BE WHAT YOU WANT TO BE.

GLADSTONE POPULATION AND HOUSING STUDY

SOCIAL IMPACT ANALYSIS

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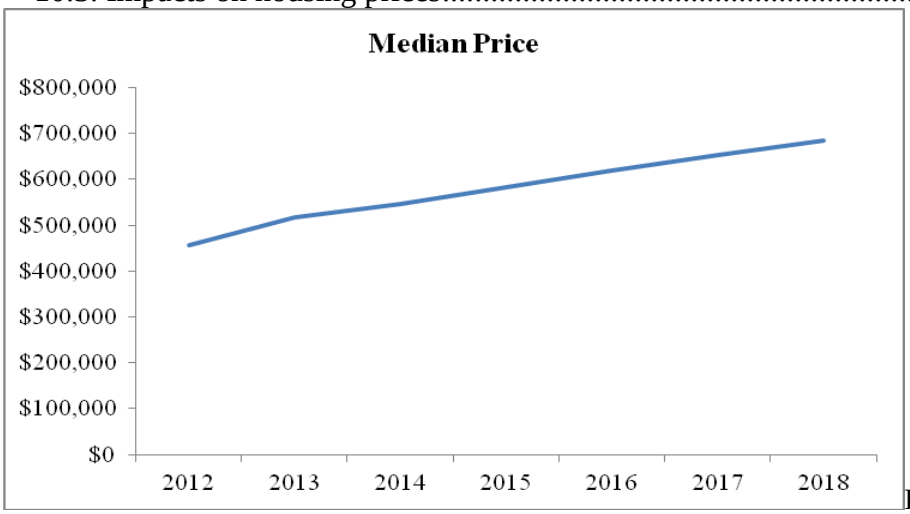

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ABBREVIATIONS

ABS	Australian Bureau of Statistics
CEM	Centre for Environmental Management
CQU	Central Queensland University
DIDO	Drive in/Drive out
DME	Department of Mines and Energy
DoH	Department of Housing
EcIA	Economic Impact Assessment
EIS	Environment Impact Statement
FIFO	Fly in/Fly out
GRC	Gladstone Regional Council
Km	Kilometre
LGA	Local Government Authority
NPD	Non-private Dwellings
NRP	Non-resident population
OESR	Office of Economic and Statistical Research
PIFU	Planning and Information Forecasting Unit
QLD	Queensland
QRC	Queensland Resources Council
QRTA	Queensland Rental Tenancy Authority
SD	Statistical Division
SLA	Statistical Local Area
SPQs	Single Person Quarters

EXECUTIVE SUMMARY

The Centre for Environmental Management (CEM) of CQUniversity has been commissioned by Lyons Capital to conduct a population and housing study of Gladstone in central Queensland. The study is focused on estimating both the direct and indirect labour force generated by new major infrastructure projects as well as the flow on effects on population, demand for new dwellings and price increases over the medium term period. This study also explores the availability of residential land development and the historic delivery rates of new dwellings.

Infrastructure Projects to employ up to 8,150 Construction Workers in Gladstone

A significant number of major energy, industrial and infrastructure projects totalling a potential $93bn will employ up to 8,150 construction workers between 2012 and 2016. More than half of this construction workforce will not be local to Gladstone. Most of the construction workforce is expected to be accommodated in temporary housing facilities and consequently will have limited impact on housing markets. However it is expected that approximately 10% of these workers will permanently move to Gladstone, due to the city's longer term prospects for growth and employment, and will generate a multiplier effect on the local economy and population.

Economic Stimulus will increase Gladstone's Population by up to 20,000 people by 2018

Modelling shows the major infrastructure projects will create a net 5,157 to 11,930 new permanent jobs in Gladstone, with 1,350 to 2,983 directly related to these projects and the remainder as a consequence of indirect impacts. While approximately 10% may be drawn from the existing workforce in the region, the remainder of workforce will need to be relocated to the Gladstone area.

Four scenarios have been considered with the central case (Scenario 3: Solid Growth) reflecting expected population growth due to the seven confirmed and commenced projects plus the two mostly likely projects (Shell LNG and TruEnergy power station) also proceeding and a permanent relocation to Gladstone of 10% of the total construction workforces associated with these projects.

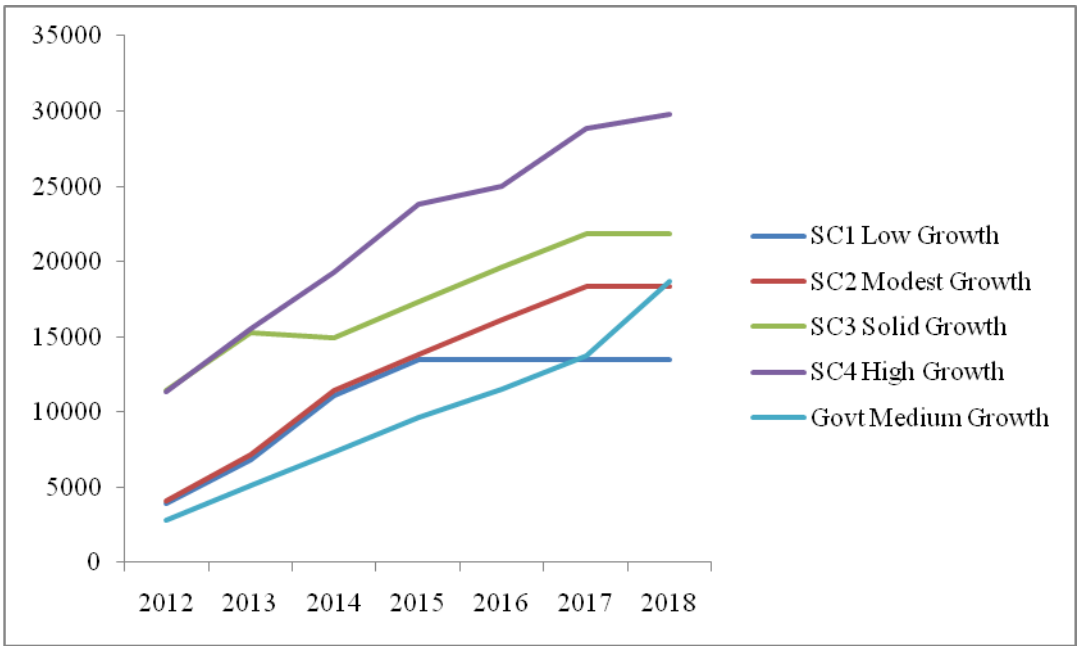


Figure 1.1: Increase in Gladstone's Population to 2018 by scenario

The four scenarios vary from a conservative population increase of 10,665 where only current projects are developed to 26,431 under a scenario where an additional number of less likely projects will proceed. The Solid Growth case is for a forecast increase of 21,152 by 2018 (inclusive of a net 902 people over this time period from net natural increase of births less deaths). These scenarios and their forecast operational workforces, demand for new dwellings and total population increase by 2018 are detailed in the table below:

Table 1.1: Summary of modelling predictions for population increases in Gladstone by 2018

SCENARIOS	Increases from 2011 to 2018		
	Operational Workforce	New Population	Population Increase
Scenario 1: Low Growth Confirmed projects only and no construction workers stay	4,640	11,600	2.75%
Scenario 2: Modest Growth As Scenario 1 but includes likely projects	6,580	16,450	3.90%
Scenario 3: Solid Growth (central case) As Scenario 2 but 10% of construction workers stay	6,582	16,455	3.90%
Scenario 4: High Growth As Scenario 3 but 20% of other projects also proceed	9,772	24,431	5.79%

More than 6,500 New Dwellings Required, Particularly in Tannum Sands Region

The increase in Gladstone's population will generate requirements for about 6,582 new dwellings by 2018 (ie, an average of 940 dwellings per annum) under the Solid Growth Scenario. The largest percentage of this increase (about 39%) in dwellings is expected to be located in Tannum Sands/Boyne Island region (the main growth corridor identified by the local and State governments) according to State government population distribution forecasts.

Lot Delivery Rates will Bottleneck Activation of Significant Land Supply For Years

A review of land and housing supply shows that the available broad hectare land in Gladstone is sufficient to build approximately 12,000 dwellings. However, the historic rate of lot registrations has been much lower than will be required to accommodate the projected demand for new dwellings. From 2006 to 2012 new land lot registrations for Gladstone Regional Council have averaged only 613 per year (OESR 2011) and peaked at 1150 in 2012. This is substantially lower than the approximate 940 new dwellings per annum needed each year under the Solid Growth scenario.

While it might be expected that land lots will be quickly brought to the market to meet demand, the next couple of years will be a very difficult environment for developers to attract and retain the builders, tradespersons and sub-contractors required to deliver these lots due to three factors:

1. The very large demand for labour associated with the major development projects
2. Flow on demand from indirect employment (eg, retail, services and government sectors); and
3. Fierce competition for workers from many other LNG and mining projects nationally.

Rapidly Rising Property Market

The increased demand for housing, coupled with a current acute housing shortage, are generating rapidly rising prices in both sales and rental markets. Over the last year, median weekly four bedroom house rental prices have increased by 79% (with vacancy rates of about 1.0%), while median house prices have increased by 14.8%. It is clear that the confirmed major development projects will place additional pressure on the already tight housing and rental markets in Gladstone.

Sustain Property Boom Forecast over the next Six Years

Unlike previous periods in Gladstone, where property booms have lasted 2-3 years, the cumulative impacts of all confirmed projects will see solid rental and sale prices increase over a much longer period of some seven year or more years.

Under the central, 'Solid Growth Scenario' for this report, median housing prices for Gladstone are forecast under regression modelling to increase by between $31,633 and $38,298 per annum on average as a consequence of the market pressures, over the next six years.

Using a price impact ratio model, which is a better determiner of short-term price gains when supply and demand imbalances are acute, annual price increases of up to $62,524 per annum are forecast over the next three years. Over the medium term though, the price increases predicted from the regression models (Table 1.2 and 1.3) are expected to be more accurate.

Under the simple and marginal change regression models used in this report (see Section 9), the median house price is expected to rise from between $16,322 under the Low Growth Scenario to $49,278 under the High Growth Scenario by 2018 (see Table 1.3). However, the Solid Growth Scenario is the most likely scenario for Gladstone and it is forecast that median house prices will rise between $189,801 and $229,787 representing a compounded annual growth rate ('CAGR') of 6% to 7% over this period.

Table 1.2: Forecast Gladstone median house price – Solid Growth Case: 2011-2018

Year	Simple Regression Model			Marginal Change Regression Model		
	Median price	Change in $	Change in %	Median price	Change in $	Change in %
2012	$455,750	-	-	$455,750	-	-
2013	$483,409	27,659	6.1	$516,627	$60,877	13.4
2014	$515,837	32,428	6.7	$547,201	$30,574	5.9
2015	$548,266	32,428	6.3	$583,122	$35,921	6.6
2016	$580,694	32,428	5.9	$618,667	$35,545	6.1
2017	$613,122	32,428	5.6	$654,213	$35,545	5.7
2018	$645,551	32,428	5.3	$685,537	$31,324	4.8
6-Year Total	-	189,801	36	-	$229,787	42
6-Year CAGR	-	31,633	6	-	$38,298	7

Source: CQU

Table 1.3: Predicted Gladstone median house price: 2011-2018 (Regression models)

Scenarios	**Simple regression model**		**Marginal change regression model**	
	Annual Price Increase	**Total Increase by 2018**	**Annual Price Increase**	**Total Increase by 2018**
Scenario 1: Low Growth	$31,633	$189,801 (41.6%)	$16322	$97,929 (21.5%)
Scenario 2: Modest Growth	$31,633	$189,801 (41.6%)	$32800	$196,800 (42.3%)
Scenario 3: Solid Growth (central case)	$31,633	$189,801 (41.6%)	$38298	$229,787 (50.4%)
Scenario 4: High Growth	$31,633	$189,801 (41.6%)	$49278	$295,670 (64.9%)

The previous property boom that accompanied the announcement and construction of the Rio Tinto Yarwun Refinery Stage 2 Expansion (2006-2008) project has been used to create a price impact ratio model to forecast changes in housing prices when major imbalances exist between demand and supply such as now currently exists in Gladstone. Under this model, median housing prices under a Solid Growth scenario may rise by up to $62,542 per annum in a single year because of supply constraints over the next two years.

1. INTRODUCTION

The Centre for Environmental Management at CQUniversity has been commissioned by Lyons Capital to conduct a growth study of the medium term future for population and housing in the Gladstone region, Queensland. There are a number of broad tasks that have been covered, including:

- Brief summary of advanced and proposed major development projects in Gladstone;
- Brief review of Gladstone's population trends, property market and housing stocks and factors affecting them;
- Forecast construction and operational workforces by project by year;
- Forecast impact on population in Gladstone over the next seven years;
- Forecast demand for new housing by year over the next seven years;
- Benchmarking previous boom periods in Gladstone to changes in median housing prices; *and*
- Predicted net impact on rental and median house prices over the next seven years.

This report is split into ten sections, being:

1. **Introduction**

2. **Methodology**
   Description of the methods that are used for forecasting population, new dwelling demand and median house sales prices.

3. **Major Infrastructure Projects Underpinning Growth**
   Details of advanced and proposed major infrastructure projects in Gladstone, including their capital expenditure, construction workforce and operational workforce.

4. **Forecast Construction & Operational Workforces**
   Annual forecast of total construction and operational workforces under four scenarios, with the central Solid Growth Scenario based on all commenced projects, future commencement of the two most likely projects awaiting approval and permanent relocation of 10% of the construction workforce.

5. **Population, Employment and Property Profile**
   Population trend, unemployment rates and trend in median rents, vacancy rates, median prices, and sales volumes over the last ten years.

6. **Previous Property Booms**
   Analysis of drivers of the two previous property booms in Gladstone.

7. **Population and New Dwelling Forecasts**
   Population increase and new dwellings demanded under each scenario to 2018

8. **Housing Supply Analysis**
   Residential land supply, historic rates of lot registrations and the integrated project housing strategy of the major LNG proponents

9. **House Sales Price Forecast for Gladstone**
   Median house price growth to 2018 under three forecast models, being a simple regression model, marginal change regression model and price impact ratios model

10. **Impacts and Conclusion**
    Summary of the report's conclusions

References

Appendices

A: Demographic profile
B: Housing market analysis
C: Accommodating non-resident workers (Bowen Basin experience)
D: Social profile of Gladstone

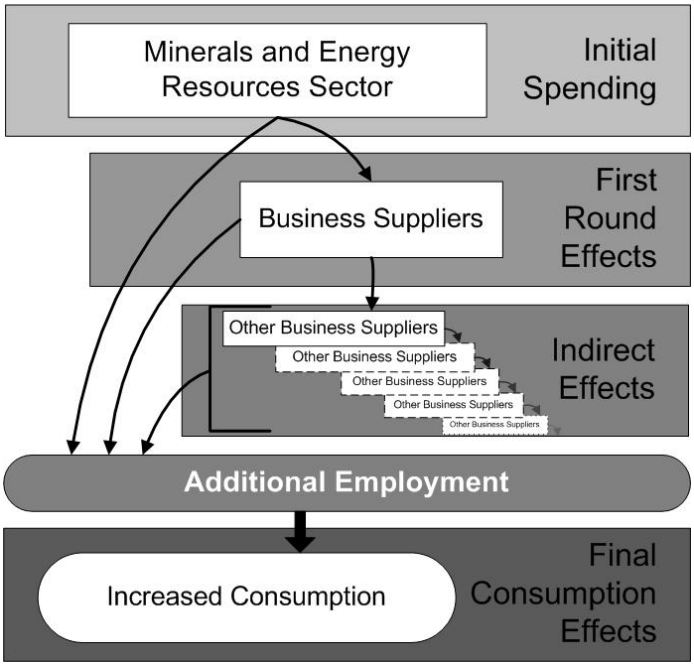
2. METHODOLOGY

This study used public and published data and information about industry, population and housing in Gladstone as well as other data from the Centre for Environmental Management of CQUniversity and in person discussion with industry personnel and other organisations such as the Gladstone Economic and Industry Development Board. Based on the availability of data the following models and indicators were used to predict population growth and housing demand in the Gladstone area, the potential land supply for new dwelling construction and housing sale price prediction through to 2018.

2.1. Population and Housing Demand Forecasting Models

The approach taken in this study is to forecast future direct employment from major development projects, and to then apply economic multipliers (Figure 2.1) to predict the flow-on employment effects through business supply and consumption chains. Population effects were then predicted from changes in total employment added to current growth from natural increase.

Figure 2.1: How major projects generate indirect effects and employment



The modelling to predict population and housing demand in Gladstone involved six steps.

1. The business as usual (i.e., no new development projects) population and rates of natural increase was estimated.
2. The construction and operational workforce for the different projects were estimated.
3. Estimates of the proportion of each workforce that would be based at Gladstone was made, as well as the proportion of direct expenditure through the business supply chain that would accrue to Gladstone businesses. This provided estimates of the direct workforce impacts.
4. The total impacts on the population were estimated by calculation of the flow on effects through two key pathways.

The first group involved the impacts of expenditure on business goods and services (business suppliers), while the second involved expenditure on the labour force (Figure 2.1). The outputs of the models can be classified into First Round and Indirect Effects, representing industry impacts through the business chain, and Final Consumption effects, which represent the economic activity needed to support the increased workforce from Direct, First Round and Indirect Effects (Figure 2.1).

5. The research team already had models of the local economy in Gladstone and the regional economy in the Fitzroy Statistical Division with predicted multipliers. These multipliers were used to predict the flow on effects of increasing the primary workforce in Gladstone. The estimate of population multipliers taking into account average household size was made.
6. Housing demand was estimated in proportion to the estimated new households (or demand for new dwellings).

2.2. Population Projections

Population projections have been modelled by estimating the flow-on effects from an increase in primary (or operational) workforce in Gladstone. There were several important flow-on effects to consider:

1. The size of the operational workforce
2. An allowance for some construction workforce (10%) to live locally
3. Multipliers on workforce numbers (multiplier of 4.0 assumed)
4. Workforce participation rate (70% assumed)
5. Household size (an average household size of 2.5 persons adopted)

2.3. Housing Supply Indicators

This study considered a number of housing supply indicators based on the availability of data. These are trends in housing supply, residential land and broad hectare stock supply and some information about the accommodation for non-resident population.

2.4. Housing Sales Price Forecast Modelling

Predictions about future housing prices have been estimated in three ways.

1. Simple Regression Model: A linear regression model based on 2001 to 2011 housing sales (median price) data was used for a Gladstone housing sales prediction model. This model used a 95% confidence level to predict upper and lower bound median house price over the period, extrapolating housing price changes over the past 10 years into the future.

2. Marginal Change Regression Model: A statistical relationship between population growth and changes in housing prices has been developed based on data over the past ten years. This has then allowed predictions about future price changes to be made based on different levels of population growth.

3. Price Impact Ratios Model: The employment impacts of a previous project in Gladstone (Yarwun Stage 2 expansion) have been compared to corresponding price changes to estimate a price impact ratio (change in house prices per one percentage change in population). This price impact ratio has then been used to estimate potential changes in housing markets.

2.5. Growth Scenarios

There are a large number of potential factors which might influence growth in Gladstone. To represent these different possibilities, the potential outcomes have been summarised into four key scenarios:

SCENARIO 1: **LOW GROWTH**

Only currently confirmed projects proceed, and no new construction workforce relocates permanently to Gladstone.

SCENARIO 2: **MODERATE GROWTH**

Both currently confirmed and most likely projects proceed, but no new construction workforce relocates permanently to Gladstone.

SCENARIO 3: **SOLID GROWTH**

Both currently confirmed and most likely projects proceed, and 10% of new construction workforce relocates permanently to Gladstone.

SCENARIO 4: **HIGH GROWTH**

Currently confirmed and most likely projects proceed, plus 20% of other planned projects, and 10% of new construction workforce relocates permanently to Gladstone.

While all of these scenarios are possible growth outcomes for Gladstone, the model predictions are largely reported against Scenario 3 (Solid Growth) which is considered as the most likely development path given current conditions.

3. MAJOR INFRASTRUCTURE PROJECTS UNDERPINNING GROWTH

A total of 18 advanced and upcoming infrastructure (valued at $86bn in capital expenditure) where identified in the report. Of these, seven projects have commenced construction and two have a high likelihood of also commencing construction, being the Shell liquefied natural gas ('LNG') project and TRUenergy power plant.

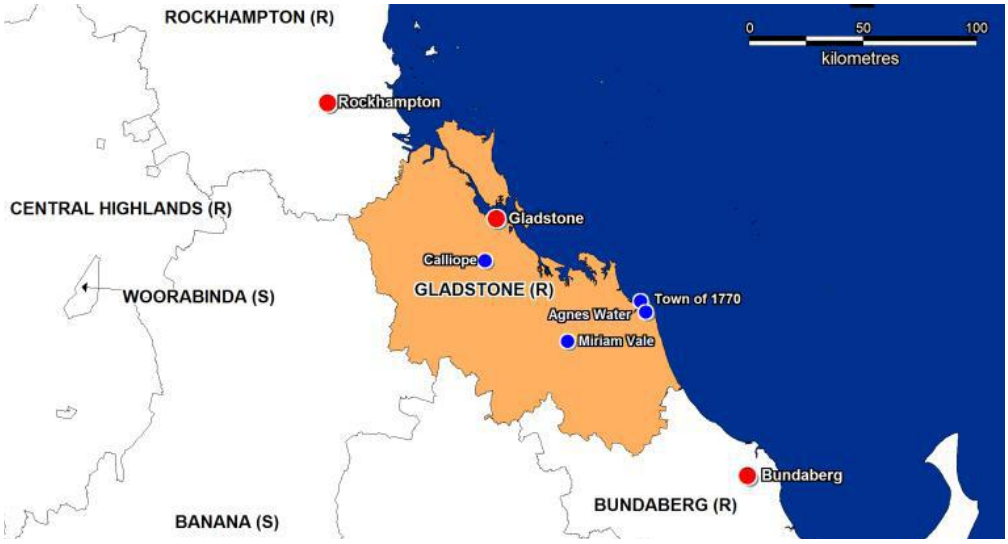
Advanced projects were defined as projects that have commenced or have a completed environmental impact statement ('EIS') that is awaiting approval. Upcoming projects were defined as those that have not yet completed their EIS.

3.1. Gladstone Study Area

The study area of this report was the 34,430 person city of Gladstone and its 13,400 person satellite community of Tannum Sands/Boyne Island (collectively 'Gladstone' in this report), and where data was not available the Gladstone Regional Council Local Government Area (the 'Gladstone LGA'), which has a total population of 60,317 (ABS, 2012).

Gladstone is home to a thriving 21st Century industrial base served by one of Australia's busiest ports, the Port of Gladstone. Gladstone's development potential is underpinned by the 22,000 hectare Gladstone State Development Area, which offers a range of development-ready sites, established infrastructure and growing possibilities for economic development to drive the region's sustainable growth. With recent and continuing investment in the LNG industry, which is expected to play an increasingly important role in global energy markets over coming years, Gladstone's strong industrial growth looks set to continue (GAPDL, 2011).

Figure 3.1: Map of the Gladstone Region



Source: OESR 2011

This city is recognised as a strategic and logical choice for industrial, commercial, retail and residential investment. Since the 1960s, Gladstone has served as an industrial hub, due to an excellent harbour, availability of services, transport system and raw materials. Mineral processing and other industrial activity are of significant benefits to the Gladstone community, providing construction employment, operational jobs and spending into business communities.

A number of other infrastructure, transport and commercial, property and land development related developments are expected to be needed to serve the growing industry over time. In the longer time frame, the co-location of minerals, energy and infrastructure should help to develop more opportunities for advanced minerals processing and manufacturing. In the shorter to medium term, the development of major industrial projects will stimulate the further development of the supply chain and services sector in Gladstone.

3.2. Advanced Development Projects

In Gladstone, thirteen development projects are currently under construction or have regulatory approvals in place, six with capital expenditure of $1.0bn or greater (Table 3.1).

In aggregate, these advanced projects total over $58bn and will employ a total construction workforce of approximately 14,000 – 18,000 people (although this workforce will be less than this in any particular year, due to the different timing of project construction peaks).

Table 3.1: Advanced Projects (under construction or with completed EIS) in Gladstone

Project status	Project name and developer	Estimated cost (A$bn)	Construction Workers	Operation Workers	Timing
Project currently under construction	Gladstone LNG (Santos, Petronas, Total and Kogas)	$16.0	5000	1000	Commenced plant construction 2011. First cargoes expected 2015
	Queensland Curtis LNG (BG Group)	$15.0	2,500/5,000	280/1,000	First production expected early 2014
	Australian Pacific LNG (Origin)	$14.0	33,00	175	First exports expected first half 2015
	Rio Tinto Alcan-Yarwun Alumina Refinery	$2.4	1,350	200	Work commenced in 3rd quarter 2007 First shipment targeted for the third quarter -2012
	Wiggins Island Coals Export Terminal	$2.5	800 (plus 1200 off site)	120	Commenced 2011 and targets Dec-14 completion
	Western Basin Dredging and Disposal Project	$1.3	225	30-40	Stage 1A and 1B –late 2010/2011
	QR National	$0.9	800	80	Rail infrastructure to be delivered in accordance with staged expansion of WICET
	Boyne Smelters Ltd	$0.7	450 (peak of 640 in 2011)	TBA	Work commenced 2008 and will be completed by 2012
	Powerlink	$0.3	TBA	TBA	Construction to be completed by 2013
	Fishermans Landing Reclamation Area	TBA	TBA	TBA	Construction commenced early 2011
	Curtis Island Water and Sewerage Infrastructure Project (Joint project GAWB and GRC)	$0.1	TBA	TBA	Work continues since 2011

	Queensland Energy Resources Limited (QER)	$0.1	140	50	Operation of demonstration plant commenced and commissioning ongoing
Project with completed EISs	Gladstone Pacific Nickel Limited	$3.8	1000-2300	530	Project on hold. Construction is expected to take 2-3 years
	Surat Basin Rail	$1.0	1,000	44	Commencement of operation targeted for 2012
	Gladstone Area Water Board	$0.3	400	TBA	Construction period may take 2 years. Earliest pipeline operation -2013
	Arrow Energy Ltd and AGL Ltd (Joint Venture)	$0.48	300-350	10	TBA
Total		**$58.88**	**13,965-18,005**	**2,519 – 3,249**	

Source: GEIDB 2012 and CQU estimates.

3.3. Upcoming Development Projects

As well as projects that are formally approved, there are a number of other major projects that are currently in planning stages. Eight of the most advanced of these have been identified (Table 3.2), which total over $34bn in capital expenditure. Overall, these major development projects indicate that the future growth for Gladstone is expected to revolve around mineral products through the port and further development in the minerals processing sector. There have been some delays because of construction bottlenecks and the slowdown in export prices in 2012, with the Arrow LNG plant delaying the investment decision to 2014. The future of the smaller LNG projects is uncertain, but it appears likely that at least one of the port developments will proceed to allow coal exports to be developed from the Surat Basin.

Table 3.2 Upcoming (pending/proposed) Development Projects in Gladstone

Project name and developer	Estimated cost (A$bn)	Construction workforce	Operation workforce	Timing
Boulder Steel Limited	$2.5	1500-2000	2820	EISs expected to be released 2012
Arrow LNG plant (Shell Australia and Petro China) Project	$24.0	2500-3,000	200-300	Planning and EIS is well developed, but project has been delayed by up to 2 years
Australian Inland Rail Expressway	$3.0	TBA	TBA	N/A
The Aldoga Power Station	$1.8	1000	TBA	Necessary approvals currently being sought
Balaclava Island Coal Terminal	$1.0	800	100	EISs expected to be released 2012. First coal shipment anticipated in 2015.
LNG Limited	$0.76	50-120	32	Necessary approvals currently being sought
Northern Oil Refineries Pty Ltd	$.03	TBA	25-35	Necessary approvals currently being sought
Sojitz Corp	$0.45	400	TBA	Necessary approvals currently being sought
Fitzroy Terminal Limited (Mitchell Group)	$1.2	250	150	EISs expected to be released 2012. First coal shipment anticipated in 2015.
Total	**$34.74**	**6,500 – 7,570**	**3,327 – 3,437**	

Source: GEIDB 2012 and CQU estimates

4. FORECAST CONSTRUCTION AND OPERATING WORKFORCES

4.1. Composition of Workforces

The major infrastructure projects will involve large construction and operational workforces. While much of the construction workforce can be expected to only temporarily reside in Gladstone over the construction period, the new operational workforces are expected to be based permanently in the Gladstone region.

The estimated peak workforces and the respective peak years for each of the four scenarios in this report are summarised in the table below:

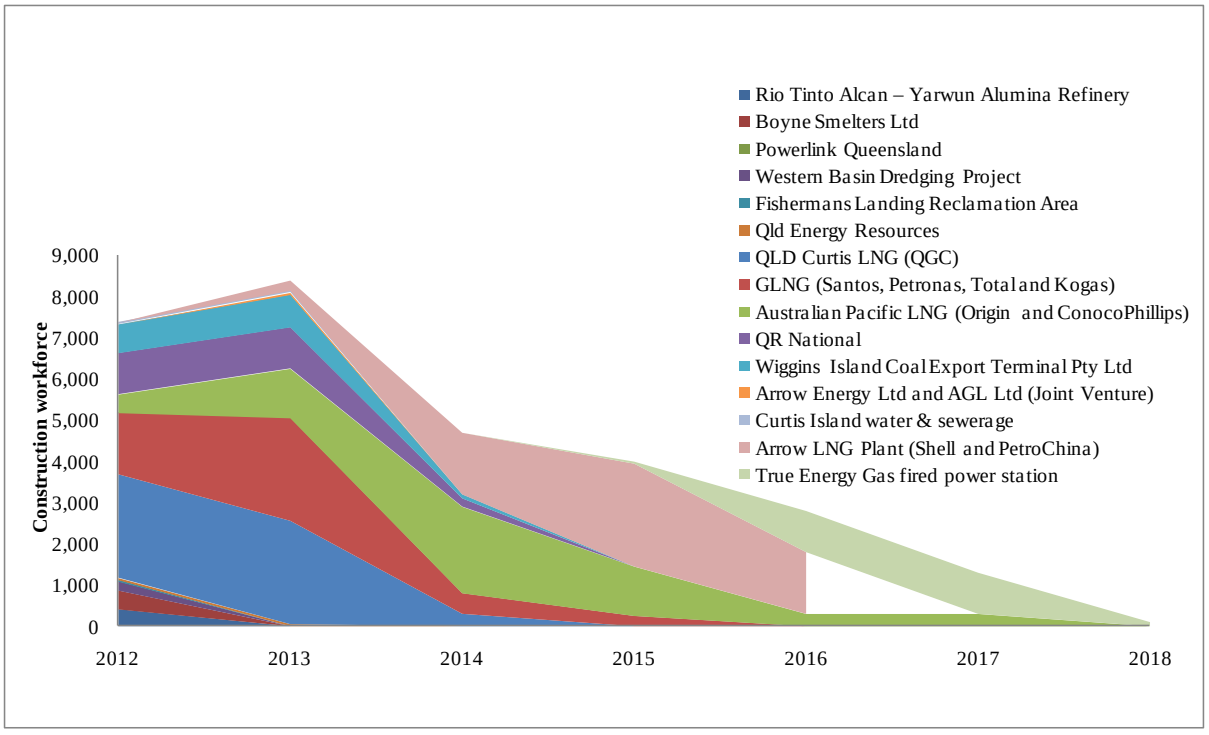
Table 4.1 Workforce Estimates for Major Development Projects in Gladstone

	Construction		Operational	
	Peak Number	Peak Year	Peak Number	Peak Year
Scenario 1	8,100	2013	1,350	2015
Scenario 2	8,150	2013	1,830	2016
Scenario 3	8,150	2013	1,830	2018
Scenario 4	8,730	2017	3,638	2018

4.2. Solid Growth Forecast Workforces

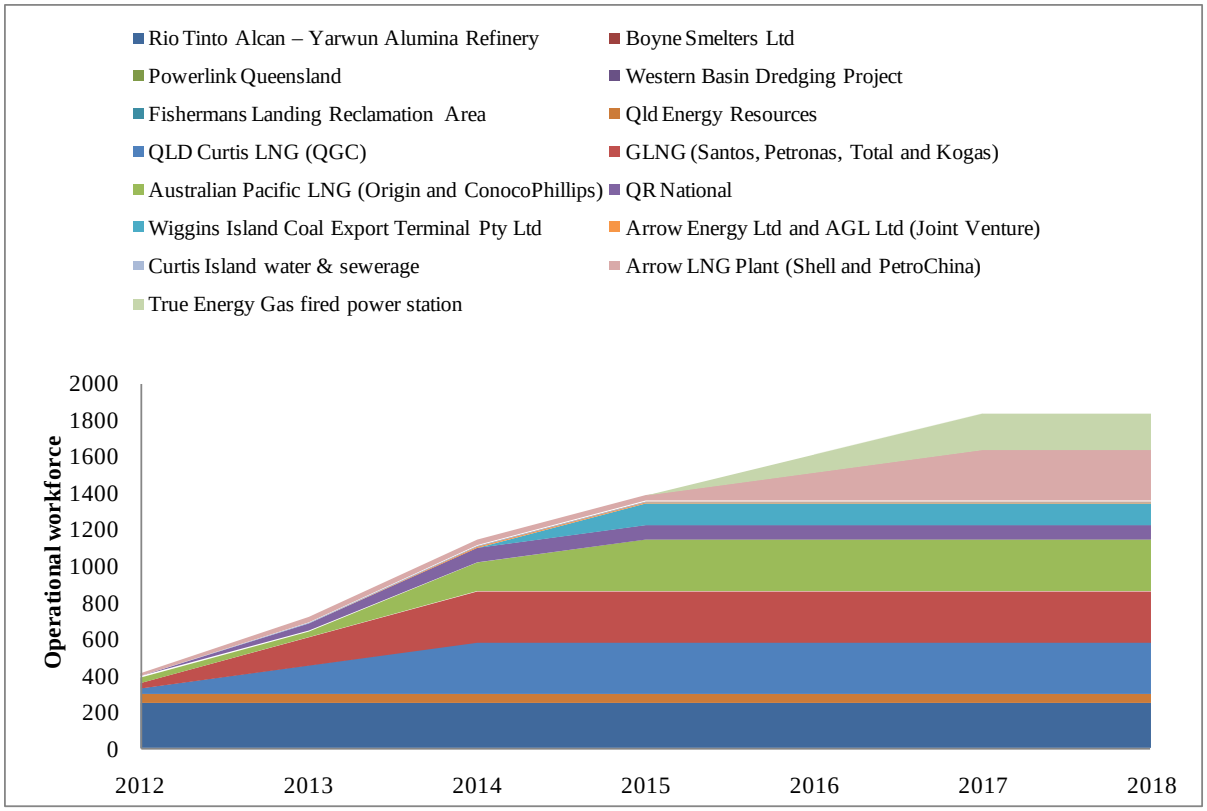
Scenario 3 (Solid Growth) forecasts a peak construction workforce of 8,150 and a final operating workforce of 1,830. The below charts detail these workforces, split by project.

Figure 4.1 Scenario 3: Solid Growth – Construction workforces, 2012-2018



Source: CQU data

Figure 4.2: Scenario 3: Solid Growth – Operational workforces, 2012- 2018



Source: CQU data

Based on discussions with Bechtel, the major contractor for the three LNG projects and the Rio Tinto Yarwun Stage 2 expansion, as at September there were approximately 7,000 construction workers related to these projects now based in Gladstone. Just over half of the workforce (52%) was drawn from the local and regional area, with the remainder commuting to Gladstone for block shift periods. There is additional construction workforce involved in the other major projects.

4.3. Workforce Modelling of Projects Assumed to Proceed

Detailed modelling of construction and operating workforces was undertaken for the scenarios, with workers outside of this area excluded (e.g. those involved in the gas fields/ gas pipelines). The Low Growth Scenario assumes only workforces from the current commenced projects, being:

1. Rio Tinto Alcan – Yarwun Alumina Refinery
2. Boyne Smelters Ltd
3. Western Basin Dredging Project
4. Fishermans Landing Reclamation Area
5. Qld Energy Resources
6. Qld Curtis LNG (QGC)
7. GLNG (Santos, Petronas, Total and Kogas)
8. Australian Pacific LNG (Origin and ConocoPhillips)
9. QR National
10. Wiggins Island Coal Export Terminal Pty Ltd
11. Curtis Island water & sewerage

The second scenario, Modest Growth Scenario assumes that in addition to the commenced major development projects that the two most likely proposed projects will also proceed, being the:

- Arrow LNG Plant (Shell and PetroChina joint venture)
- TRUenergy gas fired power station

The third scenario, Solid Growth, assumes that in addition to the workforce involved in Scenario 2, there will also be 10% of the construction workforce move to Gladstone on a permanent basis. This is assumed to be 350 construction workers relocating to Gladstone by 2014.

The fourth scenario, High Growth, assumes that in addition to the workforce involved in Scenario 2 there will be both a relocation of 10% of the construction workforce to Gladstone and 20% of other potential projects will commence.

5. POPULATION, EMPLOYMENT AND PROPERTY PROFILE

This section focuses on the population trends and property market characteristics of Gladstone.

5.1. Population Trend – Driven by Migration

The local government authority, Gladstone Regional Council, manages an area of approximately 10,465 square kilometres with a resident population of 60,317 people (ABS, 2012). In 2001, the population of Gladstone was 46,369 people, rising to 60,317 in 2011 (Table 4.1). This represents an average 3.0% population growth per year between 2001 and 2011, which is faster than the Australian average (1.5% per year) (ABS, 2012; Table 4.1). The region's rate of population growth also exceeds the Queensland's average of 2.4% over the same period. The population of this region is growing faster between 2002 and 2009 because of the increasing development activities and effects of the mining boom that occurred from 2002.

Table 4.1 also exhibits a low rate of population change between 2009 and 2011.This is because the ABS have revised the 2011 population estimates downwards prior to the release of the 2011 Census data. The 2011 population estimate of the Gladstone LGA provided by OESR was 62,986 persons, which is 2,669 persons more than the revised estimate issued with the 2011 Census. The ABS is yet to backcast the population estimates for Gladstone from 2006 to 2010.

Table 5.1: Trend of population in Gladstone, 2001-2011

Year (ending June 30)	Population	Natural increase	Assumed net migration	Annual change (total)	Annual change (%)
2000	45,948				
2001	46,369	—	—	421	0.9
2002	47,659	427	863	1,290	2.8
2003	49,075	471	945	1,416	3.0
2004	50,891	572	1,244	1,816	3.7
2005	52,186	513	782	1,295	2.5
2006	53,941	490	1,265	1,755	3.4
2007	55,716	512	1,263	1,775	3.3
2008	57,780	664	1,400	2,064	3.7
2009	59,643	693	1,170	1,863	3.2
2010	60,204	n.y.a	n.y.a	461	0.8
2011	60,317 [a]	n.y.a	n.y.a	113	0.2
Average	—	543	1,117	1,297	3.0*

Source: OESR, 2011c and ABS, 2012

Note: n.y.a. = not yet available; [a] refers to data from 2011 Census and reflects 2012 adjustment to Estimated Resident Population estimates; *Average annual change between 2001 and 2011 census period

In the Gladstone LGA, an average of 1,117 persons have migrated into the region each year between 2000 and 2011, while the average rate of natural increase has been 543 persons per year between 2001

and 2009. Therefore, the contribution of net migration is much higher than the natural increase to the population of the Gladstone LGA. Moreover, the region has shown a higher proportion of population growth attributed to migration compared to the rest of the State (GAPDL, 2011).

For information on the demographics of the Gladstone LGA, please refer to Appendix A.

5.2. Low Unemployment Rate and High Participation Rate

The unemployment rate in the Gladstone LGA in the September quarter 2012 was 3.8%, compared with Queensland which had an unemployment rate of 6.3% (Table 5.2).

Table 5.2: Unemployment Rate in the Gladstone LGA and QLD, %

Local government area	Gladstone LGA (DEEWR, 2011 and GAPDA 2011)	Queensland (OESR, 2011 and 2012)	Queensland (DEEWR, 2011 and 2012)
Mar-09	4.6	5.7	-
Sep-09	5.0	6.0	5.5
Mar-10	5.7	5.5	6.3
Sep-10	5.1	5.4	5.1
Mar-11	5.0	5.6	5.3
Sep-11	5.1	5.8	5.4
Mar-12	4.3	5.5	5.5
Sep-12	3.8	6.1	6.3

Source: GAPDA, 2011, Gladstone Regional Socio Economic Profile 2010-2011. Internet access: http://www.gladstoneregion.info/Portals/3/DOCUMENTS/Resource%20Docs/GRSEP%2010-11.pdf on 22 February 2012.; OESR, 2011 Queensland Economic Review 2009-11; DEEWR, 2009-11, Small Area Labour Markets, Gladstone, Queensland

The latest quarter is representative of the last three years, in which the region's unemployment rate has been consistently lower than the State average. It is expected that the unemployment rates for Gladstone will remain low over the next two years or more and will continue to be lower than Queensland generally as the major infrastructure projects are constructed.

The region has a high labour force participation rate (72%) compared to the Queensland (67%), average (GAPDEL, 2011), meaning that a higher percentage of the Gladstone population are in the workforce. Gladstone has a relatively high ratio of males to females in the workforce and a relatively older working population.

5.3. Strong Property Market

In 2012, the private rental vacancy rate in Gladstone area was 1.3%, indicating very tight rental availability. By comparison, the overall Queensland vacancy rate was 3.1%. The rental market in Gladstone has experienced strong growth from September 2009 to September 2012 with the median rent on four bedroom housing increasing from $350/week to $625/week (78.57% increase) and three

bedroom houses increasing from $290/week to $500/week (72.41% increase). The prices paid per week for rental units also increased substantially, with the median rent on two bedroom units increasing from $230/week to $400/week (86.44% increase).

Table 5.3 presents the median weekly rents paid for private accommodation in Gladstone from September 2009 – September 2012.

Table 5.3: Median Weekly Rents, Gladstone (2009-2011)

Type of Housing	Median Weekly Rent Sep 2009	Median Weekly Rent Sep 2010	Median Weekly Rent Sep 2011	Median Weekly Rent Sep 2012	% Change 2009-2011
4 bedroom house	$350	$380	$550	625	78.57
3 bedroom house	$290	$310	$430	500	72.41
3 bedroom unit	$295	$300	$410	550	86.44
2 bedroom unit	$230	$230	$320	400	73.91
1 bedroom unit	$200	$150	$230	300	50.00

Source: Queensland Rental Tenancy Authority 2012

The median house price in 2012 was $455,750 according to RP Data, up 15% on 2011 ($397,000) while the median unit price fell by 3% ($359,000 in 2012 and $369,775 in 2011). However residential land prices have increased by 26% (i.e., $237,400 in 2012 and $189,000 in 2011).

6. PREVIOUS PROPERTY BOOMS

This section focuses on the two previous Gladstone property booms and their key drivers.

6.1. Previous Major Development Projects

Gladstone's position as a major location for minerals processing began with the construction of the Queensland Alumina plant in 1967. The plant is one of the largest alumina refineries in the world, and employs more than 1,000 people. The Gladstone Power Station (the largest in the state) was constructed from 1971, and the RG Tanna coal terminal from 1980. According to the Gladstone Economic and Industry Development Board, Cement Australia commissioned their Gladstone plant in 1981, with Boyne Smelters following in 1982 and Orica in 1990.

Major developments between 2001 and 2008 are summarised in the table below. The development of the Yarwun alumina plant by Rio Tinto by late 2004 was the first greenfield alumina refinery constructed in the world since 1985.

Table 6.1: Major Development Projects in Gladstone, 2001-2008

Project name and developer	Estimated cost (A$bn)	Construction workforce	Operation workforce	Timing
Queensland Energy Resources Ltd (QERL)			30	Demonstration plant completed operations in 2004
Rio Tinto Aluminium Yarwun Alumina Refinery – stage 1	$1.50	> 1,000	380 workers and 100 contractors	Plant commissioned in November 2004
Rio Tinto Alcan – Yarwun Alumina Refinery – Stage 2	$2.40	1,350	250	2007-2012
Boyne Smelters Ltd: New Baking Furnance (CBF4)	$0.68	450		2008-2012

Source: GEIDB 2011 and CQU estimate

6.2. Rents Driven by Major Projects

The rental market has been significantly influenced by major infrastructure projects over the last twelve years period, with the two previous booms being the 2002-2003 boom from Yarwun Stage 1 and 2007-2008 boom following Yarwun Stage 2.

Table 6.2 overleaf details the vacancy rates of Gladstone LGA versus the rest of Queensland and the average weekly rent of Gladstone City (Gladstone City, Boyne Island, Clinton, New Auckland, Kin Kora and Tannum Sands). Figure 6.1 also clearly shows the correlation of vacancy rates to major

infrastructure projects (noting in 2008 during the GFC that Rio Tinto halved their construction workforce on Yarwun Stage 2, resulting in 600 workers leaving town).

Figure 6.1: Private rental vacancy rate: Gladstone vs Queensland

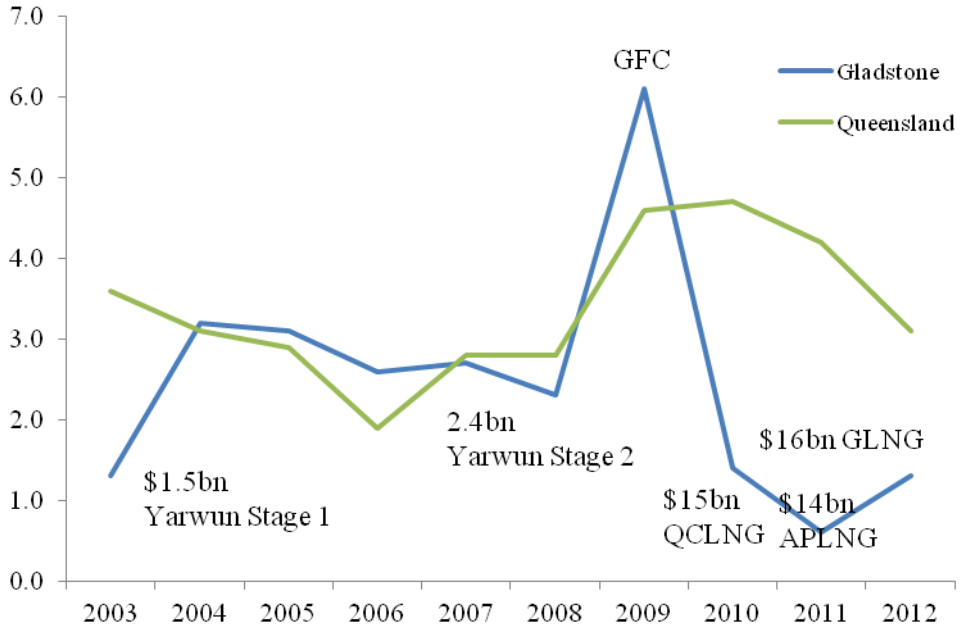


Table 6.2: Average weekly house rent of Gladstone Area: 2001-2011

Year (June Quarter)	Average weekly house rent	Annual Change	Comments
2001	$178	-	
2002	$248	39.4%	Rio Tinto –Yarwun Stage 1
2003	$250	1.0%	Rio Tinto –Yarwun Stage 1
2004	$225	(10.0%)	Rio Tinto –Yarwun completed
2005	$225	0.0%	
2006	$219	(2.8%)	
2007	$249	13.8%	
2008	$263	5.8%	Rio Tinto –Yarwun Stage 2
2009	$310	17.7%	Rio Tinto –Yarwun Stage 2
2010 (June)	$295	(4.8)%	Impact of GFC
2011 (June)	$380	26.7%	LNG projects approved
2011 (Sept)	$393	26.8%	LNG projects approved
2012 (Sept)	$562	43.0%	LNG projects approved

Source: Queensland Rental Tenancy Authority, 2012 (Note: GFC = Global financial crisis)

6.3. Cyclical Median House Price Growth Trend

In line with strong growth in rental incomes, median house prices within the project area have substantially increased from 2001 to 2012. The level of annual median house price increase within the

Gladstone City has been positive over this last decade, ranging from a high of 27.2% in 2005 for detached houses to a moderate 2.6% rise in 2009 (Tables 6.3 and 6.4).

Table 6.3: Gladstone City Area Median House Sale Prices from 2001-2012

Year	House			
	Median sale price	Annual increase	Cumulative annual increase	Annual Sales (Number)
2001	$110,000	NA	NA	-
2002	$123,000	11.8%	11.8%	-
2003	$140,000	13.8%	25.6%	348
2004	$165,000	17.9%	43.5%	341
2005	$210,000	27.3%	70.8%	697
2006	$265,000	26.2%	97.0%	860
2007	$325,000	22.6%	119.6%	755
2008	$346,000	6.5%	126.1%	392
2009	$355,000	2.6%	128.7%	464
2010	$381,000	7.3%	136.0%	537
2011	$412,222	8.2%	144.2%	584
2012*	$604,444	46.6%	190.8	(1549 sales in GRC)

Source: RP Data, 2012 (Note: * GRC figures to September 2012)

Table 6.4: Gladstone City Area Median Unit Sale Prices from 2001-2012

Year	Units and Townhouses			
	Median sale price	Annual increase	Cumulative annual increase	Annual Sales (Number)
2001	77,000	NA	NA	-
2002	113,000	46.8%	46.8%	-
2003	135,000	19.5%	66.2%	39
2004	155,000	14.8%	81.0%	49
2005	190,000	22.6%	103.6%	121
2006	235,000	23.7%	127.3%	169
2007	281,000	19.6%	146.9%	144
2008	302,612	7.7%	154.6%	85
2009	290,000	(4.2%)	150.4%	117
2010	307,333	6.0%	156.4%	105
2011	376,750	22.6%	179.0%	154
2012*	441,917	17.3%	196.3%	(430 sales in GRC)

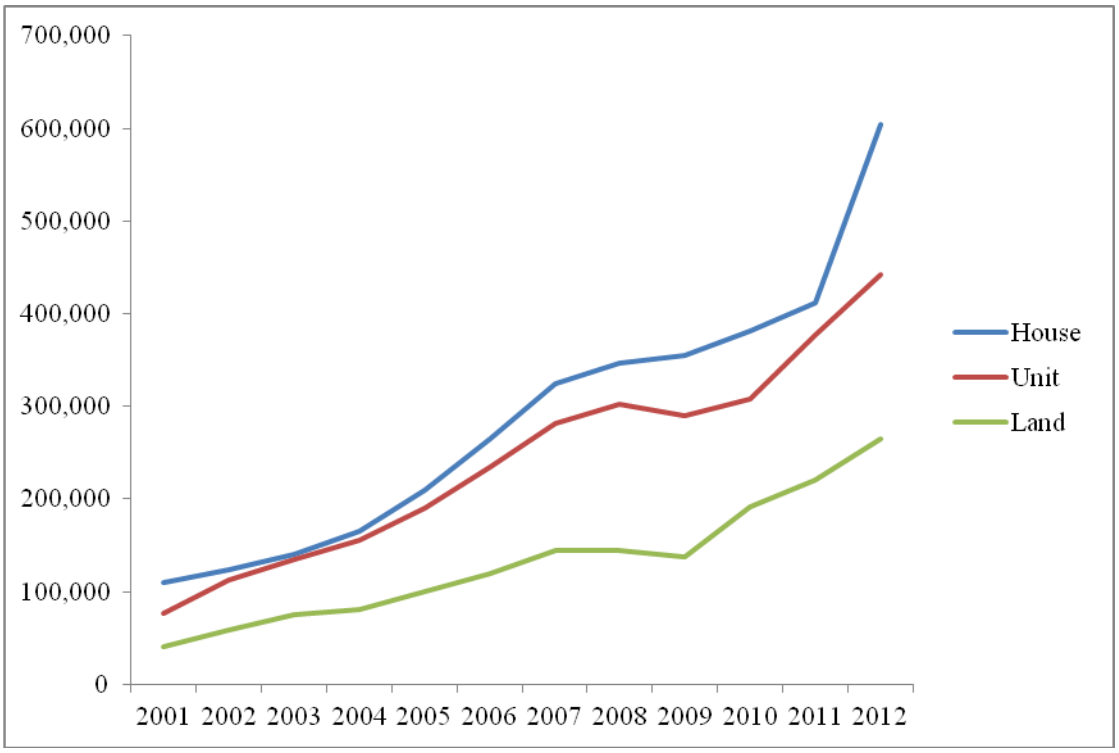
Source: RP Data, 2012 (Note: * GRC figures to September 2012)

For units and townhouses the level of annual increase ranged from a high of 46.7% in 2002 to a fall of 4.2% in 2009. This suggest that the strong demand for housing experienced in 2004-2008 within the

project area may have been partially offset by an increase in housing supply, completed house lots and a general decline in investor confidence attributable to the global financial crises, European debt crises and the Queensland floods in 2010-11.

It is interesting to also note the strong rise in median vacant land lot sale prices in 2010 and 2011, reflecting the strong demand associated with the three approved LNG projects.

Figure 6.2: Gladstone City area median sales price: 2001 -2012



Source: RP Data, 2012

6.3. Previous Rio Tinto Expansion Driven Boom

The Rio Tinto Yarwun Refinery located in Gladstone was a similar project in terms of its nature and size to the 18 projects listed in Table 3.1. The refinery was commissioned in late 2004, with the first full year of operation in 2006. The project employed 431 permanent operational staff with the majority housed in Gladstone during its first year of operation (KPMG 2009). The impact the Yarwun refinery had on property values in Gladstone will be used in this analysis to estimate the likely impact on property values of new projects progressing to 2018.

Estimating the impact on average house prices involves examining housing price time series data for Gladstone to determine if there were any deviations from the trend growth rate in 2006. Median house prices were identified from 2003 to 2011 and compared to prices in 2007 and 2008 (lag years from workforce increase).

The average increase in median house prices in 2007 and 2008 was 24%, compared to an average of 15% over the nine years from 2003 to 2012. For units and townhouses the rate of increase was higher at 34% over 2007 and 2008 compared to a nine year average of 12%.

This suggests that the operation of the Yarwun refinery resulted in an average 14% increase in the growth of median property values in the Gladstone region.

Table 6.5: Gladstone Median Sale Prices from 2002-2012

Year	Median sale price detached houses	Annual increase	Cumulative annual increase	Median sale price - unit and townhouses	Annual increase	Cumulative annual increase
2003	$140,000	n/a	n/a	$135,000	n/a	n/a
2004	$188,000	34%	34%	$155,000	15%	15%
2005	$218,000	16%	50%	$190,000	23%	38%
2006	$240,000	10%	60%	$177,750	-6%	32%
2007	$295,000	23%	83%	$227,750	28%	60%
2008	$364,750	24%	107%	$306,000	34%	94%
2009	$375,000	3%	110%	$330,000	8%	112%
2010	$365,000	-3%	107%	$354,500	7%	119%
2011	$397,000	9%	116%	$369,775	4%	123%
2012*	$455,750	15%	131%	$359,000	-3%	120%

Source: OESR 2012 (Note: *figures until September 2012)

Gladstone's population in 2006 was 53,941 people with an average household size of 2.7 people (ABS 2006). Multiplying the operational workforce of the Yarwun refinery (431) by the average household size (2.7) results in a population increase for Gladstone of 1,164 people. Without the Yarwun refinery it would be reasonable to assume Gladstone's population would have been 52,777. This translates into a 2.2% increase in Gladstone's population as a result of the Yarwun refinery commencing operations.

7. POPULATION AND NEW DWELLING FORECASTS

This section focuses on forecast population increases and new dwelling demand in Gladstone based on ABS, OESR and CEM, CQUniversity data.

7.1. Growth Scenarios

The population and new dwelling projections have been generated by the four separate scenarios for future workforce growth in Gladstone. Outcomes from the four scenarios are summarised in Table 7.1.

In Scenarios 3 and 4, it is assumed that 10% of the third highest construction workforce permanently relocate to Gladstone. This leads to 350 and 791 construction workers respectively being based in Gladstone from 2015. The estimate is higher in Scenario 4 because of the additional projects requiring a construction workforce.

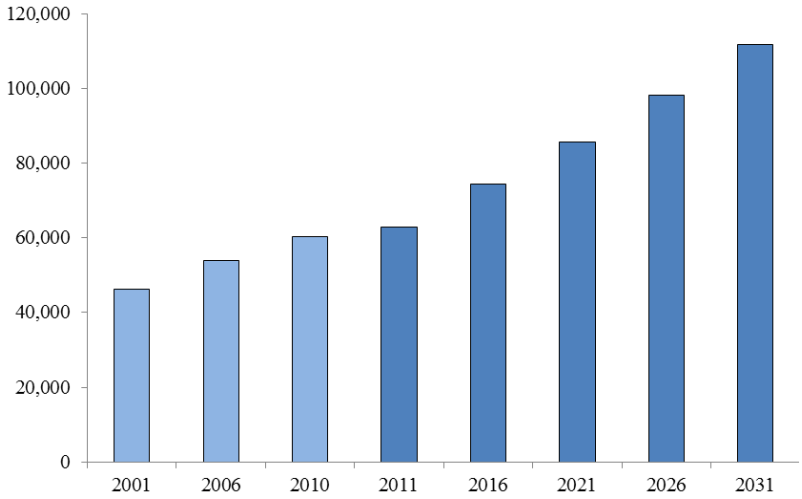
Table 7.1: Summary of modelling predictions for increases in Gladstone by 2018

SCENARIOS	Increases from 2012 to 2018		
	Operational Workforce	Population Increase	Average annual change
Scenario 1: Low Growth	4,640	11,600	2.75%
Scenario 2: Modest Growth	6,580	15,450	3.90%
Scenario 3: Solid Growth	6,582	16,455	3.90%
Scenario 4: High Growth	9,772	24,431	5.79%

7.2. Queensland Government Forecast for Gladstone Population

The trend of population growth in Gladstone is expected to continue with the region's population anticipated by the Queensland Government to grow to around 93,565 people by 2031 under a low growth scenario and as high as 123,420 people under a high growth scenario (Table 7.2 and Figure 7.2). The population of Gladstone was 60,316 (preliminary estimate) in 2010. It is estimated that this population will be nearly double by 2031 (under a high growth scenario).

Figure 7.1: Population in Gladstone, Medium Forecast: 2001-2031



Source: OESR 2011c (note that population estimates are for 30 June each year)

This represents an average increase of 2,435 people per annum between 2011 and 2031, equating to an annual average 20-year growth rate of 2.9%.

Table 7.2: Government predictions of population in Gladstone, 2011-2031

Year	Projected population			Average annual change (medium series)	
	Low	Medium	High	Number	Per cent
2011	62,587	62,982	63,510	1,808	3.1
2016	70,960	74,459	77,629	2,295	3.4
2021	78,004	85,655	91,302	2,239	2.8
2026	85,455	98,174	106,738	2,504	2.8
2031	93,565	111,690	123,420	2,703	2.6
Increase 2011-2031	30,978	48,708	59,910	2,435	2.9
Average annual change	1.98%	2.79%	3.20%		

Source: OESR, 2011

7.3. CQU Population Forecast

The population forecasts took into account three key factors, being:

1. Employment multiplier (assumed to be a multiplier of 4.0)
2. Workforce participation rate (assumed to be 70%)
3. Average household size (assumed to be 2.5 people)

The results of the population modelling for Gladstone are shown in Table 7.3 and Figure 7.2. For comparative purposes, the medium population projections of the Queensland Government have been included in the figures (from Table 7.2).

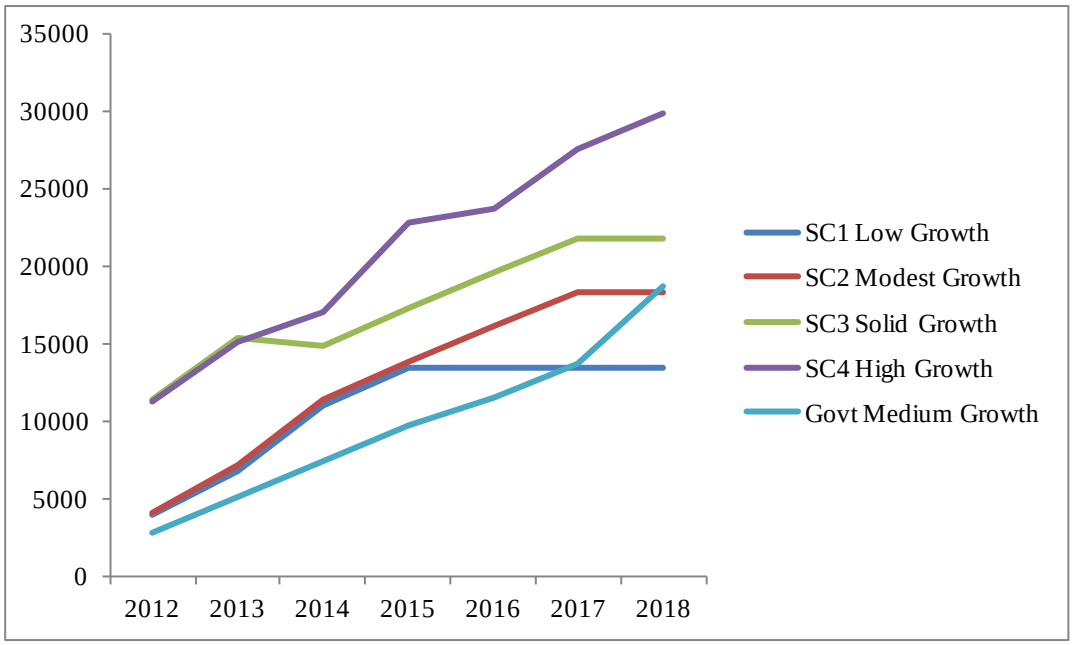
The results of the modelling indicate that by 2018 the population of Gladstone is projected to increase by a low of 11,600 persons under very conservative estimates to a high of 24,431 persons under more expansive scenarios. This compares to population projections of the Queensland Government where the population is predicted to increase by 13,462, 18,678 and 22,782 persons under low, medium and high growth scenarios respectively.

The estimates provided in this analysis match closely with the projections of government, and reflect the robust assumptions used in the modelling.

Table 7.3: Forecast Population Increases by Scenario versus QLD Government Forecasts

	Population Increase	Queensland Government Forecast	Variance
Scenario 1	11,600	13,462 (Low)	1,862
Scenario 2	16,450	13,462 (Low)	-2,988
Scenario 3	16,455	18,678 (Medium)	2,223
Scenario 4	24,431	22,782 (High)	-1,649

Figure 7.2: Population projections to 2018 by four estimated scenarios and government medium series forecast



7.4. Tannum Sands to be Key Growth Corridor

Population growth Gladstone varies by suburb and locality. Future growth areas are expected by the Gladstone Regional Council to be the coastal region to the south (Boyne Island-Tannum Sands-Benaraby-Wordong Heights) with 37% of projected growth, and the Calliope region to the west, with 32% of the growth (Gladstone Regional Council through Tyson et al. 2011).

Table 7.4: Past and projected population growth by local area in Gladstone

	2006	2011	2016	2021	Change 2011-2021	Total Growth	% of GRC Growth
Gladstone CBD	1,550	1,610	1,790	2,110	500	31%	3%
South Gladstone-Barney Point	5,010	5,350	5,500	5,600	250	5%	2%
West Gladstone	4,990	5,240	5,240	5,400	160	3%	1%
Kin Kora-Sun Valley	3,690	3,900	4,040	4,160	260	7%	2%
Telina-South trees-Glen Eden-Toolooa-O'Connell	5,110	6,000	6,300	6,350	350	6%	2%
Clinton-Byellee-Callemondah	6,270	6,800	7,150	7,450	650	10%	4%
New Auckland-Kirkwood	4,280	5,440	5,720	5,880	440	8%	3%
SUB TOTAL GLADSTONE	***30,900***	***34,340***	***35,840***	***36,950***	**2,610**	**8%**	**16%**
Agnes Water-Seventeen Seventy	1,790	2,500	3,200	3,950	1,450	58%	9%
Boyne Island-Tannum Sands-Benaraby-Wurdong-Heights	10,940	13,400	16,300	19,700	6,300	47%	39%
Calliope-Beecher-Burua	3,760	5,800	8,050	10,550	4,750	**82%**	**30%**
Rural South East-Miriam Vale	3,670	4,020	4,320	4,580	560	14%	4%
Rural West	2,920	3,060	3,200	3,360	300	10%	2%
TOTAL GRC	***53,980***	***63,120***	***70,910***	***79,090***	**15,970**	**25%**	**100%**

Source: Gladstone Regional Council through Tyson et al. (2011)

7.5. New Dwelling Demand Forecast

Demand for new dwellings was estimated by dividing population increases by average household size (2.5 people). This indicates that the total number of new households in Gladstone is expected to be between 4,640 and 9,772 by 2018, with an average expected increase of 940 and 1,396 households per annum under Scenarios 3 and 4 respectively. An approximate breakup of housing by different types has been generated in proportion to the pattern of dwelling types in central Queensland (Table 7.5).

Table 7.5: Gladstone's dwelling demand forecasting to 2018

	Total Households	Households per year				
		Total per year	Separate house	Semi-detached/ townhouse	Flat / unit / apartment	Other
New Dwelling Demand (%)			78.3%	2.7%	8.4%	10.6%
Scenario 1: Low Growth	4,640	663	519	18	56	70
Scenario 2: Modest Growth	6,580	940	736	25	79	100
Scenario 3: Solid Growth	6,582	940	736	25	79	100
Scenario 4: High Growth	9,772	1,396	1093	38	117	148

7.6. Rational for Key Assumptions

Employment Multiplier

Employment multipliers can be estimated in a number of ways, but are generally taken from input-output models or general equilibrium models of national, state or regional economies. The research team had access to two input-output models that related to the Gladstone economy. The first, published in Rolfe et al. (2010), modelled how the resources sector contributed to the Gladstone economy in 2009-10. The multiplier of 4.7 identified what the total employment growth in the local area is expected to be for each new position in the resources sector, including the initial position created. An implicit assumption underpinning this multiplier is that the local economy continues to have the same structure in the future.

An additional model built by the research team for a new project assessment at Gladstone had a slightly lower employment multiplier for the wider Fitzroy region of 3.82 (including the initial position created). This reflected assumptions that there were some constraints on growth and expenditure in the Gladstone region because of issues such as housing costs and business capacity, leading to higher leakages in the short to medium term. The lower multiplier is likely to reflect growth in the short term under constraints, while the medium multiplier is likely to reflect growth in the medium to longer term as the local economy adjusts to growth pressures.

For the purpose of analysis in this project, a multiplier of 4.0 has been selected as appropriate for Gladstone, given that there will be some constraints over growth in the short to medium term. A multiplier of 4.0 means that for every new position created there will be an additional 3 positions created in the business supply chain and to service consumption.

Workforce participation

The workforce participation rate has been assumed at 70%, based on a weighted average of the new operating workforce (assumed to be approximately one quarter of the new population and participating at the Queensland average of 67%) and the existing city's participation rate (72%). To account for the potential for construction and operation workforce to be sourced from the existing Gladstone workforce, it has been assumed that 10% of primary workforce will be sourced from the local area, with the remainder to be imported (construction) or relocated (operation).

Average Household Size in Gladstone

The average household size for all occupied private dwellings in Gladstone was 2.6 persons and 2.5 persons in 2006 and 2011 respectively. This compares with an average household size of 2.5 for Queensland in 2012 (Table 7.6).

Table 7.6: Average household size in Gladstone region

Dwelling type	Gladstone				Queensland
	1996	2001	2006	2012	2012
Separate house	3.3	2.8	2.8	2.8	2.8
Semi-detached, flats	1.7	1.7	1.7	2.0	1.8
Others	1.9	1.8	1.9	1.8	1.8
All occupied private dwellings	2.8	2.7	2.6	2.5	2.5

Source: OESR, 2011 and 2012

The average household size in Gladstone has been decreasing, from 2.8 persons in 1991 to 2.5 persons in 2012. This study has used an average household size of 2.5 people in predicting future dwelling requirements to account for the trend towards smaller households over time, and the likelihood that single people will be easier to relocate to Gladstone for employment purposes.

The 2012 Census data for Gladstone indicates that 67% of the population are of working age (aged between 18 and 65). Assuming an average household size of 2.5 persons, an average of 1.7 persons per household will be of working age. At a participation rate of 70%, it is estimated that 1.19 persons per household are in the workforce.

*

8. HOUSING SUPPLY ANALYSIS

This section of the report explores the supply of housing in Gladstone, the region's capacity to adjust to the high demand for housing, and strategies put in place to accelerate investment in housing.

8.1. Property Supply and Values

Large projects can create significant demands for land for housing requirements. Projects that stimulate higher levels of demand through upstream and downstream supply chains are likely to have larger impacts on demands for industrial land, while projects that attract more population through direct, indirect and induced employment effects are likely to have more impacts on housing markets.

These types of impacts can be minor in larger centres where there are ample stocks and development to cater for growth, but have the potential for more impact in regional centres such as Gladstone where stocks and changes in housing market tend to be relatively smaller.

8.2. Housing supply

For the Gladstone Regional Council the number of new building approvals increased in 2012 with 1150 approvals. Compared to 611 approvals in the previous year, these figures represent an increase of 88% in dwelling activity compared to 2012 levels. Table 8.1 provides a summary of the number of new residential dwellings approved for the Gladstone Regional Council from 2003 to 2012.

The data in Table 8.1 indicates Gladstone Regional Council approved 6,138 residential dwellings since 2003 (an average of 614 per year). Separate houses made up 90% of all new dwelling approvals over the year ending March 2012. New dwelling approvals have increased in the region on average by 20% per annum during this period (Table 8.1).

Table 8.1: Private Dwelling Approval Numbers

Year	Total Residential Dwelling Approvals for Gladstone Regional Council	Annual change	Average annual change in dwelling approvals (%)
2003	470	NA	NA
2004	693	223	47.44
2005	448	-245	-35.35
2006	574	126	28.13
2007	676	102	17.77
2008	697	21	3.11
2009	511	-186	-26.69
2010	308	-203	-39.73
2011	611	303	98.38
2012*	1150	539	88.21
Total	**6,138**	**680**	

Source: OESR (2011c) and OESR 2012 (Note: figures are until March 2012)

8.3. Residential land supply

Broad hectare land refers to residential greenfield land and brownfield (greater than 2,500m^2) land that is suitable for residential development. Gladstone Regional Council estimates of land available for residential development is 2,408 hectares including land at Clinton recently gazetted for residential development by the ULDA. Based on the planning scheme intent, existing approvals and an analysis of residential densities by location, this supply is expected to yield between 11,500 (OESR 2011b) and 14,000 dwellings (OESR 2011c). Also identified are approximately 824 hectares of land which will be used to accommodate workers involved in the construction of infrastructure projects in the region.

Gladstone Regional Council approved 1,360 residential lots in the year to March quarter 2012. This was an increase of 3% compared with the same period in 2011 when 1,318 lots were approved (OESR Table 8.2). Approximately 90% of the lots approved for development were at urban densities. Of the 36 development projects producing these lots, 14 accounted for approximately 90% of the total number of lots approved.

In the year to March 2012, Gladstone Regional Council gave operational works approvals for the development of 726 lots. The total stock of lots in Gladstone Regional Council with current operational works approvals in March 2012 was 656. These lots represent approved land that is most likely to be developed in the short term and accounted for 12 per cent of the regions 5,371 uncompleted lots (OESR 2011b). Table 8.2 provides a summary of uncompleted residential lots including data on operational works approvals.

Table 8.2: Uncompleted residential lots in Gladstone

Year to March	Opening stock	Lots approved	Operational works approval	Lots certified	Lots lapsed	Closing stock
2007	1,466	554	NA	435	20	1,565
2008	1,565	814	NA	482	39	1,858
2009	1,858	1,324	578	309	43	2,830
2010	2,830	1,218	339	334	68	3,646
2011	3,646	1,318	327	316	13	4,635
2012	4,715	1,360	726	378	326	5371

Source: OESR 2011b and OESR 2012 (Note: figures are until March 2012)

After the plan containing new lots has been certified by Council, they do not legally exist until the titles have been registered by the Queensland Department of Environment and Resource Management. The number of urban lots registered in Gladstone Regional Council during the March quarter 2011 decreased by 29% to 141 registrations compared with 200 registrations recorded in the preceding quarter. Total lot registrations for the year ending March 2011 were comparable with the previous year (OESR 2011b). Table 8.3 provides a summary of lot registration between 2006 and 2012.

Table 8.3: Lot registrations in Gladstone

Year to March	Standard lots 60 – 2,500 m^2	Units and townhouses	Low density registrations 2500 m^2 – 5ha	Total lot registrations
2006	476	86	87	649
2007	313	152	144	609
2008	462	100	69	631
2009	400	93	117	610
2010	309	133	61	503
2011	302	105	39	446
2012	385	194	111	690
2006-2011 Average	378	123	90	591

Source: OESR 2011b and OESR 2012

Over the 2006-2011 period, the average number of lot registrations was 583 with the peak number registered being 631 in 2008.

Once a building permit has been issued and building activity commenced, the Office of Economic and Statistical Research (OESR 2011b) consider the lot to be consumed. The number of lots consumed in Gladstone during the year ending March 2011 was 531. This was an increase of 116% on 2010 levels (OESR 2011b).

In the year ending June quarter 2011, there were 634 lots sold in Gladstone Regional Council of which 572 were vacant. The remaining 62 lots were either part of a house and land package or consisted of an existing dwelling that was sold after subdivision of a parent parcel. In the June quarter 2011, 95 vacant land sales were recorded with a median value of $215,000. This was a decrease of 17 per cent in land sales volume and an increase of 13 per cent in median value compared with the March quarter in 2010 (OESR 2011c).

8.4. Residential land stock supply

In a recent broad hectare study profile of Gladstone Regional Council, OESR (2011c) sought to compare predicted population growth against available broad hectare land, its likely yield and average persons per household to estimate the number of years of residential land supply in Gladstone Regional Council. The key assumptions used in OESR's (2011c) analysis and the conclusions drawn are presented in turn.

OESR assumed the total area of broad hectare land available in Gladstone was 2,408 hectares of which 1,614 hectares were identified as urban residential land for development and 794 hectares as lower density residential land. Table 8.4 provides a summary of the theoretic dwelling yield and expected dwelling yield taking into account factors affecting development such as ownership and fragmentation. OESR (2011_c) conclude that Gladstone's supply of broad hectare land is sufficient to yield approximately 11, 500 dwellings.

Table 8.4: Gladstone broad hectare stock and dwelling yield

Timeframe (yrs)	High density (ha)	Standard density (ha)	Low density (ha)	Total stock (ha)	Theoretic dwelling yield	Expected high density yield	Expected standard density yield	Expected low density yield	Total dwellings
0-2	4	170	213	387	1,474	175	1,071	228	1,474
2-5	25	576	334	935	4,200	600	2,811	320	3,663
5-10	8	231	0	239	2,183	379	1,497	0	1,876
10	15	549	130	694	4,522	251	3,470	150	3,871
Not specified	8	28	117	153	580	140	151	255	546
Total	**60**	**1,554**	**794**	**2,408**	**12,959**	**1,545**	**9,000**	**953**	**11,498**

Source: OESR, 2012

The average household size in Gladstone for occupied dwellings at the time of 2006 census was 2.8 people and 1.7 people for households and attached dwellings respectively. Table 7.6 presents a range of possible population yields for the broad hectare stock in each density category by a range of household sizes.

The key finding from Table 8.4 is that the available broad hectare land in Gladstone is sufficient to accommodate between 25,900 and 35,100 people. However to determine overall land supply existing vacant residential land stocks below 2,500 square meters need to be added to the broad hectare land stocks. OESR estimate that when this is included the potential dwelling yield in the Gladstone Regional Council increases to 12,824 dwellings.

Table 8.5: Gladstone population yield projections

Development type	Number of dwellings	Household size (average persons per household)				
		2.4	2.6	2.8	3.0	3.2
		Possible population yield				
Low density residential	953	2,287	2,478	2,668	2,859	3,050
Standard density residential	9,000	21,600	23,400	25,200	27,000	28,800
Development type	Number of dwellings	Household size (average persons per household)				
		1.3	1.5	1.7	1.9	2.1
		Possible population yield				
High density residential	1,545	2009	2,318	2,627	2,936	3,245
Total	11,498	25,896	28,195	30,495	32,795	35,094

8.5. Supply to Struggle to Meet Demand

From 2003 to 2011 new residential lot registrations for Gladstone Regional Council have averaged 600 per year (OESR 2011) and dwelling approvals of 554 per year. The Coordinator General (2010a, 2010b) has identified that the normal growth pattern for Gladstone requires 400 to 700 dwellings be constructed each year.

The required average increase of 940 new dwellings per year under the Solid Growth Scenario is significantly higher than the number constructed in 2012 and the highest number constructed in any 12 month period in the last 10 years (690 in 2012). This indicates that current development and supply patterns will fall below future needs.

8.6. Accommodating non-resident workers

Similar to other patterns across Australia, there is an increasing use of non-resident labour force in Gladstone. GAPDL (2009) reported that in 2006 approximately 900 workers (about 4.2% of employment in Gladstone) did not reside in the region but lived elsewhere. The major communities that provided non-resident labour into Gladstone were Rockhampton (100 workers) and Bundaberg (80 workers), while the remainder came from further away. These non-resident workers have been commuting from their own residence or relying on standard accommodation options in Gladstone to house them during shift periods. The level of non-resident workforce is likely to increase in 2011 following the commencement of construction for Gladstone's LNG projects.

There is also potential for purpose built workers' accommodation to be built in the area to service increased use of a non-resident workforce. The Gladstone Regional Council in late 2011 and Gladstone Region LNG Community Consultative Committee in October 2012 supplied the following information regarding the status of development approvals for these units.

- A development permit exists to build a 300 unit workers accommodation facility in Calliope
- A development permit exists to build 240 unit workers accommodation facility in Stage 1 at the Calliope River Road in Calliope, (to be built by Mac Camp group for APLNG)
- A development permit exists to build 1,152 unit workers accommodation facility in Stages 2 and 3 at the Calliope River Road in Calliope, and
- An application is currently in process with the Gladstone Regional Council to build 140 workers accommodation units on the Awoonga Dam Road at Benaraby (not yet submitted to Council).
- A development permit exists to build a 3,000 room workers accommodation development at 149 Stowe Road, Calliope. The development permit is for stages 1-3 of project and preliminary approval for stages 4-10.
- The Curtis Island Workers' Camp began occupancy in September 2012 and it will increase its occupation to 2,600 APLNG employees in 2013.
- APLNG also delivered 59 new properties on August 2012 for mainland workforce housing.
- GLNG developed 45 new properties for their mainland workforce and 20 of these have been occupied. They also are constructing a Curtis Island Workers' Camp, which has currently (September 2011) 500 occupancy and 844 awaiting commissioning. It targets to increase occupation to 2,208 workers in 2013. They are also building Mainland Workers' Camp with a capacity of 120 beds at the MAC facility in Calliope.
- QCLNG delivered 10 new properties at 31 December 2011 for mainland workforce housing and has a further 21 properties under construction. They are also constructing a Curtis Island Workers' Camp with 820 occupancy out of a current 1,056 person capacity (as at 31 July 2012). They will increase their work camp occupation to 1,770 workers in 2013.

It is significant to note that all but one of these proposed accommodation facilities are in Calliope (i.e., 23 km inland from Gladstone CBD) rather than the traditional residential areas surrounding the Gladstone CBD, Tannum-Sands and Boyne Island.

8.6. Integrated project housing strategies

In response to the cumulative impacts of major projects on housing stocks in Gladstone, the Queensland Coordinator General (CoG) in 2011 introduced conditions to LNG project approvals requiring the project proponent to prepare an integrated project housing strategy (IPHS) within 3 months of project commitment. The introduction of IPHSs for LNG companies will contribute to the supply of houses in Gladstone. Each LNG company's IPHS specifically needs to address:

- The likely size, makeup and housing preferences of the projects' workforce and the need for diversity in housing types and tenures including temporary worker accommodation, affordable rental units and houses and houses and units for purchase.
- The need to develop sustainable communities and to overcome negative housing outcomes.
- The circumstances of Gladstone's housing markets and land supply stocks and the residual effects of the global financial crisis (GFC).

Within this context the purpose of the IPHS is to initiate cooperative and coordinated approaches in consultation with other major project stakeholders and Government agencies to resolve cumulative housing impacts, with the outcome of achieving joint mitigation strategies and delivery of housing solutions to achieve the following objectives:

1. Minimise impacts on the availability and affordability of housing in regional communities;
2. Mitigate short term impacts relating to project start-up activities;
3. Improve the availability of housing diversity that sustains low income households within the community;
4. Release supply constraints which inhibit the private housing market from responding to increases in demand;
5. Monitor housing market activity to determine the effectiveness of strategies in stabilising the property market and develop adaptive management practices to respond to them.

In April 2011 the Queensland Premier announced that LNG project proponents will be required to submit quarterly reports on their compliance with the CoG's conditions of approval relating to housing in Gladstone (Queensland Government 2011). The first two projects to publicly release an IPHS progress report are GLNG (Santos, Perones, Total and Kogas) and QCLNG (QGC).

Key housing commitments from the QCLNG and GLNR projects include the following:

- Construction of a 2000 person workers accommodation on Curtis Island
- Construction of 90 new dwellings for their workforce over the next 12-18 months ($19.12m)
- Provision of financial incentives to employees to construct homes in Gladstone
- Agreed funding to be provided to the ULDA by both companies to fast track the development of 250 plus housing lots ($1.1m) in Gladstone's Clinton development area
- Joint funding of $2m provided for the delivery of housing assistance and support programs for Gladstone families

- Establishment of a not-for-profit housing company that, in partnership with a locally based housing provider, will draw on pooled funds of $13m to build affordable housing in the Gladstone region.

It was also revealed in the August 2012 report on Gladstone Regional Housing that the following integrated housing outcomes have been achieved to August 2012:

- 116 dwellings have been delivered and occupied by APLNG, GLNG, and QCLNG as part of the estimated 180 dwellings for their workforce;
- These three companies assisted 247 families across the Gladstone community through a range of housing assistance support programmes;
- They have provided $280,000, and have worked in partnership with the Department of Community Safety and the Gladstone Regional Council, to provide 16 subsidised rental houses for a period of 12 months as part of an Emergency Services Housing Initiatives (Queensland Government, 2012).

Whilst the IPHS commitments for the QCLNG and GLNG projects are significant, they only represent a small portion of the forecast 8,016 new dwellings required in Gladstone between 2012 and 2018 to accommodate the forecast increase of 25,718 persons in the region's population (both forecasts as per the Solid Growth Scenario).

9. HOUSE SALES PRICE FORECAST FOR GLADSTONE

This section details the three models used to forecast median house prices for Gladstone.

9.1. Supply to Lag Demand for Years

A key economic impact of increasing employment and population are additional demands for housing. Housing markets are often slow to respond to additional demands because of the large capital investments and long time frames involved in development. A consequence is that housing prices can rise rapidly in the short term to signal the imbalances between supply and demand forces.

The demographic modelling has identified that there will be substantial population growth in Gladstone in the next five and more years, with an average of 940 new dwellings required per annum under the Solid Growth Scenario. At the same time the supply analysis indicates that supply is likely to remain constrained in the medium term, with growth in supply needing to increase by more than 55% to meet projected demands. It is anticipated that significant gaps between supply and demand will continue in the next few years, as supply will be restrained by labour demands from the major development projects, flow on employment demand from population growth, and competition nationally for labour from other major development projects.

9.2. Forecast Price Growth by Scenario

Three different approaches to modelling trends in housing prices are reported in this section. The first is a simple extrapolation of housing prices during the 2001-2012 period forward to 2018. The second identifies the relationship in the past between housing price changes and population changes, and extends that forward to projected population changes in the future, while the third applies a price impact ratio from a previous growth period in Gladstone to the future.

The below table details the forecast average annual median house price rise and median price estimate for Gladstone houses in 2018 under each of the four scenarios of this report:

Table 9.1: Forecast Gladstone housing median price: 2012-2018 (Simple and Marginal Regression models)

Scenarios	Simple regression model		Marginal change regression model	
	Annual Price Increase	Total Increase by 2018	Annual Price Increase	Total Increase by 2018
Scenario 1: Low Growth	$31,633	$189,801	$16,322	$97,929
Scenario 2: Modest Growth	$31,633	$189,801	$32,800	$196,800
Scenario 3: Solid Growth (central case)	$31,633	$189,801	$38,298	$229,787
Scenario 4: High Growth	$31,633	$189,801	$49,278	$295,670

9.3. Regression model on past prices

The simple Gladstone housing model is basically a regression model of housing prices in Gladstone over the previous ten years (2001 – 2012), which has then been extrapolated to the future. Based on this model, median house prices are predicted to increase from $455,750 in 2012 to $645,551 by 2018 – almost a 36% increase (Table 9.2). In reality the increase may be higher because of the potential imbalance between demand and the capability for the market to deliver the required supply. Confidence intervals for the model suggest an upper bound of $705,846, which is almost a 46% increase compared to the current house price.

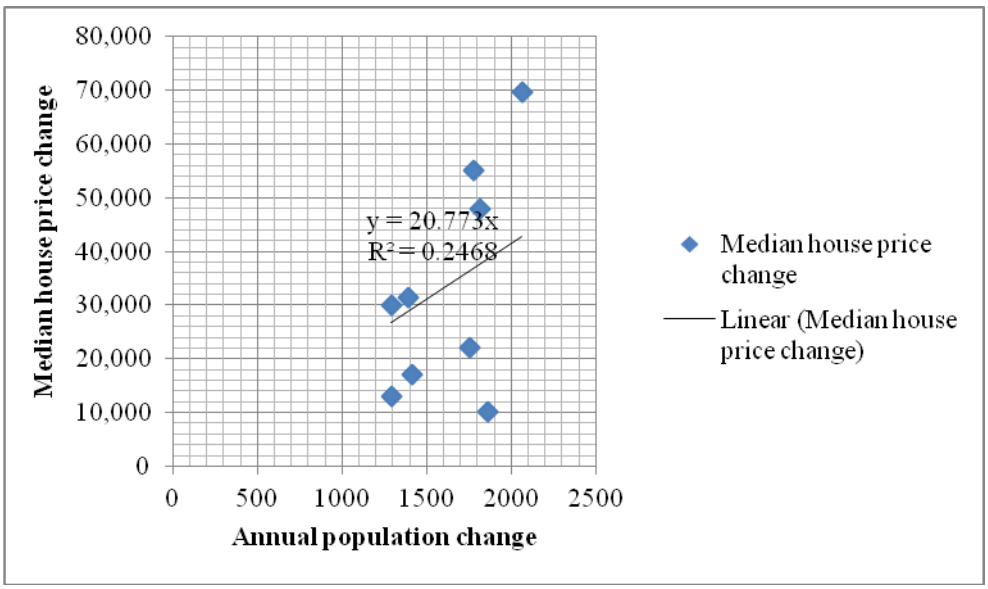
Table 9.2: Forecast Gladstone median house price: 2012-2018 (Simple Regression Model)

Year	Predicted	Change in $	Change in %	Lower Confidence interval	Upper Confidence interval
2012	$455,750	-	-	$455,750	$455,750
2013	$483,409	27,659	6.1	$445,895	$520,923
2014	$515,837	32,428	6.7	$473,895	$557,779
2015	$548,266	32,428	6.3	$501,813	$594,719
2016	$580,694	32,428	5.9	$529,669	$631,719
2017	$613,122	32,428	5.6	$557,480	$668,765
2018	$645,551	32,428	5.3	$585,255	$705,846
6-Year Total		189,801	36		
6-Year average		31,633	6		

9.4. Regression model linking population changes to median house price changes

The second modelling approach compared the change in median house prices each year against the change in population. The strongest model (Figure 9.1) was achieved when house prices lagged population changes by one year. The results show a strong positive relationship between population growth and increasing house prices, although there is some variation in the relationships with higher levels of population growth.

Figure 9.1: Predicted median house price trend against annual population growth in Gladstone



Under the predictions for population growth reported in the previous sections of between 940, 940 and 1,396 households per year for Scenarios 2, 3 and 4 (Table 7.5), house prices are modelled to increase each year by $32,800, $38,298 and $49,278 respectively. Over the six years to 2018, these levels of population increase are expected to increase median prices to $652,550, $685,537 and $751,420 respectively. The yearly increases predicted by the model for Scenario 3 are shown in Table 9.3 (the limited data underpinning the regression means that it is not appropriate to estimate confidence intervals).

Table 9.3: Forecast Gladstone median house price: 2012-2018 (Marginal Change Regression Model – Solid Growth Case)

Year	Predicted Median price	Change in $	Change in %
2012	$455,750	-	-
2013	$516,627	$60,877	13.4
2014	$547,201	$30,574	5.9
2015	$583,122	$35,921	6.6
2016	$618,667	$35,545	6.1
2017	$654,213	$35,545	5.7
2018	$685,537	$31,324	4.8
6-Year Total		$229,787	42
6-Year CAGR		$38,298	7

Source: CQU

9.5. Estimating price impact ratios

Price impact ratios are a forecasting methodology to predict changes in housing prices over short time periods (eg, up to two or three years) where imbalances exist between demand and supply.

Price impact ratios provide a mechanism to predict changes in housing prices in short time periods (over two or three years) when imbalances exist between demand and supply. Price impact ratios for housing prices have been modelled using a four step process described by KPMG (2009) and adapted to this analysis. The four steps of the modelling process are described below:

1. Identify a major project, similar in nature and location to the projects listed in table 10.1
2. Gather historic data on population and property values over the period in which the similar project commenced operation
3. Calculate a price impact ratio based on information about the similar project
4. Use the price impact ratio in conjunction with the cumulative employment data for the proposed projects to estimate the potential impact on Gladstone's property values of all 18 projects proceeding.

The Rio Tinto Yarwun Refinery Stage 2 Expansion has been detailed in Section 6.3 and has been used for forecasting median house price growth between 2012 and 2013.

The price impact ratio is calculated as the increase in average property values resulting from each 1% increase in population. The price impact ratio is multiplied by the percentage increase in population to determine the impact on mean property values attributable to the Yarwun refinery. The analysis suggests that a 2.2% increase in population resulting from the commissioning of the Yarwun refinery resulted in a 14% increase in average house prices in Gladstone. Dividing the increase in house prices (14%) by the estimated increase in population (2.2%) provides an estimate of the increase in property values likely to result from a 1% increase in population. This figure is referred to as the price impact ratio (6.4%).

The price impact ratio provides a means of estimating the impact on property values in Gladstone over the period to 2018. Using an expected population increase of 2,503 people per year on a 2011 population base of 60,317 people generates an annual population growth rate of 4.2%. Multiplying the growth rate by the price impact ratio generates a total increase in property values of up to 26.88% in a single year.

These potential price increases may be increased or mitigated by a number of different factors, including changes in the number of projects that ultimately proceed (affecting the demand for new housing) or increases in the number of new houses constructed (affecting the supply of new housing). Price increases can be expected to stimulate the supply of new housing, providing an automatic adjustment mechanism, so the price impact ratio may only be appropriate for one to three years (until the supply side of the market adjusts). However as previously noted, the required annual supply of dwellings is higher than the 6-year average and higher than any annual supply during this period.

9.4. Summary of Forecast Annual Median House Price Growth

The results of the different approaches to predicting housing price increases is summarised in the table below. These are averages across the seven years between 2011 and 2018. The price impact ratio analysis may be more accurate in the short term (i.e. one to two years) when accommodation

pressures are high, but is likely to fall over time as supply and demand adjustments to housing pressures occur.

The Marginal change regression model is likely to be the most accurate predictor of price changes over the medium to longer term. From this model, the annual price increases under Scenarios 2, 3 and 4 are $32,800, $38,298 and $49,278 respectively. The price impact ratio models identify that annual price increases of up to $62,524 are possible if there are major imbalances between supply and demand, but these are unlikely to persist for more than one or two years.

Table 9.4: Summary of models for annual housing price increases: 2012-2018.

	Annual population Growth	Simple regression model	Marginal change regression model	Price impact ratio model (will only apply for some years)
Scenario 1: Low Growth	1,657	$31,633	$16,322	$20,709
Scenario 2: Modest Growth	2,350	$31,633	$32,800	$41,617
Scenario 3: Solid Growth (central case)	2,351	$31,633	$38,298	$48,592
Scenario 4: High Growth	3,490	$31,633	$49,278	$62,524

10. IMPACTS AND CONCLUSION

This section of the report provides a summary of the assessment of potential housing and accommodation impacts for the construction and operation phases of the developments projects in Gladstone.

10.1. Changes and impacts

As estimated earlier, the development projects will directly employ 1,350 to 2,192 operational workforce by 2018 and employees will need to be accommodated mostly within the Gladstone area. The development projects will employ up to 8,150 construction workforce until 2016. Currently, some of them already in rented accommodation within the Gladstone area and a few of them reside in the nearby regional town in Rockhampton. Most of the construction workforce are expected to be accommodated in temporary housing facilities and to have very limited impact on housing markets. The multiplier effects to accommodate the new workforce has been modelled to create up to a further 8,948 employees (11,930 total permanent workers) under high growth scenarios as a consequence of indirect impacts.

The unemployment rate in Gladstone area is lower than the State average and there is a skill shortage in this region. Most new workforce will need to be imported, with subsequent requirements to provide appropriate housing and services. Currently the vacancy rate in the Gladstone area is very low, with some subsequent impacts on housing and rental prices. It is clear that the confirmed development projects are/will place additional pressure on the already tight housing and rental market in Gladstone.

The cumulative impacts of all confirmed projects will significant increase rental and sale prices over the next seven year period. Under the Solid Growth Scenario, it is forecast that 6,582 new dwellings will be required by 2018 to accommodate the expected population increase in Gladstone.

10.2. Land and housing supply

The key findings from Sections 7 and 8 are that the available broad hectare land in Gladstone is sufficient to build up to more than 12,000 dwellings, but that historic rates of lot approvals, lot development and housing construction are much lower than will be required to accommodate the projected population increase.

From 2006 to 2011 new land lot registrations for Gladstone Regional Council have averaged only 613 per year (OESR 2011) and peaked at 1150 in 2012. This is substantially lower than the approximate 940 new dwellings per annum needed each year under the Solid Growth.

10.3. Impacts on housing prices

Confirmed newly started projects and forthcoming development projects will impact on the local and regional labour markets and social infrastructures. The new labour force has already affected Gladstone property markets since the second quarter of 2010, and currently both rental and sale housing market is very tight. To accommodate the new operational work force Gladstone will need to develop new residential lots and houses. The evidence provided in this report suggests that development rates will need to increase substantially to meet the additional demand that is expected.

Under the central, 'Solid Growth Scenario' for this report, median housing prices for Gladstone are forecast under regression modelling to increase by between $31,633 and $38,298 per annum on average as a consequence of the market pressures, over the next six years.

The challenge for the Gladstone Regional Council lies in ensuring the development and release of residential lots and the construction of new dwellings is sufficient to match predicted industry and community demand. The capacity of the region to achieve this growth without the involvement of major investment and construction firms currently not operating in Gladstone would appear low.

Figure10.1: Scenario 3 (Solid Growth) Population Forecast, 2011 to 2018

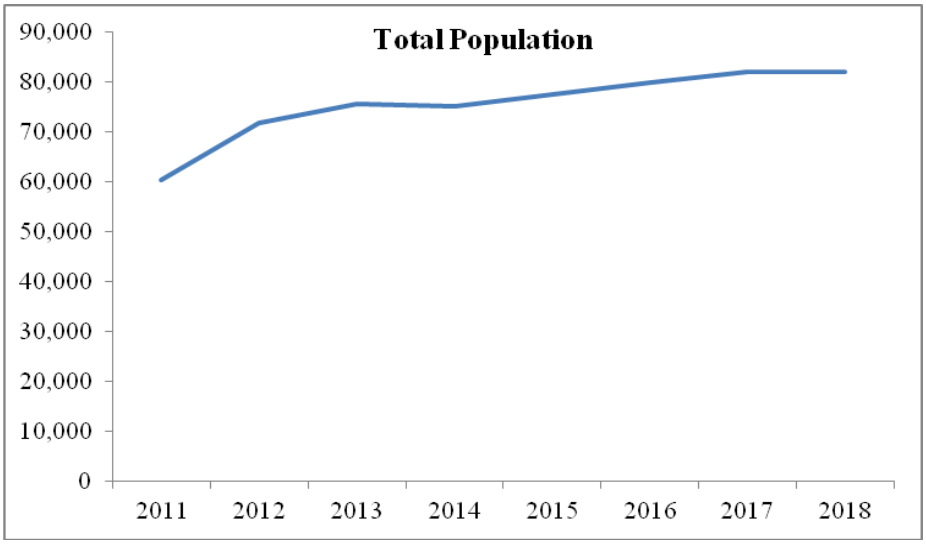
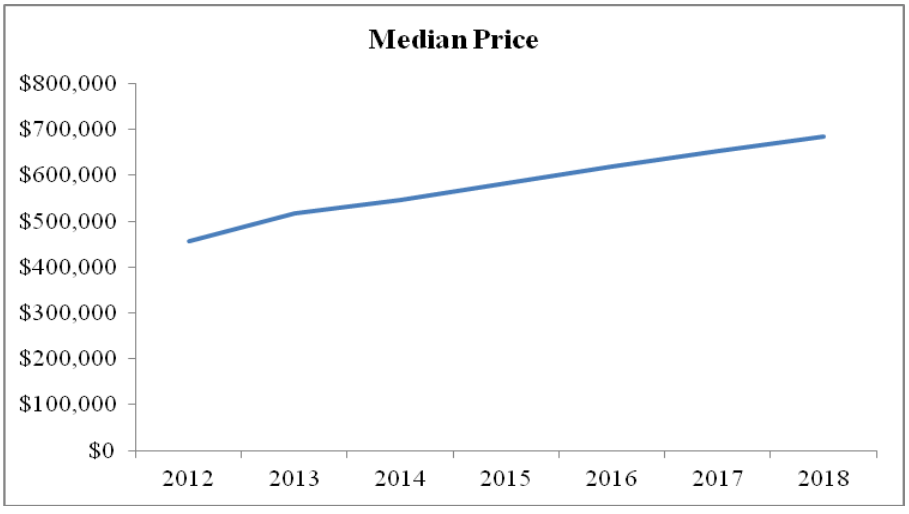


Figure 10.2: Scenario 3 (Solid Growth) Median House Price Forecast, 2012to 2018



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APPENDIX A: DEMOGRAPHIC PROFILE

This section focuses on the demographic profile of Gladstone.

A.1. Gladstone Demographics

The impact of development projects on demographic characteristics of a region is important because demographic characteristics underpin needs and demand. Therefore establishing the baseline demographic profile of a region is necessary to understand and calculate impacts of development projects. In general, the unique demographic charactristics of Gladstone can be described as:

- a strong family oriented community, with a relatively higher proportion of younger people, working adults and families with children;
- a lower proportion of people 50+ than the State as a result of the high proportion of those of working age;
- relatively low proportion of Aboriginal and Torres Strait Islanders and people from non-English speaking backgrounds, although many nationalities are represented;
- a transient population;
- relatively high incomes; and
- a work oriented community, with a low unemployment rate and high labour force participation rate.

A.2. Age-Gender Structure

Age and gender are inherent attributes of a community and represent the most basic type of demographic information. It provides a context for understanding requirements for infrastructure and services. Many socio-economic and demographic characteristics, such as education, economic activity, fertility, migration, disability and living arrangements vary not only by age but also by gender.

A.2.1 Population by age in Gladstone

In Gladstone as 2011, 22.9% of persons were aged 0 to 14 years, 68.0% were aged 15 to 64 years and 9.1% were aged 65 years and over. Table A.3 shows that, relative to State averages, there are a greater proportion of youth residents in Gladstone, aged 14 years and below (23.0%) and fewer mature aged persons over 65 years (9.0%). In 2011, more than two-thirds (68%) of the Gladstone population were aged 15 to 64 years, compared to 67.4% for Queensland). The age structure in the Gladstone region is likely to be caused by the presence of mining and industrial employees who have migrated and are living in the Gladstone region along with their families.

Table A.3: Population by age in Gladstone, 2011

Age groups	2011	% of total region	% of Queensland
0.0-14 years	13,231	22.9	20.0
15-24years	7,432	12.8	14.3
25-44 years	16,725	28.9	28.3
45-64 years	15,233	26.3	24.8
65+ years	5,271	9.1	12.6

Source: ABS 2012

A.2.2 Population by gender in Gladstone

In 2011, of the total population of Gladstone, 72.2% were males of working age group (15-64), while 67.2% were females of the same age group. In Queensland, 67.7% were male of working age group and 67.5 % were female of same age group (Table 4.4).

Table A4: Population by age and sex in Gladstone, 2011

Age groups	Male (%)		Female (%)	
	Gladstone	Queensland	Gladstone	Queensland
0-14 years	20.0	20.5	23.3	19.3
15-24years	11.7	14.6	12.5	13.6
25-44 years	25.3	28.3	29.4	28.3
45-64 years	35.1	24.8	25.3	25.6
65+ years	7.8	11.8	9.5	13.2

Source: ABS, 2012

A.3.2 Migration of labour force

Labour force migration data has not been shown in 2011 census database and here we used 2006 census data. Gladstone has shown a higher proportion of population growth attributed to migration compared to the rest of the State. Between 2001 and 2006, Gladstone has attracted a net of 375 persons from other parts of the Queensland (Table A.6). At the same period (2001-2006), Gladstone has attracted a net 1,446 persons from other parts of Australia. It is to be noted that people who have migrated from other parts of Queensland and other states of Australia are not only people of working age groups but also children. Nevertheless, this indicates a significant movement of labour force in Gladstone. Over the five years to 2006, net migration to Gladstone totalled 1,821 including people of all age groups (Table A.7). Among them, net migrants of the 5-14 year age group and working age groups (15 to 64 years) are 687 and 1,392 respectively.

Table A.6: Migration of population in Gladstone, 2001-2006

Migration into, and out of Gladstone Regional Council, 2001 to 2006	Number	% of in and out migration
Current residents who moved at least once between 2001 and 2006	23,373	-
Residents who had moved within Gladstone Regional Council	11,536	49.35
Migration from other parts of Queensland	7,405	31.68
Migration to other parts of Queensland	7,030	80.68*
Net migration from other parts of Queensland	375	-
Migration from other parts of Australia *(excluding Queensland)*	3,129	13.4
Migration to other parts of Australia *(excluding Queensland)*	1,683	19.31*
Net migration from other parts of Australia *(excluding Queensland)*	1,446	-
Migration from other countries	987	4.22

Migration to other countries	not available	-
Net Migration from other countries	not available	-

Source: ABS, 2006

Note: *percentage of out migration has been calculated based on total outmigration.

Table A.7: Migration for Gladstone by age group, 2006

Age group	In	Out	Net
5 to 14 years	2,110	1,423	687
15 to 24 years	1,508	1,858	-350
25 to 34 years	2,274	1,451	823
35 to 54 years	3,445	2,449	996
55 to 64 years	809	886	-77
65 years and over	388	646	-258
Total	**10,534**	**8,713**	**1,821**

Source: ABS, 2006

A.3.3 Profile of working population in Gladstone

As 2011 Census data for the labour force is not yet available, the profile of workers presented below provides information on the people who worked in Gladstone during the week preceding the Census in 2006. The profile of workers gives an insight into the size and structure of the day-time population as opposed to the 'residential' or 'night-time' population.

The estimated workforce in Gladstone according to the 2006 census was 20,087 people. Out of this number, 57.7 % were male and 42.3 % were female. It is to be noted that 39.2 % of total work force belonged to 35-49 year age groups, while only 11% of total workforce belonged to the 55-64 year of age group (Table A.8).

Table A.8: Working population status in Gladstone by age and sex 2006

Working population summary	Number	% (%)
Total Workers and gender		
Males	11,590	57.7
Females	8,497	42.3
Total working population	20,087	100.0
		Age structure (years)
15 to 19	1,635	8.1
20 to 24	1,934	9.6
25 to 29	1,890	9.4
30 to 34	2,224	11.1
35 to 39	2,487	12.4
40 to 44	2,725	13.6
45 to 49	2,645	13.2
50 to 54	2,067	10.3
55 to 59	1,466	7.3

60 to 64	739	3.7
65 and over	275	1.4
Total working population	**20,087**	**100.0**

Source: ABS, 2006 (Note: 'Workers' refers to the people who work in the Gladstone Regional Council but may live elsewhere.)

APPENDIX B: SOCIAL PROFILE OF GLADSTONE

This section describes the social profile of Gladstone, and includes information on the liveability of the region and a description about some community and human services in the region.

D1.1. Regional Liveability

The Socio-Economic Index for disadvantage is derived by the Australian Bureau of Statistics from a large number of social indicators recorded in the 2006 Census. It allows an objective comparison between the levels of disadvantage experienced between areas. Attributes such as low income, low educational qualifications, high unemployment, %age of single parent households and public housing levels are all factored into the calculation of the index. Locations with low index value represent communities with a higher level of disadvantage. For Census Collection Districts (CCDs) across Australia, the average (population weighted) SEIFA score on the index of disadvantage is 1,000. Therefore areas with an index above 1,000 are above the Australian average and so relatively less disadvantaged; while index figures below 1,000 indicate areas of relatively greater disadvantage when compared to the nation.

An empirical study conducted by Greer et al. (2010) shows that the communities of the Gladstone region in general, are happy with the region's current liveability though there was a perceived need of more funding for essential infrastructure to improve the liveability of the region. Transport infrastructure and the condition of key roads were identified as key priorities. Also identified was the need for planning and construction of key infrastructure to stay ahead of future industry developments in the region (Greer et al., 2010).

Gladstone Regional Council's SEIFA score for 2006 is 1002. This figure is above the Australian average (1000). This means people of Gladstone Region are less disadvantaged. However, there are some areas in Gladstone with a lower SEIFA index score (i.e. the areas of highest disadvantage in Gladstone Regional Council), were:

- Rural South East - Miriam Vale (908)
- Gladstone City (933)
- South Gladstone - Barney Point (945)
- Rural West (945)
- West Gladstone (964)

D1.2. Community Services

Service infrastructure includes a wide range of built facilities, services and networks of organisations. These include:

- Community facilities like schools, hospitals, police/fire/ambulance stations, child-care centres, youth facilities, cultural facilities like libraries and theatres, recreations and sporting facilities, facilities for older people including accommodation and social housing.
- Community services like health services, children and family services, aged care services, disability services, multicultural services, housing services and training services
- Community services networks like interagency groups,

Table A.1 shows early childhood education and care services in Gladstone region. The total number of early childhood education and aged care services including family day care, kindergartens and long day care centres is 18. This figure represents 0.07% of Queensland's facilities of same services. There are 7 aged care services providers (Table A.2). Aged care services are provided by two types of care: community care and residential care. Aged care services are distributed at 256 different places in the region. The region has 13 schools and two hospitals (Table A.3). The region also has emergency services such as ambulance, fire service and police stations.

Table D.1: Early childhood education and care services, 2011

Area	Family day cares	Kinder gartens	Long day cares	School aged cares	Total
Gladstone	1	5	9	3	18
Queensland	88	374	1,532	630	2,671
Region as % of Queensland	1.1	1.3	0.6	0.5	0.7

Source: OESR, 2011 and ABS, 2006

Table D.2: Aged care services

	Providers	Number of place by care type		Total places
		Community care	Residential care	
Gladstone	7	53	203	256
Queensland	857	8,017	31,755	40,161
Region as % of Queensland	0.8	0.7	0.6	0.6

Source: OESR, 2011

Table D.3: Emergency services, schools and hospitals

	Police stations	Ambulance stations	Fire service	Schools	Hospitals
Gladstone	1	1	1	13	2
Queensland	340	262	243	1734	271
Region as % of Qld	0.3	0.4	0.7	0.7	0.7

Source: OESR, 2011 and ABS, 2006

D1.3. Human services – need for assistance

This population is defined as people who need assistance in their day to day lives with any or all of the following activities – self-care, body movements or communication – because of a disability, long-term health condition, or old age. Information on these factors may be used in the planning of local facilities, services such as day-care and occasional care and in the provision of information and support to carers. They help in understanding the way individuals and families balance their paid work with other important aspects of their lives, such as family and community commitments.

Table D.4: Population by age for need for assistance in Gladstone region and Fitzroy statistical division

Core activity need for assistance (Persons by age)	**Gladstone Regional Council area**		
	2006		
Enumerated data	Number	%	Fitzroy (SD) %
0 to 4 years assistance needed	19	0	0.1
5 to 14 years assistance needed	167	0.3	0.4
15 to 19 years assistance needed	51	0.1	0.1
20 to 24 years assistance needed	39	0.1	0.1
25 to 34 years assistance needed	90	0.2	0.2
35 to 44 years assistance needed	143	0.3	0.4
45 to 54 years assistance needed	191	0.4	0.6
55 to 64 years assistance needed	287	0.6	0.9
65 to 74 years assistance needed	195	0.4	0.7
75 to 84 years assistance needed	262	0.5	0.9
85 years and over assistance needed	169	0.3	0.7
Assistance needed total	**1,613**	**3.1**	**5.1**
No need for assistance	46,913	90.7	88.6
Not stated	3,180	6.2	6.3
Total	**51,706**	**100.0**	**100.0**

Source: ABS, 2006

Analysis of the need for assistance of persons in Gladstone Regional Council area compared to Fitzroy - Wide Bay-Burnett Statistical Divisions shows that there were a smaller proportion of persons who reported needing assistance with core activities. Overall, 3.1% of the population reported needing assistance with core activities, compared with 5.1% for Fitzroy Statistical Divisions (Table A.4). The major reason in the age groups reporting different needs for assistance in Gladstone Regional Council area and Fitzroy Statistical Divisions is that the former has a smaller percentage of persons aged 75 to 84 (0.5% compared to 0.9%).