2.2 and Table SC3.2.1 of the LGIP. For those areas that were contained within the PIA, the OESR estimates of population projection were applied.

However, the LGIP requires a more detailed assessment of the spread of population including estimates of the population that resides in areas that are outside the PIA. The estimation of population outside the PIA was undertaken as follows:

- The **Gladstone urban area** is likely to be approaching full development over the next 10-15 years. As such, the full value of population projections within the Gladstone Urban Area were included within the PIA;

- For **Calliope,** earlier estimates of the population allocation had been undertaken using the states PIFU/PIP model (refer discussion below). This model provided estimated population across key areas (based on ABS projections). These estimates were modified slightly to align with the SA2 data provided by QGSO on March 2014 and the initial allocation of population within/outside the PIA was done using the same algorithm as had been applied previously. In broad terms, this implied that up to 40% of the Calliope population reside outside the PIA;

- In the case of the previous **Miriam Vale Shire,** there was limited previous data available. As part of the development of this LGIP, the allocation of population was estimated using the states PIFU/PIP model;

- In both cases (**Calliope and Miriam Vale**), the initial population allocation modelling was subject to a "sanity test" by Councils planners to ensure that the outcomes produced a result that was practical and reflected known development and development potential in these areas.

This process allowed Council to establish a robust set of population projections which aligned well with the most recent (March 2014) SA2 projections.

3.3 States PIP Calculator

The State had previously provided a functional excel based model to assist Councils undertake the estimation and allocation of population across their areas. This calculator was specifically designed to assist with the determination of population, dwellings, GFA and employment in areas where limited information was available. As outlined in the spreadsheet itself, the "**PIPRICS Calculator v11**" was based on:

- The latest demographic projections available from the Office of Economic and Statistical Research (OESR) at the time of publishing. As explained above, in the case of Gladstone Regional Council, this "core" data was updated as required to reflect the OESR SA2 projections provided in March 2014;

- The model determined dwelling numbers based on known estimates (and projections) provided by OESR. The model takes into account unoccupied dwelling numbers in the estimation of occupancy rates by assuming that the distribution of unoccupied private dwellings reflects that of occupied private dwellings in the estimation of occupancy rates;

- The model provides an estimate of non-residential development (where no additional information was available). However, it also allowed the user to redistribute the non-residential development by area in the LGA - i.e. PIA sub-areas and outside the PIA; and

- The outcomes from the States model include a pro-forma Table 4.2.1.1 and 4.2.2.1 for use in the LGIP.

3.4 Dwelling projections

The baseline (2011) estimate of dwelling structure (i.e. number of people/dwellings across a range of dwelling types) has been drawn directly from **ABS Catalogue No 2004 – Community Place of Enumeration Profile, Table P31 – Dwelling Structures**. A separate file was downloaded for each dwelling area. To complement this baseline data, we applied the OESR projections of anticipated changes in dwelling density (over time) as contained in the PIFU/PIP calculator. The linkage between the QGSO SA2 population projections, dwelling densities and dwelling estimates across the entire region is provided in Table 3.2. This information provided the basis for LGIP Tables SC3.1.1 and SC3.1.5.

3.5 Non Residential Floor space and employment

Baseline projections of employment data as well as estimates of residential employment rates within the region were sourced from Australian **Bureau of Statistics Community Profiles (Tables B21)**. The Council also adopted the labour force containment rates previously recommended by PIFU in determining the employment generated within the region. Initial

estimates of projected employment were based on the outcomes from the States PIFU/PIP calculator. These estimates were checked against other sources (as discussed below) and modified to suit.

The estimation of current and projected **Gross Floor Area (GFA)** by land use type is typically a challenging element of the LGIP projections. Prior to amalgamations, Gladstone had undertaken an estimate of Gross Floor Area across the region in 2006 which included an assessment of existing (2006) GFA by use (e.g. commercial, educational, industrial), by suburb and by property. This information was developed based on aerial photography and development applications at that time. Subsequently, further and more detailed studies were undertaken by **Foresight Partners**[1] and **SGS Economics and Planning**[2]. Both documents produced outcomes which compared favourably with the total GFA estimates developed from Council own internal projections[3].

Using the GFA data and baseline (census) estimates of employment from 2011, a refined estimate of the floor space conversion rates (i.e. GFA per employee) were calculated for each land use type. In addition, the distribution of floor space (by use) was also determined for each area deemed to be inside the PIA. These estimates were then subject to a "sanity check" by Council planners to ensure that the outcomes suggested were reasonable and reflected known development intentions. Through this process specific changes were made to the projections for Agnes Water/Miriam Vale to reflect likely long-term growth.

A copy of the outcomes from this assessment (including the floor space to employment conversation rates) are provided in Table 3.4. The information within this Table was used to populate LGIP Tables SC3.1.2 and SC3.1.6.

3.6 Ultimate Projections:

Where long range forecasts were not readily available (e.g. estimates of 2031 and "Ultimate" population and GFA projections), these estimates were generated based on the assumption that the growth profile from the period would be maintained. In the case of "ultimate" projections, estimates have been made for the likely ultimate population projections in each SA2 area assuming that land is developed to its full productive capacity under the Planning Scheme. This provided an estimated population from which projections of non-residential development (GFA) and employment were generated for the ultimate case.

[1] Foresight Partners Pty Ltd, "retail and Commercial Strategy – 2012 Update", July 2012
[2] SGS Economics and Planning "Gladstone Region Industrial Land Use Strategy", July 2012.
[3] Specifically refer Section 4.5, Tables 12 and 13 of the SGS "Gladstone Region Industrial Land Strategy"

Table 3.2 - -Existing and Projected Population and Residential Dwellings

PIA Locality	PIP Projection Category	Existing and Projected Population						Average Occupancy Rate (persons/dwelling)					Existing and Projected Dwellings					
		2011	2016	2021	2026	2031	Ult	2011	2016	2021	2026	2031	2011	2016	2021	2026	2031	Ult
Gladstone (Prev Sth Gladstone, Barney Pt and CBD)	Single Dwelling	5,753	6,694	7,909	8,521	9,254	14,128	2.54	2.52	2.49	2.47	2.47	2,266	2,660	3,171	3,448	3,744	5,716
	Multiple Dwelling	603	702	829	893	970	1,481	1.50	1.48	1.47	1.46	1.46	403	473	564	613	666	1,017
	Other	141	165	194	209	227	347	1.66	1.65	1.63	1.62	1.62	85	100	119	129	140	214
	Total	***6,497***	***7,560***	***8,933***	***9,624***	***10,451***	**15,956**	***2.36***	***2.34***	***2.32***	***2.30***	***2.30***	***2,754***	***3,233***	***3,855***	***4,190***	**4,550**	**6,947**
West Gladstone	Single Dwelling	4,737	5,393	6,594	7,299	7,787	7,985	2.54	2.52	2.49	2.47	2.47	1,866	2,143	2,644	2,953	3,151	3,231
	Multiple Dwelling	497	565	691	765	816	837	1.50	1.48	1.47	1.46	1.46	332	381	470	525	560	574
	Other	116	133	162	179	191	196	1.66	1.65	1.63	1.62	1.62	70	80	99	111	118	121
	Total	***5,350***	***6,091***	***7,447***	***8,244***	***8,795***	***9,019***	***2.36***	***2.34***	***2.32***	***2.30***	***2.30***	***2,268***	***2,605***	***3,213***	***3,589***	**3,829**	**3,927**
Kin Kora - Sun Valley	Single Dwelling	3,765	4,020	4,494	5,748	7,016	7,016	2.54	2.52	2.49	2.47	2.47	1,483	1,598	1,802	2,326	2,839	2,839
	Multiple Dwelling	395	421	471	602	735	735	1.50	1.48	1.47	1.46	1.46	264	284	321	414	505	505
	Other	93	99	110	141	172	172	1.66	1.65	1.63	1.62	1.62	56	60	68	87	106	106
	Total	***4,252***	***4,540***	***5,075***	***6,492***	***7,924***	***7,924***	***2.36***	***2.34***	***2.32***	***2.30***	***2.30***	***1,802***	***1,942***	***2,190***	***2,826***	**3,450**	**3,450**
Telina - Sth Trees-Glen Eden - Tooloola - O'Connell	Single Dwelling	5,048	5,827	6,191	6,204	6,225	9,124	2.54	2.52	2.49	2.47	2.47	1,988	2,316	2,483	2,510	2,519	3,692
	Multiple Dwelling	529	611	649	650	653	957	1.50	1.48	1.47	1.46	1.46	354	412	442	447	448	657
	Other	124	143	152	153	153	224	1.66	1.65	1.63	1.62	1.62	75	87	93	94	94	138
	Total	***5,701***	***6,581***	***6,992***	***7,007***	***7,031***	***10,305***	***2.36***	***2.34***	***2.32***	***2.30***	***2.30***	***2,416***	***2,815***	***3,017***	***3,051***	**3,061**	**4,486**
Calemondah, Clinton, New Auckland	Single Dwelling	10,107	12,392	12,949	14,790	16,783	21,241	2.54	2.52	2.49	2.47	2.47	3,981	4,925	5,192	5,984	6,790	8,594
	Multiple Dwelling	1,059	1,299	1,357	1,550	1,759	2,226	1.50	1.48	1.47	1.46	1.46	708	876	924	1,064	1,208	1,529
	Other	248	305	318	364	413	523	1.66	1.65	1.63	1.62	1.62	149	185	195	224	255	323
	Total	***11,415***	***13,995***	***14,625***	***16,704***	***18,955***	***23,990***	***2.36***	***2.34***	***2.32***	***2.30***	***2.30***	***4,838***	***5,985***	***6,311***	***7,273***	**8,253**	**10,445**
Boyne Island, Tannum Sands and Benaraby	Single Dwelling	5,383	6,677	9,727	12,390	14,870	14,870	2.73	2.68	2.64	2.60	2.60	1,972	2,487	3,684	4,773	5,728	5,728
	Multiple Dwelling	179	222	324	413	495	495	1.74	1.71	1.68	1.65	1.65	103	130	193	250	300	300
	Other	407	505	736	938	1,125	1,125	1.73	1.70	1.67	1.64	1.64	236	298	441	571	686	686
	Total	***5,970***	***7,405***	***10,787***	***13,741***	***16,491***	***16,491***	***2.58***	***2.54***	***2.50***	***2.46***	***2.46***	***2,311***	***2,915***	***4,318***	***5,594***	**6,713**	**6,714**

PIA Locality	PIP Projection Category	Existing and Projected Population						Average Occupancy Rate (persons/dwelling)					Existing and Projected Dwellings					
		2011	2016	2021	2026	2031	Ult	2011	2016	2021	2026	2031	2011	2016	2021	2026	2031	Ult
Gladstone Hinterland (aka Calliope)	Single Dwelling	5,747	6,891	8,431	9,632	10,850	10,850	2.73	2.68	2.64	2.60	2.60	2,105	2,567	3,194	3,710	4,180	4,180
	Multiple Dwelling	191	230	281	321	361	361	1.74	1.71	1.68	1.65	1.65	110	134	167	194	219	219
	Other	435	521	638	729	821	821	1.73	1.70	1.67	1.64	1.64	252	307	382	444	500	500
	Total	***6,374***	***7,642***	***9,350***	***10,681***	***12,033***	***12,033***	***2.58***	***2.54***	***2.50***	***2.46***	***2.46***	***2,467***	***3,008***	***3,743***	***4,348***	**4,899**	**4,899**
Agnes Water, Miriam Vale	Single Dwelling	2,810	3,097	3,363	3,632	3,906	9,560	1.89	1.80	1.71	1.63	1.63	1,489	1,725	1,969	2,234	2,402	5,879
	Multiple Dwelling	130	143	156	168	181	443	1.59	1.51	1.44	1.37	1.37	82	95	108	123	132	323
	Other	464	511	555	600	645	1,579	1.56	1.49	1.42	1.35	1.35	297	344	392	445	479	1,172
	Total	***3,404***	***3,751***	***4,074***	***4,400***	***4,732***	***11,582***	***1.82***	***1.73***	***1.65***	***1.57***	***1.57***	***1,868***	***2,163***	***2,469***	***2,802***	**3,013**	**7,375**
Gladstone Regional Area	Single Dwelling	52,644	62,101	74,006	85,320	96,444	119,300						20,860	24,939	30,036	35,082	39,559	48,934
	Multiple Dwelling	3,917	4,590	5,265	5,964	6,662	8,394						2,552	3,025	3,500	4,007	4,471	5,634
	Other	2,900	3,407	4,153	4,823	5,476	7,131						1,743	2,093	2,600	3,080	3,489	4,543
	Total	***59,461***	***70,098***	***83,424***	***96,107***	***108,582***	***134,825***						***25,155***	***30,057***	***36,136***	***42,169***	**47,519**	**59,111**
Outside PIA	Single Dwelling	9,294	11,110	14,348	17,103	19,751	24,525	2.73	2.68	2.64	2.60	2.60	3,711	4,519	5,898	7,144	8,207	10,191
	Multiple Dwelling	334	397	507	601	692	859	1.74	1.71	1.68	1.65	1.65	197	239	312	378	433	538
	Other	871	1,025	1,286	1,511	1,727	2,144	1.73	1.70	1.67	1.64	1.64	523	633	811	974	1,110	1,378
	Total	***10,498***	***12,532***	***16,141***	***19,215***	***22,170***	***27,529***	***2.37***	***2.32***	***2.30***	***2.26***	***2.27***	***4,431***	***5,391***	***7,020***	***8,496***	**9,750**	**12,107**

Table 3.4 – Calculation of existing and projected employees and non-residential floor space

Area	Non-Residential Development Category	Existing and Projected Employment (employees)						Average Floor Space Conversion Rate (m2 GFA /employee)	Existing and Projected Floor Space (m^2 GFA)					
		2011	2016	2021	2026	2031	Ult		2011	2016	2021	2026	2031	Ult
Gladstone (Prev Sth Gladstone, Barney Pt and CBD)	Commercial	1,709	1,784	1,839	1,982	2,152	3,286	300	512,801	535,200	551,776	594,459	645,568	985,617
	Retail	0	0	0	0	0	0	25	0	0	0	0	0	-
	Industrial	150	157	161	174	189	289	108	16,135	16,839	17,361	18,704	20,312	31,011
	Community	240	250	258	278	302	461	200	47,935	50,029	51,578	55,568	60,345	92,131
	Other[#]	0	0	0	0	0	0	0	0	0	0	0	0	-
	Total	***2,099***	***2,191***	***2,259***	***2,433***	***2,642***	**4,035**	NA	***576,870***	***602,068***	***620,715***	***668,730***	***726,225***	***1,108,760***
West Gladstone	Commercial	401	418	431	477	509	522	300	120,175	125,424	129,309	143,147	152,719	156,609
	Retail	0	0	0	0	0	0	25	0	0	0	0	0	-
	Industrial	0	0	0	0	0	0	108	0	0	0	0	0	-
	Community	179	187	192	213	227	233	200	35,759	37,321	38,477	42,594	45,443	46,600
	Other[#]	0	0	0	0	0	0	0	0	0	0	0	0	-
	Total	***579***	***605***	***623***	***690***	***736***	***755***	NA	***155,934***	***162,745***	***167,785***	***185,741***	***198,162***	***203,209***
Kin Kora - Sun Valley	Commercial	33	34	35	45	55	55	300	9,877	10,309	10,628	13,595	16,594	16,594
	Retail	0	0	0	0	0	0	25	0	0	0	0	0	-
	Industrial	0	0	0	0	0	0	108	0	0	0	0	0	-
	Community	54	56	58	74	90	90	200	10,766	11,236	11,584	14,818	18,087	18,087
	Other[#]	0	0	0	0	0	0	0	0	0	0	0	0	-
	Total	***87***	***91***	***93***	***119***	***146***	***145***	NA	***20,643***	***21,545***	***22,212***	***28,413***	***34,682***	***34,682***
Telina - Sth Trees- Glen Eden - Tooloola - O'Connell	Commercial	156	163	168	169	169	248	300	46,918	48,967	50,484	50,592	50,762	74,399
	Retail	0	0	0	0	0	0	25	0	0	0	0	0	-
	Industrial	1,091	1,139	1,174	1,177	1,181	1,731	108	117,424	122,553	126,348	126,619	127,045	186,204
	Community	26	27	28	28	28	41	200	5,255	5,484	5,654	5,666	5,685	8,332
	Other[#]	0	0	0	0	0	0	0	0	0	0	0	0	-

Area	Non-Residential Development Category	Existing and Projected Employment (employees)						Average Floor Space Conversion Rate (m2 GFA /employee)	Existing and Projected Floor Space (m^2 GFA)					
		2011	2016	2021	2026	2031	Ult		2011	2016	2021	2026	2031	Ult
	Total	***1,274***	***1,330***	***1,371***	***1,374***	***1,379***	***2,020***	NA	***169,596***	***177,004***	***182,486***	***182,878***	***183,492***	***268,935***
Calemondah, Clinton, New Auckland	Commercial	412	430	443	506	574	726	300	123,467	128,860	132,851	151,738	172,185	217,922
	Retail	0	0	0	0	0	0	25	0	0	0	0	0	-
	Industrial	1,003	1,046	1,079	1,232	1,398	1,769	108	107,862	112,574	116,060	132,560	150,423	190,380
	Community	117	122	126	144	164	208	200	23,455	24,479	25,237	28,825	32,709	41,397
	Other[#]	0	0	0	0	0	0	0	0	0	0	0	0	-
	Total	***1,531***	***1,598***	***1,648***	***1,882***	***2,136***	***2,703***	NA	***254,784***	***265,913***	***274,149***	***313,122***	***355,317***	***449,700***
Boyne Island, Tannum Sands and Benaraby	Commercial	1,168	1,446	1,764	2,247	2,697	2,697	25	29,209	36,151	44,102	56,181	67,424	67,424
	Retail	0	0	0	0	0	0	130	0	0	0	0	0	-
	Industrial	2,886	3,572	4,358	5,551	6,662	6,662	80	230,886	285,756	348,612	444,085	532,963	532,963
	Community	445	551	672	857	1,028	1,028	0	0	0	0	0	0	-
	Other[#]	0	0	0	0	0	0	0	0	0	0	0	0	-
	Total	***4,500***	***5,569***	***6,794***	***8,655***	***10,387***	***10,387***	NA	***260,095***	***321,906***	***392,714***	***500,265***	***600,387***	***600,387***
Gladstone Hinterland (aka Calliope)	Commercial	373	462	564	644	726	726	25	9,337	11,556	14,097	16,104	18,142	18,142
	Retail	0	0	0	0	0	0	130	0	0	0	0	0	-
	Industrial	12	14	18	20	23	23	80	927	1,148	1,400	1,599	1,802	1,802
	Community	84	104	127	145	164	164	0	0	0	0	0	0	-
	Other[#]	0	0	0	0	0	0	0	0	0	0	0	0	-
	Total	***469***	***581***	***709***	***810***	***912***	***913***	NA	***10,264***	***12,703***	***15,497***	***17,704***	***19,944***	***19,944***
Agnes Water, Miriam Vale	Commercial	757	899	1,038	1,177	1,177	2,881	25	18,931	22,478	25,941	29,414	31,633	77,426
	Retail	285	338	390	442	442	1,082	110	31,306	37,171	42,896	48,640	52,310	128,034
	Industrial	253	300	347	393	393	962	80	20,238	24,030	27,731	31,444	33,817	82,769
	Community	213	253	292	331	331	331	0	0	0	0	0	0	0
	Other[#]	0	0	0	0	0	0	0	0	0	0	0	0	0-
	Total	***1,508***	***1,790***	***2,066***	***2,343***	***2,343***	***5,256***	NA	***70,475***	***83,679***	***96,568***	***109,497***	***117,760***	***288,229***

Area	Non-Residential Development Category	Existing and Projected Employment (employees)						Average Floor Space Conversion Rate (m2 GFA /employee)	Existing and Projected Floor Space (m^2 GFA)					
		2011	2016	2021	2026	2031	Ult		2011	2016	2021	2026	2031	Ult
Outside PIA	Commercial	33	34	35	35	25	31		9,877	10,309	10,628	10,628	625	776
	Retail	0	0	0	0	110	137		0	0	0	0	12,100	15,025
	Industrial	530	554	571	571	571	709		57,068	59,561	61,406	61,406	6,400	7,947
	Community	24	25	26	26	26	26		4,742	4,949	5,103	5,103	5,103	-
	Other[#]	3,298	3,779	4,283	4,422	4422	4,422		0	0	0	0	0	-
	Total	***3,885***	***4,392***	***4,914***	***5,054***	***5,154***	***5,325***	0	***71,688***	***74,819***	***77,137***	***77,137***	***19,125***	***23,748***
Gladstone Regional Area	Commercial	5,043	5,671	6,318	7,282	8,084	11,172	0	880,592	929,254	969,816	1,065,857	1,155,652	1,614,909
	Retail	285	338	390	442	552	1,218	0	31,306	37,171	42,896	48,640	64,410	143,059
	Industrial	5,925	6,782	7,707	9,118	10,417	12,145	0	550,540	622,460	698,918	816,417	872,762	1,033,076
	Community	1,382	1,576	1,780	2,096	2,360	2,581	0	127,911	133,499	137,633	152,574	167,269	206,548
	Other[#]	3,298	3,779	4,283	4,422	4,422	4,422	0	0	0	0	0	0	-
	Total	***15,933***	***18,147***	***20,478***	***23,360***	***25,835***	***31,538***	*0*	***1,590,350***	***1,722,383***	***1,849,263***	***2,083,487***	***2,255,093***	***2,997,592***

4. Trunk Infrastructure

4.1 General

Having established the projected growth in population, employment and non-residential GFA, the next key step in the process is to determine the scope, timing and cost of trunk infrastructure necessary to accommodate the expected growth. In doing so, it is essential that Council clearly defined:

- How the projected growth would manifest in terms of **demand for trunk infrastructure;**
- The **standard of service** required of the trunk infrastructure (i.e. what are the outcomes implied or embedded in Councils planning and corporate strategies that the trunk infrastructure needs to deliver);
- The extent to which the **existing trunk infrastructure network** can accommodate the anticipated growth and deliver the nominated service outcomes;
- The scope of **additional trunk infrastructure** necessary to augment the existing networks to accommodate the development sequence outline din the PIA; and
- The **cost and approximate timing** of the proposed works.

The purpose of this section is to provide a summary of the key assumptions underpinning the development of the **schedule of trunk infrastructure works** necessary to accommodate projected growth. For simplicity, the link between infrastructure demand, service standards, technical assessment of capacity and development of a schedule of works is outlined separately for each trunk infrastructure network.

4.2 Transport Infrastructure

4.2.1 Planned Infrastructure Demand

The key source of information regarding the scope, cost and timing of trunk transportation infrastructure is summarised in the "**Gladstone Regional Councils Roads/Transport Strategic Infrastructure Plan"** developed for Council by Mongomery Watson Harza (MWH) in June 2014. This comprehensive report provides the basis for much of the LGIP and Schedule of Works Transport elements.

The scope of growth/demand applied in MWH's assessment was based on the LGIP projections of dwelling growth (refer Table 2.1 of the MWH report). In general, the demand generation rate contained within LGIP table SC3.1.9 is based on approximately 8.5 trips per dwelling. LGIP Table SC3.1.4 then assumes a development density (per ha) of approximately 10-12 lots/ha for village and residential landuses. This latter estimate is broadly consistent with the **LGIP Table SC3.1.3 -Planned Density,** Township, Dwelling House.

However, these measures of demand are largely generic in nature (i.e. vehicles per day). The MWH assessment applies **peak hour demand** as the primary determinant of transport network capabilities. In doing so the assessment uses dwellings and dwelling growth (as per LGIP Tables SC3.1.1 and SC3.1.5) as the primary determinant of transport generation while employment figures were also used to provide an indication of trip destination.

In assessing demand for transport infrastructure, the MWHs study relied on the outcomes of the department of Transport and Main Roads (TMR's) **Gladstone Area Transport Strategy (GATS)** report (2013) which was "…*considered more accurate and suitable for this exercise than identifying the OESR employment projections for each SA2 zone as described in…..* (the LGIP population and dwelling projections"".

Having established the baseline for determining trunk infrastructure demand, the next step in the process was to assess the likely location of growth (and corresponding demand for transport services) across the region. As discussed separately in the section on the Priority Infrastructure Area, an internal workshop was conducted in early April 2014 to determine the most likely (cost effective) sequencing of development across the region. While the outcome from this assessment was used to develop the PIA, it also informed the transport planning assessment by more clearly defining likely areas which may attract high levels of traffic movements both now and in the future.

4.2.2 Desired Standard of Service

Total demand is only part of the equation relevant to the determination of scope of trunk infrastructure. The size, scope and performance of trunk infrastructure networks depends on the service standards that such infrastructure is intended to provide. A service standard that is set too low will not deliver the outcomes that Council requires. A service standard that is too high can act as a potential constraint for new development.

The desired standard of service provided in Councils LGIP provides a basic series of requirements and reflects commonly used design parameters. The main parameters relevant to determining the efficiency of the local road network (both now and into the future) is the measure of volume to capacity (set at 0.90 for the region) and maximum degree of saturation (limited to less than 80-90%). MWHs assessment of the network link and intersection capacities produced a series of performance parameters that are broadly consistent with these measures.

4.2.3 Schedule of Works

Scope:

After applying the parameters above, the analysis undertaken by MWH suggested a range of transport planning initiatives that needed to be considered in the development of the regional network to ensure that traffic flows remain efficient and effective as Gladstone region continues to expand.

Initiatives proposed in the Councils current capital works plan and previous PIPs were combined into a single list. Each proposed project from this list was initially assessed to determine if it was growth related. Those projects that were identified as such were retained for consideration for inclusion in the modelling while those that were intended as a means to maintain existing standards and capabilities were removed from the list.

Those projects that were retained were then subject of an extensive workshop with Council officers (held on 15th April 2015). The purpose of this workshop was to refine the list and test these options as a solution to projected transport problem prior to a second round of reviews with Council officers at which a final list of planned works was accepted. The overall intent of this review process was to ensure that the scope of projects broadly addressed the transport issues associated with growth in the region as well as ensure that the LGIPs Schedule of Works did not contain items that were either unnecessary or not growth-related.

The scope scale of **existing trunk infrastructure** assets which are contained within the Schedule of Works have been drawn from earlier work (2011) in which the trunk assets were identified by GIS and translated into a charges model. The scope of existing trunk transportation assets contained in this list was subject to review prior to finalisation of the Schedule of Works

Costing and Timing:

The assessment of the establishment cost for proposed trunk transport assets was based on Unit Rates provided in the 2010 valuation report provided by **Harrison Grierson**[4]. Section 4.3 of the Harrison Grierson report provided rates for each type of urban and arterial road, along with additional costs for intersections, and costs for bridges. These costs were then indexed to March 2014 using the **ABS Road and Bridge Construction Index for Queensland (Index 3101).**

For most transport assets, the applied unit rates allow for owner's costs (e.g. design, planning and supervision) in the order of 15% of the capital value. However, for elements that have a high level of design relative to capital costs (e.g. bridges) a higher provision (of 15-20%) was applied in the Harrison Grierson assessment. This level of owner's costs is consistent with the recommendation contained within the **States Guideline 03/14 (Appendix C)** which suggest that the suitable estimates of project owners cost for roadworks may fall in a range from 13%-23%.

The rates specifically exclude **contingency** and land purchase. The States Guidelines (03/14: Appendix C) suggest that a contingency of between 3-10% would be appropriate for projects at the "delivery" phase with the contingency rate increasing to 10-20% for those at development phase and 15-25% to those in the scoping stage. Such contingency has been applied using the default rates provided in the States Schedule of Works (SOW) model

As part of the development of its Transport Strategy for Council, MWH also undertook a broad assessment of the unit rates provided by Harrison Grierson and concluded in their report that "*The rates were considered appropriate across the Gladstone Region*".

In undertaking the estimate of cost, MWH assigned an assumed road type, (e.g. urban arterial) to each item. This approach was necessary as Council designated road type did not always reflect its function, e.g. many arterial roads serving an urban function in Gladstone have a rural arterial cross-section. This included major roads such as Glenlyon Road, Blain Drive, and Kirkwood Road.

MWH adopted a template approach in assessing cost with no consideration given to addressing specific site complexities not covered by the unit costs, e.g. topography, purchase of land, relocation of utilities. MWH did not undertake site visits to scope the details of the initiative and hence determine specific issues that may affect costs. Traditionally (And as identified in the States Guidelines), such uncertainties are addressed through the application of contingencies. The approach taken to date suggest that the applied unit rates (while consistent across the region and across initiatives) may not reflect the full cost to be incurred by Council in delivering these projects.

[4] Harrison Grierson 2010, Gladstone Regional Council Infrastructure Unit Rates Study, Final Report, November 2010

The Schedule of Works Model includes provision for the cost of each initiative to be allocated across those catchment(s) that benefit from the infrastructure. This approach can assist Council in better understanding the cost structure of its infrastructure network and the scope of cost recovery relevant to individual development. The Schedule of Works model also includes provision for discounting of costs to reflect external use of the network. From previous involvement with the State, the Council has applied a multiplier of 0.85 on key major roads to reflect the fact that up to 15% of traffic on these roads may be allocated to regional users. This adjustment means that less of the costs of the road network is allocated to local users. Any shortfall that may result is ultimately funded by the ratepayers within the region

The timing of works was broadly linked to network performance triggers based on the coarse peak hour network assessment undertaken by MWH. However, given uncertainties arising from the likely timing of development, potential heavy vehicle use and limited traffic data means that the dates provided in the SOW should be interpreted broadly (i.e. likely to fall in a 3-5-year window) rather than being an absolute date.

4.3 Trunk Water Supply

4.3.1 Planned Infrastructure Demand

The key source of information regarding the scope, cost and timing of trunk water supply infrastructure is summarised in the **Water Supply Strategic Infrastructure Plans** developed by Mongomery Watson Harza (MWH) for the Gladstone and Agnes Water Supply Schemes (2014). These reports provided the basis for much of the LGIP and Schedule of Works elements for Water Supply trunk infrastructure.

As part of its Strategic Planning, MWH developed a demand model which aligns with the population projections provided by the Office of Economics and Statistical Research (OESR) and reflected in LGIP Table SC3.1.1. The generic demand generation rates provided in **LGIP Table SC3.1.4** assume EP/dwelling densities of between 2.2 and 2.6 which is broadly consistent with the density assumptions reflected in Table 3.2 above. The latter figures are considered more accurate as they reflect current (and projected) trends of development densities in each key area within the Gladstone region.

The base H2OMAP Water **hydraulic model** used by MWH in its Strategic Planning was provided by Council and reflected current assumptions regarding demand (residential and non-residential) and controls assigned to active assets, sizing and attributes of existing assets, setup of existing zone boundaries and other closed network valves.

4.3.2 Desired Standard of Service

The key operational and demand assumptions used in the assessment of the water supply network are reflected in the Desired Standard of Service contained within section 4.2.4 of the LGIP. In particular, the assumption of Average Day (AD) water usage (estimated at 1,450 L/ET for Gladstone, Calliope and Tannum Sands/Boyne Island and 1,170 L/ET for Agnes Water) was adopted in the assessment of the network.

Peaking factors used in the analysis were based on Councils information and are broadly consistent with the State's Water Supply Planning Guidelines[5]. These are summarised in Table 4.1.

Table 4.1 - Water Demand Peaking Factors

Demand Type	MDMM/AD	MD/AD		PH/AD	
	Gladstone and Agnes	Gladstone	Agnes	Gladstone	Agnes
Residential	1.5	2	2	4.2	4.3
Commercial	1.0	1.3	1.3	2.5	2.6
Industrial	1.0	1.2	1.2	1.6	1.6
Park	1.0	1.3	1.3	2.5	2.0
School	1.0	1.3	1.2	2.5	2.4

The assessment of firefighting capacity reflects the standards provided in the LGIP (and standard measures used by the industry[6]) as follows:

- 15 L/s for residential properties three (3) storeys or less; and
- 30 L/s for all commercial properties (including residential accommodation facilities with commercial kitchens) and residential properties of four (4) or more storeys.

In addition to the demand assumptions, the MWH strategy included a broad range of performance based standards relevant to water supply across the region as summarised in Table 4.2. These parameters are broadly consistent with other regional water supply businesses

Table 4.2 - Performance Based Water Supply Standards

Parameter	Guideline Standard	Notes
Network Performance		
Minimum Operational Pressure	25 m in the water main	Under operational Peak Hour demands
Minimum Residual Pressure (Fire Flow)	12 m at the fire node and 6 m elsewhere in the system.	Under firefighting demands with Peak Hour background demand
Maximum head loss per km	5 m/km	Under operational Peak Hour demands (Applied for sizing of new infrastructure. This criteria has not been adopted within this study for triggering the upgrade of existing infrastructure except in instances were high head losses are identified to result in low pressure or create operational issues such as high head gain requirements from pump stations).
Maximum Velocity	2.5 m/s	Under operational Peak Hour demands
Water Pump Stations		
Servicing Ground Level Reservoirs	Supply of MDMM Demand over 20 hours	
Direct Booster Pump Stations	Peak Hour demand + Fire flow capacity	
Future Kirkwood Road High Level Pump Station	Supply of MDMM Demand over 10 hours	Sized to allow overnight pumping (informed by GRC).

[5] Department of Environment and Resource Management, "Planning Guidelines for Water Supply and Sewerage", April 2010; Section 5.2.1, Table 5.4 - Indicative Ranges of Overall Peaking Factors

[6] Department of Environment and Resource Management, "Planning Guidelines for Water Supply and Sewerage", April 2010; Section 5.7

Parameter	Guideline Standard	Notes
Storage Reservoirs		
Reservoir Storage	3 Minimum Days (0.6xAD) + Firefighting Storage	
Additional Allowance for Pumped Reservoir with Gravity Reservoir Downstream	Difference in inflow and outflow rates = 4 hours @ MDMM Demands	Adopted 4 hours assumes pumping 20 hour/day and gravity feed 24 hour/day for MDMM
Special Case: Kirkwood High Level Reservoir	Max Day + Firefighting storage + 10 hours @ MDMM Demands (pumping allowance)	Designed to allow overnight pumping
Firefighting Storage – Residential only service area	2 hours @ 15 L/s	108 kL
Firefighting Storage – mixed use service area	4 hours @ 30 L/s	432 kL

Operational parameters adopted for the modelling reflected the future water supply zoning strategy as outlined in Councils document "Gladstone Water Zoning – 3 March 2014". Where future proposed solutions differed from this strategy, these were discussed and agreed with GRC stakeholders.

4.3.3 Schedule of Works

Scope:

The analysis undertaken by MWH suggested a limited range of potential deficiencies in most water networks as the region develops. The Agnes Water study identified a broader range of operational and asset issues. The overall network strategies prescribed in these studies are intended to resolve current and existing deficiencies and facilitate the anticipated growth within the region. The scope of works necessary to give effect to the proposed strategy was used as the basis of the Schedule of Works.

The scope and scale of existing assets contained within the Schedule of Works is based on earlier work (2011) in which the trunk assets were identified by GIS and translated into a charges model. These were subject to review prior to finalisation of the Schedule of Works

Costing and Timing:

As per the transport trunk infrastructure discussed above, the establishment cost of trunk water supply assets was assessed based on Unit Rates provided in the 2010 valuation report provided by **Harrison Grierson**[7]. Section 4.1 of this report provided unit rates for a broad range of water supply trunk assets. These unit costs were indexed to March 2014 using the **ABS Road and Bridge Construction Index for Queensland (Index 3101)**

Unit rates were not adjusted for geological factors (e.g. soil type). Where water main construction within greenfield areas was assumed, no allowance for road and pavement reinstatement has been allowed. An additional rate for road and pavement construction has been allowed for water mains considered within developed/urban areas. Cost Estimates for pump stations were developed using per KW rates provided in the Harrison Grierson report. A pump efficiency of 70% was assumed in calculating the pump station power requirement.

[7] Harrison Grierson 2010, Gladstone Regional Council Infrastructure Unit Rates Study, Final Report, November 2010

The rates applied included owner's costs (of 15% of the capital value) to allow for of design, planning and supervision allowance. This rate was applied regardless of the complexity of the project (e.g. a water mains typically require less investment of owner's resources than, say, a water pump station or reservoir). This level of owner's costs is consistent with the recommendation contained within the **States Guideline 03/14 (Appendix c)** which suggests that the project owners cost for Trunk Water assets may fall in a range of between 13% and 22%

The rates specifically exclude **contingency**. The States Guidelines (03/14: Appendix C) suggest that a contingency of between 3-10% would be appropriate for projects at the "delivery" phase with the contingency rate increasing to 10-20% for those at development phase and 15-25% to those in the scoping stage. A contingency has therefore been applied using the default rates provided in the States Schedule of Works (SOW) model.

4.4 Trunk Sewerage Network

4.4.1 Planned Infrastructure Demand

The key source of information regarding the scope, cost and timing of trunk water supply infrastructure is summarised in the **Sewerage Strategic Infrastructure Plans** developed by Montgomery Watson Harza (MWH) for Gladstone and Agnes Water (2014). The primary objective of these Sewer Strategic Infrastructure Plans was to identify the trunk sewer infrastructure necessary to service the existing and future catchment demands in accordance with Councils **Desired Standards of Service (DSS).** These reports provided the basis for much of the LGIP and Schedule of Works for trunk sewerage infrastructure.

The assessment was undertaken through the development of a **H2OMAP SWIMM hydraulic (all pipe) sewerage model**. The model was used to assess the capacity of the existing system to deliver Peak Wet Weather Flow (PWWF) and develop scenarios for sewerage trunk infrastructure planning over different time horizons (2016, 2021, 2026, 2031 and 2041).

4.4.2 Desired Standard of Service

The demand assumptions that underpinned the sewerage model were based on Councils latest GIS demand model which in turn reflected the advice from OESR. Key design parameters for the sewerage network which were incorporated into the LGIP Desired Standards of Service included:

- Average Dry Weather Flow (ADWF) of 585 L/ET/ day across the region;
- Peak wet weather flow of 5 x ADWF;
- Pump stations operating on a duty/standby arrangement with provision for 4hours emergency storage at ADWF;
- New gravity sewers designed to transport full LGIP capacity with no surcharge or overflow. Flow into existing sewerage to not surcharge beyond 1m below surface level at PWWF;
- Rising main velocity to be in the range 1.2m/s- 1.5m/s; and
- Sewerage treatment/release complying with future EPA licences conditions for flow.

These assumptions are broadly consistent with the States Water Services Planning Guidelines and comparable with other regional water services providers.

Where failures of these standards were identified, upgrade and augmentations were proposed.

4.4.3 Schedule of Works

Scope:

The analysis undertaken by MWH suggested a range of potential deficiencies that may arise in various sewerage networks as the region continues to develop. The overall network strategy developed by MWH is intended to resolve these deficiencies. The scope of works necessary to give effect to the proposed strategy was used as the basis of the Schedule of Works.

The scope and scale of **existing trunk sewerage assets** contained within the Schedule of Works is based on earlier work (2011) in which the trunk assets were identified by GIS and translated into a charges model. These were subject to review prior to finalisation of the Schedule of Works

Costing and Timing:

The process for determining the establishment cost of trunk sewerage transportation assets was the same as that applied to water supply and transportation assts. Unit Rates provided in Section 4.12 of the 2010 valuation report provided by **Harrison Grierson**[8] were indexed to March 2014 using the ABS Road and Bridge Construction Index for Queensland (Index 3101)

These unit rates were not adjusted for geological factors (e.g. soil type). Cost Estimates for pump stations are developed using unit rates per kW with a pump efficiency of 70% assumed in determining the pump station power requirement.

The rates include owner's costs (of 15% of the capital value) to allow for of design, planning and supervision allowance. This rate is applied regardless of the complexity of the project (e.g. a sewer rising main typically requires less investment of owner's resources than say a pump station). This level of owner's costs is consistent with the recommendation contained within the **States Guideline 03/14 (Appendix c)** which suggest that the project owners cost for Trunk Water assets may fall in a range of 13%-22%

The rates specifically exclude **contingency**. The States Guidelines (03/14: Appendix C) suggest that a contingency of between 3-10% would be appropriate for projects at the "delivery" phase with the contingency rate increasing to 10-20% for those at development phase and 15-25% to those in the scoping stage. A contingency has therefore been applied using the default rates provided in the States Schedule of Works (SOW) model.

4.5 Parks and Land for Community Purposes

4.5.1 Planned Infrastructure Demand

The demand for parks and community infrastructure is directly linked to population growth across the region. As such, the planned infrastructure demand for this asset cohort reflects the projected demand across the three key areas of Gladstone, Calliope and Miriam Vale/Agnes as indicated in Table SC3.1.1 of the LGIP.

[8] Harrison Grierson 2010, Gladstone Regional Council Infrastructure Unit Rates Study, Final Report, November 2010

4.5.2 Desired Standard of Service

The Desired standard of service applied to the Parks and Community Facilities was developed internally based on similar figures used by other Regional Councils. The key drivers of the service standards for parks was the rate of provision of public parks, accessibility standard (i.e. distance form a park) and size of public parks.

In the case of Community Facilities, the desired Standard of Service for the provision of land was informed by the "*SEQ Regional Plan 2005-2026, Implementation Guideline No. 5, Social Infrastructure Planning"*.

4.5.3 Schedule of Works

Scope:

Council's previous assessment of the need for parks and community facilities had identified some deficiencies in certain areas. In recent years, Council had taken a proactive approach secure parkland and land for community facilities. Hence, the need for acquisition of land is limited. However, deficiencies still exist in terms of making these facilities fit for purpose. Hence, parks and community facilities have been retained in the LGIP in recognition of the fact that Council has invested community capital into the acquisition of these lands and, as such, they are an important element of the Council overall trunk infrastructure service provision,

Costing and Timing:

The costs of **existing trunk infrastructure** works were estimated using a modes assumption of the cost of land at $10/m2. No additional embellishment costs have been included in the Schedule of Works at this stage.

This cost of land does not include costs associated with design, planning and supervision of the development of the land in a manner that makes the land fit for purpose. In addition, no contingency has been applied in the estimation of cost.

4.6 Schedule of Works (SOW) General Assumptions

4.6.1 Financial Assumptions

The general financial assumptions relevant to the calculations undertaken in the Schedule of Works (SOW) modelling are underpinned by the following assumptions:

- **Weighted Average Cost of Capital** has been estimated at 5.5% per annum (which reflects the baseline margin of 3.5% on the ten (10) year bond rate of 2.0% as broadly outlined in **Local Government Bulletin 06/01** as referenced in the States Guideline 3/14 appendix C);
- **Escalation of Infrastructure** was assumed at 4% being the ten (10) year average **Roads and Bridges Index (ABS 6427, Table 15, Index 3101)** as at 2014;
- **Escalation of land** has been taken as nil; and
- The Infrastructure **Charges inflator** has also been stated at nil.
- The **term of the calculations** undertaken in the Schedule of Works is twenty (20) years

4.6.2 Revenue projections:

Revenue projections have been calculated in the States Schedule of Works model assuming application of adopted charges as outlined in the Councils **Adopted Infrastructure Charges**

Resolution (No 1 – 2015), Appendix 2 and as reproduced in Tables 4.3 and 4.4 below. In most area, the maximum allowable charge ($28,311) was applied for development of residential dwellings. However, development outside the PIA were charged a discounted rate (as per Area 4) of $18,000/lot. Commercial and retail development were charges on the same basis as residential. Industrial development was charges at the rate of $20,200/lot for most areas and a discounted rate of $12,850 applied to development outside the PIA.

Table 4.3 – Adopted Charge for reconfiguring a Lot – All Zones excluding Industry Zones

Charge Area	Gladstone Regional Council				Locations
	Infrastructure Charge in all Zones (excluding Industry zones)	Calculated Charge	Trunk Infrastructure Provision	Included Trunk Infrastructure	
Charge Area 1	$28,311.20/lot	$31,227-$38,297	Water, Sewer, Transport, Parks	Existing & Future	Gladstone, Calliope, Boyne Island, Tannum Sands, Agnes Water, Seventeen Seventy
Charge Area 2	$28,311.20/lot	$38,297	Sewer, Transport, Parks	Existing & Future	Yarwun Industrial Area
Charge Area 3	$27,000/lot	$27,003	Water, Transport, Parks	Existing & Future	Mount Larcom, Miriam Vale, Bororen, Calliope Rural Residential, Beecher, Burua, Wurdong, Benaraby
Charge Area 4	$18,000/lot	$18,018	Transport, Parks	Existing	Rural and small townships in Gladstone surrounds
Charge Area 5	$16,500/lot	$16,525	Transport, Parks	Existing	Rural and small townships in Calliope surrounds
Charge Area 6	$17,800/lot	$17,780	Transport, Parks	Existing	Rural and small townships in Miriam Vale surrounds

* Typical locations for where the charge area applies. See maps for charge area for a specific property.

Table 4.4 – Adopted Charge for reconfiguring a lot -Industry zones

Charge Area	Gladstone Regional Council					
	Infrastructure Charge in Low Impact Industry Zone	Infrastructure Charge in Medium Impact Industry Zone	Infrastructure Charge in Special Industry Zone	Trunk Infrastructure Provision	Included Trunk Infrastructure	Locations
Charge Area 1	$20,200/lot	$80,900/lot	$92,000/lot	Water, Sewer, Transport, Parks	Existing & Future	Gladstone, Calliope, Boyne Island, Tannum Sands, Agnes Water, Seventeen Seventy
Charge Area 2	$20,200/lot	$80,900/lot	$92,000/lot	Sewer, Transport, Parks	Existing & Future	Yarwun Industrial Area
Charge Area 3	$19,300/lot	$77,150/lot	$87,750/lot	Water, Transport, Parks	Existing & Future	Mount Larcom, Miriam Vale, Bororen, Calliope Rural Residential, Beecher, Burua, Wurdong, Benaraby
Charge Area 4	$12,850/lot	$51,400/lot	$58,500/lot	Transport, Parks	Existing	Rural and small townships in Gladstone surrounds
Charge Area 5	$11,800/lot	$47,150/lot	$53,600/lot	Transport, Parks	Existing	Rural and small townships in Calliope surrounds
Charge Area 6	$12,700/lot	$50,850/lot	$57,850/lot	Transport, Parks	Existing	Rural and small townships in Miriam Vale surrounds

4.6.3 Alignment of SOW with LTFF

The current Schedule of Works (SOW) has been progressively developed to ensure that it aligns with the Councils Long Term Financial Forecasts as follows:

- The Initial Schedule of Works (SOW) was developed based on the Councils **Internal Project Planning (IPP).** This program includes all proposed investment (growth, new and renewal). In developing the initial SOW, those items of trunk infrastructure identified as new or renewal were excluded. This initial Schedule of Works was provided to the infrastructure groups for their review, comment and amendment;

- As outlined in detail above, from March 2014 onward, MWH undertook a more detailed assessment of the transport, water supply and sewerage elements of Councils trunk infrastructure. The outcomes from this assessment were used to inform the next iteration of the Schedule of Works;

- Council's financial managers also updated their **IPP** to reflect the more recent information contained within the Infrastructure Strategies provided by MWH. The IPP was largely incorporated into the Council Long Term Financial Forecasts;

- During this process, some items that had been included in the previous SOW but not included in the latest IPP were identified and discussed further (specifically the need for additional investment in water treatment for the Agnes supply and upgrades to WWTPs are Gladstone and South Trees STPs) and resolved;

- The Schedule of Works reflects the final version of the IPP which in turn underpins Councils Long Term Financial Forecast.

This process has ensured that all parties have agreed on the scope and timing of capital expenditure as prescribed in the IPP which underpins both the LGIP and the Council Long Term Financial Forecast (LTFF).