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1 Executive summary

1.1 Context

Karratha was established in 1968 on the central coast of the Pilbara region, 1557 kilometres north of Perth and 240 kilometres southwest of the region’s other major town, Port Hedland. Karratha’s genesis was the need for a centre to service and accommodate iron ore mining company employees working in the Hamersley Ranges inland, as well as on the freight rail and the port facilities at Dampier. Another major wave of growth in the 1980s, driven by the North Shelf West Venture, boosted Karratha’s role as a service centre for on and off-shore oil and gas facilities. Renewed investment in resource projects during the 2000s, again boosted Karratha’s role as a major service and administration centre.

Recent development in the suburbs of Tambrey, Nickol and Baynton has accommodated significant residential growth since 2006. Today Karratha is home to an estimated 14 000 residents, and provides services to an estimated 4000 - 6000 fly-in fly-out (FIFO) workers.

In November 2009, the Western Australian Government announced its Pilbara Cities vision to build on the resource boom to improve life in the Pilbara and turn Karratha and Port Hedland into diverse, 21st Century cities. This report is a component of the essential planning process to enable that vision, pinpointing what is being done, what needs to be done and the constraints that have to be overcome if the town is to grow into an attractive new era Pilbara City.

This report is one of a suite of Regional HotSpots that focus on areas of the State most impacted by changing economic and social conditions. They are prepared for the Infrastructure Coordinating Committee (ICC) of the Western Australian Planning Commission (WAPC) by the Department of Planning (DoP) with contributions from the ICC agencies. The HotSpots inform on availability of land for future residential, industrial and commercial uses and identifies the planning and infrastructure coordination needed to meet demand.

1.2 Key points

- Population growth, serviced land, housing scarcity and constrained infrastructure are among Karratha’s greatest current challenges.
- The limited capacity of Karratha’s infrastructure is imposing critical constraints on residential, industrial and business growth, although major upgrades are in progress or planned.

Economic outlook and business investment

- Karratha is at the centre of some of the world’s richest resource deposits of iron ore, natural gas and oil. This drives major business investment in mining, processing and transport infrastructure to feed export and domestic markets. Karratha acts as a hub for accommodation, goods and services supporting the construction and operational phases of those capital investment projects, requiring additional residential, industrial and commercial land.
- A round of massive investment in the 2000s to increase the throughput capacity of existing operations and to open up new resources, meant a corresponding increase in demand for developed land and infrastructure. Throughout the challenging economic conditions of the Global Financial Crisis, the committed investment projects maintained strong direct employment and wages in the town. This project investment also has considerable multiplier effects for ancillary employment, goods and services. Many of the projects currently under construction are scheduled to be commissioned during 2010 and 2011.
- Iron ore royalties which have been the backbone of Western Australia’s economy for over forty years will increase as a result of many of these business investments which enable the export of significantly greater tonnages.
- The positive economic outlook for commodity demand and prices may trigger a new round of expansion as long as there is access to investment capital.
- As projects move from construction to operational phases, workforces are likely to shift from a predominance of FIFO employment to higher levels of resident workforces, which will maintain pressure
for additional residential land and housing. Business decisions regarding the mix of FIFO and resident employees are therefore critical to determining the impact on land and housing demand.

- Attracting and maintaining workers will remain a high priority in Karratha for the medium-term. Incentives such as housing and social amenity will be an essential part of keeping key workers in the town. Normalisation of Karratha will potentially offer additional opportunities for business investment.

Employment and wages

- Estimates of resource related employment for Karratha are highly variable, due in part to the volatility of resource sector investment, and are exacerbated by difficulties accessing projected employment numbers from resource companies due to commercial confidentiality.

- Government and industry projections show that even after taking the Gorgon project into account, the Pilbara’s construction employment is likely to peak at approximately 28 000 in 2012, and decline as the capital investment phases of these projects is completed. Resource companies indicate that this may be a sharp decline across the region with a loss of around 25 000 workers over six years representing nearly 90 per cent of the current construction workforce. However, the actual rate of this decline will depend on whether resource companies commit to new investment on projects that are currently under consideration. These industry estimates may be overly conservative as a number of resource companies reported only construction employment for new and existing projects that are at an advanced planning or approvals stage, and excluded the more speculative projects.

- In contrast, operational, maintenance and service employment will increase. The 2010 Pilbara Industry Community Council (PICC) data indicates that the Pilbara region’s resource related employment (excluding construction workers) is projected to grow from 31 000 in 2010 to 47 000 in 2015, and reach 54 000+ by 2020. Figures include residential employment increasing by 28 per cent over the period 2010 to 2015, and FIFO employment increasing by 83 per cent between 2010 and 2015, and by a further 23 per cent to 2020. Increasing operational, maintenance and service employment related to resource projects will underpin demand for local housing, depending on the proportion of workers who are resident versus FIFO.

- The Pilbara region has a large number of transient workers (including FIFO) who are not included in estimates of the resident population. This group accounts for a significant proportion of the population in many Pilbara towns, adding approximately 10 to 25 per cent to the resident population. The PICC data suggests that the contribution of FIFO workers to the total resource related employment will increase over time, from 49 per cent in 2010 to more than 61 per cent of total resource related employment in 2020. This larger component of FIFO workers is an increase over 2008 figures.

- Resource related employment in Karratha has also resulted in a highly competitive market for skilled construction workers. This has created labour shortages in the local housing construction industry, contributing to the high cost of housing. There is also a shortfall in employment in the tertiary (service) sector; particularly health care and social assistance occupations in comparison to Perth.

- Compared to Western Australia as a whole, Karratha has a relatively large number of residents on very high incomes. Few Karratha households are in the State’s middle-income bracket.

- Income disparity between those who are, and those who are not, employed by the resource companies is having a direct affect on housing affordability. Growing numbers of people outside the resource industry are finding Karratha housing difficult to afford. Karratha is in critical need of affordable accommodation to house employees in the retail, hospitality, tourism and general service sectors.
Population

The Shire of Roebourne had an estimated resident population of 18,828 persons in June 2009 (based on Australian Bureau of Statistics estimates), and recorded an average annual growth rate of 2.8 per cent over the period 2004 to 2009. Karratha accounts for more than 71 per cent of the shire’s population, and had an estimated resident population of 13,435 persons in June 2009. The Pilbara Industry’s Community Council (PICC) estimates a total service population of 29,391 persons for the Karratha/Dampier/Burrup/Roebourne locality by 2015.

The population structure of Karratha differs from the rest of the state: there are more young people, more males and less elderly persons than the state average. Karratha’s population is also more mobile, and many Karratha residents have either moved to different addresses within the same statistical local area or had moved from other parts of WA within the last 5 years.

The WAPC, in its role as State demographer, has endorsed the use of the population projections prepared by the PICC by all agencies for forward planning in the Pilbara. PICC estimates a resident population of 16,282 for the Karratha/Dampier area by 2015.

Population growth in Karratha has traditionally depended on the investment cycles for major projects and has generally stagnated when there has been no new construction. Pilbara Cities vision is a departure from project-led population growth to a policy-led position to normalise Karratha and will require significant Government intervention to achieve aspirational growth targets. The Pilbara Cities vision targets a population for both Karratha and Port Hedland of 50,000 people by 2035, which would require each centre achieving an annual average population growth of 4 to 5 per cent maintained over the next 25 years.

Zoned land

There is currently more than 1160 ha of undeveloped land zoned for residential/urban uses in the Karratha area. Most of this land is located south of the Karratha Hills (840 ha) and requires significant infrastructure investment for development to proceed. Recent consultation for the Pilbara Cities growth scenario shows a community preference to keep Karratha’s development north of the hills and conceptual plans indicate it is possible to accommodate the target of 50,000 people without having to develop any of the already zoned land that is south of the hills. Land will need to be developed at higher minimum densities if this target is to be achieved.

An additional 1156 ha has been identified for potential future residential development in the draft Karratha City Growth Plan (areas not currently zoned residential or urban development).

As at June 2010, there was approximately 61 ha zoned for commercial, retail and mixed business uses in Karratha, of which approximately 5 ha was undeveloped.

There is 276 ha of undeveloped industrial zoned land in Karratha, with 362 ha identified as developed.

Subdivision approvals

At 30 June 2010, there were more than 511 residential lots with conditional approval for subdivision. A large portion of these lots will likely reach final approval stage in the short-term, improving the supply of residential lots to the market.

Analysis of the residential land development pipeline data reports a current lack of subdivision applications at the application stage, indicating a potential shortfall of lots (beyond Baynton West lots) flowing through the pipeline to final approval stage in the short-term. Subdivision applications for developments at Madigan Road and Nickol West are likely to be lodged before the end of 2010.
Over the last 10 years, Karratha has experienced relatively low levels of industrial subdivision activity, although activity has increased sharply in the last two years. There were 124 industrial lots with conditional approval for subdivision at 30 June 2010.

Residential land and housing demand

- There is a backlog of unmet land and housing demand from the previous investment boom and during 2009 only 229 new houses and 18 other residential dwellings received building approval - well short of meeting the potential demand. On a positive note, a large number of residential building lots are currently under construction (Baynton West) and will reach the market in the short-term.
- The housing shortage means house prices will remain a major challenge in the short-term. While residential land prices during 2009 were less than those recorded in metropolitan Perth, Karratha’s median house price was significantly higher. In December 2009 the median house price was $716,500 compared with Perth’s $455,000. This can be attributed to increased demand and constrained supply.
- Scarcity of housing limits diversity in the economy, the ability for private and public organisations to provide services and the opportunity for the towns to develop mature, functioning housing and labour markets. In Karratha this causes a high turnover of workers and the displacement of lower-income households from town.
- The volatility of house prices acts as a disincentive to prospective longer term residents, and investors from making a financial commitment to living or investing in Karratha.
- There is a critical need for a more diverse range of housing in the region including more affordable accommodation for service workers (to support the retail, hospitality, tourism and general service sectors) and increased levels of medium and higher density dwellings.
- Developing and selling residential land does not have an immediate effect on increasing housing supply due to dwelling construction delays.
- Building costs experienced in the Pilbara region are significantly higher than that of the Perth metropolitan region. This is due to a number of factors including a lack of competition, distance and freight costs and high labour costs as a result of labour shortages. The availability of house and land packages is likely to increase in the short-term.

Land release

- Residential land and housing releases likely to become available in the short-term include the remaining stages of Baynton West, Madigan Road, Tambrey Primary School surplus land and the Tambrey Mixed Use Precinct. Analysis indicates that more than 1000 lots/dwellings will become available to the market in the short-term (0-2 yrs) and an additional 4500 dwellings over the two to five year period. The release of land and dwellings will be subject to demand and resolution of a number of planning, environmental and servicing issues.
- The private sector is expected to become increasingly involved in land and housing development in Karratha, with the release of a number of development superlots via expression of interest processes.
- Assuming an unmet demand of approximately 1500 dwellings, supply of housing is not expected to meet demand until 2013 to 2014. Areas identified in the Karratha City Growth Plan are expected to easily meet dwelling demand if developed in the timeframes reported.
- Demand for general and light industrial land is expected to be met in the short to medium term with the development of the Gap Ridge Industrial Estate. Additional sites have been identified in the Karratha City Growth Plan, which should cater for demand into the future.
- Additional retail and commercial floorspace will be required in Karratha under medium and Pilbara Cities growth scenarios. Recent planning work suggests that this demand could be met through sites identified in the Karratha City Centre Master Plan and Karratha City Growth Plan.
There is strong demand for development of additional tourist accommodation facilities in Karratha, with very high occupancy rates currently being recorded. There are a number of projects in the planning stage that will offer additional short-stay accommodation. Provision for additional accommodation facilities has also been identified in the Karratha City Centre Master Plan. Continuing demand for residential and transient workforce accommodation will influence the availability of rooms for short stay purposes.

**Infrastructure**

- Major upgrades to utility infrastructure are on the critical path to ensure growth can be serviced beyond 2010. Limitations in infrastructure capacity currently constrain residential and industrial growth.

- Substantial residential and industrial growth forecasts for the area indicate that the existing water allocation may be reached within the short-term. The Water Corporation is currently undertaking water source planning for the West Pilbara scheme, and is considering several options including alternative groundwater sources and a seawater desalination plant on the Burrup Peninsula.

- The current capacity of wastewater treatment plant No. 1 (Mulataga) is likely to be sufficient in the short-term. The capacity of wastewater treatment plant No. 2 (Gap Ridge) has some spare capacity, but its operation is limited by the capacity of the treated wastewater storage and disposal system. The location of wastewater treatment plant No. 2 limits further expansion of this plant, given conflicting land uses in the area.

- Horizon Power’s load in the Pilbara has grown significantly in recent years. The current demand supply balance is becoming increasingly tight and does not cater for expansion in the region. Horizon Power is presently evaluating a range of options to procure this capacity.

- Distribution networks may also need upgrading if there are substantial increases in density within existing suburbs, such as those proposed in the Karratha City Growth Plan and Karratha City Centre Master Plan.

- Limitations to the supply of and access to, sufficient quantities of basic raw materials increases construction costs and may potentially pose a constraint to some developments.

### 1.3 Regional HotSpots and the Urban Development Program

The Regional HotSpots series assess land for future residential, industrial and commercial uses and identifies the planning and infrastructure coordination needed to meet demand across selected regional centres in Western Australia. The series has been prepared by the DoP, for the WAPC.

Key aspects of these reports are:

- demand drivers specific to each regional centre including an assessment of the major economic factors that influence employment and population growth – and therefore the demand for land and housing;
- assessment of zoned land supply for residential, commercial, industrial and tourism uses;
- detailed infrastructure assessments coordinated with land development;
- planning and environmental approvals assessments including Native Title agreements as well as environmental heritage and subdivision approvals; and
- infrastructure mapping indicating sites, buffer areas and corridors required for existing and future infrastructure.

This Regional HotSpots series has been prepared as part of the Urban Development Program (UDP) and is the result of consultation with a number of stakeholders, including local governments and servicing authorities. The series will also act as a key component of the forthcoming Pilbara Planning and Infrastructure Framework.

The most recent edition of all the Regional HotSpots publication editions can be accessed online at: [www.planning.wa.gov.au](http://www.planning.wa.gov.au)
1.4 Pilbara Cities

On 27 November 2009, the State Government announced the Pilbara Cities blueprint, an initiative to encourage more people to live and settle in the Pilbara. The State Government’s vision for Pilbara Cities is for modern vibrant regional centres that can support and deliver a skilled workforce for major economic projects in the Pilbara. The realisation of this vision rests on the promotion of quality regional living with modern services and facilities which will encourage the development of strong local communities. The blueprint includes proposals for major revitalisations of South Hedland, Karratha, Newman, Dampier, Tom Price and Onslow town centres, in addition to plans to create new marinas and improved waterfronts at Port Hedland, Dampier and possibly Onslow. New infrastructure and facilities such as schools, TAFEs, medical facilities, leisure and entertainment facilities and retail precinct are also proposed as part of the plan. The initiative also aims to maximise opportunities for indigenous communities.

Critical to the success of the plan is the attraction of residents and businesses not involved in the traditional mining, oil and gas sectors to the region, creating places where people choose to settle on a permanent basis with access to high standards of services.

To be successful, the Pilbara Cities vision must build on the joint contribution of the private sector, State Government and Federal Government to support the development and prosperity of the region. The private sector will play a crucial role in achieving the plan, including assisting with the delivery of affordable accommodation solutions by the release of development sites and superlots for the development of land and housing, including opportunities in the private rental market.

The relationship between key State Government agencies and groups is outlined in Figure 1.

Figure 1: Pilbara Cities governance structure (State Government)
1.5 Karratha overview

The establishment of iron ore operations in the Pilbara region followed the lifting of Commonwealth restrictions on the export of iron ore in 1960 due to growth in world demand. The Hamersley Iron State Agreement was signed with the Western Australian government in 1963. In 1966 the Tom Price to Dampier railway was completed allowing the first shipment of iron ore at Parker Point in Dampier.

Karratha was established in 1968 by a joint agreement with the Western Australian Government and Hamersley Iron to support new iron ore operations in the Hamersley Ranges. The construction of the suburb of Bulgarra began in 1969, followed by Pegs Creek in 1975, Millars Well (1980), Nickol (1981) and Baynton (1987). Karratha was gazetted in 1969 and extends from south of the hills to the North-West Coastal Highway. Following continued operation and expansion of mineral, gas and oil resource projects, Karratha has evolved into the administrative centre of the West Pilbara.

The operations of the nearby Dampier Salt project (located 14 kilometres west of Karratha) commenced in 1972. The production capacity of Dampier Salt was increased in stages during the 1990s to more than 5 million tonnes of salt per year. Currently some 3.8 million tonnes is exported annually.

The first phase of the Woodside operated North West Shelf gas fields began in 1980 with construction of the Karratha gas plant and export facilities. The Karratha gas plant was officially opened in September 1984, marking the first sale of gas to the State Energy Commission of Western Australia. In August 1989 exporting of liquefied natural gas (LNG) to Japan began following the completion of processing trains and storage gas tanks at the Karratha gas plant. The North West Shelf Venture currently provides about 65 per cent of total State production and accounts for about one per cent of Australia’s gross domestic product.

The recent development of the suburbs of Tambrey, Nickol West and Baynton West has accommodated significant residential growth since 2006. Today the town has developed into the largest and most economically diverse community in the Pilbara and is home to an estimated 14,000 residents. Karratha also provides services to an estimated 4000 - 6000 FIFO workers.

Overview > for more information see the following links:

Australian Bureau of Statistics: www.abs.gov.au
see 2006 Census QuickStats: Karratha (urban centre/locality)

Pilbara Development Commission: www.pdc.wa.gov.au

Shire of Roebourne: www.roebourne.wa.gov.au

Spotlight on the Pilbara: www.regionalspotlights.com.au
The Pilbara region plays a key role in the economy of the State and the nation. The region is dominated by resource industries including iron ore, oil and gas extraction and processing. Based on data from the Department of Mines and Petroleum, in 2008-09 the Pilbara accounted for 47.6 per cent of the value of State's mining production.

In its Australian Commodities report for the June quarter of 2010, the Australian Bureau of Agricultural and Resource Economics (ABARE) forecasts that iron ore exports will increase by 9 per cent to 396 million tonnes in 2010. This increase primarily reflects the ramp-up of BHP's Rapid Growth Project 4 expansion (completed late 2009) and Rio Tinto's Mesa A development (completed early 2010). Projects such as Fortescue Metal Group's Chichester Hub expansion and CITIC Pacific's Sino Iron Project are expected to increase iron ore exports further still in 2011 with a forecast rise of 7 per cent to 422 million tonnes.

ABARE also predicts that over the 2009-2010 period, the volume of LNG exported will increase by 13 per cent to 17.5 million tonnes. The increase reflects the start-up of the fifth processing train at the North West Shelf project. In 2010-11, Australian LNG exports are forecast to increase by 3 per cent to 18 million tonnes. The start-up of Woodside Energy's Pluto project will underlie this growth, and will increase Australia's LNG exporting capacity by an additional 4.3 million tonnes per year.

ABARE's Australian Mineral Statistics for the June quarter of 2009 indicate that the country's total earnings from mineral exports increased by 37 per cent to $159.7 billion in 2008-09. Increased export earnings primarily reflected the higher contract prices in the first nine months of 2009 and the effect of a 16 per cent depreciation of the Australian dollar. In line with higher production and export prices, the value of Australia's iron ore exports increased by 67 per cent to $34.2 billion.

The economic outlook for the Western Australia is for a return to strong growth over the next few years as business investment recovers strongly and takes the place of public investment as the primary stimulus for the State's economy. This is demonstrated by the components to the Gross State Product as shown in Table 1: Key economic forecasts, statistics and assumptions for Western Australia.
Table 1: Key economic forecasts, statistics and assumptions for Western Australia

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<td>5.25</td>
<td>5.5</td>
<td>5.5</td>
<td>6.0</td>
</tr>
<tr>
<td>State population growth (% p.a.)</td>
<td>3.2</td>
<td>2.6</td>
<td>2.3</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Other key economic forecasts and assumptions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil price (US$ per barrel)</td>
<td>68.9</td>
<td>82.5</td>
<td>86.8</td>
<td>88.4</td>
<td>89.2</td>
<td>89.8</td>
</tr>
<tr>
<td>$US / A$ (cents)</td>
<td>74.6</td>
<td>92.0</td>
<td>88.5</td>
<td>83.5</td>
<td>79.0</td>
<td>74.5</td>
</tr>
<tr>
<td>Iron ore price ($US per tonne)</td>
<td>--</td>
<td>61.7</td>
<td>107.4</td>
<td>96.5</td>
<td>85.7</td>
<td>74.9</td>
</tr>
<tr>
<td>Iron ore royalties (A$ m p.a.)</td>
<td>1 933</td>
<td>1 720</td>
<td>2 676</td>
<td>2 970</td>
<td>3 062</td>
<td>2 929</td>
</tr>
<tr>
<td>Petroleum royalties (A$ m p.a.)</td>
<td>21</td>
<td>30</td>
<td>40</td>
<td>42</td>
<td>43</td>
<td>41</td>
</tr>
</tbody>
</table>

Notes: Growth figures are annual averages over the respective period. Forecasts assume no Commonwealth policy changes.

The contribution of iron ore royalties to the State’s economy will be boosted by more than 50 per cent (see Table 1) by several factors as identified by the Western Australian Department of Treasury and Finance, including:

- a recent surge in prices indicating that iron ore royalties are set to rebound sharply in 2010-11, reflecting strong international demand, especially in China, against a backdrop of a relatively limited global supply response;
- agreements between major producers and a number of Asian steel mills to abandon the traditional annual benchmark pricing system in favour of shorter-term contracts with direct links to spot prices; and
- a substantial increase in production volumes of Pilbara iron ore producers as a result of major capital investment in over the past several years, particularly by Rio Tinto and BHP Billiton.

The outlook (above) was prepared by the Western Australian Department of Treasury and Finance before the Federal Government under Prime Minister Julia Gillard announced agreement with certain major mining companies for a new minerals resources rent tax. Consequently the figures do not take into account any possible effects the tax will have on mining investment decisions.
2.1 Dampier Port trade statistics

Cargo statistics from the Dampier Port Authority show that for the year ending 30 June 2010, 170 million tonnes of cargo was exported through the port. Some 83 per cent or 141.3 million tonnes was iron ore, 10.1 per cent LNG, 2.4 per cent condensate, 2.7 per cent salt, and 1.2 per cent LPG.

Although trade through the port has risen steadily over the last 20 years, it rose 58 per cent between 2004 and 2009 (Figure 2).

The 2008 Dampier Port Development Plan estimated throughput of iron ore to increase by 4 per cent annually to 2040, LNG by 5.8 percent and condensate by 6.1 per cent. A revised port development plan was being prepared at the time Regional HotSpots was published.

Economic outlook > for more information see the following links:

- Australian Bureau of Statistics: [www.abs.gov.au](http://www.abs.gov.au) see Catalogue 8635.5.55.001 - Tourist Accommodation, Small Area Data, Western Australia
- Dampier Port Authority: [www.dpa.wa.gov.au](http://www.dpa.wa.gov.au) see Cargo Statistics
- Department of Treasury and Finance: [www.dtf.wa.gov.au](http://www.dtf.wa.gov.au) see Treasury - Economic Indicators and State Budget
- Tourism WA: [www.tourism.wa.gov.au](http://www.tourism.wa.gov.au) see Research and Statistics
2.2 Business investment

Karratha is at the epicentre of major business investment in natural gas, petroleum, petrochemicals, iron ore and infrastructure. While many of these projects are too far from Karratha for the town to offer employee accommodation, Karratha still acts as a hub for goods and services supporting the construction and operational phases of those projects. In addition, Karratha and nearby Dampier Port are pivotal in the export of minerals, LNG and petroleum.

In its March 2010 edition of Investment Monitor, Access Economics reported that overall the region’s economic conditions were likely to encourage a lift in business investment and that the resources sector was likely to lead the way. Mining investment did soften during the worst of the global financial downturn, but more recently strong demand and price increases for iron ore have reinvigorated investment plans. In fact investment interest in the State’s mining sector hardly faded during the downturn and recent months have seen a lift in project announcements and approvals.

ABARE reports that expenditure on mineral exploration in 2009-10 in Australia is estimated at $5.5 b, the third highest on record, and nearly double the average exploration expenditure of the past 30 years. Iron ore exploration expenditure is estimated to decline by 6 per cent to $555 m in 2009-10, following a 31 per cent increase in expenditure in 2008-09. New capital expenditure in the mining industry in 2009-10 was the highest on record, at $41.3 b, with indications that this may increase further in 2010-11. These figures provide a positive indication of the pace and scale of development in the mineral and energy sector across the nation.

Rio Tinto Iron Ore commenced a $9 b expansion strategy in the Pilbara in 2003. The benefits of this capital investment have come to fruition since 2009, with the completion of the Hope Downs Stage 2 expansion project. Other major projects completed in 2010 include Mesa A (completed early 2010) and Brockman 4 at Tom Price (completed mid 2010). The investment provided a significant economic stimulus for the Pilbara, including employment for up to 3900 people. As these projects move into the production phases, maintenance, servicing and operation of these capital investments will continue to generate new employment opportunities.

The planned West Pilbara Iron Ore Project which includes a new deepwater port at Anketell Point near Cape Lambert; mine-sites near Pannawonica; and a connecting railway through the west Pilbara, will significantly enhance the region’s iron ore export capacity. Capital expenditure for the project is estimated at approximately $4 b. This project, combined with the current phase of Rio Tinto capital investment and its potential joint venture with BHP Billiton will stimulate a further capital investment for a quantum ramp-up of West Pilbara production capacity.

The Gorgon gas project is being developed by Chevron, ExxonMobil and Shell based at Barrow Island located 100 kilometres north-east of Onslow. The Gorgon project is expected to result in $43 b capital expenditure. Based on a 30 year, three train LNG and domestic gas project, peak construction employment in Western Australia may reach 10 000 direct and indirect jobs. Construction and commissioning of the trains is expected to be staggered over an 18 month period. The domestic gas pipeline from Barrow Island will connect with the Dampier to Bunbury natural gas pipeline.

Woodside Energy’s Pluto LNG project is currently under construction with first gas from the Pluto and Xena gas fields (Carnarvon Basin) expected in late 2010 and the first shipment of LNG planned for early 2011. The onshore facilities comprise a single LNG processing train with a production capacity of 4.3 Mtpa, storage facilities and an export jetty. In late 2009, Woodside announced plans to expand the Pluto project to five processing trains, capable of producing more than 20 Mtpa. Woodside is currently undertaking further exploration in order to support the project’s expansion.

Table 2 lists proposed major investments that are likely to affect demand for land and housing in Karratha. In the short to medium term, all projects now under construction or committed will have some impact on the town - but the degree of impact is highly variable. Much depends on the proximity of the project to the regional centre, the proportion of FIFO workers versus local employees and whether the project has on-site or work camp accommodation for its employees.

Understanding the local impact is a critical factor in determining the timing and quantum of future demand for land and housing in regional centres. It is not always possible to accurately determine these demand factors as they are driven by investment decisions which are most often commercial-in-confidence.
## Table 2: Major projects (selected)

<table>
<thead>
<tr>
<th>Proponent / Project</th>
<th>Resource / commodity</th>
<th>Location</th>
<th>Nearest Centre</th>
<th>Production</th>
<th>Capital Investment</th>
<th>Construction workforce</th>
<th>Additional permanent workforce</th>
<th>Start</th>
<th>Status / comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Under construction / committed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apache Energy / Santos – Devil Creek Development Project (processing up to 35 PJpa gas for domestic use)</td>
<td>Natural gas</td>
<td>Devil Creek, 6 km south-east of Karratha</td>
<td>Karratha</td>
<td>50 Tj per day</td>
<td>Condensate – 80 to 160 kT per day</td>
<td>$196 m</td>
<td>330</td>
<td>20</td>
<td>2013</td>
</tr>
<tr>
<td>Caltex / Chevron – Cape Preston Sino Iron Ore Project (magnetics line and processing plant)</td>
<td>Iron ore (magnetics)</td>
<td>Cape Preston, 100 km south-west of Karratha</td>
<td>Karratha</td>
<td>2.7 Mtpa</td>
<td></td>
<td>$52 b (USD)</td>
<td>4,000</td>
<td>5,000</td>
<td>2013</td>
</tr>
<tr>
<td>Gorgon Joint Venture / Chevron Australia Pty Ltd – Cameron Orthore Molecular Hydrogen Plant</td>
<td>Natural gas</td>
<td>Barrow Island, 130 km east of Dampier</td>
<td>Karratha</td>
<td>1.5 Mtpa</td>
<td></td>
<td>$43 b</td>
<td>3,440</td>
<td>3,300</td>
<td>2015</td>
</tr>
<tr>
<td>Hamersley Iron Pty Ltd / Robe River Mining Company Pty Ltd – Seven Mile power station (250 MW, 25 kV transmission line [power station to Cape Lambert] and substation)</td>
<td>Electricity infrastructure</td>
<td>Karratha</td>
<td>Karratha</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woodside / BHP Billiton / Rio Tinto / Chevron / Japex / Australia LNG – NSW GGL Abrolhos project</td>
<td>Natural gas, oil</td>
<td>185 km south-west of Karratha</td>
<td>Karratha</td>
<td>6.0 Mtpa</td>
<td></td>
<td>$1.8 b</td>
<td>unknown</td>
<td>unknown</td>
<td>2013</td>
</tr>
<tr>
<td>Woodside / BHP Billiton / Rio Tinto / Chevron / Japex / Australia LNG – South West Shelf Venture – NSW North Rankin B Redevelopment project</td>
<td>Natural gas</td>
<td>190 km north-west of Karratha</td>
<td>Karratha</td>
<td>6.0 Mtpa</td>
<td></td>
<td>$6.1 b</td>
<td>unknown</td>
<td>unknown</td>
<td>2013</td>
</tr>
<tr>
<td>Total investment / workforce (projects under construction / committed)</td>
<td>$59.7 b</td>
<td>11 640+</td>
<td>3 150+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Under consideration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aura Resources – BallaBalla project</td>
<td>Iron concentrate, Titanium</td>
<td>30 km east of Karratha</td>
<td>Karratha</td>
<td>6 Mtpa (concentrates (10 Mtpa ultimately), 280 000 tpa Titanium concentrate (470 000 tpa ultimately))</td>
<td></td>
<td>$2 b</td>
<td>690</td>
<td>860</td>
<td>2012</td>
</tr>
<tr>
<td>Australian Resources Ltd – Cape Preston Boralal South Iron Ore Project</td>
<td>Iron ore (magnetics)</td>
<td>30 km south of Cape Preston</td>
<td>Karratha</td>
<td>2.4 Mtpa</td>
<td></td>
<td>$2.7 b</td>
<td>2,930</td>
<td>830</td>
<td>2013</td>
</tr>
<tr>
<td>Australian Premium Iron Joint Venture – West Pilbara Iron Ore Project</td>
<td>Iron ore</td>
<td>30 km south-west of Paruna, (Mount Anketell)</td>
<td>Paruna</td>
<td>3.0 Mtpa</td>
<td></td>
<td>$4 b</td>
<td>4,000</td>
<td>930</td>
<td>2013</td>
</tr>
<tr>
<td>Bumpa Nitrates Pty Ltd – Bumpa Ammonium Nitrate Plant</td>
<td>Petrochemicals</td>
<td>Bumpa Peninsula</td>
<td>Karratha</td>
<td>370 000 tpa</td>
<td></td>
<td>$60 m</td>
<td>600</td>
<td>45</td>
<td>2013</td>
</tr>
<tr>
<td>Camper NitrogenOxy Nobel – Ammonia Urea Plant</td>
<td>Petrochemicals</td>
<td>Bumpa Peninsula</td>
<td>Karratha</td>
<td>2.30 mtpa ammonium nitrate</td>
<td></td>
<td>$90 m</td>
<td>1,000</td>
<td>1,300</td>
<td>2013</td>
</tr>
<tr>
<td>Yulees Resources NL – Platinum and palladium deposit</td>
<td>Platinum, palladium</td>
<td>Manikim, 50 km south-east of Karratha</td>
<td>Karratha</td>
<td>$71 m</td>
<td></td>
<td>unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>Joint venture partner being sought.</td>
</tr>
<tr>
<td>WIC Mining Pty Ltd – Cape Lambert Iron Ore Project</td>
<td>Iron ore</td>
<td>Cape Lambert</td>
<td>Wickham</td>
<td>1.5 Mtpa</td>
<td></td>
<td>$3.7 b</td>
<td>3,000</td>
<td>1,000</td>
<td>2015</td>
</tr>
<tr>
<td>Total investment / workforce (projects under consideration)</td>
<td>$14 b</td>
<td>11 780+</td>
<td>3 755+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prefeasibility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apache Energy Ltd – Julimar Devil Creek – Phase 2</td>
<td>Natural gas</td>
<td>Devil Creek, 5 km north of Karratha</td>
<td>Karratha</td>
<td>75 – 155 Tj</td>
<td></td>
<td>$13.7 b</td>
<td>unknown</td>
<td>unknown</td>
<td>2013</td>
</tr>
<tr>
<td>Australian Resources – Sherlock Bay Nickel Project</td>
<td>Nickel</td>
<td>Sherlock Bay, 6 km east of Karratha</td>
<td>Karratha</td>
<td>2 Mtpa</td>
<td></td>
<td>$34 m</td>
<td>unknown</td>
<td>unknown</td>
<td>2013</td>
</tr>
<tr>
<td>Rio Tinto / Robe River – Cape Lambert Port expansion</td>
<td>Port infrastructure</td>
<td>40 km north-east of Karratha</td>
<td>Karratha</td>
<td>1.0 Mtpa capacity increase (Capel Lambert)</td>
<td></td>
<td>unknown</td>
<td>1,800</td>
<td>5,000</td>
<td>2014</td>
</tr>
<tr>
<td>Sasol Chevron Australia – GTL Project</td>
<td>Natural gas</td>
<td>Barrow Island</td>
<td>Karratha</td>
<td></td>
<td></td>
<td>unknown</td>
<td>3,000</td>
<td>3,000</td>
<td>2015</td>
</tr>
<tr>
<td>Total investment / workforce (projects at prefeasibility)</td>
<td>$2.8 b</td>
<td>4,800</td>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Throughout the challenging economic conditions of the Global Financial Crisis, the Pilbara has maintained a number of resource projects which has kept demand for land and housing high. The current “under construction” projects around Karratha have maintained both strong employment and wage income in the town. These factors are the foundation of high demand for land and housing in the town. In addition, the number and scale of “committed” projects drives strong business and private confidence in the area. This directly influences investment decisions of both businesses and individuals for commercial, industrial and residential land.

Table 2 also includes projects that are “under consideration”, typically meaning future stages of projects that are not yet committed or projects in the pre-feasibility stage. While these projects can be in the very early stages of consideration or be quite speculative, they provide an indicator of the potential long-term project investment that could take place.

The continued operation of major resource projects in the Pilbara will maintain resource related employment and drive demand for housing in Karratha. The establishment of new resource projects is also likely to generate additional demand for residential, commercial and industrial land in Karratha.

The timing of existing and new resource projects will also influence the level of demand for land in Karratha. As projects move from construction to operational phases, workforces are likely to shift from a predominance of FIFO employment to higher levels of resident workforces.

2.3 Tourism

According to Tourism WA’s Overnight Visitor Fact Sheet for the Shire of Roebourne, on average 112,400 overnight visitors came to the Shire of Roebourne each year across 2007, 2008 and 2009. Business was the main purpose of visit for domestic visitors at 56 per cent, and holiday/pleasure for international visitors at 41 per cent. The annual average for room occupancy for hotels, motels and serviced apartments with 15 or more rooms for both 2007 and 2008 was in excess of 88.2 per cent. Overnight visitors spent a total of $94 m annually (average of period 2004-05 to 2006-07), with domestic day trip visitors spending another $15 m annually over this time period.

Research by the Tourism Forecasting Committee shows that between 1999 and 2009 the annual growth rate for visitor nights in regional Western Australia (excluding Perth) was -1.2 per cent. Total visitor nights in regional Western Australia are predicted to increase by 0.4 per cent each year between 2009 and 2019, which is lower than that forecast for Perth, at 2.5 per cent. Domestic visitor nights in regional Western Australia are forecast to fall by -0.5 per cent annually over the period 2009 to 2019.

Development of the tourism industry in Western Australia relies on the provision of appropriate infrastructure, which services the needs of tourists and encourages investment by the private sector. Tourism WA facilitates infrastructure development through its reports Tourism Development Priorities, which identify key infrastructure projects for tourism development across the State.

Tourism WA monitors private and public sector tourism development activity across the State, maintaining a comprehensive database that tracks the progress of tourism accommodation projects. A summary is published annually in the Tourism Accommodation Development Register. At June 2009, the register reported 10 projects at the planning stage in the north-west tourism region, with an estimated cost of $150 m.

Business investment > for more information see the following links:

Access Economics: www.accesseconomics.com.au see Investment Monitor
Department of Mines and Petroleum: www.dmp.wa.gov.au see Prospect magazine
Pilbara Development Commission: www.pdc.wa.gov.au see Pilbara Projects Update
3 Employment and wages

3.1 Industry of employment

Census 2006 data indicates the following trends with employment and wages in Karratha:

- mining and construction employment accounts for 35 per cent of all employment in Karratha (based on place of usual residence);
- employment in the mining and construction industries is tied heavily to the price of commodities and the decisions of major resource companies;
- there is a shortfall in employment in the tertiary (service) sector; particularly health care and social assistance occupations in comparison to Perth;
- public administration and safety (7 per cent) and education and training (8 per cent) employment proportions are equivalent to those recorded in Perth;
- a lower proportion of residents were working in the professional, scientific and technical services sector in comparison to Perth;
- an increase in predominance of FIFO workers;
- a total labour force (including unemployed persons) of 6153 at the 2006 Census, of which 72 per cent were employed on a full-time basis.

Industry of employment data collected from the 2006 Census is shown in Figure 3.

Karratha's high demand for both skilled workers and accommodation has led to increased wages, higher property prices and high rents. Flexible work practices such as extended shift rosters, plus greater use of temporary housing, have made FIFO arrangements common.
3.2 Income distribution

Compared to Western Australia as a whole, Karratha has a relatively large number of residents on very high incomes. Few Karratha households are in the State's middle-income bracket.

Based on data collected in the 2006 census, in Karratha (urban centre), the median weekly individual income for persons aged 15 years and over who were usual residents was $940. The equivalent median weekly individual income across Western Australia was $500. The median weekly household income in Karratha was $2078, compared with $1066 in Western Australia. Approximately 40 per cent of Karratha residents reported a gross weekly income above $1000, compared to 20 per cent across the State as a whole.

Income distribution for Karratha, Pilbara and Western Australian residents is shown in Figure 4.

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Source: Catalogue 2068.0 Census Tables – Industry of employment by occupation, Australian Bureau of Statistics (2007)

Source: Catalogue 2068.0 Census Tables – Gross individual income (weekly) by age by sex, Australian Bureau of Statistics (2007)
3.3 Working patterns

The 2006 Census showed 51 per cent of employees in the Shire of Roebourne worked more than 40 hours per week, which was higher than that of the State at 31 per cent (Figure 5). When broken down by industry, about 14 per cent of the Shire’s mineworkers and 12 per cent of its construction workers were working extended hours (i.e. 41 or more hours per week).

3.4 Labour force

The 2006 Census showed Karratha’s residents formed about 60 per cent of the Shire of Roebourne’s labour force. About 20 per cent of the total workforce were employed in mining compared to 5 per cent for Western Australia as a whole. According to the ABS report Towns of the Mineral Boom, Karratha’s labour force participation rate was 82 per cent - based on people’s responses on census night.

The Small Area Labour Markets data produced by the Department of Education, Employment and Workplace Relations indicated an unemployment rate for the Shire of Roebourne at 3.9 per cent for the March 2010 quarter. This is a significant rise over the 2 per cent recorded at the same time in 2009. In the March quarter 2010, there was a total labour force of 10,167 with 392 unemployed.

Income disparity between those who are, and those who are not, employed by the resource companies is having a direct affect on housing affordability. Growing numbers of people outside the resource industry are finding Karratha housing difficult to afford.

With so many resource projects now being built, Karratha’s own skilled construction workers operate in a highly competitive market. Anecdotal evidence suggests that many local tradesmen are lured away by mining wages. Consequently the skills needed for residential construction are in short supply with the result that Karratha homes not only cost more but they also take longer to build.

Figure 5: Census 2006 working patterns by industry - Shire of Roebourne and Western Australia

(b) Comprises employed persons who did not work any hours during the week prior to census night.

Employment and wages > for more information see the following links:

Catalogue 2068.0 (2006 census tables): Karratha (urban centre/locality) - Industry of employment by occupation (place of usual residence and location on census night) Industry of employment by gross individual income (weekly) (place of usual residence)

Department of Education, Employment and Workplace Relations: [www.deewr.gov.au](http://www.deewr.gov.au) see
Small Area Labour Markets - Australia

4. Employment projections

Key points

- Estimates of resource related employment for Karratha are highly variable; however, both government and industry projections show that construction employment will peak in 2010 and decline over the period to 2015 as the capital investment phases of these projects is completed. In contrast, operational, maintenance and service employment will increase.

- There are difficulties in estimating employment numbers due to the changeable and confidential nature of employment estimates by resource companies.

- Varying assumptions are made regarding consequential and indirect workforce multipliers, single/family status of workers and the FIFO/resident workforce components.

- There is no single comprehensive database currently available to source resource related employment information (especially for projects at earlier or pre-feasibility stages of development).

Actions and priorities

- Establishment of a single comprehensive database to source resource related employment information (especially for projects at earlier or pre-feasibility stages of development)

- Comprehensive employment projections need to include the construction workforces employed on existing projects that are coming to completion.

The Pilbara region has a large number of transient workers (including FIFO) which are not addressed through estimates of the resident population. This population accounts for a significant proportion of the population in many Pilbara towns, adding approximately 10 to 25 per cent to the resident population. Estimates of the size of this workforce are critical in order to plan for the demand for services in both the town and region. It is currently estimated that the FIFO population numbers approximately 4000 - 6000 persons in Karratha.

Resource related employment information is not currently available in a single comprehensive database, making it difficult to estimate the size and nature (resident/FIFO) of the workforces associated with future resource and/or infrastructure projects. The most current source of this information is employment projections data prepared by Heuris Partners Ltd for the Pilbara Industry’s Community Council (PICC). This data is summarised below.

4.1 Pilbara Industry’s Community Council (PICC)

The Pilbara Industry’s Community Council (PICC) is undertaking joint planning for major growth in the output of the resources sector in the Pilbara region to 2020. As part of this work, PICC is looking to broaden the understanding of the implications of this growth for service and infrastructure provision arising from the resulting employment and population changes in the region. In 2008, PICC engaged Heuris Partners Ltd to compile a bottom up picture of major planned and potential resource projects and model the resulting direct and multiplier impacts on Pilbara employment and population growth out to 2020. These figures build on the WAPC’s population projections by providing projections on townsite populations and assumptions about service and FIFO populations. Completion of this work coincided with the onset of the global financial crisis, which resulted in the delay or cancellation of a number of projects. Recent economic activity has seen a return of strong interest in new or expanded resource projects in the Pilbara region. In light of the renewed investment outlook in the Pilbara region, a review of the employment and population projections was prepared and published in May 2010.

The PICC approach involved estimating workforce numbers and then applying multiplier assumptions to determine the total
workforce and resident population. The projections produced in 2008 represent the impact from PICC members, and not the total impact from all resource and infrastructure investment in the region. The projections prepared in 2010 however, include input from a broader range of sources, including non-PICC member projects.

The 2008 figures were considered by Government and industry, and stakeholders reached a consensus to use an agreed set of population figures. The WAPC supported the use of the PICC figures for planning purposes but notes that the WA Tomorrow figures should be used for predicting resident population growth in the region.

The 2010 PICC data indicates that, at a regional level, resource related employment is projected to grow from 31 000 in 2010 to 47 000 in 2015, and reach 54 000+ by 2020 (excluding construction workers). These figures are significantly higher than the 2008 projections (an additional 15 000 workers by 2015). Other key points include residential employment increasing by 28 per cent over the period 2010 and 2015, and FIFO employment increasing by 83 per cent between 2010 and 2015, and by a further 23 per cent to 2020. This information is detailed in Figure 6.

The PICC data suggests that the contribution of FIFO workers to the total resource related employment will increase over time, from 49 per cent in 2010 to more than 61 per cent of total resource related employment in 2020. This larger component of FIFO workers is an increase over 2008 figures.

Construction employment is anticipated to peak at approximately 28 000 in 2012 and drop away sharply from 2015 onwards. These estimates are likely to be conservative due to a number of resource companies choosing only to include construction employment for new and existing projects at an advanced planning or approvals stage. The estimated construction employment for the Pilbara region over the period 2008 to 2020 is shown in Figure 7.

Combined resident, FIFO and construction workforce projections by location are shown in Figure 8. This data indicates that the combined population for the Pilbara region reaching more than 103 000 persons by 2012 before stabilising to approximately 98 000 persons over the period 2015 to 2020. This is significantly higher than the 2008 projections which estimated a peak of 75 000 persons.

**Figure 6: PICC resource related employment (2008 and 2010 projections) - Pilbara region**

![Figure 6: PICC resource related employment (2008 and 2010 projections) - Pilbara region](image)

Data for Dampier/Karratha/Burrup is shown in Table 3. This data reflects the total service population for the Dampier/Karratha/Burrup locality, including resident, FIFO and construction workforces. An estimate of the total service population is important in determining the total population who access services and facilities in an area, especially in planning for future service delivery.

The population share for FIFO workers is expected to rise steadily over the period 2010 to 2015 in line with resident population growth. A significant decrease in the total construction workforce is anticipated over the period 2010 to 2015, decreasing from 15 100 to 3800 persons. This non-resident element accounts for 44 per cent of the total population in 2010, falling to 22 per cent by 2015 as construction activity included in the projections tails away.

**Figure 7: Construction employment projections (2008 to 2020) - Pilbara region**


**Figure 8: Combined resident, FIFO and construction workforce projections by location**

The PICC projections use local multipliers between 0.2 and 1.0 to estimate additional indirect employment generated from the resource projects.

The use of local employment multipliers from resource industry projects needs to be treated with caution. A true local employment multiplier relies on an employee spending enough of their income to support other businesses and employees in the local economy. Even with the high incomes of resource workers, it is practically impossible for a single employee to spend enough of their gross income in the local Karratha economy to fully support the wages of another 1.2 or 1.6 workers. Instead, the multiplier benefits of resource projects rely primarily on the contracting practices of the resource company itself and whether it buys goods and services locally, or whether it sources them from other locations.

### Table 3: PICC settlement population projections 2010 to 2015 - Dampier/Karratha/Burrup

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident</td>
<td>20 210</td>
<td>20 359</td>
<td>20 830</td>
<td>21 792</td>
<td>22 627</td>
<td>23 424</td>
</tr>
<tr>
<td>FIFO</td>
<td>1 076</td>
<td>1 235</td>
<td>1 299</td>
<td>1 361</td>
<td>1 511</td>
<td>1 591</td>
</tr>
<tr>
<td>Construction</td>
<td>15 100</td>
<td>11 500</td>
<td>7 900</td>
<td>4 800</td>
<td>4 450</td>
<td>3 800</td>
</tr>
<tr>
<td>Total</td>
<td>36 386</td>
<td>33 094</td>
<td>30 029</td>
<td>27 953</td>
<td>28 588</td>
<td>28 815</td>
</tr>
</tbody>
</table>

Source: Pilbara Industry’s Community Council (PICC): Revised employment and population projections to 2020 (2010)

### 4.2 Employment at 50 000

The Pracsys (2010) report indicates that for a population of 50 000 persons, Karratha would need a resident working population base of approximately 22 500 or an increase in local employment of approximately 16 690 (or 287 per cent). The report also suggests that higher growth in employment in the retail/consumer and knowledge intensive consumer services would be required for Karratha (functioning as a city of 50 000), with a relative decline in the proportion of persons employed in the export/driver and producer services category (Table 4).

### Table 4: Current and projected employment levels by category – Karratha

<table>
<thead>
<tr>
<th>Employment category</th>
<th>2006</th>
<th>Projection for population of 50 000</th>
<th>Per cent increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export/driver products</td>
<td>1 051</td>
<td>3 311</td>
<td>215</td>
</tr>
<tr>
<td>Retail/consumer services</td>
<td>1 585</td>
<td>8 332</td>
<td>426</td>
</tr>
<tr>
<td>Producer services</td>
<td>2 257</td>
<td>6 715</td>
<td>197</td>
</tr>
<tr>
<td>Knowledge intensive consumer services</td>
<td>561</td>
<td>2 810</td>
<td>401</td>
</tr>
<tr>
<td>Knowledge intensive producer services</td>
<td>357</td>
<td>1 332</td>
<td>274</td>
</tr>
<tr>
<td>Total</td>
<td>5 810</td>
<td>22 500</td>
<td></td>
</tr>
</tbody>
</table>


Employment generated by export/driver projects (e.g. resource and infrastructure) is referred to as strategic employment. Population driven employment occurs as a result of population growth (as a result of the generation of strategic employment), and generally includes retail and consumer services and government services such as education and health.
The relationship between strategic project development and employment generation, population driven employment and service provision, and population growth is shown in Figure 9. The availability of land and housing is central to this continuum, and acts as a fundamental enabler.

**Figure 9: Employment generation and population growth continuum**


Employment projections > for more information see the following links:


Chamber of Minerals and Energy Western Australia: [www.cmewa.com.au](http://www.cmewa.com.au) see Pilbara Industry’s Community Council (PICC)

Department of Education, Employment and Workplace Relations: [www.workplace.gov.au](http://www.workplace.gov.au) see Labour Market Analysis

Department of Planning, Western Australian Planning Commission: [www.planning.wa.gov.au](http://www.planning.wa.gov.au) see WAPC Statement - Agreement to use PICC population and employment projections for forward planning in the Pilbara

Regional Development Australia Pilbara - (formerly Pilbara Area Consultative Committee): [www.pacc.pilbara.net](http://www.pacc.pilbara.net) see Pilbara Plan
5 Population and demography

5.1 Estimated resident population

Population data from the Australian Bureau of Statistics for the Shire of Roebourne is detailed in Table 5 and Table 6. Data for the estimated resident population, place of usual residence and place of enumeration is shown. Further information on these different count methods is detailed in the glossary of this document.

The Shire of Roebourne had an estimated resident population of 18,828 persons in 2009. Between 2004 and 2009, the shire experienced an annual average growth rate of 2.8 per cent - 0.3 per cent higher than the State. Based on estimates of the resident population by census collection district, Karratha had a resident population of 13,435 persons at 30 June 2009. This equates to 71 per cent of the shire’s population.

Karratha accounted for more than 71 per cent (11,725 persons) of the shire’s population in the 2006 census (place of usual residence). However, the number of persons present in Karratha on census night 2006 (place of enumeration) was larger, with 13,255 persons recorded. This figure includes residents, tourists, visitors and service populations.

In the 2006 census, Western Australia recorded a net undercount of 3.2 per cent, higher than the national average of 2.7 per cent. While regional figures are not available, it is understood that the undercount is more significant in areas where there is a higher population of indigenous people and young males aged 20 to 29. The Shire of Roebourne is one such area. After adjustments to accommodate the undercount and discrepancies associated with multiple places of residence, the estimated resident population was increased (intra-censal update). These figures reflect only the resident population, not the total service population (i.e. resident plus FIFO and construction workers). Current census methods do not adequately identify FIFO and construction workforces.

Current estimates of the FIFO population in Karratha range between 4000 and 6000 persons.

Table 5: Estimated resident population 2001 to 2009 - Shire of Roebourne

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shire of Roebourne</td>
<td>15,058</td>
<td>15,469</td>
<td>16,005</td>
<td>16,371</td>
<td>16,927</td>
<td>17,650</td>
<td>18,278</td>
<td>18,456</td>
<td>18,828</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>372</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Catalogue 3218.0 Regional Population Growth, Australian Bureau of Statistics (2009)

p preliminary  r revised  a average annual growth rate
Table 6: Census 2006 locality populations - Shire of Roebourne

<table>
<thead>
<tr>
<th>Locality</th>
<th>Census locality population 2006 (place of usual residence)</th>
<th>Locality population 2006 (per cent of local government)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dampier</td>
<td>1 370</td>
<td>8.3</td>
</tr>
<tr>
<td>Karratha</td>
<td>11 725</td>
<td>71.4</td>
</tr>
<tr>
<td>Pt Samson</td>
<td>274</td>
<td>1.7</td>
</tr>
<tr>
<td>Roebourne</td>
<td>857</td>
<td>5.2</td>
</tr>
<tr>
<td>Wickham</td>
<td>1 825</td>
<td>11.1</td>
</tr>
</tbody>
</table>

Source: Catalogue 2068.0 Census Tables, Australian Bureau of Statistics (2007)

5.2 Population structure

The age sex profile for the Shire of Roebourne (Census 2006) highlights the significant differences in the age spread of residents when compared to WA as a whole (Figure 10 and Figure 11). In the shire, 29.5 per cent of the population were aged between 30 and 44, compared to 22.1 per cent for the State. The shire also had a larger proportion of the population aged between 0 and 9 (17.7 per cent). The statewide figure was 13.1 per cent. Interestingly, the proportion of the shire's population at retirement age or older (65+) was only 1.9 per cent – significantly lower than the State's 12 per cent. A higher proportion of the population in the shire was male (54 per cent), compared to 49.8 per cent in the State. The median age of the Karratha population was 30, which is a year younger than for the Pilbara as a whole. Across WA the median age in 2006 was 36.
5.3 Population stability

Compared to the rest of WA, Karratha has a high resident churn factor, recording a lower proportion of usual residents who resided at their current address one and five years ago. Approximately 56 and 24 per cent of Karratha residents lived at their current address one and five years ago respectively, compared to 75 per cent and 48 per cent for the State (Figure 12 and Figure 13). Many Karratha residents had either moved to different addresses within the same statistical local area of had moved from other parts of WA. In terms of Karratha residents who previously resided in other states (5 years ago), the largest number were from Queensland (2.8 per cent), followed by Victoria (2.2 per cent).

Figure 12: Census 2006 - Place of usual residence 1 and 5 years ago - Karratha

Figure 13: Census 2006 - Place of usual residence 1 and 5 years ago - Western Australia
5.4 Household formation

In terms of household structure, the majority (78.7 per cent) of occupied private dwellings recorded at the 2006 census in Karratha were family households (Table 7). People living alone accounted for 17.4 per cent of private dwellings, and a further 3.9 per cent were identified as group households. Group households are defined as two or more unrelated people above the age of 15 living together. In comparison to averages for the State, Karratha has a lower proportion of family and lone person households, and a higher proportion of group households. Evidence suggests that the proportion of group households reported in the 2006 census may have been understated in the Pilbara region.

Based on census data the average household size in Karratha was 2.8 persons and the average number of persons per bedroom was 1.1. This compares with the WA average of 2.5 persons and again 1.1 per bedroom.

<table>
<thead>
<tr>
<th>Household type</th>
<th>Family household type</th>
<th>Number of households</th>
<th>% of total households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family households</td>
<td>Couple families with children</td>
<td>1 517</td>
<td>44.1</td>
</tr>
<tr>
<td></td>
<td>Couple families without children</td>
<td>947</td>
<td>27.5</td>
</tr>
<tr>
<td></td>
<td>One parent families</td>
<td>223</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>Other families</td>
<td>19</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>Total family households</td>
<td>2 706</td>
<td>78.7</td>
</tr>
<tr>
<td>Lone person households</td>
<td></td>
<td>598</td>
<td>17.4</td>
</tr>
<tr>
<td>Group households</td>
<td></td>
<td>136</td>
<td>3.9</td>
</tr>
<tr>
<td>Total households</td>
<td></td>
<td>3 440</td>
<td>100.0</td>
</tr>
</tbody>
</table>


5.5 Population projections - WAPC

In its role as the State’s demographer, the Department of Planning produces forecasts of the State’s resident population for the WAPC. These forecasts are based on assumptions about fertility, mortality and migration.

According to projections released in 2005, the Shire of Roebourne’s resident population is expected to grow at a rate of 1.7 per cent annually over the next 5 and 10 years respectively (from 2010). This is higher than the 1.5 per cent increase forecast for the whole of WA (Table 8).

Figures in Table 8 reflect a ‘business as usual’ approach and do not take the Pilbara Cities initiative into account. The State government’s intention is to encourage growth and support initiatives which will grow the twin Pilbara Cities of Karratha and Port Hedland. If these initiatives are delivered, the DoP/WAPC would anticipate higher growth rates in both the resident and service population than those shown in Table 8.

While population projections are often represented as average annual growth rates, in Pilbara towns, population and employment growth tends not to occur at a steady annual rate, but rather as step change in response to other factors, such as resource project construction cycles.

There are significant population pressures in the Pilbara caused by FIFO workers and short-term contract workers which are not represented by the WAPC forecasts. This additional service population is significant and could add up to 25 per cent to the resident population. The impact of these extra people is not uniform and it is likely that those living in remote areas will exert different pressures to those in regional towns. These issues are addressed in the ABS report, Towns of the Mineral Boom. Population figures in this document reflect the best available data. The use and interpretation of this data is complex (see Australian Bureau of Statistics information paper – catalogue 3107.0.55.006, Population Concepts, 2008) and will be subject to ongoing review and discussion with stakeholders.

An update to the WA Tomorrow projections is due to be released in late 2010 (long-term projections, 25 yrs). Future updates will include both short-term and scenario based projections (25 yrs+), which are particularly relevant for the Pilbara region.
Table 8: WAPC population projections¹ 2010 to 2030

<table>
<thead>
<tr>
<th>Local government authority</th>
<th>Projected population 2010</th>
<th>Projected population 2015</th>
<th>Projected population 2020</th>
<th>Projected population 2030</th>
<th>Average annual growth 2010 - 2015 (per cent)</th>
<th>Average annual growth 2010 - 2020 (per cent)</th>
<th>Average annual growth 2010 - 2030 (per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashburton</td>
<td>6000</td>
<td>6000</td>
<td>6000</td>
<td>5700</td>
<td>0.0</td>
<td>0.0</td>
<td>-0.3</td>
</tr>
<tr>
<td>East Pilbara</td>
<td>7 700</td>
<td>7 500</td>
<td>7 100</td>
<td>6 300</td>
<td>-0.5</td>
<td>-0.8</td>
<td>-1.0</td>
</tr>
<tr>
<td>Port Hedland</td>
<td>14 300</td>
<td>15 000</td>
<td>15 700</td>
<td>16 700</td>
<td>1.0</td>
<td>0.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Roebourne</td>
<td>16 200</td>
<td>17 700</td>
<td>19 100</td>
<td>21 300</td>
<td>1.8</td>
<td>1.7</td>
<td>1.4</td>
</tr>
<tr>
<td>Total Pilbara region</td>
<td>44 200</td>
<td>46 200</td>
<td>47 900</td>
<td>50 000</td>
<td>0.9</td>
<td>0.9</td>
<td>0.6</td>
</tr>
<tr>
<td>Total Western Australia</td>
<td>2 177 630</td>
<td>2 343 380</td>
<td>2 503 690</td>
<td>2 778 310</td>
<td>1.5</td>
<td>1.4</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Source: Western Australia Tomorrow, Western Australian Planning Commission (2005)

¹ Projection for resident population

Age sex profiles based on WAPC projections for the Shire of Roebourne (Figure 14) show similar characteristics to that prepared for the 2006 census (i.e. a larger proportion of the population in the working age range). It is also expected that a larger proportion of the population will be aged 60 and above, in line with general trends of an ageing population.

Figure 14: WAPC age sex profile 2021 - Shire of Roebourne

Source: Western Australia Tomorrow, Western Australian Planning Commission (2005)

5.6 Population projections - PICC

Projections prepared by Heuris Partners Ltd for the PICC (see section 4.1) include an estimate of the resident population in addition to the employment projections. These have been prepared by applying indirect employment and family multiplier assumptions to the projected resident employment data. Projections are available for townsites, although in the case of Karratha, data is available only for the combined areas of Karratha, Dampier and the Burrup (areas were aggregated where the location of employment was unclear). Preparation of this data utilised the 2008 ABS estimated resident population data which is available at local government level only, and not by townsite. Townsite populations were therefore estimated by applying a pro-rata share of the total increase in estimated resident population on the basis of their share in the 2006 census.

The PICC data reports a 2010 resident population of 16 017 for the Dampier/Karratha area, rising slightly to 16 282 in 2015 and remaining stable to 2020. Estimates of the total service population for the Dampier/Karratha area only (excluding other settlements in the Shire of Roebourne) are unavailable.


5.7 Population targets
- Pilbara Cities

The Pilbara Cities initiative, announced in November 2009, aims to encourage more people to live and settle in the Pilbara. The State Government’s vision is for modern vibrant regional centres that can support and deliver skilled workforces for the Pilbara’s major economic projects. Realising the vision rests on the promotion of quality regional living with modern services and facilities which will encourage the development of strong local communities.

Resident population growth is critical to achieving the Pilbara Cities vision, with targets of 50,000 persons set for each of Karratha and Port Hedland by 2035. To achieve this target, both centres would need to sustain an average population growth of approximately 4 to 5 per cent annually over the next 25 years.

Population and demography > for more information see the following links:

Australian Bureau of Statistics: www.abs.gov.au see Catalogue 3218.0 - Regional Population Growth, Australia, 2008-09
Catalogue 3206.0 - Household and Family Projections, Australia, 2001 to 2026
Catalogue 2001.0 - 2006 Census Basic Community Profiles, Karratha (urban centre/locality)

Chamber of Minerals and Energy Western Australia: www.cmewa.com see Pilbara Industry’s Community Council (PICC)

Department of Planning/Western Australian Planning Commission: www.planning.wa.gov.au see Western Australia Tomorrow – Population Report 6

WAPC Statement – Agreement to use PICC population and employment projections for forward planning in the Pilbara
6 Land and housing demand

Key points

- Karratha has a housing shortage - as evident by median house/unit prices and rentals costs, both of which are considerably higher than the Perth metropolitan region.
- Due to the nature of the local industry, demand for land and housing is volatile and difficult to measure. However, it is likely that housing demand will rise further due to increased activity in the resources sector.
- Landgate data indicates that the current sales price of vacant residential lots is $198 000 which is less than that recorded in the Perth metropolitan region ($224 000).
- December 2009 data indicates a median house price of $716 500 for Karratha which is significantly higher than that recorded for the Perth metropolitan region at $455 000. The median price in Karratha has increased by more than 2.5 times in the last five years.

Actions and priorities

- A greater diversity of housing is needed, including more affordable accommodation for service workers. More medium and higher density dwellings should also be established.
- A study investigating building costs in the region is needed to determine which of the construction component costs account for the overall increased costs experienced in the region, and how these costs could potentially be reduced.

6.1 Pilbara Towns Housing Study

The Pilbara Towns Housing Study (2009, unpublished) assessed the housing market conditions and unmet housing needs (to 2015) in the Pilbara towns of Karratha, Port Hedland, Onslow, Newman, Roebourne and Tom Price.

A joint initiative of the Department of Housing and the Pilbara Development Commission, the study reported the following:

- a current apparent demand for 1433 dwellings across the Pilbara region (613 dwellings for Karratha). This includes unmet housing needs from existing residents.
- a latent demand for 2445 dwellings (918 for Karratha). This includes populations outside the region whose residence in the Pilbara region is constrained by a lack of available housing.
- a future demand of 1014 dwellings across the region in a low growth scenario, 3037 and 4736 dwellings for medium and high growth scenarios respectively (560, 668 and 1125 under low, medium and high growth scenarios respectively for Karratha).

The report also provides information on affordability, overcrowding and homelessness, and puts forward a number of recommendations to improve the quantity, quality and affordability of housing in the region. The study is yet to be published.

6.2 Land sales

Between 2001 and 2009 vacant land sales in Karratha increased rapidly, reaching a peak of more than 350 in 2006 (Figure 15). The median sales price for vacant residential lots has increased over time, in line with trends experienced in the metropolitan region. In the year to December 2009, the median sales price for Karratha was approximately $26 000 less than that recorded for the metropolitan region, at $198 000.
6.3 House and unit sales

Karratha’s median house price is significantly higher than that recorded in Perth. In December 2009 it was $716 500 compared with Perth’s $455 000. In fact Karratha’s prices have increased more than 2.5 times in the last five years - up from $250 000 in 2004 (Figure 16). This can be attributed to increased demand and constrained supply. Similar trends can be found in home unit sales (Figure 17).

High housing costs make it difficult for employees to live in Karratha unless employees receive significant accommodation support from their employer. Resource companies often provide staff with this assistance; however many retail, personal services, hospitality and tourism companies are unable to provide this level of accommodation support.

A significant amount of Karratha’s dwelling stock is either owned or controlled by resource companies. As well as purchasing new homes, the companies rent privately owned properties as they become available. Resource company schemes are also offered to employees to either buy or rent houses on the open market.

Scarce housing limits diversity in the local economy and hampers the ability of private and public organisations to provide the services and opportunities for the town to develop mature, functioning housing and labour markets. In Karratha this causes a high labour turnover as workers and their families tend to only stay in the town for as long as jobs last. High-cost housing also displaces lower-income households whether they are renters or potential buyers.

Volatile house prices are a disincentive to prospective, longer-term residents and deter them from making a financial commitment to Karratha. Market volatility also works against the private property sector, with high levels of uncertainty making it difficult for developers to attract finance for both residential and large-scale commercial projects.
Figure 16: House sales 1994 to 2009 - Karratha

Source: Real Estate Institute of Western Australia (2010)
Excludes properties >1 ha

Figure 17: Unit sales 1994 to 2009 - Karratha

Source: Real Estate Institute of Western Australia (2010)
Excludes properties >1 ha
6.4 Building approvals

On average, 165 building approvals were recorded per annum in Karratha over the period 2002 to 2009 (Figure 18). Building approvals have generally increased since 2006, recording an average of 206 approvals per annum over the last five years (2005 to 2009). Approvals for new houses peaked in the September quarter 2008 with approvals for 114 new dwellings recorded, with the largest number of total building approvals (306) also recorded in the 2008 calendar year. A total of 229 new houses and 18 other residential dwellings received building approval in the 12 months to December 2009.

6.5 Residential building costs

Relative to other states, Western Australia along with the Northern Territory experienced the largest increases in house building costs over the five years to September 2009, at 8 per cent growth per annum. This was likely due to the boom in the mining and construction sectors. Macromonitor's Australian Construction Cost Trends report (2010) forecasts construction costs in Western Australia to increase by five to six per cent per annum over the period 2011 to 2013 before slowing to two per cent by 2015.

Building costs experienced in the Pilbara region are significantly higher than that recorded for the Perth metropolitan region. Anecdotal evidence suggests that the cost of building a standard home in Pilbara towns (four bedroom, two bathroom) is approximately $400 000 - $500 000 (excluding land costs). A typical standard dwelling costs approximately $180 000 - $250 000 to construct in the metropolitan region, therefore the costs for a similar product in the Pilbara are approximately double that of the Perth metropolitan region.

Building approval data obtained from the ABS indicates that the average cost per square metre for new houses has almost doubled over the last 10 years (Figure 19). Costs per square metre in the March quarter 2010 were calculated at $955 for the Perth statistical division and $1101 for the balance of the State (for new houses). A peak of $1260 per square metre was recorded in the December quarter 2008 for the balance of the State.

The National Housing Supply Council’s 2008 State of Supply report indicated that the average cost per square metre of new work for detached houses in 2008 was $961 for Perth and $1092 for the balance of WA. The total figure for WA at $1006 per square metre...
metre was the second most expensive in the country, second only to the Northern Territory. Costs per square metre for semi-detached dwellings were slightly higher at $1186 and $1354 respectively. Analysis undertaken by the DoP using data sourced from the Town of Port Hedland indicate an average cost per square metre of $2205 for new single houses. Average cost per square metre was calculated using building licence data over the period January 2009 to April 2010.

Information in the Pilbara Towns Housing Study (unpublished) notes that the cost differential may be due to a lack of competition amongst builders, distance and freight costs, and high labour costs as a result of labour shortages. Difficulties in securing affordable accommodation also impacts upon the availability of tradespersons, which therefore impacts upon labour costs. These costs are generally passed on to the purchaser.

The Pracsys (2010) report identifies the lack of a local construction capability as one of the primary reasons for high construction costs, reporting that local producer services capability is taken up with servicing resource and infrastructure projects at the expense of civil infrastructure and housing projects. High housing and accommodation costs for employees who don’t have access employer subsidies or employer housing makes it difficult for this type of workforce to establish themselves in Pilbara towns.

A detailed study into building costs in the Pilbara would be beneficial in determining which of the construction component costs account for the overall increased costs experienced in the region, and how these costs could potentially be reduced.

6.6 Residential rentals

Data on residential rentals compiled by the Pilbara Development Commission shows that the cost of renting three and four bedroom dwellings has remained relatively consistent over the last two years (Figure 20). The average cost of renting a three-bedroom dwelling in Karratha during the June quarter of 2010 was $1308. This was up $158 on the same period of 2009. Dwellings with four or more bedroom cost $1999 on average in the June quarter 2010 - up $349 on the same period in 2009.

Rental listings increased by more than five times in the year to June 2010, with large increases recorded in the last two quarters of 2009. Most listings were for three and four bedroom dwellings, with listings for smaller properties scarce.

Anecdotal evidence suggests that many properties are being leased at a per room rate and are being occupied mainly by resource sector staff.
The 2006 Census reported Karratha had 2109 rented dwellings. Of all rented dwellings, 935, or about 44 per cent, were classed as being rented through “other landlord type” which included government and private employers and “residential parks” (including caravan parks). Where rents were below $225 a week “other landlord type” provided 764 dwellings and “state or territory housing authority” supplied 410 (Figure 21).

Figure 20: Average cost of advertised rental properties 2008 - 2010 - Karratha

Figure 21: 2006 Census weekly rent by landlord type (occupied private dwellings being rented(a)) - Karratha

(a) Excludes “visitors only” and “other not classifiable” households.
(b) Comprises dwellings being rented from a parent/other relative or other person.
(c) Comprises dwellings being rented through a “residential park (includes caravan parks and marinas)”, “employer-government (includes Defence Housing Authority)” and “employer-other employer” (private).

Source: Catalogue 2068.0 Census Tables – Weekly rent by landlord type, Australian Bureau of Statistics (2007)
6.7 Demand for State Government housing

Information on Department of Housing dwelling stock and waiting lists is shown in Figure 22 and Figure 23. Social housing stock in Karratha has remained stable at about 450 dwellings but the waiting list of eligible applicants has risen from 86 in December 2007 to 358 for the June quarter of 2010 - a quadrupling of demand.

Government Regional Officers’ Housing (GROH) stock has increased in the last two years from 473 dwellings (December 2007) to 534 dwellings (June 2010). The stock comprises both dwellings fully owned by Authority and leases over private dwellings. The proportion of private leases compared to the overall housing stock has remained relatively stable. Outstanding demand for additional GROH housing has decreased since December 2007.

As part of the Royalties for Regions initiative GROH will deliver approximately 120 dwelling units in the Pilbara region by June 2011. GROH is also actively seeking opportunities to secure additional land to facilitate construction projects in Karratha, Port Hedland and Tom Price.

Figure 22: Social housing dwelling stock – Karratha

Figure 23: Government Regional Officers’ Housing (GROH) dwelling stock – Karratha

6.8 Demand for industrial land

Many factors influence demand for industrial land and quantifying it is a complex process. Demand for industrial land cannot only be derived by analysing population growth as there are additional factors which may influence this demand. Demand generally derives from local, national or international demand for goods and services, with value adding to both locally generated products and products generated in other regions. The Industrial Land Needs Study (2008) identified industrial land supply and demand cycles as having three main drivers:

**Population and settlement growth**
- Increased population growth and labour force participation rates equating to more jobs and increased demand for industrial land (20 per cent of jobs across the State are likely to be in the industrial sector)

**Economic growth and decline cycles**
- High levels of economic growth and productivity will result in an increased demand for land for industrial activity. This is particularly true for the Pilbara region, given the contribution of the mining industry to the economy of the region.
- The cyclical nature of economic growth can make short-term predictions difficult, therefore long-term predictions provide the best indication of demand.
- An additional supply (land bank) of 25-30 per cent above the long-term requirements creates flexible market choices, provides a response to short-term hyper growth situations and encourages emerging and inward investment opportunities.

**Location criteria and market preferences**
- Industry will seek sites that offer the type of amenity and location advantages that make their activities more competitive. For example a site could offer competitive advantages through its proximity to services and transport as well as roads and ports. There might also be advantage in a site that is protected or buffered and where the industry can expand.
- When land is in short or limited supply industries may be forced to limit expansion plans, seek alternative sites (interstate or overseas) or cease trade altogether. Industry may also experience increased levels of competition from all land uses, particularly retail and commercial uses.

Strong growth in the resource and building and construction industries, coupled with limited land releases have led to Karratha's current strong demand for industrial land. While no detailed analysis has been undertaken to determine demand for industrial land in Karratha, LandCorp has conducted surveys in order to determine market demand and specific end user requirements.

In the short to medium term, demand for land suitable for transport and light and general industrial uses will likely be met through future land releases at the Gap Ridge industrial estate. The estate will cater for businesses serving the mining and support industries, with larger lot sizes suitable for industries requiring areas for manufacturing, assembly, lay down or storage uses. Beyond sites offered on the estate, Karratha has no additional undeveloped land zoned for industrial uses. However, additional sites have been identified through planning work being undertaken as part of the Karratha City Growth Plan.

6.9 Demand for commercial/retail floor space

Karratha is a key regional centre in the West Pilbara and as such, provides a high level of commercial, retail and administrative services. The main commercial area (town centre) is located adjacent to Dampier Road and west of Searipple Road. Smaller zoned sites are scattered to the west of the town centre. Karratha's shopping area - the largest and most diverse in the Pilbara - is concentrated in the town centre. The major shopping centre, Centro Karratha, has a total retail floorspace of 23,600m². The town centre area also accommodates a number of offices and hotel accommodation. The town has a total retail floorspace of approximately 41,000 m² and commercial floorspace of approximately 29,700 m².
There is currently a high demand for both commercial and retail floorspace, with few premises currently available for lease.

Karratha’s growth and its implications on retail and commercial land use were investigated in the *Karratha Primary Trade Area Retail and Commercial Strategy*. Issues identified during consultation included:

- the limited provision of convenience retail in outlying suburbs;
- the lack of range in higher order retail products;
- the need to consolidate uses in the Karratha industrial area by relocating some uses in town;
- the need to upgrade and expand commercial premises with a view to accommodating new businesses and to attract the administrative functions of mine operations into town.

The strategy reports that by 2020, Karratha will require an additional 20 150 m² of retail floorspace and 16 200 m² of office floorspace (further detail provided in Table 9 and Table 10). Note that these estimates are based on a resident population of 22 795 persons and a FIFO population of 2400 persons by 2020. The strategy supports the need to expand Karratha’s town centre, establish a neighbourhood shopping centre in Nickol, and establishment of a bulky goods retail area at Gap Ridge.

Planning is currently underway for the Tambrey mixed use site which will include a supermarket, other retail and residential uses. This is referred to as the Nickol retail centre in the strategy. The site was released through an expression of interest process.

A recent study by Pracsys estimates that as a major regional centre with a population of 50 000, Karratha may require the following:

- a total retail floorspace of 123 400 m², which is an increase of more than 80 000 m² on the existing retail floorspace. This includes 54 700 m² of convenience retail, 55 700 m² of comparison retail and approximately 13 000 m² of café/restaurant/fast food floorspace.
- a total commercial/office floorspace of approximately 63 000 m² across commercial, government and institutional uses (equating to an additional 33 300 m²).

### Table 9: Additional retail floorspace requirements 2020 – Karratha

<table>
<thead>
<tr>
<th>Category</th>
<th>Additional floorspace requirements by 2020 (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Retail</strong></td>
<td></td>
</tr>
<tr>
<td>Supermarkets</td>
<td>4 500</td>
</tr>
<tr>
<td>Other food</td>
<td>600</td>
</tr>
<tr>
<td>Department stores</td>
<td>2 500</td>
</tr>
<tr>
<td>Clothing</td>
<td>650</td>
</tr>
<tr>
<td>Household goods</td>
<td>5 500</td>
</tr>
<tr>
<td>Other retail</td>
<td>3 900</td>
</tr>
<tr>
<td>Hospitality and services</td>
<td>2 500</td>
</tr>
<tr>
<td><strong>Total increase</strong></td>
<td>20 150</td>
</tr>
<tr>
<td><strong>Total floorspace</strong></td>
<td>61 150</td>
</tr>
<tr>
<td><strong>Net increase</strong></td>
<td>68%</td>
</tr>
</tbody>
</table>

**Commercial**

<table>
<thead>
<tr>
<th>Category</th>
<th>Karratha CBD</th>
<th>Karratha industrial</th>
<th>Nickol retail centre</th>
<th>Gap Ridge bulky goods centre</th>
<th><strong>Total</strong> (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supermarkets</td>
<td>0</td>
<td>0</td>
<td>4 500</td>
<td>0</td>
<td>4 500</td>
</tr>
<tr>
<td>Other food</td>
<td>0</td>
<td>0</td>
<td>600</td>
<td>0</td>
<td>600</td>
</tr>
<tr>
<td>Department stores</td>
<td>2 500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2 500</td>
</tr>
<tr>
<td>Clothing</td>
<td>650</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>650</td>
</tr>
<tr>
<td>Household goods</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5 500</td>
<td>5 500</td>
</tr>
<tr>
<td>Other retail</td>
<td>1 900</td>
<td>0</td>
<td>2 000</td>
<td>0</td>
<td>3 900</td>
</tr>
<tr>
<td>Hospitality and services</td>
<td>1 500</td>
<td>0</td>
<td>1 000</td>
<td>0</td>
<td>2 500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6 550</strong></td>
<td><strong>8 100</strong></td>
<td><strong>5 500</strong></td>
<td><strong>5 500</strong></td>
<td><strong>20 150</strong></td>
</tr>
</tbody>
</table>

Source: *Karratha Primary Trade Area Retail and Commercial Strategy, SGS Economics and Planning (2009)*
a total of 134 100 m² of health, welfare and community service floor space (additional 118 000 m² over 2006 estimates).

- a total of 89 000 m² of entertainment/recreational/cultural floorspace (additional 57 600 m² over 2006 estimates).

Note that this information is an estimate only, and is based on benchmark floorspace provision in a range of regional centres across Australia. The estimates do not include provision for areas such as car parking, landscaping and setbacks, and are based on an average per square metre of floor space per employee. The projections incorporate employment estimates based on aspirational population targets.

The following variables (over and above resident population), identified by Pracsys as part of the Karratha City Centre Master Plan, may also influence the demand for floorspace, in particular retail floorspace:

- the nature and extent of the tourism sector and visitor base to Karratha;
- the extent of the FIFO population;
- the extent to which Karratha as a major regional population centre will act as an attractor for Pilbara residents in general; and
- the extent of expenditure leakage, which is partly a function of the range of retail, commercial and institutional services on offer in Karratha.

The report also notes that rather than being driven by population growth, demand for non-retail floorspace is driven by commercial and strategic service delivery and resourcing decisions of business, companies, government agencies and institutions.

The Karratha City Centre Master Plan estimates a total yield of 44 464 m² of core retail, 15 264 m² of other retail and 51 480 m² of office uses across the four precincts in the town centre.

### 6.10 Demand for tourist accommodation

#### North West visitor summary

In the 12 months to December 2009, WA’s North West – which encompasses both the Pilbara and Kimberley regions – had an estimated 500 600 visitors. The figure was down on the previous two years with visitors in 2007 numbering 568 900 and in 2008, 540 400. In 2009, international visitors stayed the longest – an average 25.2 days. Interstate visitors followed with an average stay of 8.6 days while intrastate visitors averaged 5.7 days. Data for the Shire of Roebourne indicates that domestic visitors averaged 8.1 days and international visitors 19.6 days for the same period. Average visitor numbers are shown in Figure 24.

Data collected by Tourism WA shows that the leading purpose of visit to the Shire of Roebourne for domestic visitors was business (56 per cent). Holiday or leisure visits were prominent among international visitors (41 per cent). This data is shown in Figure 25.
Figure 25: Main purpose of visit to Shire of Roebourne, visitors 2007 to 2009

According to Tourism WA, all forms of visitor accommodation in Karratha have at least a 90 per cent occupancy rate during the year. Availability of short-stay accommodation has been reduced in recent years as a result of housing and workforce accommodation supply shortages. Much of the available tourist accommodation is occupied by long-term guests such as resource company employees (contractor block bookings) or lower paid service workers unable to afford more permanent accommodation (caravan parks). Long-term guests staying two months or more occupy about a third of sites in caravan parks. The high level of permanent occupancy of the visitor accommodation means that many visitors face difficulty finding affordable accommodation, requiring them to book months in advance of their stay. As a result of the crowded nature of caravan parks, visitors are now seeking alternate, more remote camping locations.

Research by the Tourism Forecasting Committee shows that between 1999 and 2009 the annual growth rate for visitor nights in regional Western Australia (excluding Perth) was -1.2 per cent. Total visitor nights in regional WA are predicted to increase by 0.4 per cent each year between 2009 and 2019, which is lower than that forecast for Perth, at 2.5 per cent. Domestic visitor nights in regional Western Australia are forecast to fall by -0.5 per cent annually over the period 2009 to 2019.

Development of the tourism industry in Western Australia relies on the provision of appropriate infrastructure, which services the needs of tourists and encourages investment by the private sector. Tourism WA facilitates infrastructure development through its reports *Tourism Development Priorities*, which identify key infrastructure projects for tourism development across the State.

In December 2009, a study by Tourism WA indicated strong demand for new tourist accommodation in Karratha. Early analysis suggests that there may be demand for an additional 300 to 700 rooms. Anecdotal reports indicate that caravan park accommodation is also in heavy demand.

Land and housing demand > for more information see the following links:

- Australian Housing and Urban Research Institute: [www.ahuri.edu.au](http://www.ahuri.edu.au) see Housing market dynamics in resource boom towns (July 2009)
- Pilbara Development Commission: [www.pdc.wa.gov.au](http://www.pdc.wa.gov.au) see Housing and Land Snapshots
- Real Estate Institute of Western Australia: [www.reiwa.com.au](http://www.reiwa.com.au) see Regional Centres Profile
7 Land and housing supply

Key points

- Karratha is in critical need of affordable accommodation to house employees in the retail, hospitality, tourism and general service sectors.
- The town has more than 1200 ha of undeveloped land zoned for residential/urban uses and much of it - 840 ha - is south of the Karratha Hills.
- The Karratha City Growth Plan identifies another 1156 ha for future development in areas not currently zoned for residential or urban development. Many of these areas will require resolution of issues before development can proceed, including native title and heritage, further planning, zoning, environmental and servicing issues.
- Areas identified in the Karratha City Growth Plan could potentially accommodate a population of 50,000 persons if developed at medium and higher densities. The plan reflects community preference to contain development north of the Karratha hills.
- Development of areas beyond Baynton West will trigger substantial infrastructure upgrades.
- Difficulties have been experienced in meeting 30-month development conditions for lots due to limited capacity for construction in the building industry. Initiatives to address these issues include use of alternative building materials and pre-fabricated housing, establishment of builders display villages and incentives to attract other builders to the market. House and land packages have also become increasingly available.
- A key feature of the Pilbara Cities blueprint is to attract private developers to the market through the release of development sites and super lots for the construction of medium and high-density housing.

Actions and priorities

- Native title negotiations are progressing, but there is a need to clear additional land for future development.

7.1 Issues affecting delivery of land and housing to market

Many issues affect the delivery of land and housing to the Karratha market. These can be summarised as follows:

- inadequate capacity in potable water, wastewater, energy and power distribution networks is affecting the release of residential, commercial and industrial land. Funding has been sought from Infrastructure Australia and agencies capital works programs may need to be revised.
- highly volatile house prices create difficulties in attracting the finance necessary to develop new residential areas or to undertake larger scale commercial projects.
- difficulties and high cost of obtaining supplies of basic raw materials.
- difficulties and long timeframes associated with progressing government approvals. The Ministerial Taskforce on Approvals, Development and Sustainability is investigating these issues and developing initiatives to address the problems.
- indigenous heritage and native title issues.
- clearance under the Mining Act enabling Crown land to be released for development.
- construction capacity is hampered by Karratha’s various industries competing for skilled and unskilled labour and other resources.
- lack of short-term accommodation for contractors and builders.
• Long construction timeframes.
• Issues with population estimates and determining agreed land supply requirements. Agreed growth rates are required to assist infrastructure agencies with their forward planning. There is also inadequate information available relating to employment numbers for major resource projects.

7.2 Planning context

State and regional planning

State Planning Strategy (1997)

The State Planning Strategy provides a strategic guide for land use planning through to the year 2029, Western Australia’s bicentenary. The strategy is aimed at developing a land use planning system to help the State achieve a number of key goals. These include generating wealth, conserving and enhancing the environment, and building vibrant and safe communities for the enjoyment of this and subsequent generations of Western Australians. The strategy assists strategic decision making and provides a basis for coordinating and promoting regional land use planning and land development, and for guiding government departments and instrumentalities and local governments on those matters.

The strategy is currently being reviewed, with a draft due to be released for public comment in 2011.

State planning policies

State planning policies are prepared and adopted by the WAPC under statutory procedures set out in part 3 of the Planning and Development Act 2005. These policies are concerned with broad planning controls and can be made for matters which may be the subject of a local planning scheme or which relate to a specific region or area of the State. Examples include state policies for coastal planning; rural land use planning; and residential design codes (R-Codes). The WAPC and local governments must have due regard to the provisions of state planning policies when preparing or amending local planning schemes and when making decisions on planning matters. Further information can be accessed at the Department of Planning’s website, www.planning.wa.gov.au.

Blueprint for Pilbara Cities (2009)

The State Government’s Pilbara Cities initiative is designed to encourage more people to live and settle in the Pilbara. The Pilbara Cities blueprint provides a framework to transform the region by creating modern higher density centres, supported by infrastructure and amenity upgrades and improvements. The blueprint includes proposals for major revitalisations of South Hedland, Karratha, Newman, Dampier, Tom Price and Onslow town centres, in addition to plans to create new marinas and improved waterfronts at Port Hedland, Dampier and possibly Onslow. New infrastructure and facilities such as schools, TAFEs, medical facilities, leisure and entertainment facilities and retail precincts are also part of the plan.

Critical to the success is the attraction of new residents and businesses not involved in the region’s traditional sectors of oil, gas and mining, creating places where people choose to settle on a permanent basis with access to high standards of services. The private sector is expected to play a crucial role in achieving the plan, including assisting with the delivery of affordable accommodation solutions by the release of development sites and superlots for land and housing, including opportunities in the private rental market.

Pilbara Planning and Infrastructure Framework (under way)

The Pilbara Planning and Infrastructure Framework defines a strategic direction for the future development of the Pilbara region over the next 25 years. It addresses the scale and distribution of future population growth and housing development as well as identifying strategies for dealing with: economic growth, environmental issues, transport, infrastructure, water resources, tourism and the emerging impacts of climate change. It seeks to ensure that development and change in the Pilbara region is achieved in a way that improves people’s lives and enhances the character and environment of the region.

The Framework sets out regional planning principles together with goals, objectives and actions to achieve these. The strategy also addresses the Pilbara’s priority infrastructure needs over the next five years.
The Framework represents an agreed ‘whole of government’ position on the broad future planning direction for the Pilbara and will guide the preparation of local planning strategies and local planning schemes. It will be particularly important in informing government of infrastructure priorities in the Pilbara and giving the private sector confidence to invest in the region.

It is anticipated that the draft framework will be released for public comment in early 2011.

**Pilbara Framework: Regional Profile (2009)**

The *Pilbara Framework: Regional Profile* provides a spatial planning profile for the Pilbara region. The document provides a background and rationale for the Pilbara Planning and Infrastructure Framework, which will set out the spatial strategic direction for the region. This will inform State Government investment in infrastructure and provide the context for local government planning in the region.

The document provides detailed information on the existing settlement structure within the region. The regional profile was released in August 2009.

**Pilbara Regional Water Plan 2010 – 2030 (2010)**

Released by the Department of Water in June 2010, the *Pilbara Regional Water Plan 2010 – 2030* provides a strategic and long term approach to sustainable water resource planning and management for the Pilbara region. The plan presents a strategic overview of the region’s water resources and the major challenges facing the region, both today and in the future. Included in the document is an action plan which lists priority actions for water planning in the region for the next five years.

Actions included in the plan are intended to address the current shortage of regional, district and local water management plans and strategies that are necessary to guide future developments, and demonstrate the lands capability to support these developments from a water perspective.

**Better Urban Water Management (2008)**

*Better Urban Water Management (BUWM)* provides guidance on the implementation of *State Planning Policy 2.9 Water Resources* and has been adopted as the state policy approach in integrating land and water planning and working towards water sensitive urban design. This approach was collaboratively developed by the Department of Planning and Infrastructure, Department of Water (DoW), the Western Australian Local Government Association and the Australian Government Department of Environment, Water, Heritage and the Arts.

BUWM is designed to facilitate better management and use of water resources by ensuring an appropriate level of consideration is given to the total water cycle at each stage of the planning system. The document intends to assist regional, district and local land use planning, as well as subdivision phases of the planning process. The document is to be used by all stakeholders and decision makers and has statewide application for new urban, commercial, industrial and rural-residential developments.

**Local planning**

**Karratha Revitalisation Plan (2010)**

The Karratha Revitalisation Plan provides an overall framework for the future development of Karratha and its evolution into a city, through the coordination of State and local governments and other stakeholders in a coherent plan to improve the quality of life for all people living in the area. The three components of the plan are:

**Implementation Blueprint**

The *Implementation Blueprint* is a business plan for delivering the Pilbara Cities vision, describing an integrated approach for local, state and federal government, the private sector and the community. The document provides an overview of the project, summarises the key conclusions drawn from the analysis of the current situation, key drivers and pressures, outlines the project goals and objectives, and sets out the implementation strategies and action projects. The plan identifies specific responsibilities, time and costs to ensure delivery can be coordinated and monitored.
Karratha City Growth Plan

The *Karratha City Growth Plan* identifies a series of neighbourhood precincts, setting out how and when land should be used and developed, how the environment should be protected and the associated infrastructure and servicing requirements. The plan identifies key facilitating actions that over time will have flow on affects to ensuring that Karratha and its communities are vibrant and safe places that people will be born into as well as attractive for retirement years.

The *Karratha City Growth Plan* adopts a growth model that accommodates a much more diverse housing typology that will ensure there are a variety of housing choices available, facilitating a diverse community demographic. The plan focuses growth north of the Karratha hills.

Karratha City Centre Master Plan

The *Karratha City Centre Master Plan* outlines the principles, objectives and strategies for delivering a robust city centre commensurate of a regional centre with a population of 50,000 or more persons. The plan will guide the development of future housing, open spaces, commercial activities, tourist accommodation, entertainment and retail areas, as well as service infrastructure, transport, education and community facilities. Preparation of the master plan involved the consideration, examination and assessment of a wide range of issues at both the regional level and the Karratha urban area context. The plan includes urban and landscape design guidance and also includes a phasing plan identifying how and in what sequence land for development and supporting infrastructure will be provided. Specific responsibilities, time and costs are also identified, ensuring delivery can be coordinated and monitored.

Each of the above documents were adopted by the Shire of Roebourne in May 2010. It is intended that these plans will be forwarded to the WAPC for consideration of endorsement.


Prepared in response to anticipated population growth, the plan assesses the infrastructure and service needs of Karratha around six key themes, these being:

- business, entrepreneurialism and economic development
- infrastructure investment and transport
- leadership and capacity
- liveability and lifestyle
- environmental capital
- community health and wellbeing

The plan was prepared by the Shire of Roebourne in conjunction with Rio Tinto and Woodside.

Karratha Area Development Strategy (1998)

Released in 1998, the *Karratha Area Development Strategy* is a sub-regional development strategy formulated to resolve conflicting land and water use demand, guide and control the use of land and water, and coordinate infrastructure provision and urban expansion for the next 25 years. The strategy is based on a desktop compilation of about 30 different studies and initiatives.

Shire of Roebourne Town Planning Scheme No. 8

Local planning schemes set out the way land is to be used and developed. They classify areas for land use and include provisions to coordinate infrastructure and development in a locality. They also include controls to ensure long-term strategic planning objectives are achieved. The Shire of Roebourne’s Town Planning Scheme No. 8 was gazetted on 22nd August 2000 and identifies the following objectives for Karratha:

- facilitate the continued growth of Karratha as the regional centre of the West Pilbara, in accordance with the Karratha Townsite Structure Plan (as amended);
- develop Karratha as the tourist entry for the West Pilbara built upon and taking into account the levels of commercial travellers associated with resource developments;
Karratha
Regional HotSpots Land Supply Update

7.3 Role of LandCorp

LandCorp is Western Australia's government land development agency, acting commercially to identify, design and implement major land, tourism and infrastructure projects which have a lasting and positive impact for Western Australians.

Projects are State wide and fall into industrial, metropolitan and regional categories. LandCorp works with all levels of Government and business on projects ranging from discrete residential subdivisions to the creation of whole new towns, industrial infrastructure and tourism development to support the long term growth of the State.

Principle services include:

- providing sufficient industrial land to assist the growth of WA's economy;
- urban development and renewal projects where unique opportunities or constraints exist;
- optimising triple bottom line outcomes from government-owned land;
- providing asset management and expert services to government; and
- supporting the growth of regional towns State wide by providing suitable land.

LandCorp operates with an independent board and is responsible to the Minister for Regional Development; Lands.

7.4 Role of Department of Regional Development and Lands

State Land Services within the Department of Regional Development and Lands is responsible for the administration, assembly and allocation of Crown land. Operating under the Land Administration Act 1997, the department has the following functions in dealing with Crown land:

- administer Crown land;
- conduct land assembly for Government land;
- support and advise other agencies in relation to Government land tenure issues under the Land Administration Act 1997;
The Department of Regional Development and Lands also delivers and oversees the Pilbara Revitalisation Plan funded under the Royalties for Regions Act 2009. The Pilbara Revitalisation Plan includes initiatives to provide housing for workers accommodation and sustainable housing for Aboriginals.

### 7.5 Residential

#### Existing dwelling stock

Approximately two-thirds of Karratha’s occupied private dwellings recorded in the 2006 Census were separate houses (Table 11). More than 500 ‘other dwellings’ were also recorded including caravans, cabins or houseboats, tents or sleep outs, or houses or flats attached to shops and offices. Approximately 63 per cent of occupied dwellings had three or more bedrooms. Just over half of the dwellings were rented which is comparable to that of the Pilbara region (at 49 per cent).

Significant housing stock owners in Karratha include resource companies (Rio Tinto, Woodside and other companies involved in the North West Shelf projects), the Department of Housing (social housing and GROH housing), Commonwealth government and the Shire of Roebourne.

#### Table 11: Census 2006 dwelling stock – Karratha

<table>
<thead>
<tr>
<th>Dwelling type</th>
<th>Number of dwellings</th>
<th>Per cent of total occupied private dwellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total private dwellings (including unoccupied private dwellings)</td>
<td>4914</td>
<td>-</td>
</tr>
<tr>
<td>Occupied private dwellings</td>
<td>4334</td>
<td>-</td>
</tr>
<tr>
<td>Separate house</td>
<td>2851</td>
<td>65.8</td>
</tr>
<tr>
<td>Semi-detached, row or terrace house, townhouse etc</td>
<td>811</td>
<td>18.7</td>
</tr>
<tr>
<td>Flat, unit or apartment</td>
<td>156</td>
<td>3.6</td>
</tr>
<tr>
<td>Other dwellings</td>
<td>516</td>
<td>11.9</td>
</tr>
<tr>
<td>Not stated</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Much of Karratha’s housing was built between the mid-1970s and mid-1980s (Figure 26). Dwelling construction peaked in 1974 when almost 600 dwellings were built in 12 months. Over the past ten years housing construction has steadily increased, with almost 300 dwellings completed in 2008. A map showing a decade of construction (all land uses) has been prepared for Karratha (see Map 3).

**Existing development density/lot size and additional development potential**

Development density and the potential for Karratha to absorb additional development has been assessed using the DoP’s Integrated Land Information database (ILID). The database is a net land use assessment and capability model that is generated at a cadastral level for the whole of Western Australia. Outputs from this spatial model are shown in Table 12 and Map 4.

The data indicates that there may be opportunities for infill development in some of Karratha’s more established suburbs where larger lots exist with higher density codes. Additional infill development utilising existing infrastructure should be encouraged where possible.

**Existing vacant lots**

Analysis of satellite imagery capture on 1 June 2010 revealed a total of 369 vacant residential lots across Karratha. The majority are in recently developed areas of Baynton West (263 lots) and Nickol West developments (68 lots). There are few vacant lots in the established suburbs of Bulgarra, Millars Well and Pegs Creek (25 lots total).

### Table 12: Integrated land information database outputs – Karratha

<table>
<thead>
<tr>
<th>Suburb</th>
<th>R-code</th>
<th>No. of lots</th>
<th>No. of dwellings</th>
<th>Vacant lots</th>
<th>Average net density</th>
<th>Additional dwelling potential</th>
<th>Average area per dwelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baynton</td>
<td>Null^3</td>
<td>416</td>
<td>363</td>
<td>41</td>
<td>11.7</td>
<td>47</td>
<td>853</td>
</tr>
<tr>
<td></td>
<td>R20</td>
<td>276</td>
<td>279</td>
<td>2</td>
<td>14.0</td>
<td>13</td>
<td>712</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>692</td>
<td>642</td>
<td>43</td>
<td>12.6</td>
<td>60</td>
<td>792</td>
</tr>
<tr>
<td>Bulgarra</td>
<td>R20</td>
<td>732</td>
<td>740</td>
<td>0</td>
<td>13.6</td>
<td>40</td>
<td>734</td>
</tr>
<tr>
<td></td>
<td>R30</td>
<td>251</td>
<td>467</td>
<td>3</td>
<td>16.7</td>
<td>280</td>
<td>598</td>
</tr>
<tr>
<td></td>
<td>R40</td>
<td>3</td>
<td>96</td>
<td>0</td>
<td>45.0</td>
<td>11</td>
<td>222</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>986</td>
<td>1303</td>
<td>3</td>
<td>15.4</td>
<td>331</td>
<td>648</td>
</tr>
<tr>
<td>Millars Well</td>
<td>Null^3</td>
<td>201</td>
<td>175</td>
<td>12</td>
<td>12.8</td>
<td>13</td>
<td>784</td>
</tr>
<tr>
<td></td>
<td>R20</td>
<td>448</td>
<td>530</td>
<td>0</td>
<td>14.4</td>
<td>35</td>
<td>695</td>
</tr>
<tr>
<td></td>
<td>R30</td>
<td>82</td>
<td>194</td>
<td>2</td>
<td>21.1</td>
<td>78</td>
<td>473</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>731</td>
<td>899</td>
<td>14</td>
<td>15.0</td>
<td>126</td>
<td>664</td>
</tr>
<tr>
<td>Nickel</td>
<td>Null^3</td>
<td>264</td>
<td>207</td>
<td>57</td>
<td>7.2</td>
<td>63</td>
<td>1379</td>
</tr>
<tr>
<td></td>
<td>R20</td>
<td>742</td>
<td>796</td>
<td>4</td>
<td>14.0</td>
<td>41</td>
<td>715</td>
</tr>
<tr>
<td></td>
<td>R30</td>
<td>125</td>
<td>223</td>
<td>3</td>
<td>19.1</td>
<td>99</td>
<td>523</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1131</td>
<td>1226</td>
<td>64</td>
<td>12.6</td>
<td>203</td>
<td>792</td>
</tr>
<tr>
<td>Pegs Creek</td>
<td>R20</td>
<td>513</td>
<td>570</td>
<td>2</td>
<td>14.1</td>
<td>46</td>
<td>710</td>
</tr>
<tr>
<td></td>
<td>R30</td>
<td>90</td>
<td>175</td>
<td>6</td>
<td>19.9</td>
<td>82</td>
<td>503</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>603</td>
<td>745</td>
<td>8</td>
<td>15.1</td>
<td>128</td>
<td>662</td>
</tr>
</tbody>
</table>

Source: Integrated Land Information Database, Department of Planning (July 2009)

^1 Only includes those dwellings that are within residential zones of the current local planning scheme.

^2 Additional dwelling potential refers to existing developed lots and is based on current R-codes and lot size. In the case of split R-codes the highest R-code is used (i.e. maximum potential) to calculate the additional dwelling potential.

^3 Refers to areas zoned urban development that do not have an R-code applied.
Recent subdivision activity

Residential subdivision activity has increased in recent years, with increases in both conditional and final subdivision approvals being recorded (Figure 27). Conditional approvals peaked in 2008-09 and final approvals in 2006-07. At 30 June 2010, there were 511 residential lots with conditional approval for subdivision. Almost all of these approvals relate to LandCorp’s Baynton West subdivision. Remaining lots in this development will reach final approval stage in the short-term, improving the supply of residential lots to the market.

Residential zoned land supply

Data in Table 13 details the area of developed and undeveloped residential zoned land in Karratha. The analysis focused on undeveloped greenfield areas, and as such, single vacant lots in the existing urban area have been classified as developed. Large areas of undeveloped zoned land are located in Mulataga (160ha), Baynton and Gap Ridge. The Regals area (south of the Karratha Hills), has more than 840 ha zoned for urban development, but is unlikely to be developed for some time, given the preference to contain development north of the Karratha hills. Development of this area would also require resolution of a number of issues (such as the preparation of a native title agreement) and significant infrastructure investment.

Table 13: Residential zoned land supply – Karratha

<table>
<thead>
<tr>
<th>Zone</th>
<th>Developed (ha)</th>
<th>Undeveloped (ha)</th>
<th>Total (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential R20</td>
<td>210.1</td>
<td>0</td>
<td>210.1</td>
</tr>
<tr>
<td>Residential R30</td>
<td>56.2</td>
<td>1.0</td>
<td>57.2</td>
</tr>
<tr>
<td>Residential R40</td>
<td>1.8</td>
<td>0</td>
<td>1.8</td>
</tr>
<tr>
<td>Urban development</td>
<td>228.8</td>
<td>1162.9</td>
<td>1391.7</td>
</tr>
<tr>
<td>Total</td>
<td>496.9</td>
<td>1163.9</td>
<td>1660.8</td>
</tr>
</tbody>
</table>

Source: Internal databases, Department of Planning (2010)

The Shire of Roebourne has recently released the Karratha Open Space Strategy. Developed in consultation with the DoP, the strategy provides a framework for the provision of public open space in Karratha. It also identifies potential residential

Figure 27: Residential conditional and final approvals1 1999-00 to 2009-10 – Karratha

*Includes subdivision/strata approvals for the purposes of subdivision, amalgamation, boundary realignment, resubdivision and road purposes.

*As at 30 June each year. Refers to conditional approvals for which construction or servicing has not yet commenced, or is currently under way (i.e. has not reached final approval stage).

Source: Approvals database, Department of Planning (2010)
development areas resulting from the excision of approximately 19.8 ha of land from open space areas across the town. Collectively, the areas identified could accommodate a significant number of dwellings.

As part of the Karratha Revitalisation Plan, a master plan has also recently been prepared for the Karratha town centre. The master plan identifies four distinct precincts in the city centre, these being the retail, commercial, accommodation and entertainment precincts. The master plan identifies a yield of 2516 dwellings, 718 hotel rooms and additional retail, commercial and community floorspace across the city centre (Table 14). The precincts are shown in Figure 28 and Map 5.

Further information is available in the Karratha City Centre Master Plan, available on the Shire of Roebourne’s website, www.roebourne.wa.gov.au.

Residential land development pipeline

The residential land development pipeline detailed in Figure 29 presents data for key points of the land development process, from identification of land in strategic plans, through to subdivision and building approvals. Regular monitoring of the amount of land and approvals flowing through the pipeline will assist with identifying bottlenecks in the development process, and potential periods of over or under supply.

The pipeline data identifies a current lack of subdivision applications flowing through the system with only one application lodged and no applications awaiting determination at the end of the March quarter 2010. Few residential lots were granted conditional approval in 2009, indicating a potential shortfall of lots flowing through the pipeline to final approval stage in the short-term. The majority of lots with conditional approval (end of March quarter 2010) are for the remaining stages of Baynton West. Subdivision applications for Madigan Road (KA17) and Nickol West (KA07B) are likely to be lodged before the end of 2010.

Table 14: Precinct yield table - Karratha City Centre Master Plan

<table>
<thead>
<tr>
<th>Precinct/ features</th>
<th>Dwelling yield</th>
<th>Core retail/ cafes NLA (m²)</th>
<th>Other retail NLA (m²)</th>
<th>Office, health, community NLA (m²)</th>
<th>Hotel rooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail precinct</td>
<td>358</td>
<td>33 400</td>
<td>1 481</td>
<td>10 786</td>
<td>181</td>
</tr>
<tr>
<td>Main street shopping, mixed uses, public plazas and specialty stores</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial precinct</td>
<td>1 509</td>
<td>5 224</td>
<td>9 033</td>
<td>98 468</td>
<td>0</td>
</tr>
<tr>
<td>Offices and small showrooms, community, youth and cultural focus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accommodation precinct</td>
<td>561</td>
<td>2 855</td>
<td>4 246</td>
<td>16 662</td>
<td>492</td>
</tr>
<tr>
<td>Short-term accommodation and ancillary entertainment uses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entertainment precinct</td>
<td>88</td>
<td>2 985</td>
<td>504</td>
<td>2 785</td>
<td>45</td>
</tr>
<tr>
<td>Restaurants, cinemas, bars, theatre and amusement facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2 516</td>
<td>44 464</td>
<td>15 264</td>
<td>128 701</td>
<td>718</td>
</tr>
</tbody>
</table>

Source: Karratha City Centre Master Plan, LandCorp (2010)

NLA = net lettable area
Figure 28: Karratha City Centre Master Plan - precinct and land use plan
### Additional areas identified in local planning strategies or townsite plans (ha) \(^1\)
(Source: DoP internal databases, 2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>1156</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Gazetted local planning scheme amendments (additions to residential or urban development zone) (ha)
(Source: DoP internal databases, 2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>2.9</td>
<td>2.7</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Undeveloped zoned land (ha)
(Source: DoP internal databases, 2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>1258</td>
<td>1212</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

### Applications lodged (number of applications and proposed lots) \(^2\)
(Source: DoP internal databases, 2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9</td>
<td>6</td>
<td>9</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>415</td>
<td>485</td>
<td>881</td>
<td>3</td>
<td>64</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

### Applications awaiting determination (number of applications and proposed lots) \(^2\)
(Source: DoP internal databases, 2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>860</td>
<td>3</td>
<td>9</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

### Lots granted conditional approval (lots) \(^2\)
(Source: DoP internal databases, 2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>322</td>
<td>413</td>
<td>19</td>
<td>841</td>
<td>56</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>419</td>
<td>470</td>
<td>311</td>
<td>905</td>
<td>695</td>
<td>703</td>
<td></td>
</tr>
</tbody>
</table>

### Lots with conditional approval (lots) \(^2\)
(Source: DoP internal databases, 2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>157</td>
<td>321</td>
<td>178</td>
<td>242</td>
<td>213</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>220</td>
<td>456</td>
<td>455</td>
<td>600</td>
<td>n/a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Lots with conditional approval (Water Corporation lots on non-cleared agreements) \(^3\)
(Source: Water Corporation, 2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>125</td>
<td>112</td>
<td>272</td>
<td>306</td>
<td>247</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>56</td>
<td>187</td>
<td>445</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Lots issued final approval (lots) \(^2\)
(Source: DoP internal databases, 2010)

### Lots available for construction (vacant) \(^4\)
(Source: VGO, 2010)

### Building approvals \(^5\)
(Source: ABS, 2010)

### Additional dwelling stock (dwellings) \(^6\)
(Source: VGO, 2010)

---

\(^1\) Additional residential development areas (not currently zoned) identified in draft Karratha City Growth Plan adopted by the Shire of Roebourne in May 2010.

\(^2\) Includes subdivision and strata applications/approvals for the purposes of subdivision, amalgamation, boundary realignment, road purposes etc.

\(^3\) Refers to conditionally approved lots where a servicing agreement (agreement to construct) has been signed between the Water Corporation and the developer. These are termed lots on non-cleared agreements.

\(^4\) Vacant lot data as at July of each calendar year.

\(^5\) In some cases approvals have not been coded to a specific census collector district. These records have been excluded from this data.

\(^6\) Calculated from Valuer General’s Office data (variance between total number of residential dwellings between each year). May include transient workforce accommodation if identified as residential dwelling by VGO. As at July of each calendar year.
Residential land release summary

In summary:

- The remaining stages of Baynton West (KA03) are likely to be completed by late 2010/early 2011.
- Other sites that are likely to be developed in the short-term include Madigan Road (KA17), Tambrey Primary School surplus land (KA35), Nickel West (KA07B) and Tambrey Mixed Use Precinct (KA24/KA24A). These sites require further planning (structure planning and subdivision approvals) and finalisation of local planning scheme amendments. Such development will also trigger upgrades to water and wastewater services.
- The Karratha City Growth Plan identifies a number of additional sites for future residential development. If developed at medium/high densities, a population of 50,000 persons could potentially be accommodated north of the Karratha Hills, therefore avoiding the need to develop the Regals area (south of Karratha Hills).

If these densities are not achieved, additional greenfield land may be required. The majority of the sites require resolution of a number of issues including native title, heritage, zoning, planning, environmental and servicing issues.

- The Karratha City Growth Plan proposes a range of residential densities (average of R40 or 40 dwellings per hectare) and a variety of housing types to improve housing diversity.
- There are ongoing accommodation and housing shortages, particularly for social housing, government housing and service populations.
- Development of higher density housing is emerging with the release of higher density group housing sites and proposals to develop multi-level projects in the town centre and Tambrey area.

Land and dwelling release information is summarised in Table 15. Further project specific information is available in Table 27 and Map 5 and 6.

Table 15: Residential land and dwelling release summary – Karratha

<table>
<thead>
<tr>
<th>Project (City/Component)</th>
<th>Short-term (0-2yrs)</th>
<th>Short-term (2-5yrs)</th>
<th>Medium-term (5-10yrs)</th>
<th>Long-term (10yrs+)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town centre – additional residential dwellings</td>
<td>0</td>
<td>696</td>
<td>807</td>
<td>1 013</td>
<td>2 516</td>
</tr>
<tr>
<td>Baynton West (KA03)</td>
<td>457</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>457</td>
</tr>
<tr>
<td>Baynton West site (KA03A)</td>
<td>114</td>
<td>114</td>
<td>0</td>
<td>0</td>
<td>228</td>
</tr>
<tr>
<td>Nickel West (KA07B)</td>
<td>0</td>
<td>250</td>
<td>0</td>
<td>0</td>
<td>250</td>
</tr>
<tr>
<td>Nickel (KA07C)</td>
<td>0</td>
<td>0</td>
<td>926</td>
<td>927</td>
<td>1 853</td>
</tr>
<tr>
<td>Mulataga (KA15)</td>
<td>0</td>
<td>1 250</td>
<td>1 250</td>
<td>0</td>
<td>2 500</td>
</tr>
<tr>
<td>Mulataga (KA15A)</td>
<td>0</td>
<td>546</td>
<td>547</td>
<td>0</td>
<td>1 093</td>
</tr>
<tr>
<td>Mulataga (KA15B)</td>
<td>0</td>
<td>83</td>
<td>84</td>
<td>0</td>
<td>167</td>
</tr>
<tr>
<td>Mulataga Hills (KA15C)</td>
<td>0</td>
<td>0</td>
<td>315</td>
<td>0</td>
<td>315</td>
</tr>
<tr>
<td>Madigan Road (KA17)</td>
<td>200</td>
<td>400</td>
<td>0</td>
<td>0</td>
<td>600</td>
</tr>
<tr>
<td>Tambrey mixed use – residential component (KA24/KA24A)</td>
<td>0</td>
<td>300</td>
<td>0</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>Seven Mile (KA28A)</td>
<td>0</td>
<td>0</td>
<td>893</td>
<td>893</td>
<td>1 786</td>
</tr>
<tr>
<td>Seven Mile (KA28B)</td>
<td>0</td>
<td>0</td>
<td>211</td>
<td>0</td>
<td>211</td>
</tr>
<tr>
<td>Uniting Church site (KA31)</td>
<td>14</td>
<td>14</td>
<td>0</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td>Balmoral Apartments - residential component (KA33)</td>
<td>0</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>Tambrey Primary School surplus land (KA35)</td>
<td>80</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>80</td>
</tr>
</tbody>
</table>
Karratha
Regional HotSpots Land Supply Update

<table>
<thead>
<tr>
<th>Project</th>
<th>Short-term (0-2yrs)</th>
<th>Short-term (2-5yrs)</th>
<th>Medium-term (5-10yrs)</th>
<th>Long-term (10yrs+)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tambrey Luxury Apartments – residential component (KA37)</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>Galbraith Road (KA38)</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Grouped housing sites (KA39)</td>
<td>35</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>Regals (KA42) (beyond 20 years)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
<tr>
<td>Regals Rural Living (KA43)</td>
<td>0</td>
<td>171</td>
<td>0</td>
<td>0</td>
<td>171</td>
</tr>
<tr>
<td>Karratha Open Space Strategy sites (KA47)</td>
<td>0</td>
<td>0</td>
<td>426</td>
<td>0</td>
<td>426</td>
</tr>
<tr>
<td>Bulgarra (KA47A)</td>
<td>0</td>
<td>131</td>
<td>0</td>
<td>0</td>
<td>131</td>
</tr>
<tr>
<td>Karratha Open Space Strategy sites (KA48)</td>
<td>0</td>
<td>41</td>
<td>0</td>
<td>0</td>
<td>41</td>
</tr>
<tr>
<td>Karratha Open Space Strategy sites (KA49)</td>
<td>0</td>
<td>99</td>
<td>0</td>
<td>0</td>
<td>99</td>
</tr>
<tr>
<td>Karratha Open Space Strategy sites (KA50)</td>
<td>0</td>
<td>119</td>
<td>0</td>
<td>0</td>
<td>119</td>
</tr>
<tr>
<td>Warambie Road High Rise (KA52)</td>
<td>0</td>
<td>300</td>
<td>0</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>Lot 309 Perentie Road (KA53)</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Lot 403 Gardugarli Drive (KA54)</td>
<td>72</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>72</td>
</tr>
<tr>
<td>Regals Valley (KA55)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>629</td>
<td>629</td>
</tr>
<tr>
<td>Mulataga/Mangroves (KA57)</td>
<td>0</td>
<td>0</td>
<td>1462</td>
<td>1462</td>
<td>2924</td>
</tr>
<tr>
<td>The Links (KA58)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>428</td>
<td>428</td>
</tr>
<tr>
<td>The Links (KA59)</td>
<td>0</td>
<td>0</td>
<td>245</td>
<td>0</td>
<td>245</td>
</tr>
<tr>
<td>The Links (KA60)</td>
<td>0</td>
<td>0</td>
<td>334</td>
<td>0</td>
<td>334</td>
</tr>
<tr>
<td>Karratha Hills East (KA65)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>210</td>
<td>210</td>
</tr>
<tr>
<td>Karratha Hills West (KA66)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
<tr>
<td>Karratha Hills West (KA67)</td>
<td>0</td>
<td>0</td>
<td>209</td>
<td>0</td>
<td>209</td>
</tr>
<tr>
<td>Mulataga Hills (KA68A)</td>
<td>0</td>
<td>0</td>
<td>98</td>
<td>0</td>
<td>98</td>
</tr>
<tr>
<td>Mangroves (KA68B)</td>
<td>0</td>
<td>0</td>
<td>93</td>
<td>0</td>
<td>93</td>
</tr>
<tr>
<td>Karratha Hills East (KA84D)</td>
<td>0</td>
<td>0</td>
<td>70</td>
<td>0</td>
<td>70</td>
</tr>
<tr>
<td>Baynton West additional lots (KA86)</td>
<td>27</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Total residential</td>
<td>1054</td>
<td>4535</td>
<td>7566</td>
<td>5966</td>
<td>19121</td>
</tr>
</tbody>
</table>

Adequacy of supply

Data presented in Table 15 indicates that if land were to be released as planned, approximately 5600 dwellings could be developed over the next five years, and an additional 7500 over the following five years (Figure 30). This equates to the development of 500 dwellings each year over the next two years, followed by 1500 dwellings each year thereafter. Fast tracking the resolution of development constraints may however enable a larger number of lots and/or dwellings to be released over the short to medium term. Furthermore, the potential for an additional 6000 dwellings has been identified for the period beyond 10 years. This data has been generated by researching existing project information and analysing data prepared as part of the Karratha City Growth Plan. Staging information presented in the Karratha City Growth Plan has been modified somewhat with more conservative staging used for the larger Mulataga (KA15A/B/C, KA57), Nickol (KA07C) and Seven Mile (KA28A/B) projects.
Note that in many cases, the release and development of land is subject to resolution of a number of issues, such as Native Title, planning, environmental and servicing issues. Demand is also a critical factor, with land and dwellings unlikely to be developed unless considerable demand is evident.

Projected future dwelling requirements have been calculated using a range of average annual growth rates (as an indication of demand) and assumptions regarding existing unmet demand (Table 16). This information has been compared to potential supply using existing dwelling stock information and potential supply data presented in Table 15.

Assuming no existing unmet demand and potential supply as detailed above, supply is expected to easily meet demand over the short, medium and long term (Figure 31). Assuming an existing unmet demand for 1500 dwellings (as determined by the Pilbara Towns Housing Study), there is a potential undersupply in the short-term, with supply meeting demand over the medium and long-term. This information is displayed graphically in Figure 32. The unmet demand was calculated determining

![Figure 30: Potential future dwelling release by precinct](source: Internal databases, Department of Planning (2010))

the current apparent and latent demand for housing. Apparent demand was determined by analysing waiting lists for social and Government Regional Officer’s Housing and estimating the extent of primary, secondary and tertiary homelessness in Pilbara communities. Latent demand was estimated using an input/output model to determine the gap in the supply of workers, which was then converted to dwelling requirements.
Figure 31: Potential future dwelling supply and requirement¹ (assuming no existing unmet demand)

Source: Internal databases, Department of Planning (2010)

¹ Calculated using assumption of 2.5 persons per dwelling, and dwelling stock in mid-2010 at 5372 dwellings. Population and dwelling requirement calculated as at end of each time period (i.e. 0-2 yrs calculated as at mid-2012, 2-5 yrs calculated as at mid-2015 etc).

Figure 32: Potential future dwelling supply and requirement¹ (assuming existing unmet demand²)

Source: Internal databases, Department of Planning (2010)

² Assumes existing unmet demand of approximately 1500 dwellings (as identified in Pilbara Towns Housing Study).

¹ Calculated using assumption of 2.5 persons per dwelling, and dwelling stock in mid-2010 at 5372 dwellings. Population and dwelling requirement calculated as at end of each time period (i.e. 0-2 yrs calculated as at mid-2012, 2-5 yrs calculated as at mid-2015 etc).
7.6 Transient workforce accommodation

As at September 2009, the Shire of Roebourne had transient workforce accommodation facilities to accommodate more than 10,300 persons (Table 17). Known proposals for additions to facilities or new facilities could potentially accommodate an additional 9,000 persons, taking the potential occupancy of workforce accommodation in the shire to more than 19,000 persons.

Karratha currently has workforce accommodation facilities to accommodate more than 4,500 persons. Larger facilities include the Gap Ridge Village on Madigan Road (2,100 persons), the Searipple Village (1,500 persons) and Bay Village (500 persons).

A number of smaller facilities are located in the Karratha Industrial Estate. Note that this data does not include the proposed MAC Services village to be established on Madigan Road.

Many of the current facilities operate as gated or stand alone facilities having their own recreational and hospitality facilities, meaning that many FIFO workers do not integrate into the broader community, and have a minimal social and economic impact on the town.

Table 16: Projected residential dwelling requirements

<table>
<thead>
<tr>
<th>Growth rates/assumptions</th>
<th>Short-term (0-2yrs)</th>
<th>Short-term (2-5yrs)</th>
<th>Medium-term (5-10yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assuming no existing unmet demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5% average annual demand growth</td>
<td>5,620</td>
<td>5,876</td>
<td>6,330</td>
</tr>
<tr>
<td>Projected over/under supply</td>
<td>+806</td>
<td>+5,085</td>
<td>+12,197</td>
</tr>
<tr>
<td>2.0% average annual demand growth</td>
<td>5,702</td>
<td>6,052</td>
<td>6,682</td>
</tr>
<tr>
<td>Projected over/under supply</td>
<td>+723</td>
<td>+4,909</td>
<td>+11,845</td>
</tr>
<tr>
<td>3.0% average annual demand growth</td>
<td>5,872</td>
<td>6,417</td>
<td>7,439</td>
</tr>
<tr>
<td>Projected over/under supply</td>
<td>+554</td>
<td>+4,544</td>
<td>+11,088</td>
</tr>
<tr>
<td>4.0% average annual demand growth</td>
<td>6,045</td>
<td>6,800</td>
<td>8,273</td>
</tr>
<tr>
<td>Projected over/under supply</td>
<td>+381</td>
<td>+4,161</td>
<td>+10,254</td>
</tr>
<tr>
<td>5.0% average annual demand growth</td>
<td>6,221</td>
<td>7,202</td>
<td>9,191</td>
</tr>
<tr>
<td>Projected over/under supply</td>
<td>+205</td>
<td>+3,759</td>
<td>+9,336</td>
</tr>
</tbody>
</table>

| Assuming existing unmet demand of 1,500 dwellings |                     |                     |                       |
| 1.5% average annual demand growth | 7,120               | 7,376               | 7,830                 |
| Projected over/under supply | -694                | +3,585             | +10,697               |
| 2.0% average annual demand growth | 7,202               | 7,552               | 8,182                 |
| Projected over/under supply | -777                | +3,409             | +10,345               |
| 3.0% average annual demand growth | 7,372               | 7,917               | 8,939                 |
| Projected over/under supply | -946                | +3,044             | +9,588                |
| 4.0% average annual demand growth | 7,545               | 8,300               | 9,773                 |
| Projected over/under supply | -1,119              | +2,661             | +8,754                |
| 5.0% average annual demand growth | 7,221               | 8,702               | 9,773                 |
| Projected over/under supply | -1,295              | +2,259             | +7,836                |

1 Calculated using assumption of 2.5 persons per dwelling.
2 Assumes dwelling stock in mid-2010 at 5,372 dwellings.
3 Population and dwelling requirement calculated as at end of each time period (i.e. 0-2 yrs calculated as at mid-2012, 2-5 yrs calculated as at mid-2015 etc).
4 Source: Internal databases, Department of Planning (2010)
In summary:

- There are a number of existing sites accommodating transient workforces in Karratha, and planning is progressing for the development of additional sites (at Gap Ridge, Karratha town centre and Karratha Industrial Estate).
- Funding ($30.4 m) was announced in November 2009 for the construction of a workers village located adjacent to the existing town centre. The village will provide approximately 100 units, accommodating up to 250 persons. Offering rental accommodation ($350 - $450 per week) for private sector service workers (e.g. retail, hospitality and tourism workers), development of the village will assist employers with staff attraction and retention and provide an interim solution to the high rental costs currently being experienced in the town. The first units are expected to become available in mid-2010, with completion anticipated early to mid-2011.
- Service workers accommodation is not considered an appropriate long-term use for the town centre area.

Land and dwelling release information is summarised in Table 19. Further project specific information is available in Table 27 and Map 5 and 6.

### Table 17: Occupancy of transient workforce accommodation facilities - Shire of Roebourne

<table>
<thead>
<tr>
<th>Location</th>
<th>Approved occupancy</th>
<th>Proposed occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Lambert/Wickham</td>
<td>2 354</td>
<td>4 531</td>
</tr>
<tr>
<td>Cape Preston/Mardie Station</td>
<td>2 459</td>
<td>8 466</td>
</tr>
<tr>
<td>Dampier</td>
<td>709</td>
<td>804</td>
</tr>
<tr>
<td>Karratha</td>
<td>4 539</td>
<td>5 210</td>
</tr>
<tr>
<td>Other remote camps</td>
<td>100</td>
<td>275</td>
</tr>
<tr>
<td>Roebourne</td>
<td>114</td>
<td>78</td>
</tr>
<tr>
<td>Whim Creek</td>
<td>116</td>
<td>203</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10 391</strong></td>
<td><strong>19 567</strong></td>
</tr>
</tbody>
</table>

Source: Shire of Roebourne (2009)

### Table 18: Transient workforce accommodation zoned land supply – Karratha

<table>
<thead>
<tr>
<th>Zone</th>
<th>Developed (ha)</th>
<th>Undeveloped (ha)</th>
<th>Total (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transient workforce</td>
<td>16.8</td>
<td>5.5</td>
<td>22.3</td>
</tr>
<tr>
<td>accommodation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16.8</strong></td>
<td><strong>5.5</strong></td>
<td><strong>22.3</strong></td>
</tr>
</tbody>
</table>

Source: Internal databases, Department of Planning (2010)
Table 19: Transient workforce accommodation development summary – Karratha

<table>
<thead>
<tr>
<th>Project</th>
<th>Short-term (0-2yrs)</th>
<th>Short-term (2-5yrs)</th>
<th>Medium-term (5-10yrs)</th>
<th>Long-term (10yrs+)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karratha Service Workers Accommodation (KA19)</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Gap Ridge – MAC Services (KA27)</td>
<td>1180 (beds)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1180 (beds)</td>
</tr>
<tr>
<td>Gap Ridge (KA27B)</td>
<td>0</td>
<td>181</td>
<td>0</td>
<td>0</td>
<td>181</td>
</tr>
<tr>
<td>Velocity Village (KA56)</td>
<td>92</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>92</td>
</tr>
<tr>
<td>Gateway (KA63)</td>
<td>0</td>
<td>0</td>
<td>231</td>
<td>0</td>
<td>231</td>
</tr>
<tr>
<td>Gateway (KA64)</td>
<td>0</td>
<td>143</td>
<td>0</td>
<td>0</td>
<td>143</td>
</tr>
<tr>
<td>Bulgarra (KA71)</td>
<td>0</td>
<td>126</td>
<td>0</td>
<td>0</td>
<td>126</td>
</tr>
<tr>
<td>Cherratta Road (KA85)</td>
<td>94</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>94</td>
</tr>
<tr>
<td>Cherratta Road (KA87)</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>299 (units)</td>
<td>450</td>
<td>231</td>
<td>0</td>
<td>980 (units)</td>
</tr>
</tbody>
</table>

1 Estimates are based on Karratha City Growth Plan data, which calculates a yield based on residential densities of R40. Actual yield for workforce accommodation uses will be determined by further detailed planning.

**Adequacy of supply**

Without affordable accommodation available, the key service sector will continue to experience staff shortages and a high employee turnover. The Pilbara Towns Housing Study (unpublished) reports a latent demand of 710 dwellings for key service workers and 208 dwellings for residential construction workers in Karratha (as at 2008).

A number of projects are currently under construction, which will likely meet existing unmet demand in the short-term. While no figures are available regarding future demand for this type of accommodation, proposals for new facilities (Gateway precinct) or expansion to existing facilities (Bulgarra) should meet demand if developed in timeframes specified in the Karratha City Growth Plan.

**7.7 Industrial**

**Recent subdivision activity**

Over the last 10 years, Karratha has experienced relatively low levels of industrial subdivision activity, with the majority of activity relating to minor subdivision and amalgamation in the Karratha industrial estate. Activity increased sharply in 2010 with the granting of approval for subdivision of lots in the Gap Ridge Industrial Estate (Figure 33). At 30 June 2010, there were 124 industrial lots with conditional approval for subdivision.

The data shown below does not include lots released in 2009 at the Karratha Industrial Estate. These existing Crown lots (39) were recently serviced and released to the market, and were not subject to typical subdivision processes.

**Industrial zoned land supply**

As at the end of June 2010, Karratha had about 640 ha zoned for industrial uses, of which about 276 ha was undeveloped (Table 20). The zoned land supply includes 182.9 ha of industry zoned land at the Karratha Industrial Estate. The estate is now fully
subdivided although some lots are not yet built out. The existing estate contains 306 lots at an average lot size of ~5900 m² (ranging from 1500 to 56 000 m²).

Also included in the zoned land supply is 196.6 ha of land zoned industrial development at Seven Mile (proposed Gap Ridge Industrial Estate) and 259.4 ha of strategic industry zoned land also at Seven Mile. This area accommodates Rio Tinto’s rail operations and Seven Mile power station.

Additional zoned areas in the vicinity of Karratha include the 4500 ha Maitland Industrial Estate south of Dampier (strategic industry), approximately 6500 ha on the Burrup Peninsula and surrounds near Dampier (strategic industry and industrial development zones), and 4900 ha at Mount Anketell, west of the townsite of Wickham (strategic industry).

Table 20: Industrial zoned land supply – Karratha

<table>
<thead>
<tr>
<th>Zone</th>
<th>Developed (ha)</th>
<th>Undeveloped (ha)</th>
<th>Total (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial development</td>
<td>0</td>
<td>196.6</td>
<td>196.6</td>
</tr>
<tr>
<td>Industry</td>
<td>182.9</td>
<td>0</td>
<td>182.9</td>
</tr>
<tr>
<td>Strategic industry</td>
<td>179.5</td>
<td>79.9</td>
<td>259.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>362.4</strong></td>
<td><strong>276.5</strong></td>
<td><strong>638.9</strong></td>
</tr>
</tbody>
</table>

Source: Internal databases, Department of Planning (2010)
Industrial land release summary

In summary:

- LandCorp has recently released lots at the Karratha Industrial Estate and is progressing planning for the Gap Ridge Industrial Estate (light and general industrial uses). Stage one (37 lots) of this estate is anticipated to be completed in August 2011, and stage two (26 lots) by December 2012. Further stages will be developed subject to demand.

- Beyond the Gap Ridge estate, Karratha has no further undeveloped land zoned for industrial purposes.

- The Karratha City Growth Plan identifies a future development area at Seven Mile - a site south of the airport. This site could potentially accommodate future industrial development, but is subject to further detailed investigation. Additional sites for future general and light industrial development (adjacent to the Karratha Industrial Estate) have also been identified.

Land release information is summarised in Table 21. Further project specific information is available in Table 27 and Map 6.

Table 21: Industrial land release summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Short-term (0-2yrs)</th>
<th>Short-term (2-5yrs)</th>
<th>Medium-term (5-10yrs)</th>
<th>Long-term (10yrs+)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gap Ridge general industrial estate (KA30)</td>
<td>37</td>
<td>59</td>
<td>18</td>
<td>0</td>
<td>114 lots</td>
</tr>
<tr>
<td>Gateway Industrial (KA45A) - light</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>451 000 m² NLA</td>
<td>451 000 m²</td>
</tr>
<tr>
<td>Gateway Industrial (KA45B) - general</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>319 000 m² NLA</td>
<td>319 000 m²</td>
</tr>
<tr>
<td>Gateway Industrial (KA66A) - light</td>
<td>0</td>
<td>0</td>
<td>207 000 m² NLA</td>
<td>0</td>
<td>207 000 m²</td>
</tr>
<tr>
<td>Gateway Industrial (KA66B) - general</td>
<td>0</td>
<td>0</td>
<td>259 000 m² NLA</td>
<td>0</td>
<td>259 000 m²</td>
</tr>
<tr>
<td>Total industrial (light/general industrial)</td>
<td>37 lots</td>
<td>59 lots</td>
<td>18 lots</td>
<td>770 000 m² NLA</td>
<td>114 lots</td>
</tr>
</tbody>
</table>

NLA = net lettable area

Adequacy of supply

While it is difficult to calculate actual demand for industrial land, anecdotal evidence suggests there is high demand for industrial land in Karratha. Demand for general and light industrial land is anticipated to be met in the short to medium term with the release of lots at the Gap Ridge Industrial Estate. A variety of lot sizes are included in the plans for the estate, which includes 114 lots in total. Additional land will be released subject to demand.

Beyond sites offered on the estate, Karratha has no additional undeveloped land zoned for industrial uses. However, additional sites have been identified through planning work being undertaken as part of the Karratha City Growth Plan, with large areas identified to the west and north of the existing Karratha Industrial Estate.
7.8 Commercial/retail

Commercial/retail zoned land supply

The shire’s local planning scheme includes commercial, mixed business and town centre zones. As at June 2010, Karratha had some 61 ha zoned for commercial, retail and mixed business uses, of which approximately 5 ha was undeveloped (Table 22). Almost all of the zoned areas are located in the Karratha town centre, with a few smaller sites scattered through Pegs Creek, Millars Well and Nickel. Most of the town centre land is developed, with few sites currently vacant. The majority of lots in the town centre are in government ownership.

As part of the Karratha Revitalisation Plan, a master plan has also recently been prepared for the Karratha town centre. The master plan identifies four distinct precincts in the city centre, these being the retail, commercial, accommodation and entertainment precincts. The master plan identifies a yield of 2516 dwellings, 718 hotel rooms and additional retail, commercial and community floorspace across the city centre (Table 14 on page 61). The precincts are shown in Figure 28 and Map 5.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Developed (ha)</th>
<th>Undeveloped (ha)</th>
<th>Total (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>5.2</td>
<td>0.1</td>
<td>5.3</td>
</tr>
<tr>
<td>Mixed business</td>
<td>3.7</td>
<td>0</td>
<td>3.7</td>
</tr>
<tr>
<td>Town centre</td>
<td>47.7</td>
<td>4.7</td>
<td>52.4</td>
</tr>
<tr>
<td>Total</td>
<td>56.6</td>
<td>4.8</td>
<td>61.4</td>
</tr>
</tbody>
</table>

Source: Internal databases, Department of Planning (2010)

Commercial/retail land release summary

In summary:

- Planning is progressing to develop commercial and mixed-use precincts in the short to medium term, including a bulky goods precinct at Gap Ridge.
- In May 2010, the preferred proponent was announced to develop the Tambrey mixed use precinct, which will include a neighbourhood shopping centre (capped at 8100m²), residential accommodation and tourism facilities. Final uses and yields will be determined by further planning.
- There are proposals for additional mixed use projects which will likely include a commercial and/or retail component.
- As part of the Karratha City Centre Master Plan, work is underway to enable more land to be released for commercial, retail and residential development (see yield estimates in Table 14).
- The Karratha City Growth Plan includes proposals to establish lower order district centres at Tambrey and Mulataga as well as several local centres (providing local retail services). The timing and scale of retail and commercial development in these centres will need to be at a level that does not undermine the activity centre status of the city, and will need to be carefully managed. The Karratha City Growth Plan notes that the ultimate size should not exceed 8000 m² in the long-term, and development should be initially be kept to 3000 – 4000 m² with the potential to double in size over the long-term.

Land release information is summarised in Table 23. Further project specific information is available in Table 27 and Map 5 and 6. Further information is also available in the Karratha City Centre Master Plan, available on the Shire of Roebourne’s website, www.roebourne.wa.gov.au.
### Table 23: Commercial/retail land release summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Short-term (0-2yrs) (m²)</th>
<th>Medium-term (2-5yrs) (m²)</th>
<th>Medium-term (5-10yrs) (m²)</th>
<th>Long-term (10yrs+) (m²)</th>
<th>Total (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karratha Town Centre - Core Retail²</td>
<td>4 700</td>
<td>7 000</td>
<td>12 200</td>
<td>20 600</td>
<td>44 500 m²</td>
</tr>
<tr>
<td>Karratha Town Centre - Other Retail²</td>
<td>800</td>
<td>1 200</td>
<td>5 600</td>
<td>7 800</td>
<td>15 400 m²</td>
</tr>
<tr>
<td>Karratha Town Centre – Commercial, office, health, community²</td>
<td>10 500</td>
<td>15 800</td>
<td>58 000</td>
<td>40 300</td>
<td>128 700 m²</td>
</tr>
<tr>
<td>Mulataga District Centre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tambrey mixed use – retail component (KA24/KA24A)</td>
<td>0</td>
<td>8 100</td>
<td>0</td>
<td>0</td>
<td>8 100 m²</td>
</tr>
<tr>
<td>Balmoral Apartments – commercial component (KA33)</td>
<td>0</td>
<td>710</td>
<td>0</td>
<td>0</td>
<td>710 m²</td>
</tr>
<tr>
<td>Gap Ridge Bulky Goods Precinct (KA51)</td>
<td>13 (lots) 5 500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13 (lots) 5 500 m²</td>
</tr>
<tr>
<td>Warambie Road – commercial/retail component (KA52)</td>
<td>0</td>
<td>3 000</td>
<td>0</td>
<td>0</td>
<td>3 000 m²</td>
</tr>
<tr>
<td>Gateway (KA63)</td>
<td>0</td>
<td>0</td>
<td>74 000</td>
<td>0</td>
<td>74 000 m²</td>
</tr>
<tr>
<td>Gateway (KA64)</td>
<td>0</td>
<td>46 000</td>
<td>0</td>
<td>0</td>
<td>46 000 m²</td>
</tr>
<tr>
<td>Airport (logistics) (KA80)</td>
<td>0</td>
<td>0</td>
<td>25 400</td>
<td>0</td>
<td>25 400 m²</td>
</tr>
<tr>
<td>Airport (KA80A)</td>
<td>0</td>
<td>0</td>
<td>13 000</td>
<td>0</td>
<td>13 000 m²</td>
</tr>
<tr>
<td>Total</td>
<td>21 500</td>
<td>81 810</td>
<td>162 800</td>
<td>94 100</td>
<td>592 710 m²</td>
</tr>
</tbody>
</table>

¹ Data for many of the projects is an estimate only. Actual floorspace will be determined by further detailed planning.
² Estimates include existing uses in the town centre.

### Adequacy of supply

The Karratha Primary Trade Area Retail and Commercial Strategy reports that Karratha will require an additional 20 000 m² of retail and 16 000 m² of commercial floorspace by 2020. These figures are based on a resident population of 22 795 and FIFO population of 2400 persons in 2020.

The retail shortfall may be met in part by the development of retail uses at the Tambrey mixed use site (KA24/KA24A), Warambie Road site (KA52) and the Gap Ridge Bulky Goods Precinct (KA51). It is likely that other development sites identified in the master plan will be released and developed over the medium term, which will likely meet the shortfall for both retail and commercial floorspace.

Based on the assumption of 50 per cent site coverage for buildings and five storey height, the Karratha City Centre Master Plan estimates that the total land requirement for retail/office uses at 10 703 m² at 2020 and 20 896 m² at 2041. Assuming retail being developed on the ground floor only results in the modified requirement of 40 300 m² at 2020 and 164 888 m² at 2041.

For a population of 50 000 persons, Pracsys (2010) estimates that an additional 80 000 m² (total 123 000 m²) of retail floorspace will be required. The Karratha City Centre Master Plan estimates the yield for retail floorspace (core retail and other retail) in the city centre at 60 000 m². The potential retail floorspace from other projects identified in the Karratha City Growth Plan is estimated at 105 000 m² (district centre, local centres, airport precinct, bulky goods precinct etc), therefore a total floorspace of 165 000 m² across Karratha is estimated. This estimate is therefore well above the Pracsys estimate of 123 000 m².

Pracsys estimates an additional 33 000 m² (total 63 000 m²) of commercial/office floorspace, and an additional 175 500 m² (total 223 000 m²) of health/community/cultural/entertainment floorspace will be required to service a population of 50 000.
Analysis completed as part of preparation of the *Karratha City Centre Master Plan* estimates the yield for office/commercial floorspace at 51 500 m², and the yield for health/community/cultural/entertainment floorspace in the city centre at 77 000 m². The potential yield for these uses from other projects identified in the *Karratha City Growth Plan* are estimated at 28 000 m² for office/commercial and 207 500 m² for health/community/cultural /entertainment floorspace. These total yield estimates for floorspace across Karratha are therefore above the Pracsys estimates.

Note that the floorspace data presented in this document are estimates only. Actual floorspace data will become available as a result of further detailed planning.

### Table 24: Tourism accommodation summary

<table>
<thead>
<tr>
<th>Site</th>
<th>Accommodation type</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karratha Caravan Park</td>
<td>Caravan park</td>
<td>26 chalets/units</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 permanent caravan sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 powered caravan sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 unpowered tent sites</td>
</tr>
<tr>
<td>Pilbara Holiday Park</td>
<td>Caravan park (including cabins/chalets)</td>
<td>62 cabins/units</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 permanent caravan sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>86 short stay caravan sites</td>
</tr>
<tr>
<td>Balmoral Holiday Park</td>
<td>Long term caravan park (3 months+)</td>
<td>31 permanent on-site caravans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 short stay on-site caravans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>186 long term powered van sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 short stay caravan sites</td>
</tr>
<tr>
<td>Best Western Karratha Central Apartments</td>
<td>Serviced apartments</td>
<td>85 serviced apartments</td>
</tr>
<tr>
<td>All Seasons Karratha</td>
<td>Hotel</td>
<td>60 rooms</td>
</tr>
<tr>
<td>Comfort Inn and Suites Karratha</td>
<td>Serviced apartments</td>
<td>23 serviced apartments</td>
</tr>
<tr>
<td>Karratha Apartments</td>
<td>Serviced apartments</td>
<td>10 serviced apartments</td>
</tr>
<tr>
<td>Karratha International Hotel</td>
<td>Hotel</td>
<td>79 rooms</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>139 hotel rooms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>118 serviced apartments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>97 chalets/units</td>
</tr>
<tr>
<td></td>
<td></td>
<td>314 permanent caravan sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>104 short stay caravan sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31 permanent on-site caravans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 short stay on-site caravans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 tent sites</td>
</tr>
</tbody>
</table>

Source: Tourism WA (2010)
the crowded nature of caravan parks, visitors are now seeking alternate, more remote camping locations, or bypassing Karratha altogether.

According to data from the Pilbara Development Commission, during the quarter ending March 2010, there were a total of 574 caravan sites, on-site vans and cabins/chalets/motel rooms in Karratha. The dominant site type was powered with 391 sites (68 per cent), followed by cabin/chalet at 101 sites (18 per cent). The average occupancy rate for the period for powered sites and cabin/chalet was around 90 per cent, with on-site vans (81 per cent) and donga/motel (79 per cent). This data is shown in Figure 34.

Tourism zoned land supply

Karratha has 35 ha zoned for tourism uses and about 90 per cent is developed (Table 25). Undeveloped sites include the former drive-in on Karratha Road and a small lot adjacent to the Balmoral Holiday Park. Some of the developed land accommodates transient workforce facilities.

Table 25: Tourism zoned land supply

<table>
<thead>
<tr>
<th>Zone</th>
<th>Developed (ha)</th>
<th>Undeveloped (ha)</th>
<th>Total (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tourism</td>
<td>30.9</td>
<td>3.6</td>
<td>34.5</td>
</tr>
<tr>
<td>Total</td>
<td>30.9</td>
<td>3.6</td>
<td>34.5</td>
</tr>
</tbody>
</table>

Source: Internal databases, Department of Planning (2010)

Figure 34: Capacity and site availability of caravan parks in Karratha

Source: Land and Housing Snapshot – Karratha, Pilbara Development Commission (2010)
Tourism accommodation development summary

In summary:

- Karratha has several tourism projects in the planning stage that will offer a mix of short and long stay accommodation.
- Development of additional hotels, serviced apartments and resort facilities is identified in the Karratha City Centre Master Plan. The plan identifies the potential for an additional 718 hotel rooms in the town centre.

Land release information is summarised in Table 26. Further project specific information is available in Table 27 and Map 5 and 6.

Tourism WA continually monitors the State’s private and public sector tourism development activity, maintaining a comprehensive database that tracks the progress of tourism accommodation projects. The department publishes an annual summary in the Tourism Accommodation Development Register.

### Table 26: Tourism accommodation development summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Short-term (0-2yrs)</th>
<th>Short-term (2-5yrs)</th>
<th>Medium-term (5-10yrs)</th>
<th>Long-term (10yrs+)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karratha Town Centre – additional hotel rooms</td>
<td>0</td>
<td>305</td>
<td>181</td>
<td>232</td>
<td>718 (rooms)</td>
</tr>
<tr>
<td>Tambrey mixed use precinct – tourism component (KA24/KA24A)</td>
<td>0</td>
<td>Not determined</td>
<td>0</td>
<td>0</td>
<td>Not determined</td>
</tr>
<tr>
<td>Ranges Apartment Complex (KA32)</td>
<td>103</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>103</td>
</tr>
<tr>
<td>Balmoral Apartments - short-stay component (KA33)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>49</td>
</tr>
<tr>
<td>Tambrey Luxury Apartments (KA37) (short-stay component of project)</td>
<td>40</td>
<td>69</td>
<td>0</td>
<td>0</td>
<td>109</td>
</tr>
<tr>
<td>Nickel (KA70)¹</td>
<td>0</td>
<td>341</td>
<td>0</td>
<td>0</td>
<td>341</td>
</tr>
<tr>
<td>Airport (KA80A)¹</td>
<td>0</td>
<td>0</td>
<td>312</td>
<td>0</td>
<td>312</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>143</strong></td>
<td><strong>764</strong></td>
<td><strong>493</strong></td>
<td><strong>232</strong></td>
<td><strong>1632</strong> (261 units) 718 (rooms)</td>
</tr>
</tbody>
</table>

¹Estimates are based on Karratha City Growth Plan data, which calculates a yield based on residential densities of R40. Actual yield for tourism uses will be determined by further detailed planning.

### Adequacy of supply

Research by Tourism WA in late 2009 identified a strong demand for additional tourist accommodation in Karratha, suggesting a demand for an additional 300 to 700 rooms, as well as additional caravan park accommodation. Given the high occupancy rates, many visitors experience difficulties in obtaining accommodation, and therefore may bypass Karratha altogether or seek more remote camping locations, which in turn impacts the local economy.

Additional short-stay accommodation is expected to become available in the short-term with the development of the Ranges Complex (KA32) and the Tambrey Luxury Apartments (KA37). The Karratha City Centre Master Plan identifies the potential for an additional 718 hotel rooms, the majority of which are within the accommodation precinct, on the western and northern perimeter of the town centre. If a portion of these rooms are developed in the short-term (as suggested by analysis of master plan data), the existing/latent demand should be met. This is however subject to sites being made available in the town centre. While future demand is difficult to quantify, it should be noted that the continuing demand for residential and transient workforce accommodation will influence the availability of rooms for short stay purposes (given existing levels of permanent occupancy of visitor accommodation).
Additions to caravan park facilities have not been captured by DoP research of land development projects. Information from Tourism WA indicates that no new caravan parks are currently proposed, which is of concern, given the extremely high occupancy currently being experienced by existing facilities.

Table 27: Project summaries – Karratha

<table>
<thead>
<tr>
<th>Location</th>
<th>Land ownership</th>
<th>Existing zoning</th>
<th>Purpose</th>
<th>Current zoning</th>
<th>Anticipated development</th>
<th>Area (ha)</th>
<th>Yield (lots)</th>
<th>Valuation for sale (2009)</th>
<th>Approvals pending</th>
<th>Short term (2-5yrs)</th>
<th>Medium term (5-10yrs)</th>
<th>Long term (10+yrs)</th>
<th>Resolved</th>
<th>Critical but resolution anticipated</th>
<th>Critical and resolution not definite</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>K003</td>
<td>Lot 604, Dampier Road</td>
<td>Residential</td>
<td>Residential</td>
<td>Development Plan prepared</td>
<td>20.6</td>
<td>250+</td>
<td>250+</td>
<td>0</td>
<td>0</td>
<td>P</td>
<td>Z</td>
<td>Notes: \nProposed Development Area 27 &amp; 28 under scheme amendment no. 21 (initiated July 2010), requiring a district level development plan, approved development plan and economic impact assessment to determine retail floorspace.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K008A</td>
<td>Lot 365, Dampier Road</td>
<td>Residential</td>
<td>Residential</td>
<td>Development Plan prepared</td>
<td>76.2</td>
<td>1853</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>P</td>
<td>P</td>
<td>Notes: \nProposed Development Area 10 under scheme amendment no. 21 (initiated July 2010), requiring a district level development plan, approved development plan and economic impact assessment to determine retail floorspace.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K010</td>
<td>Lot 603, Dampier Road</td>
<td>State of WA</td>
<td>Residential</td>
<td>Development Plan prepared</td>
<td>1093</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>P</td>
<td>P</td>
<td>Notes: \nProposed Development Area 1 under scheme amendment no. 21 (initiated July 2010), requiring a district level development plan, approved development plan and economic impact assessment to determine retail floorspace.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K011C</td>
<td>Crown land</td>
<td>Residential</td>
<td>Residential</td>
<td>Development Plan prepared</td>
<td>137.4</td>
<td>250+</td>
<td>250+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>P</td>
<td>P</td>
<td>Notes: \nProposed Development Area 17 &amp; 18 under scheme amendment no. 21 (initiated July 2010), requiring a district level development plan, approved development plan and economic impact assessment to determine retail floorspace.</td>
<td></td>
</tr>
<tr>
<td>K015</td>
<td>Lot 402A, Maitland Road</td>
<td>Residential</td>
<td>Residential</td>
<td>Development Plan prepared</td>
<td>59.6</td>
<td>1083</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>P</td>
<td>P</td>
<td>Notes: \nProposed Development Area 15 under scheme amendment no. 21 (initiated July 2010), requiring a district level development plan, approved development plan and economic impact assessment to determine retail floorspace.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- NT: Not yet decided
- H: High priority
- P: Priority
- Z: Zoned
- PF: Planning approval
- S: Scheme amendment
- W: Work in progress
- D: District level development plan
- Pw: Parks, recreation and natural landscapes
- CR: Conservation, recreation, wetlands and natural landscapes
- UCL: Urban development
- R30: Residential, rural
- R40: Residential, town

Western Australian Planning Commission
<table>
<thead>
<tr>
<th>Location</th>
<th>Land ownership</th>
<th>Location1</th>
<th>Existing tenure</th>
<th>Purpose</th>
<th>Zoning/planning Area</th>
<th>Area (ha)</th>
<th>Yield (lots)</th>
<th>NLA (ha)</th>
<th>Approvals pending</th>
<th>Anticipated release</th>
<th>Short term (0-2yrs)</th>
<th>Medium term (2-5yrs)</th>
<th>Long term (5-10yrs)</th>
<th>Rezoned</th>
<th>Critical but resolution anticipated</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>KAR25</td>
<td>G</td>
<td>Lot 41 G</td>
<td>Dampier Road (CR 41143), Lot 40</td>
<td>State of WA</td>
<td>Residental</td>
<td>Commercial, re-creative and natural landscapes, State and regional roads, National Lifestyle Villages appointed as preferred proponent (Karratha Consortium comprising FJM Equities Pty Ltd, Rapley Wilkinson and Raydale Holdings Pty Ltd) announced May 2010</td>
<td>10.9</td>
<td>5.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10.9</td>
<td>5.7</td>
<td>E</td>
<td>H</td>
<td>NT</td>
</tr>
<tr>
<td>KAR26</td>
<td>G</td>
<td>Lot 42 G</td>
<td>Dampier Road (CR 41143), Lot 190</td>
<td>State of WA</td>
<td>Residental</td>
<td>Commercial, re-creative and natural landscapes, State and regional roads, National Lifestyle Villages appointed as preferred proponent (Karratha Consortium comprising FJM Equities Pty Ltd, Rapley Wilkinson and Raydale Holdings Pty Ltd) announced May 2010</td>
<td>44.3</td>
<td>3.9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>44.3</td>
<td>3.9</td>
<td>E</td>
<td>H</td>
<td>NT</td>
</tr>
<tr>
<td>KAR27</td>
<td>G</td>
<td>Lot 100 G</td>
<td>Dampier Road (CR 41143), Lot 100</td>
<td>State of WA</td>
<td>Residental</td>
<td>Upland development</td>
<td>No</td>
<td>66.3</td>
<td>600</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>66.3</td>
<td>600</td>
<td>E</td>
<td>H</td>
</tr>
<tr>
<td>KAR28</td>
<td>G</td>
<td>Lot 600 G</td>
<td>Dampier Road (CR 41143), Lot 600</td>
<td>State of WA</td>
<td>Residental</td>
<td>Town centre</td>
<td>No</td>
<td>6.0</td>
<td>1</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>6.0</td>
<td>1</td>
<td>E</td>
<td>H</td>
</tr>
<tr>
<td>KAR29</td>
<td>G</td>
<td>Lot 601 &amp; 602 G</td>
<td>Dampier Road (CR 41143), Lot 601 &amp; 602</td>
<td>State of WA</td>
<td>Mixed use</td>
<td>Mixed use</td>
<td>No on site development</td>
<td>4.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KAR30</td>
<td>G</td>
<td>Lot 606 &amp; 607 G</td>
<td>Dampier Road (CR 41143), Lot 606 &amp; 607</td>
<td>State of WA</td>
<td>Mixed use</td>
<td>Urban development</td>
<td>No</td>
<td>6.1</td>
<td>600</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6.1</td>
<td>600</td>
<td>E</td>
<td>H</td>
</tr>
<tr>
<td>KAR31</td>
<td>G</td>
<td>Lot 806 &amp; 807 G</td>
<td>Dampier Road (CR 41143), Lot 806 &amp; 807</td>
<td>State of WA</td>
<td>Mixed use</td>
<td>Urban development</td>
<td>No</td>
<td>6.1</td>
<td>600</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6.1</td>
<td>600</td>
<td>E</td>
<td>H</td>
</tr>
<tr>
<td>KAR32</td>
<td>G</td>
<td>Lot 4148 G</td>
<td>Dampier Road (CR 41143), Lot 4148</td>
<td>State of WA</td>
<td>Mixed use</td>
<td>Mixed use</td>
<td>No</td>
<td>3.6</td>
<td></td>
<td></td>
<td></td>
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</table>
Table 27: Project summaries – Karratha (continued)

<table>
<thead>
<tr>
<th>Location</th>
<th>Location (UCL)</th>
<th>Zoning/planning Area</th>
<th>Land ownership*</th>
<th>Purpose</th>
<th>Current zoning</th>
<th>Other planning underway</th>
<th>Anticipated completion (commencing July 2010)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dampier Road, Crown land, Dampier Road</td>
<td>State of WA (UCL)</td>
<td>licensing development, Reuse</td>
<td>Yes</td>
<td>transient workforce accommodation</td>
<td>Urban development</td>
<td>Currently under review</td>
<td>To be determined</td>
<td>NT</td>
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<tr>
<td>Dampier Road (CR 30948), Lot 506 Dampier Road, Lot 4599 Dampier Road (leasehold)</td>
<td>State of WA (UCL)</td>
<td>Gap Ridge Industrial Estate, Strategic industry investigation area</td>
<td>Yes</td>
<td>industrial development, Strategic industry investigation area</td>
<td>Urban development</td>
<td>Stage 1 (37 lots) – completion anticipated August 2011. Stage 2 (26 lots) – completion anticipated December 2012.</td>
<td>To be determined</td>
<td>NT</td>
</tr>
<tr>
<td>Dampier Road</td>
<td>State of WA (UCL)</td>
<td>Strategic industry investigation area</td>
<td>Yes</td>
<td>industrial development, Strategic industry investigation area</td>
<td>Urban development</td>
<td>Stage 1 (37 lots) – completion anticipated August 2011. Stage 2 (26 lots) – completion anticipated December 2012.</td>
<td>To be determined</td>
<td>NT</td>
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<tr>
<td>Karratha Road</td>
<td>State of WA (UCL)</td>
<td>Strategic tourism site, tourism village</td>
<td>Yes</td>
<td>tourism accommodation</td>
<td>Urban development</td>
<td>Site identified in draft Karratha City Growth Plan as potential site for tourism village.</td>
<td>To be determined</td>
<td>NT</td>
</tr>
</tbody>
</table>

* Land ownership refers to the current legal tenure of the land. Zoning/planning Area refers to the area within Karratha City Growth Plan. Other planning underway refers to any other planning or development initiatives that are ongoing or planned. Anticipated completion refers to the expected completion date for the project.
Table 27: Project summaries – Karratha (continued)

<table>
<thead>
<tr>
<th>Location</th>
<th>Purpose</th>
<th>Zoning/Planning</th>
<th>Area/ha/yr</th>
<th>Subdivision approvals</th>
<th>Anticipated release</th>
<th>Constraints</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>KA03 G</td>
<td>Lot 905A &amp; 905B Tabby Drive</td>
<td>Residential</td>
<td>Yes</td>
<td>1.0</td>
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<td>KA04 G</td>
<td>Lot 427 Tabby Drive</td>
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<td>Yes</td>
<td>0.2</td>
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<tr>
<td>KA07 G</td>
<td>Lot 174 Rankin Road</td>
<td>Commercial</td>
<td>Yes</td>
<td>1.0</td>
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<td>KA08 G</td>
<td>Lot 584 Mortlock Park Road</td>
<td>Light Industrial</td>
<td>Yes</td>
<td>0.6</td>
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<tr>
<td>KA09 G</td>
<td>Lot 596 Mortlock Park Road</td>
<td>Light Industrial</td>
<td>Yes</td>
<td>1.0</td>
<td>31.9</td>
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<tr>
<td>KA42 G/P</td>
<td>Lot 503 &amp; 504 Galbraith Road</td>
<td>Residential</td>
<td>Yes</td>
<td>0.1</td>
<td>1</td>
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<td>0</td>
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</table>

Karratha Regional HotSpots Land Supply Update

Western Australian Planning Commission
Table 27: Project summaries – Karratha (continued)

<table>
<thead>
<tr>
<th>Location</th>
<th>Land ownership*</th>
<th>Location</th>
<th>Existing tenure</th>
<th>Purpose</th>
<th>Zoning/planning</th>
<th>Approvals pending</th>
<th>Current approvals</th>
<th>Anticipated release (commencing July 2010)</th>
<th>Constraints</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>G/KNT 4</td>
<td>L.C. 10/22</td>
<td>14 Dampier Road (CR 40080), Lot 108, Kepel Street (CR 40081)</td>
<td>State of WA</td>
<td>Residential</td>
<td>Yes (not in the bed)</td>
<td>0.4</td>
<td>4/0</td>
<td>0</td>
<td>D</td>
<td>0</td>
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<tr>
<td>G/KNT 4</td>
<td>L.C. 10/22</td>
<td>14 Dampier Road (CR 40080), Lot 108, Kepel Street (CR 40081)</td>
<td>State of WA</td>
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<td>13</td>
<td>1</td>
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<tr>
<td>G/KNT 4</td>
<td>L.C. 10/22</td>
<td>14 Dampier Road (CR 40080), Lot 108, Kepel Street (CR 40081)</td>
<td>State of WA</td>
<td>Residential</td>
<td>Yes (not in the bed)</td>
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<tr>
<td>G/KNT 4</td>
<td>L.C. 10/22</td>
<td>14 Dampier Road (CR 40080), Lot 108, Kepel Street (CR 40081)</td>
<td>State of WA</td>
<td>Residential</td>
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<td>G/KNT 4</td>
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<td>14 Dampier Road (CR 40080), Lot 108, Kepel Street (CR 40081)</td>
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<td>G/KNT 4</td>
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<td>14 Dampier Road (CR 40080), Lot 108, Kepel Street (CR 40081)</td>
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<td>Residential</td>
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<tr>
<td>G/KNT 4</td>
<td>L.C. 10/22</td>
<td>14 Dampier Road (CR 40080), Lot 108, Kepel Street (CR 40081)</td>
<td>State of WA</td>
<td>Residential</td>
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<td>0.8</td>
<td>1</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>
Karratha
Regional Hotspots Land Supply Update

Table 27: Project summaries – Karratha (continued)

<table>
<thead>
<tr>
<th>Location</th>
<th>Zoning/Planning</th>
<th>Area/ha</th>
<th>Agreed approval(s)</th>
<th>Anticipated release(s) (commencing July 2019)</th>
<th>Comments</th>
</tr>
</thead>
</table>

KWA 12.8 Karratha (amendment no. 21 -> urban development initiated July 2010)

47.1 NT Site identified in draft Karratha City Growth Plan for mixed uses (offices and transient workforce accommodation, short-term). Requires further planning, local scheme amendment (initiated July 2010), resolution of servicing issues and native title. Proposed ODA amendment July-03, subject to development approval and preparation of a landscape master plan.

47.2 Rural land north of Karratha, Lot 476 Karratha Road (24,413.3)

7.4 NT Site identified in draft Karratha City Growth Plan for residential uses (long-term, 10-20 years). Requires further planning, local scheme amendment (initiated July 2010) and resolution of native title. Proposed ODA amendment July-03, subject to development approval and preparation of a coastal vulnerability study and provision for future city bypass causeway link.

47.3 Wilsons Point, Karratha Road, Lot 276, 3898, 4935 & 4946 Karratha Road, Lot 1136 Stovehill Road

10.2 NT Site identified in draft Karratha City Growth Plan for residential uses (long-term, 10-20 years). Requires planning, local scheme amendment (initiated July 2010) and resolution of native title. Proposed ODA amendment July-03, subject to development approval and preparation of a coastal vulnerability study and provision for future city bypass causeway link.

47.4 Cranes Beach, Karratha Road, Lot 49 & 498 Karratha Road

13.9 NT Site identified in draft Karratha City Growth Plan for residential uses (long-term, 10-20 years). Requires planning, local scheme amendment (initiated July 2010) and resolution of native title. Proposed ODA amendment July-03, subject to development approval and preparation of a coastal vulnerability study and provision for future city bypass causeway link.

47.5 Cranes Beach, Karratha Road, Lot 3371-3373, 1064 & 1065, 1074 & 1084, Mystery Road (20,245.8) & 4614 King Way (leasehold)

4.1 NT Site identified in draft Karratha City Growth Plan for residential uses (long-term, 10-20 years). Requires planning, local scheme amendment (initiated July 2010) and resolution of native title. Proposed ODA amendment July-03, subject to development approval and preparation of a coastal vulnerability study and provision for future city bypass causeway link.

47.6 Cranes Beach, Karratha Road, Lot 3371-3373, 1064 & 1065, 1074 & 1084, Mystery Road (20,245.8) & 4614 King Way (leasehold)

29.1 NT Site identified in draft Karratha City Growth Plan for residential uses (long-term, 10-20 years). Requires planning, local scheme amendment (initiated July 2010) and resolution of native title. Proposed ODA amendment July-03, subject to development approval and preparation of a coastal vulnerability study and provision for future city bypass causeway link.

47.7 Cranes Beach, Karratha Road, Lot 3371-3373, 1064 & 1065, 1074 & 1084, Mystery Road (20,245.8) & 4614 King Way (leasehold)

13.8 NT Site identified in draft Karratha City Growth Plan for residential uses (long-term, 10-20 years). Requires planning, local scheme amendment (initiated July 2010) and resolution of native title. Proposed ODA amendment July-03, subject to development approval and preparation of a coastal vulnerability study and provision for future city bypass causeway link.
### Table 27: Project summaries – Karratha (continued)

<table>
<thead>
<tr>
<th>Location</th>
<th>Land ownership</th>
<th>Location1/2</th>
<th>Planning area</th>
<th>Purpose</th>
<th>Zoning/planning</th>
<th>Area (ha)</th>
<th>Subdivision approval3</th>
<th>Anticipated release4 (commencing July 2010)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>KARAHA</td>
<td>G</td>
<td>Lot 310 &amp; CR 6708</td>
<td>402 Road, East End</td>
<td>Crown land</td>
<td>Industrial</td>
<td>118.3</td>
<td>To be determined</td>
<td>D</td>
<td>H P S W Z</td>
</tr>
<tr>
<td>KARAHA</td>
<td>G</td>
<td>Crown land</td>
<td>Karratha Road, Lot 3064</td>
<td>Industrial</td>
<td>Commercial</td>
<td>66.2</td>
<td>To be determined</td>
<td>D</td>
<td>H P S W Z</td>
</tr>
<tr>
<td>KARAHA</td>
<td>G</td>
<td>Crown land</td>
<td>Dampier Road</td>
<td>Industrial</td>
<td>Tourism</td>
<td>20.8</td>
<td>To be determined</td>
<td>D</td>
<td>H P S W Z</td>
</tr>
<tr>
<td>KARAHA</td>
<td>G</td>
<td>Lot 4641</td>
<td>402 Road, East End</td>
<td>Industrial</td>
<td>Commercial</td>
<td>7.8</td>
<td>To be determined</td>
<td>E</td>
<td>H P S W Z</td>
</tr>
<tr>
<td>KADA</td>
<td>G</td>
<td>Lot 600</td>
<td>401 Road, East End</td>
<td>Industrial</td>
<td>Commercial</td>
<td>24.7</td>
<td>To be determined</td>
<td>E</td>
<td>H P S W Z</td>
</tr>
<tr>
<td>KARAHA</td>
<td>G</td>
<td>Lot 302, Box 3344H</td>
<td>402 Road, East End</td>
<td>Industrial</td>
<td>Commercial</td>
<td>19.0</td>
<td>No pre-determined</td>
<td>E</td>
<td>H P S W Z</td>
</tr>
</tbody>
</table>

Notes:
2. "Lot xx" indicates the lot number identified in the relevant council's council planning scheme.
3. "Subdivision approval" indicates the stage at which further planning, local scheme amendment, resolution of servicing issues and native land acquisition is required.
4. "Anticipated release" indicates the date when the project is expected to commence development.
5. "Comments" provide additional information on the project.

**Karratha Regional HotSpots Land Supply Update**

Western Australian Planning Commission
<table>
<thead>
<tr>
<th>Location</th>
<th>Land ownership*</th>
<th>Purpose</th>
<th>Anticipated release4</th>
<th>Opposition a</th>
<th>Area (ha)</th>
<th>Development approval5</th>
<th>Approvals pending</th>
<th>Development approval6</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karratha</td>
<td>State of WA (UCL) – parcel 13</td>
<td>Residential</td>
<td>2010</td>
<td>2015</td>
<td>0.5</td>
<td>1</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Karratha</td>
<td>State of WA (UCL) – parcel 13</td>
<td>Non-residential (commercial and industrial)</td>
<td>2010</td>
<td>2015</td>
<td>0.5</td>
<td>1</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*CR = Crown reserve

5 UCL = unallocated Crown land

6 Refers to the number of lots/units with current subdivision or strata approval, and the number of lots/units for which a subdivision/strata application has been lodged but which is yet to be determined. Does not include local government development approvals.

7 In some cases the anticipated release of lots is yet to be determined. This could be for reasons such as market conditions, demand/supply of services or a requirement of future uses and constraints.

8 Constraints and issues codes: Environmental (E), heritage (H), land assembly (L), native title (NT), planning (P), power (Pw), sewer (S), water (W) and zoning (Z).

9 Land and housing supply > for more information see the following links:

Karratha projects (Land Search > Karratha)

Australian Bureau of Statistics: www.abs.gov.au see Catalogue 2068.0 (2006 Census tables): Dwelling structure (location on census night), Karratha (urban centre/locality)

Government of WA Ministerial Media Statements: www.mediastatements.wa.gov.au see Blueprint for Pilbara Cities (27 November 2009)

Shire of Roebourne: www.roebourne.wa.gov.au see Shire of Roebourne local planning scheme

Western Australian Planning Commission: www.planning.wa.gov.au see Western Australian Planning Commission


Karratha City Centre Master Plan

Shire of Roebourne: www.roebourne.wa.gov.au see Shire of Roebourne local planning scheme
Key points

- To supply the infrastructure Karratha needs to meet its expansion will require significant government funding and improved coordination between agencies and service providers.

- Much of the town’s essential service infrastructure – particularly water and wastewater – is operating close to capacity. Upgrades are necessary if the pressure for new housing and new land developments are to be met.

- Karratha’s power generating capacity and transmission lines will need upgrading in the short to medium term to ensure enough electricity to meet current and projected demands. Distribution networks may also require upgrading if there are substantial increases in density within existing suburbs, such as those proposed in the Karratha City Growth Plan and Karratha City Centre Master Plan.

- A key feature of the Pilbara Cities blueprint is to improve the liveability of regional centres by investing in community infrastructure.

Actions and priorities

- Karratha’s expansion is being held back by its water supply limitations and a series of infrastructure upgrades will be needed in all serviced areas as the town grows.

- It is critical that long-term electricity supplies are secured and that they are ready to meet forecast demand beyond 2012.

- Obtaining basic raw building materials can be difficult and expensive. The problems not only force up construction costs but also have the potential to constrain Karratha’s long-term growth. Short-term solutions must be found – including identifying alternative sources of supply.

8.1 Water

Karratha is supplied with potable water by the Water Corporation from two main sources:

- Harding River Dam (surface water) - primary source;
- Millstream aquifer (groundwater) - secondary source.

Harding River Dam is located 23 kilometres south-east of Roebourne and was formed by the construction of two embankments. Originally the dam could only be used for six to eight months of the year because high turbidity caused quality problems. These were solved in 2004 by the installation of a $31.5 m micro-filtration water treatment plant that enabled the dam to be used all year round - providing that it held sufficient water. In 2009-10, 1343 ML was drawn from the dam.

Millstream aquifer is located 96 kilometres south of Karratha and has been the town’s secondary source of supply since 2000. In 2009-10 270 ML was drawn from the aquifer but there is now growing concern about its sustainability and the amount of water that can be drawn from the system without effecting Millstream’s ecology. The Department of Water is currently investigating the issue.

Together the dam and aquifer make up the West Pilbara Water Supply Scheme and service domestic and industrial customers in Karratha, Dampier, Roebourne, Wickham, Cape Lambert and Point Samson. Both sources rely on rainfall associated with summer cyclones for recharging. The Water Corporation is licensed to draw up to a total of 15 GL a year from the two sources operating them either together or independently. Actual draw depends on dam storage and aquifer level. Information on the total scheme draw is shown in Table 28.
Table 28: Total scheme draw\(^1\) - West Pilbara Water Supply Scheme

<table>
<thead>
<tr>
<th>Year (ending March)</th>
<th>Millstream Aquifer</th>
<th>Harding River Dam</th>
<th>Total draw(^1) (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-02</td>
<td>9.34</td>
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<td>9.34</td>
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<tr>
<td>2002-03</td>
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<td>2003-04</td>
<td>9.66</td>
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<td>9.66</td>
</tr>
<tr>
<td>2004-05</td>
<td>3.26</td>
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<td>2007-08</td>
<td>0.93</td>
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<tr>
<td>2009-10</td>
<td>0.27</td>
<td>13.43</td>
<td>13.70</td>
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</tbody>
</table>

Source: Department of Water (2010)

\(^1\) Data does not include system losses.

Bulk water from the scheme is transferred into service storage tanks in the Karratha Hills. It is carried there in the Harding River main pipeline that runs underground in a south-easterly direction from Harding Dam to the junction of the North West Coastal Highway and Karratha Road. The 600 mm main is located either in or adjacent to road reserves or vested pipe reserves for the majority of its route. Water supply for Karratha is gravity fed from storage tank no. 3. The tank has a storage capacity of 25 ML (water level 65.6 AHD). Chlorination dosing takes place at the outlets of tank no. 3 and LIA tank no. 1.

Two 9 ML tanks (water level 65.7 AHD) located on Karratha Road, south of the town centre have previously been decommissioned and are not currently operational. The Water Corporation is currently investigating the recommissioning of these tanks over the short to medium term, to alleviate the current water storage constraints with the existing scheme.

The existing water distribution and reticulation network may also require significant upgrade if there are substantial increases in housing density, such as those proposed in the Karratha City Growth Plan. A new major water source is required as soon as practicable to avoid constraining domestic growth in the West Pilbara towns. Water source planning has therefore become a critical task.

To solve the problem the Water Corporation is considering several options including alternative groundwater sources and the construction of a desalination plant on the Burrup Peninsula. An expression of interest process was announced in late July 2010 to formally identify all viable water source options for the West Pilbara Water Supply Scheme, including third party supply proposals. A report identifying all viable water source options will be submitted to State Cabinet.

The existing water distribution and reticulation network may also require significant upgrade if there are substantial increases in housing density, such as those proposed in the Karratha City Growth Plan. A new major water source is required as soon as practicable to avoid constraining domestic growth in the West Pilbara towns. Water source planning has therefore become a critical task.

To solve the problem the Water Corporation is considering several options including alternative groundwater sources and the construction of a desalination plant on the Burrup Peninsula. An expression of interest process was announced in late July 2010 to formally identify all viable water source options for the West Pilbara Water Supply Scheme, including third party supply proposals. A report identifying all viable water source options will be submitted to State Cabinet.

The Water Corporation is also continuing its water efficiency campaign in the West Pilbara to target community behavioural change, retrofitting properties, industrial efficiency and reducing leaks. Although cost will vary dependant on the option that is adopted, the expansion and upgrade are expected to cost in the region of $470 m.
8.2 Wastewater

Karratha's residential and commercial areas are fully serviced by deep sewerage, with sewerage from Pegs Creek east treated at a wastewater treatment plant (WWTP No.1) located in the Karratha Hills between Mulataga and the light industrial area. Wastewater is transferred through a gravity sewer reticulation network connecting to wastewater pumping stations, located on Balmoral Road and Searipple Road which is then pumped via pressure main up to the WWTP.

Sewerage from the western portion of the town is treated at the Gap Ridge WWTP (WWTP No. 2). A further small treatment plant supports the industrial accommodation area adjoining the light industrial area, however the remainder of the light industrial area remains unsewered.

The current capacity of WWTP No. 1 (Mulataga) is 2300 kL/d, which is sufficient in the short term. The capacity of WWTP No. 2 (Gap Ridge) is 3000 kL/d and, although the plant currently has some spare capacity, its operation is currently limited by the capacity of the treated wastewater storage and disposal system. The Water Corporation is currently examining options and funding opportunities for a treated wastewater management standpipe system for dust suppression, which may provide a short-term solution.

Options for expansion of WWTP No. 2 are limited by its location and conflicting land uses in the area. However, given the direction of town site growth and the lack of available alternative sites, there may be a need to expand the site and the odour buffer. Residential density increases proposed as part of the Karratha City Growth Plan and Karratha City Centre Master Plan will also result in increased flows and therefore the requirement for pumping station and pressure main upgrades.

Wastewater is treated to a secondary standard and is used by the Shire of Roebourne to reticulate ovals in Karratha or is contained within evaporation ponds. The treated wastewater re-use scheme is in need of significant upgrade works.

The existing wastewater network is shown on Map 8.

Future requirements and planning

Estimated costs to upgrade WWTP No. 1 to 8000 kL/d is approximately $122 m. This includes $51 m for facility upgrade, $40 m for wastewater conveyance (upgrade to 11 000 kL/d) and $31 m for treated wastewater management.

Depending on the magnitude of growth in Karratha, a new wastewater treatment plant may be required in the future.

8.3 Power

Electricity generation

Today Karratha receives its electricity supply from Horizon Power through the North West Interconnected System (NWIS). The NWIS covers thousands of square kilometres extending 400 kilometres east to west and 350 kilometres north to south. It serves Dampier, Wickham, Pannawonica, Paraburdoo and Tom Price through the Pilbara Iron (Rio Tinto) network and Port Hedland, South Hedland, Karratha, Roebourne and Point Samson through the Horizon Power Network. The interconnected system is owned and operated by numerous companies including Horizon Power, Pilbara Iron (Rio Tinto), Alinta and BHP Billiton. Since the 1970s, the system has developed from a series of stand-alone networks to an interconnected system first launched in 1985.

Rio Tinto's power stations at Dampier and Cape Lambert provide Karratha with its primary source of electricity with Horizon Power buying much of Rio Tinto's output under a power purchase agreement and then on-selling it to domestic and business customers. That agreement began to 'roll off' in March 2010 and the power produced at the new ATCO power station (see below) will be purchased by Horizon Power under a 100 per cent power purchase agreement. Rio Tinto has recently made the decision to develop a new 250 MW gas turbine power station near its Seven Mile railway workshop west of Karratha. It is understood this will enable the company to close its ageing Dampier and Cape Lambert power stations.

The Karratha terminal is located south of the Karratha Hills with transmission lines linking distribution substations at Pegs Creek and Bula.
New ATCO power plant

A new power station has been constructed adjacent to Horizon Power’s base facility on Stove Hill Road, south of the Karratha Hills. The plant developed by ATCO Power, employs two 43 MW high-efficiency gas turbines, and was fully commissioned in April 2010. The new power station, with a capacity of 86 MW, has been designed to meet the growing needs of the region, and has current capacity to cater for the power needs of 75,000 households (excluding other activity usage). The power station could, in the future, be expanded to 150 MW generation capacity to meet the future energy demands on the NWIS.

Additional power sources

A similar plant is planned for Port Hedland. Power from this source would be available to the Karratha area via the NWIS. Citic Pacific is developing a major power plant at Cape Preston, which will have the ability to generate 450 MW, but at this stage there is no plan for Citic Pacific to interconnect to the NWIS.

Electricity distribution

Power is supplied to Karratha via an 11 kV network of overhead and underground power cables fed from zone substations located on Millstream Road and Dampier Highway. A change in voltage from 11 kV to 22 kV is needed to support Karratha’s future load growth in residential and commercial areas. The changeover will cost an estimated cost $25 m and funding has already been allocated as part of the Pilbara Underground Power Project, with construction anticipated to commence in July 2010 and completion by the end of 2011. Upgrading the high voltage network to 22 kV will enable the existing zone substations to provide adequate power for some time without the need for a new zone substation to be established. Design of the new 22 kV underground network should also include provision for potential significant additional load resulting from increased residential and commercial development proposed as part of the Karratha City Centre Master Plan.

Underground power

Horizon Power has begun placing Karratha’s existing power distribution network underground - starting with the older suburb of Bulgarra. All recent residential and industrial subdivisions have been supplied with underground power. The Pilbara Underground Power Project will improve the reliability of power supply during cyclones as well as reduce maintenance costs. Funding was made available through the Pilbara Revitalisation Plan – a Royalties for Regions initiative.

Future requirements and planning

Horizon Power’s load in the Pilbara has grown significantly in recent years. The current demand supply balance is becoming increasingly tight and does not cater for expansion in the region. A further 100 MW of new generation capacity will be required by December 2012 to meet existing known loads. It is estimated that a total of 380 MW and power transmission upgrades will be required to meet the power requirements of Karratha and Port Hedland over the next 10 years. Horizon Power is presently evaluating a range of options to procure this capacity.

Unless additional power supplies and/or upgrades to transmission lines are provided prior to 2013 there exists a possibility that demand may exceed supply during peak times if the projected growth in demand is realised.

Additional funding will be required for the region to continue to grow, and costs are estimated at:

- Stage 1 - new power station to meet Pilbara demand ($370 m)
- Stage 2 - Roebourne to Karratha transmission line ($70 m)
- Stage 3 - Cape Lambert to Port Hedland transmission line upgrade ($20 m)

Actual funding costs and staging of upgrades will be dependant on the outcomes of more detailed assessments by Horizon Power and business cases presented to Government.

The existing power network is shown on Map 9.
8.4 Transport

Existing transport networks are shown on Map 10.

Roads

Karratha is strategically located on Dampier Highway - a national highway connected to other national and State highways including the North West Coastal Highway, Burrup Peninsula Road and Madigan Road. Dampier Highway is the primary link to Dampier Port, the major industries of the Burrup and the regional airport.

Ongoing regional expansion - including inland and offshore oil and gas projects - is expected to increase traffic substantially. There will be more heavy vehicles and road trains in double and triple truck configurations, which will cause both safety hazards and congestion, particularly in peak periods.

About 80 per cent of the Pilbara region’s inputs are transported by road. At the same time, much of the region’s outputs are carried by rail. Just three per cent go by road. The inputs that include large-sized equipment, consumables, construction materials and transit freight, mainly originate from Perth, Port Hedland and Dampier. Road freight volumes are likely to increase to meet the needs of a growing number of smaller scale resource projects, which do not have rail access. The major new offshore projects are also expected to generate more road traffic.

The Pilbara Freight Study found that in the long term road freight would increase significantly. Traffic volumes on Dampier Highway and Burrup Peninsula Road were expected to increase from the present 9000 - 10 000 vehicles a day to 30 000 - 35 000 long-term.

General road transport issues include:

- growing traffic pressure will put pressure on the road network’s safety, efficiency and reliability. Regional through traffic including very large heavy vehicle will come into increasing conflict with local traffic - particularly during peak hours in townsites;
- operational conflicts will grow with the increased movement of pre-assembled large module transport across the road network to service the resource sector.

To assist with addressing these issues, stages 1A and 1B of the Dampier Highway duplication project have recently been completed with the result that there is now a dual carriageway between Balmoral Road east and west, and roundabouts at Broadhurst, Bathgate Road, Gailbraith and Balmoral Road west.

Other improvements are now in progress. Stages 2 – 6 of the project involve the design and construction of 12.3 kilometres of dual carriageway highway from Balmoral Road west to the Burrup Peninsula Road. It involves several intersections, strengthening work and a new bridge at Seven Mile Creek. The project will improve the road network’s safety and efficiency by minimising the conflict between residential, business and heavy haulage vehicles and optimising traffic flow. The project is due to commence in late 2010 and be complete by late 2012. It will cost an estimated $90 m (including a Federal Government contribution of $80 m). There are also numerous road works associated with new residential subdivisions occurring near by. Work has also recently commenced on improvements to Dampier Highway near the Karratha Industrial Area.

Work on a key road connection from Karratha to Tom Price is now in progress and Stage 2 was opened in August 2008. When complete, the road will provide a valuable link between Karratha and the central Pilbara as well as improve road safety and boost tourism. The road now extends 115 kilometres from Karratha to Barowanna Hill. Completion of Stages 3 and 4, which extends the road 158 kilometres from Barowanna Hill to the Nanutarra-Munjina Road, is subject to funding availability.

Other road upgrades are being planned for the short and medium-term including the $14 m reconstruction of Burrup Peninsula Road to provide a number of passing lanes, and the provision for a truck breakdown area at Two Mile at a cost of about $4 m.

Medium to long-term road proposals include construction of a second airport access road, upgrading the Burrup Peninsula Road to four lane divided road standard and a new Karratha Western Bypass route to replace Madigan Road as the primary freight route to the Burrup Peninsula. The development of a more direct road link between Karratha and Wickham/Mount Anketell is also being considered.
Rail

There are currently three mineral export rail systems operating in the Pilbara region. These heavy duty standard gauge railways transport iron ore to port facilities in the region and are operated by BHP Billiton, Rio Tinto and Fortescue Metals Group. These railways are on leased land and subject to Agreement Acts. The leases are 60 metres wide to accommodate service roads as well as railway facilities.

Within the Karratha area, the Rio Tinto Iron Ore rail system covers 1300 kilometres of track, servicing 11 mines and connects to the Dampier iron ore processing plant and export berths. The company has started duplicating the trunk line to increase its capacity. Rio Tinto maintains its locomotives and rolling stock at the Seven Mile railway maintenance facility near Karratha airport but there are plans to build a new facility closer to Dampier. The increased frequency of ore trains will have implications for road traffic at road crossings.

A new West Pilbara railway is planned by the Australian Premium Iron Joint Venture as part of the West Pilbara Iron Ore Project. It will have a capacity of 30 Mtpa, and retain an expansion potential to cater for the significantly larger tonnages to be shipped from the new port at Anketell.

Neither general rail freight nor passenger services operate in the area.

Ports

The Pilbara region has three major ports at Dampier, Port Hedland and Cape Lambert. Dampier Port is located 16 kilometres from Karratha.

The port caters for exports of iron ore, LNG, salt, condensate, LPG and other general commodities and imports of petroleum and general goods. About 80 to 83 per cent of the export trade is iron ore, and 15 per cent gas products (LNG, LPG and condensate). The remainder is salt, petroleum products, general cargo and anhydrous ammonia.

Dampier Port facilities include:

- Dampier Port Authority
  - cargo wharf
  - barge ramp
  - bulk liquids berth
  - heavy load out facility
- Rio Tinto Iron Ore
  - East Intercourse Island (including lay-by berth)
  - Parker Point 1, 2, 3, 4 and 5
- Dampier Salt Limited
- Woodside Energy Limited
  - Whithnell Bay (LNG jetty, LPG/condensate jetty)
  - King Bay supply base
- Mermaid Marine Australia

Dampier Port Authority released its Port Development Plan in 2008 and is proposing to issue an update in 2010. The revised plan will accommodate the expected rise in ships calling at the port and the planned introduction of a vessel management system to handle the extra movements within the port's four channels. As well as the overall increase in trade, the extra navigational movements will include traffic from rig tenders and a higher level of recreational boating.

The Port Development Plan includes provision to increase berth capacity at the cargo wharf. Subject to final funding approvals, work is expected to start in mid-2010 and be completed by 2014.

In March 2010, plans were announced for a new multi-user deepwater port and industrial precinct to be built at Anketell, 30 kilometres east of Karratha. It will be designed to complement existing facilities at Dampier and Port Hedland, and have an annual export capacity of more than 350 million tonnes. It will accommodate a range of users and mineral commodities and include an industrial area of more than 1400 ha. Access to the port will be via a dedicated infrastructure corridor for transport and services.
Potential foundation investors in the new precinct include:

- API Management for its 30-40 Mtpa West Pilbara Iron Ore Project
- Fortescue Metals Group Ltd for its 30-60 Mtpa Solomon Project
- China Metallurgical Group Corporation for its 15 Mtpa Cape Lambert Iron Ore Project.

The port will be built by a private proponent under agreement with the State Government and aim to start operations by 2015. A cap will be placed on the new port to ensure the viability of existing ports into the future.

Airport

Karratha airport is located 15 kilometres to the west of Karratha, near Dampier. It is the busiest regional airport in the State, offering both intrastate and interstate services. There are currently 73 scheduled regular passenger transport services per week, operated between Qantas and QantasLink, Skywest and Virgin Blue. While the majority of services operate between Karratha and Perth, there are scheduled interstate services, operating weekly to Brisbane, Sydney and Melbourne and twice weekly to Darwin.

The airport also provides for regular passenger transport, off-shore helicopter and general aviation services. The airport is one of the busiest helicopter airports in the country, servicing facilities in the North West Shelf. Since late 2009, Cobham has provided a workers’ shuttle service to the Barrow Island gas project using two BAE-146s based at Karratha.

The airport currently experiences the highest number of air passenger arrivals in the Pilbara, with the majority being FIFO workers. The airport has experienced growth of approximately 9 per cent per annum over the past ten years, with 2008-09 passenger throughput reaching approximately 497 000 passengers, and throughput for 2009-10 expected to reach 620 000 passengers. As at May 2010, the airport was servicing approximately 56 000 passengers per month. Runway expansion works were completed in March 2009 to cater for this growth, with the runway lengthened from 1850 m to 2200 m and widened from 30 m to 45 m. Helicopter and general aviation aprons were also expanded. The runway was expanded to ultimately accept B767 type aircraft.

Upgrades to be completed by the end of 2010 include improvements to the car park (increase from 300 to 680 parking bays) and terminal building including dedicated bus and taxi lanes and passenger drop off zones. Check in operations and baggage handling systems will also be improved. Planning is also under way to further expand the western helicopter apron, expand the terminal building and upgrade electrical and water services.

The Karratha City Growth Plan includes proposals for development of commercial/logistics uses within the airport precinct. The Shire of Roebourne completed the Karratha Airport Master Plan in June 2009, to plan for future development of the airport precinct. The master plan includes revenue passenger forecasts out to 2027-28. The master plan can be accessed at www.roebourne.wa.gov.au.

Future requirements and planning

Costs for ongoing airport upgrades are estimated at $24.3 m, with $7.2 m required for the 2009-2013 period. A terminal upgrade is also proposed (~$60 m).

Public transport

The Shire of Roebourne advise that a community bus service currently operates on Tuesday and Saturday on a twice daily and return timetable. The bus services Dampier, Karratha, Roebourne, Wickham and Point Samson, and is funded by the Shire of Roebourne and the Public Transport Authority. The Shire is currently in discussions with Rio Tinto regarding the sponsorship and provision of a Sunday bus service.

Greyhound operates a Karratha to Perth service three times weekly. The cost per passenger is approximately $300.
8.5 Education

Karratha has the most extensive range of educational facilities in the Pilbara region. There are six primary schools (five State and one Catholic), an education support centre and two high schools (one State and one Catholic). Enrolment details for primary and secondary schools are shown in Table 29. The primary schools are located on sites ranging from two to three hectares with the exception of Tambrey Primary School which has 3.3 ha site part of which is earmarked for future development.

The location of existing facilities is shown on Map 11.

Table 29: Karratha school enrolment trend: 2005 - 2009 (semester one)

<table>
<thead>
<tr>
<th>School</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karratha Primary School</td>
<td>383</td>
<td>374</td>
<td>374</td>
<td>355</td>
<td>331</td>
</tr>
<tr>
<td>Millars Well Primary School</td>
<td>350</td>
<td>403</td>
<td>427</td>
<td>366</td>
<td>374</td>
</tr>
<tr>
<td>Pegs Creek Primary School</td>
<td>178</td>
<td>166</td>
<td>191</td>
<td>210</td>
<td>217</td>
</tr>
<tr>
<td>Tambrey Primary School</td>
<td>371</td>
<td>361</td>
<td>371</td>
<td>375</td>
<td>400</td>
</tr>
<tr>
<td>St Paul’s Primary School</td>
<td>280</td>
<td>290</td>
<td>304</td>
<td>279</td>
<td>283</td>
</tr>
<tr>
<td>Karratha Senior High School</td>
<td>719</td>
<td>720</td>
<td>701</td>
<td>682</td>
<td>683</td>
</tr>
<tr>
<td>St Luke’s College</td>
<td>308</td>
<td>337</td>
<td>371</td>
<td>355</td>
<td>402</td>
</tr>
<tr>
<td>Total primary students</td>
<td>1562</td>
<td>1594</td>
<td>1667</td>
<td>1585</td>
<td>1605</td>
</tr>
<tr>
<td>Total secondary students</td>
<td>1027</td>
<td>1057</td>
<td>1072</td>
<td>1037</td>
<td>1085</td>
</tr>
</tbody>
</table>


The primary schools have seen a steady increase in enrolments, in contrast to the high schools where enrolments have remained relatively steady. The reason for the lack of growth in secondary school students may be the result of an exodus of company and government employees when their children reach high school age. When parents do remain in Karratha after their children reach high school age, some send their children out of the town to boarding schools.

Karratha Senior High School’s year 11 and 12 students were relocated to the Karratha Education Leisure and Training Precinct (adjacent to the TAFE campus) in 2010. Years 8 to 10 (currently accommodated at the high school site in Bulgarra) are expected to be relocated by 2013, as part of stage two of the development ($46 m was allocated in the 2010-11 State Budget for this project). The project will create an education hub combining the high school, a community library, TAFE, Curtin University and Australian Technical College facilities.

The relocation of Karratha Senior High School has also opened up the opportunity for the redevelopment of Karratha Primary School. The replacement of the primary school is under way at a cost of $22.5 m.

Future requirements and planning

Based on current demand, it is not anticipated that Karratha will require a third high school, with demand being met through the two existing facilities. Additional sites have been identified in the Mulataga and Nickol areas as part of the Karratha City Growth Plan. Additional facilities will be developed subject to local demand.

Current growth is placing pressure on Tambrey and Millars Well Primary Schools. A site has been allocated in the Baynton West estate for development of a primary school, but funding (~$23 m) has not been allocated at this stage. It planned that a new primary school will be constructed in the Baynton West development in the next two to three years.

Tertiary education

In 2009, Pilbara TAFE recorded a total of 969 987 student contact hours (SCH) for mainstream institutional delivery. The College delivered 147 405 SCH in employment based training and 549 582 SCH for institution based training. Pilbara TAFE enrols over 6000 students each year, including residents and FIFO workers, and operates within a competitive training market alongside other private training providers.

The College is the largest trainer of apprentices in the region, and also trains personnel across a broad range of industries. In terms of training products, Pilbara TAFE delivers programs which range from entry-level certificates through to advanced diplomas,
as well as community capacity-building programs (literacy and numeracy, Work Ready and return to work) and customised programs for business. Pilbara TAFE is scoped to deliver 162 qualifications in 68 different industry areas. In 2009, Pilbara TAFE had approximately 200 full time equivalent academic and support staff.

The Karratha City Growth Plan reports that TAFE facilities are in need of an upgrade, particularly in relation to trade workshops. An upgrade to facilities will enable a broader range of courses to be provided.

Limited university courses are available at the Karratha and Port Hedland TAFE colleges through Curtin University, primarily in areas related to business and humanities. Some Pilbara TAFE diplomas and advanced diplomas also provide students with advanced standing towards Curtin university degrees. Development of university facilities will allow a greater range of courses to be available to students.

Commencing operation in 2007, the Australian Technical College offers courses to year 11 and 12 students. Students enter into an Australian school based apprenticeship in various trades, providing incentives for more students to stay on at school and encouraging more students to pursue trade qualifications. An initiative of the Department of Education, Employment and Workplace Relations, the college locations were selected based on areas experiencing gaps in the skills required for local industry. The colleges are supported locally through the involvement of local industry, such as Rio Tinto, BHP Billiton, Woodside Energy and Chevron Australia, and offer courses in metal and engineering, construction, automotive, electrotechnology and commercial cookery.

Future requirements and planning

Pilbara TAFE has plans to build a new trade training centre. Construction is due to commence in 2010.

8.6 Health

Karratha's main medical facility is the Nickol Bay Hospital on Dampier Road (see Map 11). It caters for accident and emergency cases and offers acute inpatient care. There are obstetric services (including caesarian section) and general surgery however patients requiring major surgery are referred to Port Hedland or Perth. Bed numbers for each of the Pilbara's hospitals is detailed in Table 30.

The hospital's facilities include:

- general beds including multi-day surgical cases and midwifery units;
- beds for same day surgery;
- treatment bays in accident and emergency department plus resuscitation bed; and
- operating theatres.

Karratha is also the base for delivering comprehensive, district-wide health services including immunisation, school health screening, community and child health, allied health and therapy services. Most of the services are offered through the Warambie Centre on Warambie Road, Karratha.

Table 30: Hospital facilities - Pilbara region

<table>
<thead>
<tr>
<th>Hospital facility</th>
<th>Same day (number of beds)</th>
<th>Overnight (number of beds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newman Hospital</td>
<td>n/a</td>
<td>8</td>
</tr>
<tr>
<td>Nickol Bay Hospital (Karratha)</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Onslow Hospital</td>
<td>n/a</td>
<td>6</td>
</tr>
<tr>
<td>Paraburdoo Hospital</td>
<td>n/a</td>
<td>2</td>
</tr>
<tr>
<td>Port Hedland Hospital</td>
<td>16</td>
<td>39</td>
</tr>
<tr>
<td>Karrarra House Aged Care (Port Hedland)</td>
<td>n/a</td>
<td>56</td>
</tr>
<tr>
<td>Roebourne Hospital</td>
<td>n/a</td>
<td>8</td>
</tr>
<tr>
<td>Tom Price Hospital</td>
<td>n/a</td>
<td>8</td>
</tr>
<tr>
<td>Pilbara total</td>
<td>24</td>
<td>147</td>
</tr>
</tbody>
</table>

Source: Government of Western Australia Department of Health
Data as at 25 February 2010
Beds: The total number of beds allocated for use by a hospital patient within the hospital or facility. Where n/a is displayed, data is not available or the bed count does not apply to these hospitals or facilities.
Aged care

Aged care services are delivered through Pilbara Aged Care Services (PACS), a regional service specialising in non-residential care services across the Pilbara, including Karratha. PACS provides access to Aged Care Assessment (ACATs), Home and Community Care (HACC) services and the Commonwealth Aged Care Packages (CACPs) along with the Commonwealth Care Link and Respite Service.

Other health services

There are currently three medical centres operating in Karratha, and two dental surgeries.

Future requirements and planning

The 2010-11 State Budget includes a $150 m allocation to replace the Nickol Bay Hospital with construction expected to start in 2011-12 with completion in 2014-15.

This complements funding already provided in the 2009-10 budget which included a $10 m allocation to enhance existing services at the Nickol Bay Hospital and plan for the future. The funding covered:

- $7 m for housing for new and existing staff through construction or lease;
- $2 m for upgrades to obstetric services; and
- $1 m for facility master planning.

In 2009 under the Royalties for Regions initiative, a partnership was formed between the State Government and the Pilbara Industry Community Council (PICC) to identify funding priorities. As a result, the Pilbara Health Initiative was established with a long-term budget of $32.96 m. Karratha was allocation $5.28 m to be spent over the next three years on urgently needed equipment and services. Funds will be spent on:

- Improved emergency transport services including the employment of rural paramedics to support volunteer ambulance services
- Construction of an all-weather 24-hour helipad with remote-controlled lighting at Nickol Bay Hospital
- Advanced training for hospital staff to enhance the region’s ability to respond to large-scale emergencies
- Installation of a CT scanner at Nickol Bay Hospital to reduce the need for patients to travel to Perth and Port Hedland for diagnostic tests
- Enhancement of vital signs emergency monitoring equipment through electronic networking at Nickol Bay Hospital
- Improved emergency, surgical and paediatric services through employment of specialists in the West Pilbara.

The Department of Health has also recently finalised the WA Health Clinical Services Framework 2010-2020 which will guide the delivery of public health services across the State for the next 10 years. The blueprint is available at www.health.wa.gov.au/publications/subject_index/

The Department is also currently preparing a State Health Infrastructure Plan which will outline the management and development of capital assets over the next 10 years.
8.7 Police, justice and emergency services

Police

The Pilbara District Police Complex is a new facility designed to meet the anticipated needs of the expanding community. The new complex has been built to replace the old regional headquarters, and was opened in May 2010. The station provides 24 hour policing to Karratha and strategic support for Dampier, Wickham and Roebourne police stations. The station caters for up to 62 staff and has been designed to enable additional police officers to be based at the facility in the future.

Justice

The Karratha Courthouse adjacent to the police station, provides services to the surrounding region and acts as a district court registry for civil actions.

Emergency services

Emergency response facilities in Karratha include a fire station, State Emergency Services unit and a St John ambulance station. They are co-located in the town centre on the corner of Balmoral Road and Welcome Road.

The location of police, justice and emergency service facilities is shown on Map 11.

Future requirements and planning

The Karratha 2020 Vision and Community Plan identifies the need for Karratha to have a Fire and Emergency Services (FESA) regional office and headquarters, encompassing an emergency management command centre and a fire station for career officers. The plan also found the need to identify more spaces for emergency evacuation.

8.8 Telecommunications

Karratha's telecommunications exchange and tower is located in the town centre on Balmoral Road, south of Morse Court. A communications reserve is also located on View Road, south of Millstream Road. This site accommodates the Telstra satellite station.

There are a number of mobile phone towers located across Karratha. Both Telstra and Optus have recently installed, or are planning to establish additional towers to improve coverage and address reliability issues.

Future requirements and planning

Projects to improve the existing mobile phone coverage, and access to the National Broadband Network have been identified as part of the Pilbara Cities initiative.

8.9 Other community infrastructure

A problem faced by all communities - especially fast growing ones like Karratha - is the need for good social infrastructure to enhance people's general health and wellbeing. At present, this type of infrastructure is often planned, funded and delivered in an uncoordinated manner through federal, state, local Government and private sector mechanisms, and is, in some cases not adequately aligned with population growth and urban expansion. There is now significant pressure to ensure that social infrastructure is delivered in line with population growth, and a need to better define the roles and responsibilities of federal, state, and local Governments and the private sector in the delivery of this type of infrastructure and services. More effective outcomes may also be realised as a result of more integrated land use and infrastructure planning.

Karratha's community services are struggling to meet current demands. Services delivered by non-government organisations are especially affected by the high cost of living and resultant difficulty to attract and retain staff. The lack of affordable housing for non-government community workers contributes to the high turnover of staff, and this, combined with a low rate of volunteering due to shift work, and fly-in fly work rosters, has stressed provision of essential community services.
In recent times, local government has experienced an increasingly expanding role in the provision of community infrastructure. Local governments however, are often constrained by their revenue raising capacity and limitations due to staff and other resources. Limited funding, coupled with evolving community demands, increased expectations and lifestyle changes continues to put pressure on state and local governments to maintain existing infrastructure and develop new infrastructure.

In response to issues in Karratha, the Shire of Roebourne has recently developed the Karratha 2020 Vision and Community Plan and the Karratha City Growth Plan which has been developed jointly by Landcorp and the Shire of Roebourne to guide future development in Karratha. These reports identify a number of challenges and opportunities to address community infrastructure needs, including provision of additional community, cultural, civic and youth facilities. The plans identify costs and set the priorities for what community infrastructure should be rolled out over the next decade.

Open space and recreation

Open space in Karratha performs dual roles, these being recreation and amenity and drainage functions. The arid climate of the region impacts on the use patterns and provision of open space and recreation facilities.

Karratha has four main ovals, located in Bulgarra, Pegs Creek, Millars Well and Tambrey, and a number of smaller parks and drainage corridors. Indoor sporting facilities are provided through the aquatic centre and entertainment centre. Recreation infrastructure in Karratha is shown in Table 31.

The Karratha Open Space Strategy was recently prepared to provide a framework for the provision of public open space in the urban areas of the Karratha townsit. The strategy will also assist council rationalise its open space system in the context of overall need, function and operation. The strategy identifies significant opportunities across Karratha for the excision of land from the open space system for potential residential purposes.

Table 31: Recreation infrastructure – Karratha

<table>
<thead>
<tr>
<th>Facility</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swimming pool 50m</td>
<td>1</td>
</tr>
<tr>
<td>Swimming pool 25 m</td>
<td>1</td>
</tr>
<tr>
<td>Tennis courts outdoor</td>
<td>8 (lit)</td>
</tr>
<tr>
<td>Basketball courts indoor</td>
<td>2</td>
</tr>
<tr>
<td>Basketball courts outdoor</td>
<td>8 (lit)</td>
</tr>
<tr>
<td>Netball courts indoor</td>
<td>1</td>
</tr>
<tr>
<td>Netball courts outdoor</td>
<td>4 (lit)</td>
</tr>
<tr>
<td>Golf course</td>
<td>1 (18 holes)</td>
</tr>
<tr>
<td>Lawn bowling green</td>
<td>1</td>
</tr>
</tbody>
</table>

Future requirements and planning

Arising through the Karratha 2020 Vision and Community Plan, the Karratha Education Leisure and Training Campus is a joint project with the State Government to co-locate Karratha’s key educational infrastructure and to provide additional cultural and recreational facilities. The project includes indoor and outdoor sporting facilities including a new aquatic centre, performing arts facilities, community meeting spaces and childcare facilities. The facilities are intended to be constructed to a standard so as to operate as Karratha’s main evacuation centre in the case of a natural disaster. The objectives of the project include:

- To address ageing infrastructure issues for community sporting organisations
- To provide a modern and effective evacuation centre for the town
- To provide additional youth meeting spaces
- To cater for children and families.

A draft master plan was prepared in 2009 in consultation with the community and key stakeholders. The community was invited to comment on the project in late 2009. Construction is anticipated to commence in August 2011 with completion anticipated April 2013. The total project cost is approximately $112 m, with more than $66 m committed through Royalties for Regions allocations and the Department of Education and Training. There is a current shortfall of approximately $46 m.
Other projects include the development of the Bulgarra Community Centre and Baynton West Family Centre. The Bulgarra Community Centre project is a $12m mixed use recreational facility including family day care, function centre, storage space, meeting rooms and kitchen facilities. The Baynton West Family Centre is a $13m multi-purpose family centre to include family services (i.e. child health and associated services), conference rooms and workshops for the community, child care centre, playgroup facilities, offices for not for profit groups and a coffee shop.

The tenders for both of the above projects are anticipated to be released in October 2010, with construction anticipated to commence in November 2010 and completion by December 2011 – January 2012.

Youth services

Currently, there are limited youth services, activities and facilities in Karratha. The Karratha 2020 Vision and Community Plan found that currently only limited space had been set-aside in the town for young people. Ideally, the plan suggests future facilities should be located in the town centre and have a combination of outdoor/indoor, informal and programmed activities. A skate plaza has been proposed for Sharpe Avenue as part of a town centre enhancement scheme.

Future requirements and planning

The Karratha City Centre Master Plan notes that three potential sites have been identified for the development of a youth centre, which is urgently required. A site in close proximity to the retail core is preferred, with the capacity to accommodate 500 to 700 m² of indoor space with an adjacent area for sporting facilities. A feasibility study will be required to select the preferred site. A more cohesive approach to youth development is also required.

Arts/cultural facilities

Karratha’s arts and cultural facilities include the multi-purpose Walkington Theatre with its outdoor amphitheatre, and the Karratha Entertainment Centre. The entertainment centre has poor access and design limitations that restrict its uses.

Future requirements and planning

The Shire of Roebourne has prepared a draft cultural plan that identifies a number of arts and cultural needs including proposals for a multi-purpose creative arts and cultural space with wet and dry workshop spaces, music studios, a gallery and exhibition areas. Some of these facilities may be developed as part of the Karratha Education Training and Leisure Precinct.

The Karratha City Centre Master Plan notes that the preferred location for the establishment of a cultural arts centre and gallery is a site on the south eastern corner at the intersection of the main street and Welcome Road. An external sculpture garden could also be established in this location.

Libraries

Karratha has one public library co-located at the TAFE campus and jointly serviced by the Shire of Roebourne, Pilbara TAFE and the State Library of Western Australia.

Childcare

Childcare services are in critical short supply across the Pilbara region and the situation is exacerbated by the region’s demographic profile. Additional factors include the high workforce participation rate and this, coupled with the low number of extended families, means relatives are not normally present to offer traditional childcare support. The Shire of Roebourne estimates a current shortfall of around 300 day care places.

The prime issues governing the provision of childcare include licensing, land and building, staff attraction and retention and industry engagement.

Karratha has two long day care centres (74 places), two occasional care centres (35 places), seven family day care centres and one outside school hours facility. In December 2009, construction commenced on the new Tambrey Early Learning and Care Centre. The centre is being built on the grounds of Tambrey Primary School and will provide 120 long day care places. The Federal Government and Woodside jointly fund the project.

Additional family day care services as proposed as part of the development of the Bulgarra Community Centre.
8.10 Waste management

Every year each Pilbara resident generates about 731 kilograms of waste and in 2007, the Shire of Roebourne produced some 13,500 tonnes of waste. At present, only one per cent is recovered for recycling, and the bulk is sent to landfill. Therefore, there is significant potential to divert wastes away from landfill.

The Shire of Roebourne has experienced considerable growth in recent years and reports an increase of over 50 per cent in waste volumes over the last five years. Karratha’s main disposal facility, the Seven Mile Waste Disposal Facility west of Karratha (see Map 11), permits the disposal of general, effluent, hazardous and green waste, and includes a recycling facility.

Future requirements and planning

Anticipated population growth will result in significant increases in waste quantities. The Pilbara local governments, through the Pilbara Regional Council, completed a Regional Waste Management Plan in 2008 to improve the management and use of landfills, extend the life of existing landfills, and, if possible, replace the smaller landfills with transfer stations equipped to meet the needs of the people and the environment. The report recommended further investigation into waste management processes, practices and requirements in the Shire of Roebourne. A review of waste management services was completed in April 2010, and includes a number of recommendations regarding upgrades to existing facilities, resourcing and investigations into emerging technologies. The Pilbara councils are also considering options to divert waste to recycling and also using waste to produce energy.

The Karratha 2020 Vision and Community Plan also identified the need to redevelop part of the landfill disposal site for recycling purposes, and to acquire additional plant and collection trucks.

8.11 Basic raw materials

No comprehensive regional assessment has yet been made of the availability and source of all the basic raw building materials needed for Karratha’s expansion. These include sand, clay, hard rock, limestone, metallurgical limestone, gravel and other construction and road building materials. The materials themselves are relatively cheap to produce, but to keep building costs down it is essential that supplies are identified as close to the town as possible.

Karratha’s expansion will consume large quantities of basic raw materials. For example, several proposed industry and residential sites will need large quantities of fill to raise them above flood levels.

There has not been a comprehensive regional assessment of basic raw materials. Although some site-specific studies for Karratha were undertaken - notably Gozzard (1989), and Martinick (1997), the information is limited and data for some resource extraction areas may be out of date. The studies that have been completed have revealed a shortage of materials suitable for fill. The sites that have been located where sand may be available are often constrained by environmental considerations or the fact that it is located in significant heritage sites. To date the utilization of potential substitutes not been fully explored.

This has become a critical issue to be addressed in the Pilbara. It is essential that a program be introduced to determine the availability of supplies and consider the cost effectiveness of using alternative sources where supplies are limited.

Infrastructure > for more information see the following links:

Department of Treasury and Finance: www dtf wa gov au see Western Australian State Budget 2010-11:
www ourstatebudget wa gov au

Infrastructure Australia:
www infrastructureaustralia gov au see Government Infrastructure Plans - Western Australia

Shire of Roebourne: www roebourne wa gov au see Karratha 2020 Vision and Community Plan Karratha City Centre Master Plan Karratha City Growth Plan
Each year the State Government’s Royalties for Regions initiative will see the equivalent of 25 per cent of the State’s annual revenue from mining and resource royalties reinvested in regional communities. The initiative will provide additional investment to help regional communities plan for their longer term sustainable development. Funds will be available for regional infrastructure, services and capacity building projects.

Funds will be invested in rural and regional Western Australia based around six policy objectives, these being:

- building capacity in communities;
- retaining benefits in local communities;
- improving services to achieve equality with metropolitan communities;
- attaining sustainability;
- expanding employment and growth opportunities; and
- growing prosperity.

### 9.1 Delivery mechanisms

Royalties for Regions distributes benefits to regional communities through three funds as follows:

**Country Local Government Fund**

Funding of $101.7 m for 2010-11 will be provided to assist country local governments to build and maintain community infrastructure. Local governments in the nine Regional Development Regions, as defined by the Regional Development Commissions Act 1993 are eligible for funding.

**Regional Community Services Fund**

The fund is designed to improve the access to services in the regions. Some of the projects supported by the fund include the Patient Assisted Travel Scheme, Boarding Away From Home Allowance, Royal Flying Doctors Service, Community Resource Centres and Country Age Pension Fuel Card.

### Regional Infrastructure and Headworks Fund

The fund supports large scale, strategic regional infrastructure and headworks projects. The fund also includes an annual allocation for the Regional Grants Scheme which offers contestable funds for private and public organisations to improve and develop infrastructure and services in the regions.

### 9.2 Decision-making criteria

**Country Local Government Fund**

Funding in 2010-11 will be provided to individual local governments and regional groups of local governments to promote strategic infrastructure development and asset preservation and renewal. Funding for the Shire of Roebourne is shown in Table 32.

**Regional Community Services Fund**

- Allocations will be provided to programs that:
  - assist regional communities achieve improved access to a range of community services;
  - assist regional communities overcome disadvantages caused by remoteness;
  - attract and retain essential regional government employees.

**Regional Infrastructure and Headworks Fund**

- Funds will be allocated to projects that:
  - are acknowledged as being of strategic importance to Western Australia;
  - apply broadly to a region;
  - do not fall neatly into the responsibilities of one State Government department or local government for implementation.

- The Regional Grants Scheme will be administered by the nine Regional Development Commissions, including assessing applications and determining grants.
9.3 Funded projects

Table 32: Country Local Government Fund allocations

<table>
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<tr>
<th>Local Government</th>
<th>Allocation</th>
<th>2010-11 ($ excluding GST)</th>
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<tbody>
<tr>
<td>Roebourne</td>
<td>Direct to local government</td>
<td>989,836</td>
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<tr>
<td>Roebourne</td>
<td>Regional groups of local government</td>
<td>532,988</td>
</tr>
</tbody>
</table>

Source: Country Local Government Fund Allocations 2010-11, Department of Regional Development and Lands (2010)

Royalties for regions > for more information see the following links:


Crown land

**Alienated land** is land held in freehold.

**Crown land** is defined as all land, not being alienated land, within the limits of the State of Western Australia that form the airspace, seabed and subsoil of marine waters and coastal waters as defined under the Commonwealth’s *Coastal Waters (State Powers) Act 1980*. Crown land is referred to as State land in Western Australia.

**Freehold land** is land held in fee simple, whether absolute, conditional or otherwise, of that land.

**Notice of intention to take** is a notice issued under section 170 of the *Land Administration Act 1997* and served on a landowner and any person affected by land the subject of a proposed public work. The notice provides interest holders with the opportunity to formally object to the taking of the land for the public work.

**Tenure** means the manner of possessing or holding Crown land for a specific purpose or purposes, for example: reserve tenure, road tenure.

**Unallocated Crown land** (formerly known as vacant Crown land) is Crown land that is not subject to any interest (other than Native Title interests under the *Native Title Act 1993*) and which is not reserved or declared or otherwise dedicated under the *Land Administration Act 1997* or any other Act.

Population

**Estimated resident population (ERP)** - Available for local government areas only, this figure represents the number of people counted in an area on 30 June. It is calculated by:

- adding the people who were temporarily absent from the area on census night;
- subtracting the overseas visitors counted in the area on census night;
- augmenting the figure for estimated net undercount in the census;
- adjusting for difference between census night and 30 June; and
- updating each year using administrative data from a variety of sources.

ERPs are the official population figures for Australia. They are widely used as a basis for Government decision-making, including the allocation of seats in federal parliament and distribution of Commonwealth grants.

**Net undercount** - Immediately following the census, the Australian Bureau of Statistics (ABS) conducts a post-enumeration survey in randomly selected households to get a picture of the net undercount. This factors in the human error associated with collection of census data. Factors contributing to undercount include geographic location, ethnicity, people travelling, errors with the census form, confidentiality. People may also be counted more than once if they were away from home on census night, but were included on the census form at their usual residence. In the 2006 census the estimated net undercount in Western Australia was 3.2 per cent. This figure was 4.4 per cent for the balance of Western Australia, and 2.7 per cent for Perth.

**Place of enumeration** - This count includes every person who spent census night in Australia based on where they were on census night. The figure includes residents, tourists, visitors and service populations. This data is available for towns, localities and postcode areas.

**Place of usual residence** - The number of people who state an area on the basis of where they usually live, rather than where they were on census night. This can be a subjective measure as it depends where people consider their home to be. This data is available for towns, localities and postcode areas.
Service populations - people who demand goods or services from providers of such commodities. Such persons may be permanent or temporary residents of the area from which the service is sought, or they may be daytime visitors (including commuters), overnight or short-term visitors to the area or fly-in fly-out workers. Service populations are not counted separately at the census but may represent up to 25 per cent (in the Pilbara) of the number of people enumerated in a town or locality on census night.

Subdivision approvals

Conditional approval is granted by the Western Australian Planning Commission (WAPC) for subdivision to begin subject to certain conditions being met. The approval is preceded by an assessment of the proposed subdivision plan by statutory referral agencies, including servicing authorities. On receipt of conditional approval, the proponent may commence subdivision development in accordance with the conditions of approval. A conditional approval remains valid for three years where five lots or less are approved and for four years where six lots or more are approved.

Current valid conditional approvals refer to those conditional approvals that are still valid but have not yet been issued with final approval. In general, these are approvals for which construction/servicing has not yet commenced or is currently under way (see active conditional approvals).

Active conditional approvals refer to conditionally approved lots where a servicing agreement (agreement to construct) has been signed between the Water Corporation and the developer. These are termed lots on non-cleared agreements.

Inactive conditional approvals are where conditional approval has been granted and the approval is still valid, but where a servicing agreement (agreement to construct) has not been signed between the Water Corporation and the developer.

Lapsed conditional approvals are those where the approval has expired and the conditions have not been met.

Final approval is the WAPC endorsement of the proponent’s submitted plan/diagram(s) of survey describing the now complete subdivision; constructed in accordance with the conditions set down in the conditional approval. Final approvals are then registered with the Office of Titles where certificates of titles for the newly created lots can be issued.

Planning

Local planning schemes are detailed planning schemes developed by local governments to identify the range of permitted land uses within specified locations. Within the Metropolitan Region Scheme and Peel Region Scheme areas, local planning schemes must be consistent with the provisions identified within the relevant region scheme.

Local planning strategy contains the strategic plan and policy context of a local planning scheme. The strategy sets out the general aims, intentions and desired outcomes for long-term growth and change, having regard to social, economic and environmental factors. An assessment of the capacity of infrastructure such as water, sewerage, electricity and roads is also usually considered in a local planning strategy. Residential densities and commercial centres may also be identified.

A scheme amendment is the process of changing zones or reservations from one use to another. The amendment process requires proposed amendments to be advertised for wider community and government comment. The amendment process is regulated by the Planning and Development Act 2005, allowing for extensive community consultation to review the proposal before a final decision is made.

Structure plan refers to a document including spatial plans that details the proposed layout of a future development area. The preparation of a structure plan is one of the first steps in progressing proposals for the development of new areas. In addition to illustrating details such as road configuration and the location of retail and community facilities such as shops, schools and public open space, a structure plan can also show details such as housing density, land use classifications and buffer zones. Structure plans highlight opportunities and constraints in an area, and can provide the basis for amendments to local planning schemes. Structure plans can generally be categorised as either region, district or local structure plans.
Building approvals

A **house** is a detached building primarily used for long-term residential purposes. It consists of one dwelling unit. For instance, detached ‘granny flats’ and detached dwelling units (for example, caretaker’s residences) associated with a non-residential building are defined as houses. Also includes ‘cottages’, ‘bungalows’ and rectories.

**Other dwellings** include all dwellings other than houses. They can be created by: the creation of new other residential buildings (for example, flats); additions/alteration work to an existing residential building; either new or alteration/addition work on a non-residential building; conversion of a non-residential building to a residential building creating more than one dwelling unit.

**Dwelling commencements** - a dwelling unit is a self-contained suite of rooms, including cooking and bathing facilities and intended for long-term residential use. Units (whether self-contained or not) within buildings offering institutional care, such as hospitals, or temporary accommodation, such as motels, hostels and holiday apartments, are not defined as dwelling units. A building is commenced when the first physical building activity has been performed on site in the form of materials fixed in place and/or labour expended (this includes site preparation but excludes delivery of building materials, the drawing of plans and specifications and the construction of non-building infrastructures, such as roads).

Other

**Vacant lots** refer to those lots that are undeveloped (i.e. have no premises constructed on the lot) and that are located on residential or special zones as designated under the various local planning schemes in Western Australia. The base information is provided by the Valuer General’s Office.
11 References


Department for Planning and Infrastructure (2009) Karratha Primary Trade Area Retail and Commercial Strategy, prepared by SGS Economics and Planning for Department for Planning and Infrastructure, DPI, Perth.


LandCorp and Shire of Roebourne (2010) Karratha City Centre Master Plan Karratha City of the North Volume 3, LandCorp and Shire of Roebourne, Karratha.


Select Senate Committee on Housing Affordability in Australia (2008) *A good house in hard to find: Housing affordability in Australia*, Select Senate Committee on Housing Affordability in Australia, Canberra.


Tourism Western Australia (2009) *Tourism Accommodation Development Register Western Australia*, Government of Western Australia, Perth.


## 12 Websites and resources

<table>
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<tr>
<th>Website</th>
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<tbody>
<tr>
<td>Australian Bureau of Agricultural and Resource Economics - Bureau of Rural Sciences</td>
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13 Acknowledgements

This document was prepared in consultation with the following government agencies and infrastructure providers and private sector stakeholders:

- Australian Premium Iron JV
- Chamber of Minerals and Energy WA
- Dampier Port Authority
- Dampier Salt
- Department of Education
- Department of Health
- Department of Housing
- Department of Mines and Petroleum
- Department of Regional Development and Lands
- Department of State Development
- Department of Transport
- Fire and Emergency Services Authority WA
- Government Regional Officers’ Housing
- Horizon Power
- LandCorp
- Main Roads Western Australia
- Rio Tinto
- Shire of Roebourne
- Tourism WA
- Water Corporation
- Western Australia Police
- Woodside Energy Ltd
MAP 3:
Decade of construction (first build) - Karratha

Legend:
- Cadastre
- Suburb boundary
- Vacant lots
  (as at 1 June 2010)
Decade of construction - first build (as at July 2009)
- 1970-1979
- 1980-1989
- 1990-1999
- 2000-2009

Western Australian Planning Commission