PART 4

CONTENTS

OVERVIEW
DEMOGRAPHICS
ECONOMY
LAND SUPPLY AND TENURE
PROPERTY MARKET
URBAN FABRIC
TOWN PLANNING
HOUSING
MOVEMENT NETWORKS
AMENITY AND INFRASTRUCTURE
COMMERCIAL INFRASTRUCTURE
ENVIRONMENT
TOPOGRAPHY
CLIMATE
THERMAL COMFORT
BUILDING MATERIALS
GROWTH PLAN
CONSTRAINTS AND OPPORTUNITIES
DESIGN STRATEGIES

PORT HEDLAND/SOUTH HEDLAND
Port Hedland is located 1,700 kilometres north of Perth. Its port is a vital connection between some of the world's largest iron ore deposits and Australia’s major export markets. Accordingly, the town's identity is strongly linked to the iron ore which is processed and exported from there. This is evident in the tradition of the annual Black Rock Stakes which started in 1971. Men, women and children push a wheelbarrow full of iron ore from Goldsworthy to Port Hedland to raise money for charity. The event has raised more than $1 million.

Port Hedland was gazetted in 1896 and, because of its natural deep harbour, became a supply centre for the surrounding pastoral and short-lived pearling activities. In the 1960s, the harbour was dredged to enable the huge iron ore export ships to enter. Today, the port is the largest (by tonnage) in Australia.

With the discovery of iron ore deposits, railways were constructed between the port and iron ore mines at Newman and Goldsworthy as well as housing and facilities for mine and port workers. By 1965, thousands of construction workers camped on Spinifex Hill, where the Cultural Centre now stands.

To cope with the demand for accommodation, a satellite town named South Hedland was established 23 kilometres south of the port. South Hedland has its own town centre with a growing service and retail base.

Port Hedland and South Hedland are separated by large expanses of low lying tidal flats and mangroves, with the smaller residential area of Redbank and the industrial area of Wedgefield between the two hubs.

The port facilities are planned to double in size to cope with the increase in mining production. This will require significant additional residential accommodation. However, limited suitable land is available for development adjacent to Port Hedland because of the surrounding low lying tidal flats. Existing infrastructure requires significant upgrading or replacement if it is to cope with increased commercial, industrial and residential development.

The climate in Port and South Hedland is hot and humid, with several days over 45°C each year. Rainfall is low and erratic, primarily because of the tropical cyclones that affect the area between November and April. The land around Onslow is low-lying and susceptible to flooding during heavy storms and cyclones.

The Western Australian Government’s Pilbara Cities Vision is to transform Port Hedland into a diverse, 21st century city with a permanent population of 50,000. Port Hedland has the opportunity to plan a sustainable and long term vision for its future. Strategies that acknowledge and consider Port Hedland’s existing character and address the extreme conditions will ensure place and climate responsive development.
PORT HEDLAND/SOUTH HEDLAND

The current combined population of Port Hedland and South Hedland is estimated to be around 19,000 with 14,500 permanent residents and 3,500 transient workers (fly-in fly-out). 

Approximately 49% of the resource sector workforce is transient. This is expected to increase to 61% by 2020.

The Port Hedland area is the home to the indigenous Karriyarra and Nyamal people who are called Marapikurrinya. The percentage of indigenous people in Port Hedland is greater than the national average.

The population peaked in the early 1980s to levels that supported the introduction of direct fights to Bali from Port Hedland airport.

When demand for iron ore declined later in the 1980s, the population of the town dropped by almost half.

The new surge of mining sector growth is expected to increase the population by 250% to 50,000 people by 2035. This will make Port Hedland, along with Karratha, the largest towns in the Pilbara. The State Government’s ‘Pilbara Cities Vision’ focuses on policy led planning rather than industrial project driven growth.

1 Pilbara Planning and Infrastructure Framework, 2011
2 Port Hedland Regional HotSpots Land Supply Update, April 2011
3 Pilbara Planning and Infrastructure Framework, 2011
PORT HEDLAND/SOUTH HEDLAND

PORT
The port has always been central to Port Hedland's economy. From 1896, it was used to export pearl shell, wool, livestock, gold, tin and small amounts of copper. Since the 1960s, the port has continued to expand and the harbour has been dredged several times to accommodate larger iron ore ships. Port Hedland is currently the largest port by tonnage in Australia, with an annual throughput of approximately 170 million tonnes. A significant expansion program encompassing mines, rail and additional port facilities is underway. By 2015, the port's current export volume is expected to double.

Whilst the port is the mainstay of the town's economy, it also creates air borne dust. A buffer zone has been created between the port facilities and surrounding housing and commercial areas to mitigate the dust problems.

MINING
Over the past ten years the value of Western Australia's iron ore industry has grown by an average of 28% per annum. This growth has seen the rapid expansion of the mining industry in and around Port Hedland and the increase in the number of mining companies operating in the area.

BHP Billiton, the largest mining company in the Port Hedland area, operates a significant iron ore processing and shipping facility out of Port Hedland, exporting 70 million tonnes of iron ore per year. BHP also operates a direct reduced iron plant which produces iron briquettes for export. Fortescue Metals Group (FMG), Hancock Prospecting, Posco, STX Corp., Hanlong Mining, and Atlas Iron Limited are some of the many mining companies operating in the Port Hedland region and using the Port Hedland harbour facilities for exporting.

SALT
Dampier Salt, a subsidiary of Rio Tinto, produces over three million tonnes of industrial salt annually from the solar salt ponds west of Port Hedland. In combination with their Dampier and Lake MacLeod salt operations, Dampier Salt has a production capacity of about eight million tonnes a year making it the world's largest salt exporter.

TOURISM
The coastal location and warm winter climate of Port Hedland attracts around 100,000 tourists each year, approximately one third of those visiting the Pilbara. The main reason for the town's low share of the Pilbara tourist market is the lack of affordable, good quality short-term accommodation.

FARMING/PASTORAL
A few large stations still operate in the Port Hedland area and export livestock through the port. However, the pastoral industry has declined severely in recent years.

ECONOMY

PORT
The port has always been central to Port Hedland's economy. From 1896, it was used to export pearl shell, wool, livestock, gold, tin and small amounts of copper. Since the 1960s, the port has continued to expand and the harbour has been dredged several times to accommodate larger iron ore ships. Port Hedland is currently the largest port by tonnage in Australia, with an annual throughput of approximately 170 million tonnes. A significant expansion program encompassing mines, rail and additional port facilities is underway. By 2015, the port's current export volume is expected to double.

Whilst the port is the mainstay of the town's economy, it also creates air borne dust. A buffer zone has been created between the port facilities and surrounding housing and commercial areas to mitigate the dust problems.

MINING
Over the past ten years the value of Western Australia's iron ore industry has grown by an average of 28% per annum. This growth has seen the rapid expansion of the mining industry in and around Port Hedland and the increase in the number of mining companies operating in the area.

BHP Billiton, the largest mining company in the Port Hedland area, operates a significant iron ore processing and shipping facility out of Port Hedland, exporting 70 million tonnes of iron ore per year. BHP also operates a direct reduced iron plant which produces iron briquettes for export. Fortescue Metals Group (FMG), Hancock Prospecting, Posco, STX Corp., Hanlong Mining, and Atlas Iron Limited are some of the many mining companies operating in the Port Hedland region and using the Port Hedland harbour facilities for exporting.

SALT
Dampier Salt, a subsidiary of Rio Tinto, produces over three million tonnes of industrial salt annually from the solar salt ponds west of Port Hedland. In combination with their Dampier and Lake MacLeod salt operations, Dampier Salt has a production capacity of about eight million tonnes a year making it the world's largest salt exporter.

TOURISM
The coastal location and warm winter climate of Port Hedland attracts around 100,000 tourists each year, approximately one third of those visiting the Pilbara. The main reason for the town's low share of the Pilbara tourist market is the lack of affordable, good quality short-term accommodation.

FARMING/PASTORAL
A few large stations still operate in the Port Hedland area and export livestock through the port. However, the pastoral industry has declined severely in recent years.

ECONOMY

PORT
The port has always been central to Port Hedland's economy. From 1896, it was used to export pearl shell, wool, livestock, gold, tin and small amounts of copper. Since the 1960s, the port has continued to expand and the harbour has been dredged several times to accommodate larger iron ore ships. Port Hedland is currently the largest port by tonnage in Australia, with an annual throughput of approximately 170 million tonnes. A significant expansion program encompassing mines, rail and additional port facilities is underway. By 2015, the port's current export volume is expected to double.

Whilst the port is the mainstay of the town's economy, it also creates air borne dust. A buffer zone has been created between the port facilities and surrounding housing and commercial areas to mitigate the dust problems.

MINING
Over the past ten years the value of Western Australia's iron ore industry has grown by an average of 28% per annum. This growth has seen the rapid expansion of the mining industry in and around Port Hedland and the increase in the number of mining companies operating in the area.

BHP Billiton, the largest mining company in the Port Hedland area, operates a significant iron ore processing and shipping facility out of Port Hedland, exporting 70 million tonnes of iron ore per year. BHP also operates a direct reduced iron plant which produces iron briquettes for export. Fortescue Metals Group (FMG), Hancock Prospecting, Posco, STX Corp., Hanlong Mining, and Atlas Iron Limited are some of the many mining companies operating in the Port Hedland region and using the Port Hedland harbour facilities for exporting.

SALT
Dampier Salt, a subsidiary of Rio Tinto, produces over three million tonnes of industrial salt annually from the solar salt ponds west of Port Hedland. In combination with their Dampier and Lake MacLeod salt operations, Dampier Salt has a production capacity of about eight million tonnes a year making it the world's largest salt exporter.

TOURISM
The coastal location and warm winter climate of Port Hedland attracts around 100,000 tourists each year, approximately one third of those visiting the Pilbara. The main reason for the town's low share of the Pilbara tourist market is the lack of affordable, good quality short-term accommodation.

FARMING/PASTORAL
A few large stations still operate in the Port Hedland area and export livestock through the port. However, the pastoral industry has declined severely in recent years.

ECONOMY

PORT
The port has always been central to Port Hedland's economy. From 1896, it was used to export pearl shell, wool, livestock, gold, tin and small amounts of copper. Since the 1960s, the port has continued to expand and the harbour has been dredged several times to accommodate larger iron ore ships. Port Hedland is currently the largest port by tonnage in Australia, with an annual throughput of approximately 170 million tonnes. A significant expansion program encompassing mines, rail and additional port facilities is underway. By 2015, the port's current export volume is expected to double.

Whilst the port is the mainstay of the town's economy, it also creates air borne dust. A buffer zone has been created between the port facilities and surrounding housing and commercial areas to mitigate the dust problems.

MINING
Over the past ten years the value of Western Australia's iron ore industry has grown by an average of 28% per annum. This growth has seen the rapid expansion of the mining industry in and around Port Hedland and the increase in the number of mining companies operating in the area.

BHP Billiton, the largest mining company in the Port Hedland area, operates a significant iron ore processing and shipping facility out of Port Hedland, exporting 70 million tonnes of iron ore per year. BHP also operates a direct reduced iron plant which produces iron briquettes for export. Fortescue Metals Group (FMG), Hancock Prospecting, Posco, STX Corp., Hanlong Mining, and Atlas Iron Limited are some of the many mining companies operating in the Port Hedland region and using the Port Hedland harbour facilities for exporting.

SALT
Dampier Salt, a subsidiary of Rio Tinto, produces over three million tonnes of industrial salt annually from the solar salt ponds west of Port Hedland. In combination with their Dampier and Lake MacLeod salt operations, Dampier Salt has a production capacity of about eight million tonnes a year making it the world's largest salt exporter.

TOURISM
The coastal location and warm winter climate of Port Hedland attracts around 100,000 tourists each year, approximately one third of those visiting the Pilbara. The main reason for the town's low share of the Pilbara tourist market is the lack of affordable, good quality short-term accommodation.

FARMING/PASTORAL
A few large stations still operate in the Port Hedland area and export livestock through the port. However, the pastoral industry has declined severely in recent years.

ECONOMY

PORT HEDLAND/SOUTH HEDLAND

There is a shortage of vacant residential land in both Port and South Hedland due to the surrounding low lying tidal flats. Currently, there is approximately 100 hectares of undeveloped land zoned for residential/urban uses in the Port Hedland area. Almost all of this land is located in South Hedland, with limited supply in Port Hedland.

The existing Wedgefield industrial estate is almost fully utilised and additional land will be required to meet short to medium term demand. The Shire and State Government are working to ease this situation, with the Western Australian Planning Commission identifying these key actions.

The Town of Port Hedland has investigated the availability of vacant residential, rural residential, commercial and industrial land (in both government and private ownership) through the Port Hedland Public Land Rationalisation Plan and Hedland Land Availability Plan. These plans summarise development opportunities and constraints for each site, aiming to rationalise and facilitate the development of identified sites.

A housing capacity study has been prepared, identifying potential housing development land, processes and time frames for developing housing land and the housing capacity of individual sites.

The Pilbara Cities Vision focuses on attracting private developers to the market through the release of development sites and super lots for the construction of medium and high density housing.

PROPERTY MARKET

The cost of houses in Port and South Hedland is exaggerated because of a shortage of supply and the demand by an increasing work force. The median house price in Port Hedland in the year to September 2010 was $960,000 and in South Hedland $670,000.

The average cost of renting a three bedroom dwelling in Port Hedland during the September quarter of 2010 was $1,770 per week in Port Hedland and $1,270 per week in South Hedland.

The cost of housing is significantly higher in Port Hedland than South Hedland because of the desire to live close to the ocean, the cooling sea breezes and the possibility of ocean views. Many of Port Hedland’s dwellings are either owned or controlled by resource companies for use by employees, which further exacerbates the shortage of housing stock.

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. The provision of rent subsidised accommodation drives the refurbishment and construction of units and also contributes to a more expensive and volatile housing market. This market volatility makes it difficult for developers to attract finance for both residential and large-scale commercial projects.

There is a critical need for affordable accommodation for employees in the retail, hospitality, tourism and general service sectors.

LAND SUPPLY AND TENURE

High housing costs make it difficult for employees to live in Port Hedland unless they receive accommodation support from their employer. High accommodation costs also contribute to high labour turnover. Workers tend to stay in the town for the duration of one employment term. High cost housing also displaces lower income households and retirees as well as deterring prospective, longer-term residents.

THE MEDIAN HOUSE PRICE IN PORT HEDLAND IN THE YEAR TO SEPTEMBER 2010 WAS $960,000 AND IN SOUTH HEDLAND $670,000.

1 Port Hedland Regional HotSpots Land Supply Update, April 2011
2 Port Hedland Regional HotSpots Land Supply Update, April 2011
3 Port Hedland Regional HotSpots Land Supply Update, April 2011
4 The Real Estate Institute of Western Australia
5 Pilbara Development Commission
The original townsite of Port Hedland is located on a narrow strip to the north of the port, known as the West End. The town’s commercial area then expanded along the northern coastline on the top of the dunal system. Remnants of the town’s early history and most of the buildings identified in the Shire’s Municipal Inventory of Heritage Places are in this area (refer Appendix for list of places). The West End has most of the commercial, cultural and service facilities for Port Hedland. Streets are oriented west-east with lots running north-south. A small retail based shopping centre is located on Anderson Street, halfway between the West End and Cooke Point residential areas.

In South Hedland, the town centre is located to the west of the township, ringed by Forrest Circle. The town centre has large areas of carpark surrounding the shopping centre. Town Centre Redevelopment is currently under construction with a town centre and main street due for completion by the end of 2011.

A recent good example of a building that responds to its context is the Wangka Maya Language and Cultural Centre, an environmentally sensitive approach to a significant cultural facility.
Houses around the Port Hedland town centre, Cooke Point and Pretty Pool, are the more desirable areas to live. The preference for these areas is because of access to the coast and cool sea breezes. The premium location is also reflected in the greater care and maintenance of the houses.

Two key differences between Port and South Hedland subdivisions are landscaping and front fencing. Where houses in Port Hedland demonstrate front gardens and breezeway permeable fencing, South Hedland’s streets are dominated by impermeable fencing and minimal landscaping. Houses in the older areas of South Hedland generally require renovation also.
The Port Hedland Town Planning Scheme (TPS) identifies two major areas zoned for industrial use: south of the town centre in the West End, including a large portion of the port facilities; and the suburb of Wedgefield, accessed from Great Northern Highway, between Port and South Hedland.

The zone south of the town centre is classified as light industry and the BHP owned portion of the port zoned as heavy industry. Wedgefield is made up of a combination of light and heavy industry for mining support services, transportation-related businesses, construction yards, pre-fabricators, maintenance and repairs.
PORT HEDLAND/SOUTH HEDLAND

URBAN FABRIC

RECREATION
In Port and South Hedland, residents’ recreational activities are generally well catered for with a diverse network of sporting facilities, sports clubs and public ovals. There are also a number of formal and informal public open spaces throughout the town area. A new $35 million multi-function recreation centre has recently been constructed on the Kevin Scott oval site, just north of the South Hedland town centre. Fishing, boating and water sports are popular on the coast.

RECREATION FACILITIES
Racecourse and Sports Ground
Faye Gladstone Netball Courts
Gratwick Aquatic Centre
Colin Matheson Oval
Port Hedland Yacht Club
South Hedland Recreation Centre
Port Hedland Golf Course
South Hedland Aquatic Centre
Skate Parks
Town Oval West
Rugby Oval
Soccer / Hockey Oval
Port Hedland Tennis Club
Marie Marland Reserve
South Hedland Tennis and Bowling Club
JD Hardie Centre
Equestrian area
Port Hedland has extensive areas of land designated for formal and informal public open space. These areas are along the beach and coast, landscaped parks, lookouts and playgrounds. BHP Billiton has funded a number of parks in the town. The largest is Marrapikurinya Park in the West End.

South Hedland has several large areas of open spaces that incorporate sports ovals and playgrounds within them.
South Hedland has an extensive network of drainage reserves and swales designed to cope with the substantial stormwater run-off from heavy deluges of rainfall during cyclone season. These swales direct the water from roads and public spaces into channels where they can soak more slowly through the clay-like pindan soil. The town of Port Hedland falls within one of only six Rangelands Natural Resource Management regions in Western Australia, resulting in a coastal and sustainability use management strategy which applies across the town. Specific areas for conservation and drainage are identified in the Port Hedland Town Planning Scheme.
Port Hedland was originally an island but in 1898 a four and half mile causeway was constructed to connect the island to the mainland. A jetty was built which enabled building materials to be shipped in and the settlement began to take form. The first area settled was at One Mile, now called the West End.

The town was laid out in a grid street pattern, a standard planning approach to designing new towns during this period. The orientation is generally cardinal with the long side of the lots facing north-south. This provides optimal house layout for the control of heat gain and maximize the cooling from the prevailing ocean breeze. However, the decision to orient lots in this direction was more likely to be influenced by the topography of the dunal system and shape of the island.

The planning of residential lots at Cooke Point continued the grid layout. The Pretty Pool housing estate was developed in the 1980s and is noticeably curvilinear with multiple cul-de-sacs.

Subdivision development is earmarked for the low lying areas between Pretty Pool and Cooke Point and will require significant infill prior to development.
With the influx of mining and port workers, there were large demands for accommodation in the 1960s. However, there was a shortage of suitable land for residential development because of the low lying tidal flats around the Port Hedland settlement. In 1968, the State government announced plans to create a new satellite suburb 23 kilometres south of the Port Hedland township to accommodate 30,000 people. The project was implemented by the Department of Land Administration and Homeswest. The design was initially based on a quasi-Radburn concept with four circular residential cells, including cluster housing, built around a central commercial centre. The first cell was completed in 1974 and included extensive landscaping. Following this, the Radburn concept was abandoned. The significance for future planning is recognizing that South Hedland was a purpose designed and constructed town concept. The curvilinear nature of the streets and the orientation of lots reduces opportunities for simple solar control for each house.
PORT HEDLAND

The oldest houses in Port Hedland are in the West End area and date back to the earliest years when the port exported livestock and various minerals.

The transition from local stone, timber and corrugated iron to masonry and fibre cement follows the growth of the town up to the 1960s when the mining companies arrived.

Most houses in Port Hedland are detached, single or double storey.

SITE PLANNING

Lots in the historic area of Port Hedland are oriented north-south along east-west running roads. As development moves east, lot orientation becomes less consistent, and lots tend to follow the dunal landforms.

WINDOWS AND EAVES

Many of the earlier houses in Port Hedland have shutters and other protective additions to block dust, cyclonic winds and rain. Newer houses use screens and shutters which have been specifically designed for extreme conditions.

Climate responsive design is evident in some elements used in design and construction of houses, these include verandahs, shutters and wider eaves.

STRUCTURE, ROOF AND WALLS

Earlier houses were built with a variety of construction systems materials, often using whatever was readily and cheaply available. The walls were either masonry, concrete panels, fibre cement or metal clad over steel frames. More recently built houses are usually constructed with Colorbond metal cladding or weatherboards on lightweight steel framing. Generally, roofs are metal cladding.

BUILT CONDITION

Even though many of the Port Hedland homes are older and more exposed to the elements (particularly salt) they are generally in better condition than their South Hedland counterparts.

LANDSCAPING

Gardens in Port Hedland are generally well maintained and demonstrate a greater pride by home owners. These houses also create a more welcoming and attractive streetscape.

ADDITIONS AND RENOVATIONS

The high cost of housing encourages owners to renovate and build additions to existing homes.

HOUSING

Port Hedland house using Colorbond and lightweight steel framing

Early Port Hedland house built with concrete blocks and breeze blocks. Note the timber lattice awnings and steel angle tie-downs across the roof for cyclone protection
South Hedland was established in the late 1960s to meet the demand for more accommodation in Port Hedland. It now houses approximately two thirds of the Port Hedland population. Most houses in South Hedland are detached, single storey. There are a few apartments and semi-detached two storey townhouses.

SITE PLANNING
Lots in South Hedland are oriented along winding, organic routes leading to cul-de-sacs, based on the early attempts to use Radburn planning principles.

WINDOWS AND EAVES
Climate responsive design is not evident in many of the houses in South Hedland. Eaves are generally narrow and there are few awnings used over openings.

STRUCTURE, ROOF AND WALLS
South Hedland houses are predominantly steel framed and clad in Colorbond sheeting.

GARAGING
In South Hedland, garages and carports are a dominant element which imposes on the aesthetic of the houses. The front door of many houses is accessed through the carport or garage. Lightweight shade structures are often erected over the driveway or adjacent to it to protect fishing boats and trailers.

BUILT CONDITION
Many houses in South Hedland are in need of general repair and maintenance.

LANDSCAPING
The front yards of many houses in South Hedland have minimal, low maintenance landscaping, often consisting of mulch, red dirt and gravel with a few small trees and some areas of grass. Solid Colorbond front fencing is common. The fences minimise views in and out of house lots, blocking air flow and contributes to an inhospitable streetscape.
ROADS
Vehicular movement into and within Port Hedland is via two primary roads: Wilson Street and Sutherland Street. Wilson Street primarily services the industrial areas and South Hedland traffic. Sutherland Street primarily services residential traffic, connecting Cemetery Beach, Cooke Point and Pretty Pool residential areas with the town centre.

PEDESTRIAN/CYCLING
Along the northern coastline of Port Hedland is a pedestrian path, which links the suburban areas of Cooke Point and Cemetery Beach with the town centre at the West End. There are also a number of formal footpaths allowing access to many minor roads. Currently, there are no dedicated cycle paths in Port Hedland, with cyclists generally restricted to the road or footpath.

Pathways, access and circulation for cyclists and pedestrians are being currently evaluated. Connections between recreational spaces, residential areas and the town centres, path finding signage and recreational trails are being considered. A dedicated bike path to link Port Hedland to South Hedland is planned.

Pilbara Vremacural Handbook / Part 4-18