

January 2012

Pilbara

planning and
infrastructure
framework

Summary



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Introduction

The Pilbara Planning and Infrastructure Framework is a 'whole of government' initiative that sets the agenda for the physical development of the Pilbara. The Framework provides a response to many of the opportunities and challenges facing the region. It will inform the review of the State Planning Strategy, which is currently underway and guide the preparation of local planning strategies and local planning schemes across the Pilbara.

Vision

The Pilbara has evolved into the economic powerhouse of Australia and is on the threshold of another period of expansion.

By 2035, the region will have a resident population of more than 140 000, based on a more diverse economy that has capitalised on its competitive advantages. As part of the Pilbara Cities vision, the Pilbara will have two cities: Karratha and Port Hedland, each with a population of 50 000. These would be supported by the Newman sub-regional centre with a population of 15 000 and the major towns of Tom Price, Onslow and Wickham.

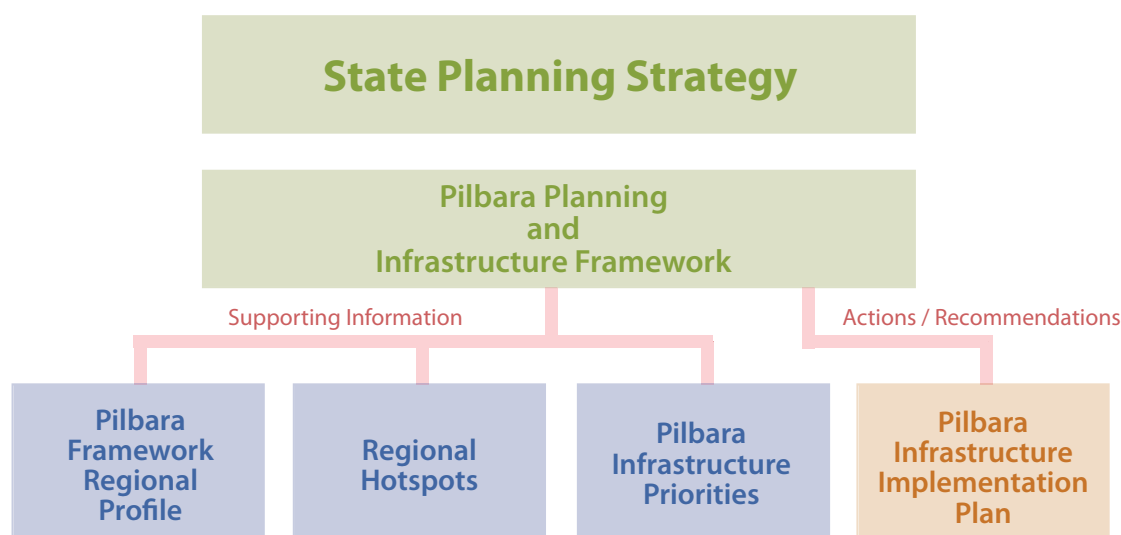
Higher levels of population in the region's main urban centres will support a wider range of employment opportunities; greater housing choice; higher levels of amenity; and access to higher standards of education, health, recreational and other community services. The natural and cultural heritage assets of the Pilbara, such as the coastline, Karijini and the Burrup Peninsula's rock-art galleries will be conserved, celebrated and cherished.

Settlement

Over the next 25 years, the scale and character of Pilbara settlements will change significantly. Some will experience major expansion while others will have more modest growth and, in some cases, decline. No significant new permanent settlements are envisaged for the region. It is anticipated that fly-in fly-out will have a lesser role in the work-living equation as the level of services, facilities and general amenity increase in the cities and towns, making them more attractive places in which to live.

The region's settlement structure will experience a step change, achieving a higher threshold of housing choice and community facility provision, making them inherently more liveable places. The evolving settlement structure will be:

- | | |
|---------------------------|--|
| 1. Pilbara City: | Karratha (Karratha and Dampier), Port Hedland (Port Hedland and South Hedland) |
| 2. Sub-regional centre: | Newman |
| 3. Major town: | Tom Price, Onslow, Wickham |
| 4. Town: | Paraburdoo, Roebourne, Pannawonica |
| 5. Village: | Point Samson, Marble Bar, Nullagine, Cossack, Shellborough |
| 6. Aboriginal communities | |



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To cater for the region's population targets and to satisfy unmet latent demand, an additional 35 430 dwellings will be needed, taking up some 2130 hectares of net residential land. The settlement housing density and form is anticipated to change greatly in each Pilbara City and major towns. This will mean more residential apartments, townhouses and other forms of medium and higher density living.

Economy

The Pilbara will have a robust, diverse and sustainable regional economy to service the needs of its industry and commerce effectively. This will be based on the region's competitive advantages. The region's economy will be diversified on the basis of resource industry supply chain completion in the first phase, widening in the later phases to encompass more knowledge-based industries, with an increasing capacity to export goods and services. Elements of this transition are already evident. However,

Utility infrastructure priorities – 2015

Infrastructure	Priorities
Water	<ul style="list-style-type: none"> • Investigate the potential for expansion of the Bungaroo borefield or development of other nearby groundwater resources. • Investigate construction of a desalination plant to service Karratha City (Karratha/Dampier). • Encourage strategies that promote responsible consumption of water by industry and consumers. • Upgrade existing water sources – Yule and de Grey borefields – to service Port Hedland. • Identify a new water source – Cane River borefields, Lower Robe aquifer or an alternative – to service Onslow. • Identify water re-use options and opportunities. • Use fit-for-purpose options for dust suppression. • Improve planning for water services across the region. • Investigate development of a new water source utilising the West Canning Basin.
Waste water	<ul style="list-style-type: none"> • Upgrade Karratha Waste Water Treatment Plant. • Upgrade Port Hedland deep sewerage scheme. • Decommission the Port Hedland Waste Water Treatment Plant and augment capacity at the South Hedland Waste Water Treatment Plant. • Identify opportunities for reuse of treated waste water. • Provide waste water services to the region's aboriginal communities.
Energy	<ul style="list-style-type: none"> • Provide new power generation and transmission at Port Hedland. • Provide new power generation and transmission at Karratha. • Expand power generation at Onslow. • Investigate renewable energy options.
Waste management	<ul style="list-style-type: none"> • Develop a system of townsite transfer stations. • Investigate recycling options in service hubs. • Continue to monitor and identify new or upgrade existing waste management facilities. • Promote implementation of improved waste management practices in aboriginal communities.
Telecommunications	<ul style="list-style-type: none"> • Augment mobile phone coverage – telecommunication companies. • Roll out of National Broadband Network in the Pilbara.

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significant government intervention is needed if it is to be accelerated in line with the Pilbara Cities vision. This could be in the form of a new defence base, a university sub-campus or a collaborative research institution in the region.

To achieve long-term economic viability in the region, strategies will be put in place to ensure adequate wharf-side and land-side capacity at the region's ports, strategic industrial areas and townsites (light industrial and commercial areas). There is a need to identify suitably located campus-sites for potential large government-sponsored facilities.

Utility infrastructure

Most of the Pilbara's urban infrastructure was constructed in the 1960s and 1970s and is reaching the end of its useful life. It is now constraining economic productivity and impacting on the functionality of communities. There is now a strong need to upgrade and replace much of the region's infrastructure and, in turn, this will provide the impetus to look at new approaches and technologies for utility infrastructure provision.

Water: There is a growing supply-demand dichotomy between inland and coastal Pilbara – the location of the greatest future demand. Currently, Karratha and the other Nickol Bay settlements, Port Hedland and Onslow are entirely climate-dependent for their water supply.

To ensure a reliable future water source it is essential that new sources are identified and developed. Potential sources include:

- constructing a new desalination plant on the Burrup Peninsula and piping water from Bungaroo for Karratha and the Nickol Bay settlements;
- expanding the Yule and De Grey borefields in the case of Port Hedland; and
- Expanding the Cane River borefields, developing the Birdrong aquifer or identifying another source to service future town and industrial demand for Onslow.

The Framework makes provision for the conservation of these water source areas.

Waste water: There is a need to provide deep water sewerage facilities in all Pilbara cities and towns and to provide adequate local absorption systems in the region's villages and Aboriginal communities. Wherever feasible, wastewater will be utilised for open space irrigation.

Energy: The Pilbara economy cannot expand without additional power generation being installed. Forecasts of demand and generation supply indicate that Horizon Power has access to sufficient generation capacity to meet its demand projections until late 2012. There is a need for a broader, integrated approach to long-term Pilbara power supply planning to ensure that the region's energy supply needs can be met. A commercial approach is likely to optimise efficient investment and innovative supply options.

Waste management: While there is currently minimal recycling of waste in the region, the next decade will require a comprehensive waste recycling and disposal plan. It will be important to ensure that options for strategic waste transfer, collection, treatment, recycling and disposal facilities, including buffer areas, are clearly identified in local planning strategies and schemes.

Telecommunications: Current mobile phone coverage in the region is patchy and access to broadband is limited and slow. The anticipated increase in the Pilbara's economic activity and population, with high expectations for fast and efficient communications, will require a major upgrade of the region's telecommunications infrastructure. The increase in mobile phone antennae will necessitate their sensitive location in urban areas and along major highways.

Community facilities

The expansion of the Pilbara region's population to more than 140 000 by 2035 will require a higher threshold of facilities and services. The enhancement of these facilities and services will greatly assist the region's ability to attract and retain workers and their families.

Health: Hospital facilities will be expanded to meet future needs, with a focus on Port Hedland and Karratha. More general practitioner, dental and other health specialist services will be provided. There is also potential to establish a Royal Flying Doctor Service hub in Karratha, in addition to that which already operates out of Port Hedland.

Community facility priorities – 2015

Infrastructure	Priorities
Health	<ul style="list-style-type: none"> • Commission the Karratha Health campus. • Undertake major upgrades or replacement of all current state hospital and health clinic infrastructure. • Investment in state health workforce housing at regional centres and small hospital sites. • Provide short-term patient accommodation in regional centres. • Expand ambulatory care services and provide appropriate physical infrastructure to support the additional capacity. • Progress Aboriginal health initiatives consistent with 'Closing the Gap' and other local priorities, with associated investment in physical infrastructure to support the expanded services. • Provide investment/incentives for private or not-for-profit health sector expansion to meet future projected demand.
Education	<ul style="list-style-type: none"> • Undertake further development of the Karratha Education and Training Precinct (high school and Pilbara Institute). • Upgrade and expand Port Hedland High School. • Renew infrastructure at Roebourne District High School. • Expand Onslow Primary School to a District High School. • Provide educator and administrator housing across the Pilbara. • Provide boarding schools in Karratha and Port Hedland to cater for remote communities.
Recreation	<ul style="list-style-type: none"> • Construction of a marina in Dampier. • Construction of a marina in Port Hedland. • Development of a Karratha aquatic complex (part of Karratha Leisure Centre Precinct). • Construction of a multi-purpose recreation facility in Port Hedland. • Develop a swimming pool in Onslow. • Expand and diversify recreation facilities to include new sports and recreation opportunities. • Provision for passive open space and public parks in new settlement developments. • Consider recreation needs in light of tourism and expansion opportunities.
Community support	<ul style="list-style-type: none"> • Supply of office and residential accommodation for community service workers. • Expansion of childcare places to meet the demands of a growing population and changing demographic profile.
Culture and entertainment	<ul style="list-style-type: none"> • Development of Marquee Park in South Hedland. • Development of an entertainment precinct in Karratha under the Karratha City of the North Plan. • Identify opportunities for the development of culture, the arts and cultural tourism, including Aboriginal cultural facilities, across the Pilbara.

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Transport priorities – 2015

Infrastructure	Priorities
Road transport	<ul style="list-style-type: none"> Investigate options for Karratha-Wickham road. Enhance access at the region's ports – Dampier, Port Hedland, Cape Lambert and Anketell. Upgrade Newman-Marble Bar Road. Upgrade the road network around Onslow to support the Ashburton North Strategic Industrial Area. Upgrade the region's highways to provide safe, all-weather road connections. Construct a new road between Millstream and Tom Price.
Rail transport	<ul style="list-style-type: none"> Minimise excessive delays at road-rail grade intersections resulting from longer and more frequent ore trains. Promote multi-user rail networks.
Marine transport	<ul style="list-style-type: none"> Facilitate berth capacity expansion. Promote multi-user port facilities. Upgrade road and rail access to port areas. Provide sufficient port-related land for storage and processing. Encourage diversification of activities at the region's ports.
Air transport	<ul style="list-style-type: none"> Upgrade Karratha Airport. Upgrade Port Hedland Airport. Investigate a new Tom Price airport to regular public transport standard to provide a gateway to Karijini National Park and Hamersley Ranges. Upgrade Onslow Airport to service the Ashburton North Strategic Industrial Area and the expanded town site.
Urban transport	<ul style="list-style-type: none"> Upgrade community bus services in Pilbara cities. Upgrade taxi services in main towns. Make provision in each city for the establishment of a bus fleet and associated infrastructure.



Education: New primary schools, new and expanded high schools, expanded TAFE facilities and one or two university sub-campuses will be developed to meet greater demand for educational services and to retain senior students in the region's schools.

Recreation: A number of facilities are proposed to meet the increased demand for recreation opportunities. These include: two new marinas (at Dampier and Port Hedland); upgrades to boat harbours and boat launching facilities; improved access to beaches; upgrades to the region's swimming pools; provision of fully equipped sports ovals; and indoor recreation centres.

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Community safety and support: The changing size and composition of the Pilbara communities will require a higher level of police and court facilities and a wider range of childcare and family support facilities. It will also need more community facilities such as places of worship, and accommodation for volunteer organisations and clubs.

Culture and entertainment: There is a need to expand both community and commercially based places of culture and entertainment, including: theatres, cinemas, galleries and museums – particularly in Karratha and Port Hedland.

Retail facilities: The higher population thresholds will be able to sustain more retail facilities, particularly in Karratha and Port Hedland.

Civic facilities: The range of civic facilities – town halls, libraries and community centres will be expanded in the two Pilbara cities, the sub-regional centre and the major towns.

Transport

To meet the Pilbara's projected expansion of economic activity and population, a transport system that provides equitable access for residents and industry; and practical, safe and affordable opportunities for intra-regional, intra-state, inter-state and international travel will be required.

Road transport: There is a need to develop a regional road network that provides safe all-weather connections between the region's centres of activity. Key future road transport priorities include:

- investigation of a coastal road between Karratha and Wickham;
- port access enhancements – Dampier, Port Hedland, Cape Lambert and Anketell;
- upgrades to Newman-Marble Bar Road;
- construction of a new road between Millstream and Tom Price;
- road pavement upgrades along heavily trafficked sections of the Great Northern and North West Coastal Highways; and
- development of viable public transport systems in the two Pilbara cities.

Rail transport: The region's rail system will expand from three privately-operated networks to five, during the next decade. Ore tonnages carried by rail will increase significantly, resulting in more frequent



and longer trains travelling between mine and port. Future priorities include:

- promoting multi-user rail network;
- minimising excessive delays at road-rail grade intersections resulting from longer and more frequent ore trains; and
- investigating opportunities to carry non ore products on the region's rail networks.

Marine transport: Trade tonnage at the region's seaports is set to expand significantly over the next decade. There will be expanded seaport facilities at Port Hedland and Dampier and ore export terminals at Cape Lambert, Anketell and Cape Preston. These are supplemented by marine servicing boat harbours at Onslow (Beadon Creek) and Point Samson (Johns Creek). Future priorities include:

- facilitating berth capacity expansion;
- promoting multi-user port facilities;
- upgrading road and rail access to port areas;
- providing sufficient port related land for storage and processing; and
- providing facilities for general cargo as well as bulk commodities.

Air transport: Airport passenger throughput has increased significantly over the past five years, particularly at Karratha. More recently, there has been increased connectivity between the region's airports

and other Australian centres, with direct flights to Brisbane, Sydney and Melbourne. In future, there may be demand to support greater connections between the region and selected international destinations. Future priorities include:

- developing the region's four hub airports to be capable of accepting high frequency services by Code 3 jet aircraft. This will require upgrades to air-side infrastructure, terminal facilities, access and parking;
- investigating the viability of intra-regional regular passenger air services;
- maintaining the integrity of flight paths to the region's airports; and
- investigating demand for connections between the region and selected international destinations.

Natural environment

The realisation of the Pilbara Cities vision to triple the resident population and expand mining, petroleum and industrial activities could significantly challenge the region's natural environmental values. It is important to acknowledge the contribution these values make to the Pilbara's liveability, health, lifestyle and economy.

The Framework builds on the region's environmental values, national parks and conservation reserves. It will also provide momentum for a better understanding and respect for the natural

environment; promote the conservation and protection of significant natural features; and ensure opportunities for discovery, recreation and a sense of meaning for the benefit of future generations.

Cultural heritage

With an expanded urban population, there will be a need to create better understanding, recognition and respect for the region's past and present indigenous culture; together with the cultural heritage of its early settlement, pastoral and mining activities. This will engender a sense of continuity and general lifestyle enhancement, as well as providing attractions for tourists. Future priorities include:

- identification and protection of significant regional and local heritage places to ensure that development, in or adjacent to those places, will not compromise their cultural heritage values and significance;
- maintenance of the cultural integrity of the rock-art galleries contained within the newly declared Murujuga National Park on the Burrup Peninsula; and
- maintenance of the region's urban heritage, in particular: Cossack, Marble Bar, Roebourne, Port Hedland and Onslow.



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Development

The region should be developed in a timely and responsible manner that responds to the Pilbara Cities vision and creatively addresses constraints and impediments. The key development issues comprise:

Climate change: The projected impact of climate change will need to be considered, particularly in a region that is significantly impacted most years by cyclonic activity. This, however, needs to be considered on a risk management basis, taking into account the susceptibility of a proposed land use and the probability that an extreme event will eventuate within a certain time scale.

Development assessment: To ensure that responsible development progresses in a timely manner, tracts of englobo land will need to be identified for urban expansion and industrial development. All relevant issues triggered by a proposed development will need to be identified and assessed well in advance of demand. These include: environmental impact assessment; assessment of Indigenous heritage and native title agreements.

Basic raw materials: As much of the proposed development associated with the Pilbara Cities will be on low-lying, flood-prone land, there will be a need to source and transport large quantities of fill material. Pragmatic strategies will need to be put in place to identify locations where large quantities of suitable material can be excavated in an environmentally sustainable and cost effective manner.

Implementation

The Framework will be endorsed by the WAPC as a regional strategy under the State Planning Framework.

Governance

The Framework will guide the decision-making of relevant government agencies in the areas of:

- **Planning** – by providing the over-arching policy framework within which local governments will prepare their local planning strategies and schemes.
- **Infrastructure** – by informing the Infrastructure Coordinating Committee of the WAPC when assigning priorities to infrastructure funding and development.



- **Economic development** – by informing the Pilbara Cities Office and other agencies in attracting investment to the region.

Current and future planning work

Further work identified by the Framework includes:

- mapping storm surge and flooding;
- preparing a Port Hedland growth plan; and
- undertaking investigations for a potential Karratha-Wickham link road.

In addition, the WAPC has commenced preparation of the 'Pilbara Infrastructure Implementation Plan', which will provide more detail on infrastructure requirements for the Pilbara including responsible agencies, costs and timelines for delivery.

Financial strategy

A funding structure will be established to finance the infrastructure priorities identified by the Framework. A number of mechanisms and funding sources will be considered.

Monitoring and review

The Framework is a living document and its performance will be monitored and reviewed.

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Settlement – Objectives/Actions

Objectives	Actions
Settlement: Develop the region's settlements to be sustainable and liveable communities.	<ul style="list-style-type: none"> a Achieve an efficient supply of project-ready land, in a timely manner, to accommodate growth in Karratha, Port Hedland and other major urban centres, through the preparation of local planning strategies and schemes. b Promote areas for mixed-use and higher density residential forms in major centres by their inclusion in local planning schemes. c Identify areas of land for community and recreational needs in growth and redevelopment areas through zoning in local planning schemes. d Facilitate private sector involvement in urban land development. e Reflect the findings of the Port Hedland Dust Management Taskforce in the preparation of planning documents and strategies for Port Hedland.
Housing: Provide choice, quantity, quality and affordability in housing provision.	<ul style="list-style-type: none"> a Continue to undertake work that focuses on accelerating land releases for housing. b Provide serviced residential land in identified growth areas to meet the needs of the labour market. c Encourage higher density residential development in Karratha and Port Hedland through the application of residential design codes.
Fly-in fly-out: Provide for fly-in, fly-out workforces that do not adversely impact on the resident population.	<ul style="list-style-type: none"> a Identify appropriately located sites to accommodate fly-in fly-out workforces through the preparation of regional and local government transient workers accommodation policies. b Encourage urban based transient worker accommodation that is located close to commercial centres, to serve multi-purpose functions within the region's communities. c Support the use of on-site transient worker accommodation during the construction stage of major community, commercial and housing development projects. d The State, in consultation with industry and local government, to develop a specific policy relating to workforce accommodation in the Pilbara.
Urban form: Create sustainable, well defined, cohesive settlements, with a strong sense of place and high quality urban design that is climate responsive.	<ul style="list-style-type: none"> a Identify ways that settlements can engender connectivity and create a sense of place. b Develop a Pilbara vernacular design style that is sensitive to and enhances the identity and character of settlements through the development and adoption of urban design guidelines. c Provide for climate responsive urban form and buildings through the development and adoption of urban design guidelines. d Continue to implement water sensitive urban design policies and practices. e Ensure provision of public open space and recreation facilities as part of subdivision.



Economy – Objectives/Actions

Objectives	Actions
Encourage continuation of extraction and processing of natural resources to enhance community, economic and environmental values.	a Identify high-value and essential mineral resource areas and prevent changes in land uses from constraining future extraction.
	b Engage the community, landowners and industry in promoting and practicing sustainable natural resource management.
Provide for an adequate supply of industrial land in the region to meet the expanding demands of industry and its associated services and transport requirements.	a Coordinate planning and development of strategic, general and light industrial areas to accommodate the needs of industry through the preparation of regional and local strategic plans and their incorporation into local planning strategies and schemes.
	b Ensure the planning of industrial areas makes provision for appropriate transport and ancillary support activities and facilities.
Promote the diversification of the region's economy.	a Identify and implement projects that support the region's economic development and ensure appropriate locations are available for their timely introduction.
	b Coordinate planning and development of commercial areas to accommodate a range of business types through the preparation of regional and local strategic plans and their incorporation into local planning strategies and schemes.
	c Promote the development of start-up business (incubator) units in the region's main development areas and other measures to assist the establishment of small businesses.
	d Seek the introduction of significant government or education-based establishments, such as a military base, a university sub-campus or a collaborative research organisation and identify appropriate locations for these uses and their associated requirements in the region.
	e Work collaboratively with Tourism WA to implement the regional tourism strategy.
	f Identify opportunities to promote Aboriginal tourism and integrate it with mainstream domestic tourism.



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Utility infrastructure – Objectives/Actions

Objectives	Actions
General: Ensure that the needs of the community and industry are well served by the provision of an adequate and efficient system of utility infrastructure that takes into account new technologies and approaches as well as 'whole-of-life' and 'whole-of-system' costs.	a Undertake a 'whole-of-government' gap analysis to identify utility infrastructure needs across the Pilbara at regional and local government levels and within specific settlements. b Prepare the Pilbara Infrastructure Implementation Plan for utility infrastructure that includes an estimate for a 'whole-of-life' and 'whole-of-system' costs.
Water: Provide settlements and industry with a secure supply of potable water; promote total water cycle management; and adopt water sensitive urban design principles.	a Improve planning for water services across the region. b Through the 'whole-of-government' gap analysis identify regional water utility needs in the short, medium and long-terms. c Identify, secure and develop new water sources, including climate-independent water options for Port Hedland, Karratha and Onslow. d Improve demand-supply imbalances to ensure that water does not pose a constraint to economic or community development. e Improve the responsible consumption of water by industry and the community. f Develop a fit-for-purpose and grey-water usage framework which can relieve demand on potable water sources.
Waste water: Minimise waste water at source and recycle where feasible.	a Provide appropriate sewerage facilities and services in all Pilbara cities and towns. b Provide adequate local absorption systems in the region's villages and Aboriginal communities. c Decommission Port Hedland Waste Water Treatment Plant and augment capacity at the South Hedland Waste Water Treatment Plant. d Upgrade Karratha Waste Water Treatment Plant. e Reuse waste water to irrigate public open space.



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Objectives	Actions
Energy: Provide a sustainable, sufficient, reliable and well managed energy supply and infrastructure that meets community, industrial and commercial needs.	a Facilitate the development of a framework that ensures future additional power generation and efficient management of the regional energy network. b Develop new power generation and transmission capacity in all towns experiencing development pressures.
Waste management: Minimise waste and associated environmental impacts and maximising re-use and recycling through the use of best practice technology and waste disposal minimisation.	a Ensure the provision of sites and buffer areas for waste transfer, collection, treatment, recycling and disposal facilities within town sites. b Investigate the potential for consolidating and investing in larger regional waste and recycling facilities that service both industry and communities. c Provide for improved waste management in remote aboriginal communities.
Telecommunications: Provide affordable access to mobile phone and high speed broadband telecommunications.	a Improve coverage of the mobile phone network. b Provide affordable access to high speed broadband networks. c Develop a policy for location of towers and other telecommunications structures to minimise the impact on the natural and built environment.



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Community infrastructure – Objectives/Actions

Objectives	Actions
General: Provide a comprehensive range of accessible community, cultural, and recreational facilities and services commensurate with growing resident and fly-in fly-out population levels and taking into account the region's remoteness and the distance between its settlements.	<ul style="list-style-type: none"> a Undertake a 'whole-of-government' gap analysis to identify regional community infrastructure needs. b Prepare the Pilbara Infrastructure Implementation Plan for community infrastructure that includes an estimate for a 'whole-of-life' and 'whole-of-system' cost. c Ensure local planning strategies and local planning schemes incorporate suitable areas of land for community infrastructure. d Develop efficient methods of providing community services throughout the region, including public transport and e-communications. e Develop co-located multipurpose community facilities and services that can respond to changing and emerging community needs. f Provide for state, private or not-for-profit community service workforce housing in regional centres and major towns.
Health: Provide a comprehensive range of accessible health services and support facilities.	<ul style="list-style-type: none"> a Undertake major upgrades of all current state hospital and health clinic infrastructure. b Commission the Karratha Health Campus. c Incorporate a community health service facility into the South Hedland Health Campus. d Expand ambulance services and provide appropriate physical infrastructure to support the additional capacity. e Progress Aboriginal health initiatives consistent with 'Closing the Gap' with associated investment in physical infrastructure to support the expanded services. f Provide investment/incentives for private or not-for-profit health sector expansion to meet future projected demand. g Provide for accommodation for short-stay patients and visitors at regional centres. h Expand existing population health services to include drug and alcohol counselling, mental health and general psychological services. i Invest in housing for health workers at regional centres and small hospital facilities.



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Objectives	Actions
Education: Provide a comprehensive range of accessible education services and support facilities.	a Facilitate the development of the Karratha Education and Training Precinct (high school and Pilbara Institute). b Upgrade and expand Port Hedland High School, Roebourne District High School and Onslow Primary School (to a District High School). c Assess and identify training facility requirements to meet the needs of the growing population. d Undertake further evaluation of university sub-campus opportunities. e Provide for educator and administrator housing across the region. f Provide for boarding/hostel accommodation on, or close to, education campuses in Karratha and Port Hedland to cater for remote communities.
Recreation: Provide active and passive public open space and built facilities for formal and informal sport and recreation to enable community activity and healthier life styles.	a Provide for adequate and well located areas of active and passive public open space in new urban developments. b Develop the Karratha Leisure Centre precinct. c Develop a swimming pool at Onslow. d Construct marinas at Port Hedland and Dampier. e Construct a multi-purpose recreation centre in Port Hedland.
Entertainment and culture: Provide a comprehensive range of entertainment and cultural facilities throughout the region.	a Undertake a study of culture and the arts and cultural tourism opportunities in the region. b Develop an entertainment precinct in Karratha. c Develop Marquee Park in South Hedland.



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Transport infrastructure – Objectives/Actions

Objectives	Actions
General: Ensure that the needs of the community and industry are well served by an integrated, efficient and safe roads, air and public transport system.	a Undertake a 'whole-of-government' gap analysis to identify regional transport infrastructure needs. b Prepare the Pilbara Infrastructure Implementation Plan for transport infrastructure that includes an estimate for a 'whole-of-life' and 'whole-of-system' cost.
Road transport: Promote a regional road network that provides safe all-weather road connections between the region's centres of activity and the rest of the state and serve the needs of the community requiring access to community services and places of employment and education.	a Continue to upgrade existing highways to provide safe, all-weather road connections between the region's centres of activity and the rest of the state. b Assess and act on measures required for high traffic regional roads. c Investigate options for Karratha-Wickham road. d Identify areas in local planning strategies and planning schemes for transport industry zones. e Provide an all-weather, sealed road from Marble Bar to Newman (through Nullagine). f Construct the Millstream to Tom Price link road. g Provide an all-weather, sealed road from the Great Northern Highway to Jigalong. h Investigate a link road between Karratha and its airport. i Undertake works relating to development of the Ashburton North Strategic Industrial Area and expansion of Onslow.
Rail transport: Promote the rationalisation of the region's rail networks.	a Promote new multi-user rail networks. b Minimise excessive delays at road-rail grade intersections resulting from longer and more frequent ore trains. c Investigate opportunities to carry non ore products on the region's rail networks.



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Objectives	Actions
Marine transport: Promote new multi-user, highly accessible port facilities.	a Facilitate berth capacity expansion. b Provide for multi-user port facilities. c Upgrade road and rail access to port areas. d Provide sufficient land for on-shore storage and processing. e Investigate options for diversification of the region's ports.
Air transport: Provide an efficient regional airport network that enables intra-regional, intra-state and interstate connections for passengers and freight.	a Take into account airport growth requirements and flight paths around the region's airports when undertaking land development. b Upgrade infrastructure (terminal facilities, access and parking) at the region's airports. c Investigate the viability of regular intra-regional regular passenger air services. d Investigate the feasibility of upgrading Onslow airport. e Investigate the capacity of Tom Price airport to accommodate the needs of tourism as well as mining.
Urban public transport: Provide an equitable and efficient public transport system in the region's cities and major towns.	a Establish city public transport systems in Karratha and Port Hedland. b Make provision in each city for the establishment of associated infrastructure for a public transport system. c Upgrade taxi services in cities and main towns.



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Environment – Objectives/Actions

Objectives	Actions
Conserve and manage the region's natural environmental values and maintain supporting ecological processes for future generations.	a Undertake assessment of the region's flora and fauna to adequately inform future planning decisions.
	b Pursue additions to the region's reserves to support the concept of a comprehensive, adequate and representative reserve system that aims to protect flora and fauna of conservation value.
	c Maintain and enhance safe public access to the foreshore and coastal waters and ensure public access is designed and maintained to conserve coastal resources.
	d Minimise development near waterways and wetlands in locations where there is potential for environmental damage and flood risk.
	e Conduct research based on seismology, sedimentology and oceanography to evaluate the risk of a tsunami impacting the Pilbara.
	f Develop emergency response strategies should there be a realistic threat to the region.
	g Develop a region-wide plan which provides recommendations and guidance on important natural environmental matters in the Pilbara for all stages of land use planning.
	h Develop management plans that cover the region's sensitive coastal areas and complete the draft plans arising from the Pilbara marine planning process.
Incorporate natural resources and all significant environmental considerations into the preparation and assessment of strategic and statutory planning proposals to achieve environmental protection and management outcomes.	a Develop suitable data delivery systems on the regional natural environmental attributes so that relevant information is available at early planning stages of future development initiatives, and that this data is given due consideration in approval processes.
	b Land use strategies and plans should consider the potential impacts of climate change and sea level rise.
	c Land use strategies and plans should identify and provide for protection of areas of high conservation value and take into account sustainability targets and environmental measures to preserve environmentally significant features.



Cultural heritage – Objectives/Actions

Objectives	Actions
Protect and manage the region's cultural heritage, arts including indigenous significant places, historic places, and landscapes of significance as guided by the State Planning Policy 3.5 – Historic Heritage Conservation.	a Undertake a study of culture heritage in the region.
	b Maintain the cultural identity of the Burrup Peninsula.
	c Plan and develop Cossack as a 'living' heritage village.
	d Conserve and restore the Old Onslow Town site and protect its cultural landscape from the impact of industrial development.
	e Investigate the conservation of the old town site of Shellborough, to the north of Port Hedland.
	f Conserve the heritage buildings and precincts at Marble Bar, Nullagine and Whim Creek.
	g Develop mining, oil or gas museums in Karratha, Port Hedland and Newman.
Create partnerships between Government, resource companies and aboriginal communities for shared ownership, responsibility and designing of strategies in relation to promoting and protecting cultural heritage.	a Invest in capacity building of aboriginal communities across the Pilbara.
Create a sense of place by acknowledging the living cultures and their shared values and experiences of the various communities that have and currently inhabit the region.	a Facilitate the development of Aboriginal arts and cultural centres across the Pilbara.
	b Plan and develop Roebourne in partnership with the Roebourne Rejuvenation Project.



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Development issues – Objectives/Actions

Objectives	Actions
Climate change: Mitigate and adapt to climate change impacts in the Pilbara. Promote the resilience of communities, development, forms of economic activity, and essential infrastructure that are resilient to the potential impacts of climate change.	<ul style="list-style-type: none"> a Develop measures that reduce the region's contribution to climate change and promote adaptation as a way of managing risks, addressing impacts and identifying opportunities. b Establish adaptation strategies to minimise vulnerability to extreme weather events, including tropical cyclones, storm surge and flooding and the range of potential sea level rises. c Land use planning strategies and proposals should address risk from the projected effects of climate change by avoiding areas with high exposure and vulnerability to flooding, storm surge, sea level rise, inundation and coastal erosion. d Develop accurate coastal mapping so that the location of coastal facilities and development takes into account coastal processes including erosion, accretion, storm surge, wave conditions, sea level rise and biophysical criteria.
Environmental assessment: Promote strategic environmental assessment of the region's environment, particularly in areas subject to land use change and development proposals, as early in the planning process as possible.	<ul style="list-style-type: none"> a Prepare strategic environmental assessments of the region's environmental assets and values and address matters of local, state and national environmental significance. This should be a priority for areas subject to land use change and development proposals. b Promote the development, sharing and continued update of environmental data for the Pilbara.
Indigenous heritage and native title agreements: Support timely and mutually satisfactory native title determination outcomes.	<ul style="list-style-type: none"> a Continue to work collaboratively with indigenous communities in the Pilbara to enhance improved community awareness of indigenous heritage. b Ensure assessment and determination of planning and development proposals takes into account appropriate assessment of indigenous heritage and, where appropriate, take into account relevant native title agreements, including Indigenous Land Use Agreements.
Planning approvals: Contribute to a more efficient, flexible and simplified planning approvals system and implement the planning reform agenda to facilitate the provision of project-ready land aligning with the Pilbara Cities vision.	<ul style="list-style-type: none"> a Support actions to implement planning reform measures identified in the WAPC's publication <i>Planning Makes it Happen: A Blueprint for Planning Reform</i> to achieve a more efficient, flexible and simplified planning approvals system. b Support actions in the planning reform agenda that facilitate the provision of project-ready land. c Promote planning and development proposals that align with the Pilbara Cities vision. d Develop and adopt subdivision design and Residential Design Codes that are relevant to the region.
Basic raw materials: Identify sources of basic raw materials and ensure that required quantities are available to meet industry and residential requirements.	<ul style="list-style-type: none"> a Quantify the amounts of basic raw materials needed for proposed residential and industry initiatives. b Identify alternatives that may be used in the place of basic raw materials where supplies are limited and in short supply, and evaluate the cost effectiveness of their use. c Evaluate cost effective alternatives to traditional construction techniques that minimise requirements for basic raw materials.

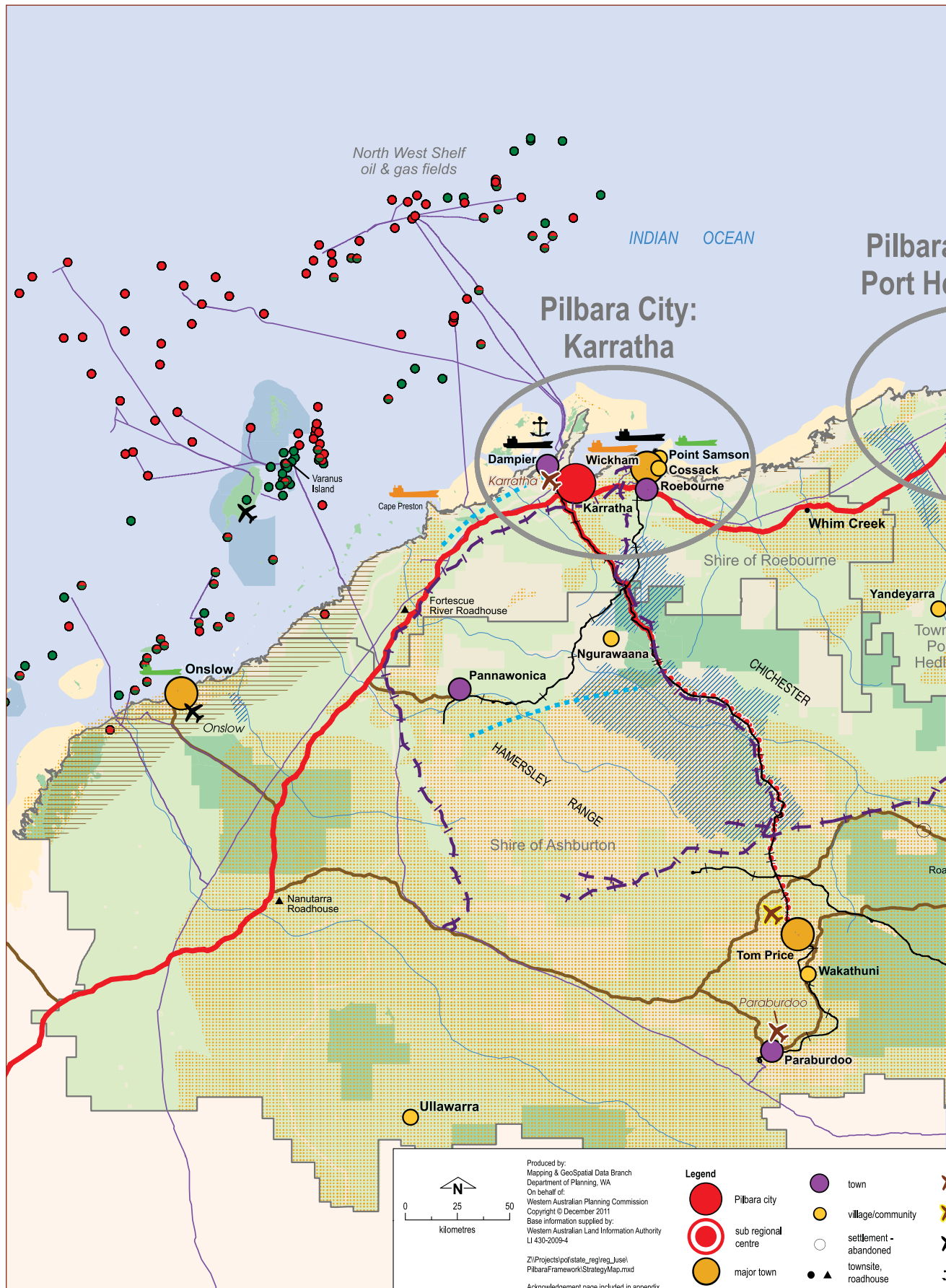
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Strategy map

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Enquiries/Suggestions

As the Pilbara and Infrastructure Framework is intended to be a 'living document' that is periodically reviewed your suggestions for improving/updating the document are welcomed.

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