

PILBARA DEVELOPMENT COMMISSION Regional Investment Blueprint: Technical Report



Government of **Western Australia**
Department of **Regional Development**



**ROYALTIES
FOR REGIONS**



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 Report Number: PR124273-1
 Version / Date: Draft 5.0

Document Status

Version	Purpose of Document	Orig	Review	Review Date
1.0	Working draft	TC	MW	8/12/14
2.0	First draft	TC	MW	16/12/14
3.0	Draft for external stakeholder review	TC	MW	21/12/14
4.0	Updated Draft for PDC review	TC	MW	05/02/15
5.0	Draft for final review	TC	MW	27/02/15

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Contents

CHAIRMAN’S FOREWORD.....	1
EXECUTIVE SUMMARY.....	2
2.0 INTRODUCTION.....	6
Towards a Resilient and Prosperous Pilbara.....	6
The Framework for Regional Development.....	6
Blueprint Development Approach.....	8
3.0 LOCAL DRIVERS & CHARACTERISTICS.....	15
Regional Overview.....	15
The Economy.....	21
Community and Culture.....	37
4.0 REGIONAL & GLOBAL INFLUENCES.....	42
Emerging Markets.....	42
Security & Sustainability.....	48
Technological Advances.....	51
5.0 REGIONAL CAPACITY FOR GROWTH.....	53
Human Capital.....	53
Sustainable Communities.....	58
Connectivity.....	64
Business Competitiveness.....	69
6.0 COMPARATIVE ADVANTAGES.....	72
Geographical Proximity to Asia.....	72
Natural Environment and Resources.....	72
Location of Major Industrial Activity.....	73
Aboriginal Culture and Heritage.....	73
Export Infrastructure.....	74
Political Stability.....	74
A Unique Combination.....	74
7.0 PILBARA VISION.....	75
Pilbara @ 2050.....	75
Aspirational Population Targets.....	76
Different Approaches to Growth & Development.....	79
Regional Pillars.....	80
The Future Role of the Resources Sector.....	90
Strategic Priorities.....	90
8.0 TRANSFORMATIONAL OPPORTUNITIES.....	92
Realising the Pilbara @ 2050 Vision.....	92

9.0 IMPLEMENTATION OVERVIEW	134
Development of an Implementation Plan	134
Why Does the Blueprint Need an Implementation Plan?	134
What Will the Implementation Plan Include?	134
Who is Responsible?	135
Financing & Funding Development	138
Monitoring and Reviewing Outcomes and Actions	139

Tables

Table 1 Transformational Opportunities Summary	5
Table 2 Local Government Key Indicators, Pilbara	19
Table 3 Jobs by Top Industries, Pilbara	24
Table 4 Business Counts by Industry and Employment, Pilbara, 2013	35
Table 5 Human Capital Indicators, Pilbara	54
Table 6 Sustainable Community Indicators, Pilbara	59
Table 7 Connectivity Indicators, Pilbara	64
Table 8 Business Competitiveness Summary, Pilbara.....	70
Table 9 Pillar Outcomes	83
Table 10 Table Transformational Opportunity Summary	93

Figures

Figure 1 Western Australian Planning Regions	7
Figure 2 Blueprint Structure	9
Figure 3 Key Strategic Themes.....	11
Figure 4 Relationship of Blueprint to State Planning Development Framework	12
Figure 5 Pilbara Regional Context.....	16
Figure 6 Historical Population by Local Government Area, Pilbara	18
Figure 7 Indicative Service Population by Local Government Area, Pilbara, 2011	18
Figure 8 2Contribution of Pilbara Economy.....	22
Figure 9 Unemployment, Pilbara and Australia.....	23
Figure 10 Annual Wages and Salaries by Region, 2010/11.....	23
Figure 11 Pilbara Workers Place of Residence.....	24
Figure 12 Value of Minerals and Petroleum Production, Pilbara	25
Figure 13 Iron Ore Spot Prices, \$US per Dry Tonne, by Month, 2011 to 2015	26
Figure 14 Iron Ore Port Throughput, Port Hedland and Dampier Ports, 2009/10 to 2013/14.....	27
Figure 15 Mineral and Energy Regions, Pilbara	29

Figure 16 Exploration Expenditure, Western Australia	30
Figure 17 Value of Building Approvals, Pilbara	31
Figure 18 Average Daily Visitation, Pilbara	32
Figure 19 Age and Gender Profile, Pilbara compared to Western Australia, 2013	37
Figure 20 Percentage of Males and Females, Pilbara, 2013	38
Figure 21 Median House Price, Regional Western Australia, 2013/14	39
Figure 22 Housing Tenure by Urban Area, Pilbara, 2011	40
Figure 23 Global Megatrend Relationship	42
Figure 24 Projected Urban Population by Region	43
Figure 25 Historical Population by Urban Centre Size, Australia	44
Figure 26 Projected Expenditure of Global Middle Class by Region	45
Figure 27 Global Middle Class Product Opportunities	46
Figure 28 Projected Agriculture Consumption by Region	46
Figure 29 Projected Agriculture Imports by Commodity, World	47
Figure 30 Projected Energy Consumption by Source, World	49
Figure 31 Country Gross Domestic Product Ranking	50
Figure 32 Pilbara School Enrolments, 2010-14.	57
Figure 33 Port Locations, Pilbara	68
Figure 34 Adjusted Porter's Diamond	69
Figure 35 Population Scenarios and Targets, Pilbara	78
Figure 36 What Does an Extra 135,000 Residents Mean?	78
Figure 37 Spectrum of Approaches to Regional Growth and Development	79
Figure 38 Regional Pillars by Approach to Growth and Development	80
Figure 39 Regional Pillars	92
Figure 40 Pilbara Regional Investment Blueprint Stakeholders	137

Appendices

Appendix 1	Acronyms
Appendix 2	Key Plans and Strategies
Appendix 3	Key Regional Indicators
Appendix 4	Acknowledgements
Appendix 5	References

Chairman's Foreword

Innovation and technological change are the greatest drivers of productivity and the greatest sources of inspiration for the Pilbara's future.

The Pilbara Regional Investment Blueprint is our commitment to view our challenges and changing environment as opportunities to be innovative in our thinking, and resilient as a community.

Haul trucks will be driverless, one in four people will be working from home and energy will be harvested from renewable sources; these are some of the likely scenarios the Pilbara, and the world, will be experiencing in the year 2050.

Considering these, among a myriad of emerging global trends that will shape the way we live and do business 35 years from now, has been vital in the development of the Blueprint.

The success of the Western Australian State Government's Pilbara Cities initiative in addressing the land and infrastructure needs of the growing population centres has been critical to revitalising the region. It is also a great example of what is possible if we work together towards a clear, shared vision.

While there is still work to be done, the Blueprint heralds a new direction for the Pilbara as we turn our focus firmly towards expanding the region's economic base and building a legacy that we are proud to pass on to our children, and grandchildren.

More than three times the size of England and accounting for 36% of the nation's merchandise exports, the Pilbara boasts a powerhouse combination of location, access to markets, a world-class customer base and unique natural assets that position us for future growth and prosperity. It's an exciting region on the cusp of new discoveries and opportunities.

Undeniably the resource sector will remain the foundation of the Pilbara's economy for decades to come, however the region boasts numerous other comparative advantages that present exciting opportunities for new industries. These opportunities will take the Pilbara beyond just "business as usual" and will chart our aspirational future.

In reading this Blueprint I encourage you to embrace big picture thinking towards what could be possible for the Pilbara of tomorrow. Collective strategic action will enable us to seize new opportunities that will achieve prosperous economic outcomes for the region and for Western Australia.

We look forward to working with you to make the Blueprint vision a reality.

Chris Gilmour
CHAIRMAN

"The future is not some place we are going but one we are creating."

John H. Schaar

Executive Summary

The Pilbara has been a powerhouse of growth for Western Australia and the nation. Its proximity to Asia and unique and extensive resource endowments have resulted in the region being recognised as a globally significant mining and energy area. It is blessed by stunning natural landscapes, a sub-tropical environment with consistent sunshine, a dynamic and engaged community and a large Aboriginal population.

The Pilbara has been the centre of the most rapid expansion of iron ore production in history and the construction of some of the largest gas projects in the world. The economic activity associated with these projects has substantially increased the importance of the Pilbara to both the Western Australian and Australian economies.

However, the heavy reliance on resource and energy extraction and export has created many vulnerabilities and risks, resulting in a range of challenging outcomes, which left unaddressed will continue to impede the sustainable development of the Pilbara. These include volatile population growth, an imbalanced age and gender profile and high costs for households and businesses (including housing). The region is also challenged by its relative isolation from Perth and other capital cities and significantly below average small business creation and development.

The Western Australian Government's \$1.7 billion Royalty for Regions Pilbara Cities program has contributed significantly to addressing these challenges, with Pilbara townships receiving significant public and private sector investment in amenity and liveability enhancements over the past five years. Effort is now required to guide and extend this investment, to engender the collective action required to continue the transformation of the region and enable new and emerging opportunities to be realised.

The Pilbara Regional Investment Blueprint (the Blueprint) identifies opportunities for the region to achieve aspirational population, economic and community development outcomes. The Blueprint is the product of extensive engagement and analytical understanding of the region. It is structured and formulated by the Pilbara Development Commission but incorporates the effort, skills and knowledge of local government, key State and Commonwealth Government agencies and the non-government, community and not-for-profit sectors.

Central to the Blueprint is recognition that the region needs more than “business as usual” planning, that is, relying solely on the resources and energy industries to drive growth and development. Instead, it charts a more aspirational future and therefore establishes a long-term Vision and supporting Regional Investment Pillars to support that Vision.

The Blueprint establishes the following **Vision** for the Pilbara:

“In 2050, the Pilbara will have 200,000 people living in vibrant, modern and inclusive cities and communities which offer quality services, career choice, affordable living and a thriving civic life. The economy will feature diverse, innovative and resilient local and international firms underpinned by the resources and energy industries.”

The achievement of this Vision is currently impeded by a lack of critical mass of residents in major centres and towns in the Pilbara. Such a critical mass is essential to realising the economic, social and environmental potential of the region. If historically large cyclical upturn and downturn trends continue, the Pilbara's population will likely grow from approximately 65,000 now to 140,000 in 2050. The Royalties for Regions Pilbara Cities' investment will pull this growth forward, with the Pilbara now expected to reach 140,000 residents by 2035 or some 15 years early. This Blueprint

seeks to extend and sustain this growth, establishing an ***aspirational but achievable population target of 200,000 residents by 2050.***

Shifting the Pilbara’s population and economic growth trajectory from “business as usual” towards a more transformational future requires a comprehensive, consolidated and integrated approach to the growth and development of the region. There are a range of ways to foster and promote the growth of a regional economy. Different initiatives generally fall into three broad ***approaches to growth and development:***

- **Enabling Initiatives** – investment in activities, infrastructure, facilities and services that catalyse and enable the private sector and the community to grow and prosper in a region.
- **Value Adding** – building upon and adding value to the strengths of the foundational industry to deepen regional economic activity. This can include physical value adding to raw materials, increased capture of upstream supply chains expenditure in the region or innovative use of existing infrastructure and economic capacity.
- **Diversification** – broadening of the economic base of a region through the promotion, fostering and growth of new industries and businesses. These businesses are generally separate from the value adding activities associated with the foundational industry, drawing upon the region’s competitive advantages, innovation, research and entrepreneurship to drive new business and industry growth.

By pursuing enabling, value adding and diversifying activities and investments, the Pilbara @ 2050 will be characterised by levels of population, employment, business activity and investment greater than the “business as usual” profile of the region would achieve.

Realising the Vision for the Pilbara @ 2050 will entail the development and growth of a regional economy founded on a range of competitive economic strengths or ***Regional Pillars***. These Pillars represent those areas of the Pilbara’s economy and community where public and private investment should be prioritised in order to make the Vision a reality. Nine Regional Pillars have been identified and profiled.

- **Land Access, Core Infrastructure and Facilities:** The provision of suitable land, infrastructure and facilities has been a barrier to the development of the Pilbara. Therefore, continuing investment in land access and infrastructure, such as energy, water (both potable and for agriculture and industry), waste, digital communications and transport will be required. Overcoming land tenure challenges and improving access to quality services, markets and communities will improve the attractiveness of the region to households and investors, catalysing new industries and businesses in the region.
- **Education, Training and a Skilled Workforce:** The growing global middle class with higher levels of education will mean that the Pilbara will need to maintain a high level of skills and knowledge in order to compete. Therefore, quality secondary and tertiary education and training facilities and services are needed to educate and develop the skills and capabilities of the region’s current and future workforce. Increased access to educational services, from childcare to university, will encourage local residents to live and study in the region and provide opportunities for industry-specific research and development and innovation to be generated. The Pilbara’s high level of industrial activity provides the opportunity for the region be a significant influence in education, training and knowledge in these areas.
- **Health & Community Wellbeing:** In order to make the Pilbara an attractive place to live, work, invest and visit, health and community services and facilities to maintain and enhance the quality of life of the region’s residents will be required. Further investment will encourage community vibrancy, celebrate the Pilbara’s unique Aboriginal culture and history, and overcome isolation and remoteness challenges.

- **Marine & Resource Engineering and Supply Chains:** Opportunities exist to leverage the region’s industrial activity, advancements in technology, existing local skills and infrastructure base and growing population to promote and encourage a globally competitive engineering sector to service onshore and offshore industry needs, including defence support and emergency management. Greater levels of locally provided services to the existing mining and energy supply chains will improve the local capacity in the supply of maritime services, equipment and materials fabrication, assembly and technologies.
- **Innovative & Advanced Technology:** Capitalising on technological change, including micronisation, automation, telecommunications capacity and new communication mediums, will unlock opportunities in the Pilbara across both the foundation mining base and new industries. The research, development and integration of new and advanced technologies will improve access to learning and commerce opportunities, drive productivity growth and support the resilience and sustainability of communities, businesses and industry. In partnership with the region’s education and training providers, the Pilbara can be a global leader in innovative and advanced operations technologies associated with the mining, resource and new and emerging industries.
- **Diverse & Robust Small & Medium Businesses:** Currently underrepresented in the Pilbara compared to national averages, the Pilbara’s small and medium business sector will need to be the heart of the Pilbara’s diversified economy. Diverse, robust and resilient small and medium businesses take advantage of a growing population base and are innovative, entrepreneurial and use technologies to address operational challenges and access new markets. Local businesses will fully incorporate into mining and major project supply chains, leverage off the region’s reputation as a quality and reliable supplier and will actively targeting opportunities in Asia. A thriving small and medium business sector will support communities during mining downturns and provide a diversity of career choices for local residents.
- **Agriculture & Aquaculture:** Amid changing climates and increased water security challenges, the natural comparative advantages of the Pilbara in food production will be promoted. With considerable mine de-water and ground water opportunities, and vast amounts of sunlight and suitable soils for agriculture, the region is in strong position to utilise existing local export infrastructure and expertise to capture existing and emerging food markets. Optimal environmental conditions make local algae production – namely for use as biofuel – highly attractive while the coastal orientation of the region allows for the development of both onshore and offshore aquaculture.
- **Energy:** The Pilbara’s latent energy resources (particularly in LNG) and expansive and underutilised land and natural assets will be developed for local, national and global markets. Proximity, political stability and export infrastructure advantages will be exploited with targeted investment in traditional and innovative alternate energy production opportunities, including geothermal, algae and crop based biofuel, hydrogen, tidal and other stationary and mobile energy sources. This energy production will help to support the growth of the regional population as well as provide new export opportunities to major and emerging global markets.
- **Tourism:** By leveraging the Pilbara’s unique environmental and cultural assets, current strong regional visitation for business and employment reasons will be fostered and diversified to increase travel and expenditure for education, leisure and “visiting friends and relatives” visitation. The Pilbara will capitalise on its proximity to Asia and emerging middle class markets and its airport infrastructure to realise the tourism industry’s potential. Greater investments in the 4As of tourism activity – accommodation, accessibility, amenity and attractions – will be pursued.

Within each of the broad Regional Pillars identified in this Blueprint are a range of more specific Transformational Opportunities that enable, add value and diversify the regional economy and community. The Pilbara boasts a diverse range of economic and social drivers that have the potential to generate significant benefit for residents and businesses that call the Pilbara home. The opportunities identified under each of the Regional Pillars are regarded as the most transformational at the time of preparing this Blueprint.

Table 1 Transformational Opportunities Summary

APPROACH TO GROWTH & DEVELOPMENT	REGIONAL PILLAR	TRANSFORMATIONAL OPPORTUNITY
Enabling Initiatives	Land Access, Core Infrastructure & Facilities	Normalised Property Market and Land Access
		Secure and Sustainable Infrastructure Services
	Education, Training and a Skilled Workforce	Lifelong Education
		Workforce Development & Skilled Migration
	Health and Community Wellbeing	Diverse and Intergenerational Communities
		Innovative Local and Remote Healthcare Delivery
Value-Adding	Marine & Resource Engineering & Supply Chains	Maritime Maintenance, Safety and Emergency Management
		Industrial Fabrication, Assembly and Technology
	Innovation and Advanced Technology	Business Digital Connectivity
		Automation Technology & Services
	Diverse and Robust Small to Medium Sized Businesses	SME Support
		Streamlining Governance
Diversification	Agriculture & Aquaculture	High Value Agriculture and Cropping
		Aquaculture, Algae Biofuels and Co-products
	Energy	Energy Production
		Energy Export
	Tourism	Nature Based Tourism
		Heritage and Aboriginal Tourism Development

2.0 Introduction

The Pilbara is the powerhouse of Australia's economy. It accounts for 36% of Australia's merchandise exports, employs almost 50,000 people across the nation and is a lead contributor to State and Commonwealth royalty and tax receipts. It has a deep, rich Aboriginal and European history and some of the world's most ancient natural landscapes.

Towards a Resilient and Prosperous Pilbara

The Pilbara is a powerhouse of growth for Western Australia and the nation. Its proximity to Asia and unique and extensive resource endowments have resulted in the region being recognised as a globally significant mining and energy area. The rapid expansion of export capacity over the last decade has had a substantial impact on the region's communities and the broader economy. Billions of dollars invested in the region has had flow on benefits across the nation in the form of direct resource sector jobs, employment in supporting industries, rising incomes and increased government revenue.

However, the heavy reliance on resource exports creates vulnerabilities and risks and has resulted in a range of challenging outcomes - the region has a high cost structure, is highly exposed to commodity price fluctuations and regional towns do not possess the critical mass to support certain services and industries. Additionally, geographic dispersion, community service availability and income inequality present many challenging social issues.

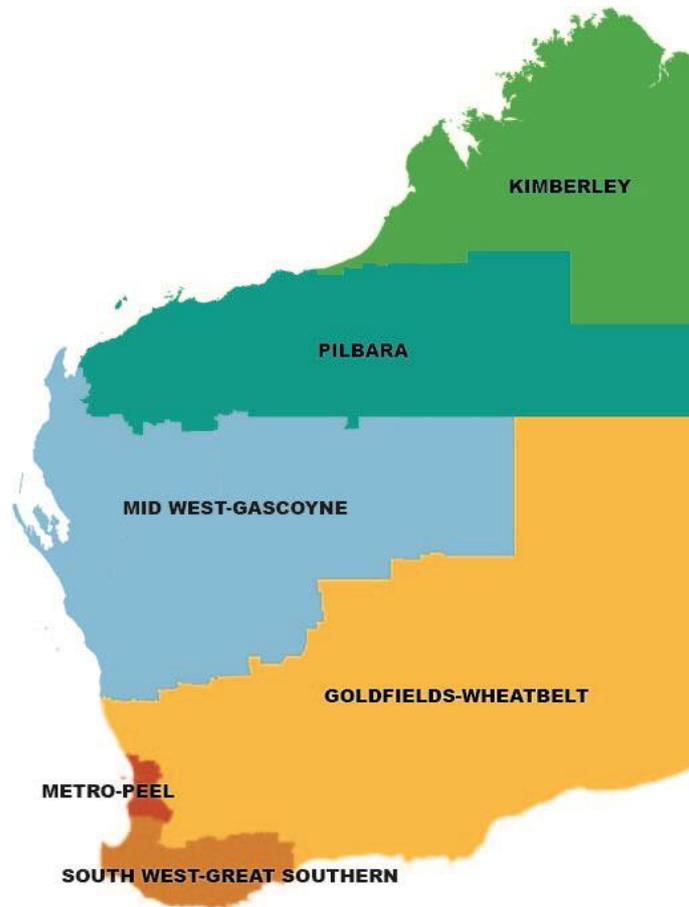
The Western Australian Government's Royalty for Regions funded Pilbara Cities program has contributed significantly to addressing many of these challenges, with Pilbara townships receiving significant public and private sector investment in amenity and liveability enhancements over the past five years. The challenges to growth, community development and economic diversification in the Pilbara are however formidable and more needs to be done to develop a sustainable future and guide the region towards a growth trajectory which meets the aspirations of resilience and prosperity.

The Framework for Regional Development

Context

In response to the 2010 Duncan Review¹ the Western Australian Government recognised that achieving future economic and community development aspirations in regional Western Australia requires the development of strategic plans to guide collective and coordinated action across the State.

Since 2013, the Western Australian Government has facilitated the development of regional investment blueprints across regional Western Australia which provide a credible and guiding framework that will foster economic opportunities and build communities, ensuring the integration of government, industry and community sector planning.

Figure 1 Western Australian Planning Regions²

Blueprint Purpose

“to engender the collective action required to transform the region and enable opportunities to be realised”

The Pilbara Regional Investment Blueprint (the Blueprint) identifies opportunities, initiatives and priorities for the region to achieve aspirational economic and community development outcomes. By highlighting the development potential of the Pilbara, the Blueprint aims to:

- Encourage diverse private sector investment in the region;
- Inform infrastructure planning, investment and delivery decisions; and
- Maximise social, environmental and economic outcomes for local communities, the State of Western Australia and the national as a whole.

The Blueprint seeks to achieve these aims through a collaborative approach to the region’s development. It engenders the required collective action which will transform how stakeholders coordinate infrastructure development and service delivery to address challenges and opportunities. It also aims to improve the regulatory, social and physical environment where public and private investment can be employed with confidence.

It is intended that residents, community groups, business, service providers and government agencies will use the Blueprint as a source of information on programs, initiatives, resources and opportunities to assist in forming partnerships to realise an aspirational Vision for the Pilbara.

It is important to note that this Blueprint cannot provide a single or definitive pathway for economic development and growth in the region. Whilst it presents the regional significant economic opportunities and proposes priority outcomes for the region, it cannot precisely predict the economic future of the region and recognises that other initiatives are important for detailed investment planning.

Blueprint Development Approach

Stakeholder Engagement

The Pilbara Development Commission (the Commission) began the development of the Blueprint in the second half of 2013. The Commission consulted widely with stakeholders at the time to develop the first version. This version was well received by key stakeholders, however the challenge was set by stakeholders to build further on and improve the document.

In September 2014 the Commission engaged consultants RPS Australia to assist it in finalising the Blueprint. During November and December of 2014 RPS completed approximately 40 one-on-one interviews with key stakeholders. A draft of the Blueprint was circulated for comment in late 2014 and early 2015 and further revisions were made based on the feedback received. A list of all the stakeholders that have assisted in developing the Blueprint can be found at Appendix 4.

The Blueprint therefore is the outcome of extensive engagement and analytical understanding of the region. It has been prepared by the Commission and it incorporates the effort, skills and knowledge of local government, key State and Commonwealth Government agencies and the non-government, community and not-for-profit sectors.

Blueprint Structure

The Blueprint has been structured through a logical process of understanding:

- Where we are;
- Where we want to be (and why); and
- How we can get there.

Central to the Blueprint is recognition that the region needs more than business as usual planning and instead needs to chart a more aspirational future. The Blueprint therefore establishes a Vision and supporting strategic objectives based on local knowledge and analysis to encourage aspirational economic and social development outcomes. This Vision challenges stakeholders to collectively create a future Pilbara which fully capitalises on its strengths and comparative advantages, maximising beneficial outcomes from emerging and global trends whilst importantly improving social and environmental outcomes.

The Blueprint will be complemented by an implementation plan which will importantly identify actions to facilitate and enable the region to capitalise on its major growth opportunities and address development issues that may impede this growth.

Figure 2 Blueprint Structure



Aligning Strategic Objectives

The Blueprint is an overarching and guiding strategy for the Pilbara which has been informed by a range of policies, strategies, plans and frameworks covering a diversity of issues in the Pilbara and the wider region. To facilitate change, the Blueprint relies on, links to and builds upon other strategic priorities put in place by Commonwealth, state and local partners.

These include, but are not limited to (an expanded list of documents relevant to planning and development in the Pilbara is provided at Appendix 1):

- **State Planning Strategy 2050:** The lead strategic planning document for the Western Australian Government which highlights principles, strategic goals and strategic directions that are important to the land-use planning and development of Western Australia. A Vision of sustained growth and prosperity underpins the Strategy and is framed around diversity, liveability, connectedness and collaboration.
- **Council of Australian Governments (COAG) Themes of Economic Importance:** The Council of Australian Government (COAG) five themes of strategic importance lie at the intersection of jurisdictional responsibilities and cover economic and social participation, competitive advantages, liveability, sustainable health and Aboriginal disadvantage.
- **Developing Northern Australia:** The Australian Government has identified developing the potential of Northern

Australia as a key priority to the nation's prosperity. It has identified high level priorities based on infrastructure development, land and water access, trade, education and innovation, and governance.

- **Regional Freight Transport Network Plan:** The Plan identifies the strategic long-term planning, policy and project priorities required to facilitate growth and ensure optimal network performance for the Western Australian regional freight network to 2031. It identifies a number of future road and port infrastructure priorities in the Pilbara.
- **State Aviation Strategy:** The Strategy aims to support the economic and social development of regional Western Australia through the provision of safe, affordable, efficient and effective aviation services and infrastructure. It considers future infrastructure needs and identifies proposals to encourage investment and fosters the development of tourism through improved and affordable air services.
- **Pilbara Planning and Infrastructure Framework:** The Framework sets out a range of strategic planning goals, objectives and actions to address opportunities and challenges, such as the provision of adequate physical and community infrastructure to accommodate population growth over a 25 year period from 2012. The Framework additionally identifies an economic development Vision whereby the Pilbara will have a robust, diverse and sustainable regional economy to service the needs of its industry and commerce effectively.
- **Pilbara Cities Vision:** The Pilbara Cities' Vision is to create places in the Pilbara with access to high standards of education, health and diverse employment and career opportunities, where people choose to settle on a permanent basis. Notably, Karratha and Port Hedland are envisioned as cities of 50,000 people each and Newman with a population of 15,000 people. Other Pilbara towns, including Tom Price and Onslow, are also set to grow to become more attractive and sustainable local communities to benefit the entire region.
- **Regional Development Australia – Pilbara Strategic Plan 2011-2014 and Regional Plan 2013-2016:** Regional Development Australia (RDA) is a partnership between the Australian, state and territory and local governments to support the growth and development of Australia's regions. RDA Pilbara has developed four key priority areas around infrastructure investment, economic diversification, longevity and sustainability, and liveability.
- **Pilbara Regional Water Supply Strategy:** The Strategy provides a short-list of feasible options for meeting demand at the coastal towns and ports, scenarios of future demand for water and triggers to inform when new investigations and additional planning will be required.
- **Pilbara Workforce Development Plan:** The Plan aims to build, attract and retain a skilled workforce to meet the economic needs of the Pilbara. It contains a range of priority actions which were identified by local stakeholders to address local workforce development challenges.
- **Pilbara Tourism Product Development Plan:** The Plan provides a framework for the long term development of the tourism industry in the region based on product development, marketing and promotions, and training and support. Various identified priority initiatives and target markets will contribute to the achievement of tourism industry growth in the region.
- **Numerous local strategies and plans:** Myriad local plans, strategies and priorities informed the Blueprint, in particular growth plans and community strategic plans.

A review of all the myriad plans and strategies relevant to the development of the Pilbara revealed that there are a range of common themes. These themes and objectives have informed the development of a Vision for the Pilbara. These are illustrated below.

Figure 3 Key Strategic Themes

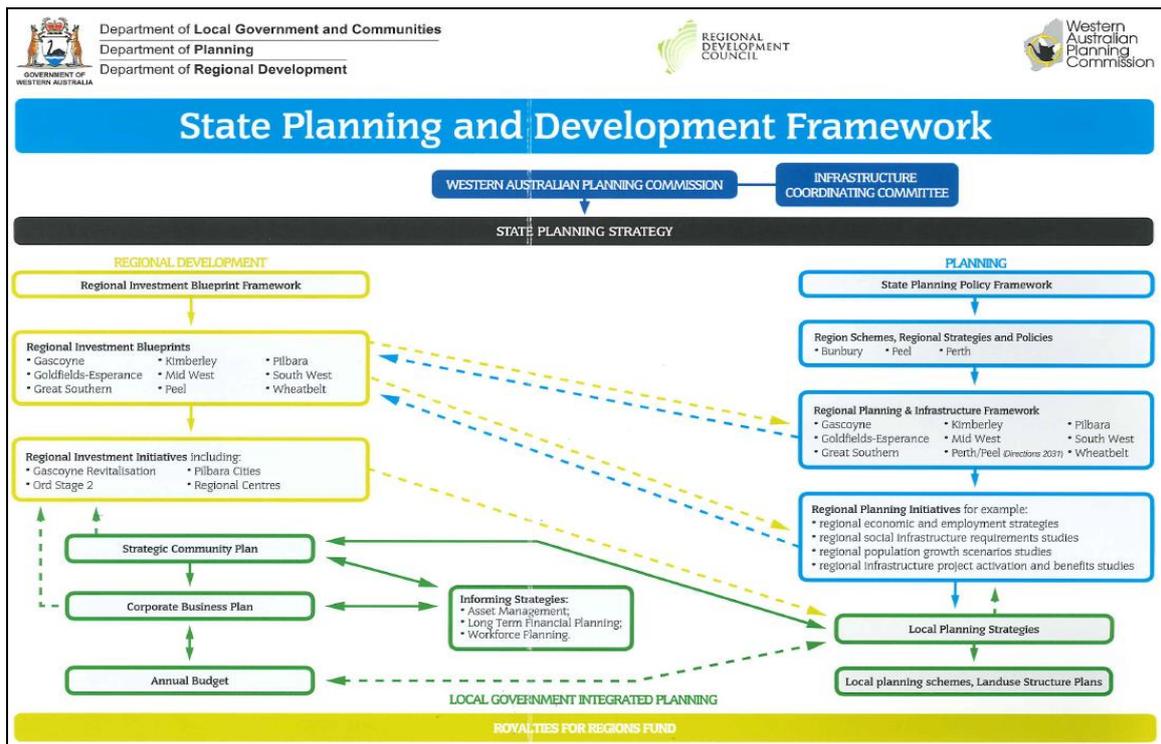


Building on Pilbara Cities and the Pilbara Planning and Infrastructure Framework

Many of the above planning documents reference the Pilbara Planning and Infrastructure Framework (PIIF) and the Pilbara Cities' goals and objective to inform their own priorities and objectives. In this sense the Blueprint complements these, but at the same time extends them to identify what the Pilbara might look like in 2050.

The PIIF highlights how the Blueprint aligns with existing regional and state planning initiatives in the illustration below.

Figure 4 Relationship of Blueprint to State Planning Development Framework



The PPIF, released in 2012, stands as a clear guide as it clearly articulates the shared government vision for the Pilbara to 2035. The Blueprint, specifically in relation to population forecasts, leverages off the targets set in this document and the Pilbara Cities Vision to arrive at the aspirational target of 200,000 in 2050.

By 2035, the Pilbara region has become the economic powerhouse of Australia and is on the threshold of another period of significant expansion. The region is strategically located close to key markets in Asia. By 2035, the region will have a resident population of some 140 000 persons, due to a more diverse economy that has capitalised on competitive advantages.

The region will have two cities: Karratha City (consisting of the Karratha and Dampier townsites) and Port Hedland City (consisting of Port Hedland and South Hedland). Each is expected to have a population of 50 000 by 2035. These major settlements will be supported by the Newman sub-regional centre (population 15 000). Other settlements (e.g. Paraburdoo, Tom Price and Onslow) will be planned to accommodate growth largely associated with expansion of the mining and oil and gas sectors.

The larger population in the region’s main urban centres will support a more diversified economic base, providing a much wider range of employment opportunities. Mining and oil and gas companies will support local supply chains. Cities will have a locally based construction industry, and defence facilities, and higher education facilities that will provide significant employment opportunities.

More affordable housing and a greater housing choice, together with access to higher standards of education, health, recreation and other community services and a general improvement in amenity will result in many fly-in fly-out workers choosing to live in the Pilbara on a more permanent basis. Some will choose to retire in the region. The Pilbara’s natural and cultural heritage assets, such as its coastline, Karijini and the Burrup Peninsula’s rock-art galleries, will be conserved, celebrated and cherished.

The PPIF also outlines the unique future Vision and role for each of the cities and towns within the region which builds on their locations, population services and relative competitive advantages.

The West Pilbara

At the centre of the West Pilbara will be Karratha City- a thriving city of 50,000 residents. Karratha will be the focus of a regional hub servicing the West Pilbara, with the five Nickol Bay satellite settlements of: Dampier, Roebourne, Wickham, Point Samson and Cossack Dampier relying on Karratha for the majority of higher order community and commercial facilities and services. Karratha city will also provide regional centre facilities and services to Onslow, Cape Preston, Anketell and Pannawonica.

Dampier Port will continue to function as the prime economic driver through the processing and export of iron ore, hydrocarbons and solar salt. The town of Dampier will be a sought after residential area with a focus on maritime recreation and tourism.

Wickham will continue as a mining port town, providing local level services to an expanded Rio Tinto Iron Ore (RTIO) Cape Lambert workforce, together with a potential workforce associated with projects in Anketell. Roebourne will be a vibrant town with a strong Aboriginal community business and cultural focus. Roebourne will have a diversified local economy offering tourism and cultural experience opportunities and employment options.

Point Sampson village will be a highly attractive seaside location with high quality tourist development. The fishing-maritime character of the town will be maintained and there will be a high standard of urban design and building design. Point Samson will continue to rely on Wickham for local community services and Karratha for higher order community and commercial services

Cossack, a small residential village will have well established tourist facilities for short stay tourism and serve as a recreation centre for the West Pilbara, as well as providing cultural/eco-tourism experiences for local, interstate and international in-transit visitors.

Tom Price, the doorway to Karijini and Millstream-Chichester National Parks will be the visitor and service hub for the Pilbara 'high country'. Employment options will continue to thrive with expanded employment opportunities through tourism as Tom Price continues to function as Rio Tinto's mining 'hub' for the central Pilbara.

Onslow's future role and character is largely dependent on the construction of processing facilities for off-shore hydrocarbons at the proposed Ashburton North Strategic Industrial Area. While a permanent workforce in Onslow is encouraged, growth will be largely dependent on the proportion of fly-in fly-out workers during the construction and operations phases. Onslow will continue to depend on Karratha for higher order community and commercial facilities.

Paraburdoo will continue as a support centre for existing RIO Tinto mining activity at Paraburdoo Channar and Eastern Ranges. Post mining the town, while likely to contract in size will operate as an Aboriginal service and tourism centre offering another gateway to the regions inland tourism highlights.

Pannawonica will continue as a service centre for the existing Mesa J mine and the development of the Mesa A iron ore deposit. At the end of mine life, the most likely scenario would be the closure of the town and the reinstatement of its urban footprint to natural bushland.

The East Pilbara

The hub of the East Pilbara is Port Hedland City, the cosmopolitan city of 50,000 residents servicing the East Pilbara. Its pivotal location as one of the Pilbara's major ports, together with the increasing international demand for mineral resources, has enabled Port Hedland to diversify its economic base and provide a high threshold of community services and opportunities.

Newman, the region's sub centre is a major economic hub with 15,000 residents. Newman continues to be the major service support centre for a number of mining operations. Strategically located along the Great Northern Highway, the town is also a sub-regional distribution centre. Capitalising on mining operations in the area, Newman develops as a hub for the region's horticultural industry based on mine de-watering. The Eastern gateway to Karijini and with access to Karlamilyi National Parks and the Canning Stock Route, Newman will be the Eastern Pilbara tourism centre. Supporting Port Hedland City as the sub-regional service hub, Newman will play a key role in servicing the needs of the Aboriginal settlements located through the East Pilbara.

Marble Bar is established as a tourist and local service centre providing services to the Aboriginal communities in the district, as well as the resource and pastoral industries. A developed tourism industry is focused on the in-transit ('grey nomads') and special interest (prospecting/fossicking) visitor markets. Marble Bar will continue to rely on Port Hedland for higher order community and commercial facilities.

Nullagine, a local service centre will cater primarily to the needs of the district's Aboriginal community and mining activities.

Shelborough, a coastal village will offer a recreational option for residents of nearby Port Hedland.

3.0 Local Drivers & Characteristics

The growth and development of the Pilbara to 2050 and beyond will build upon the current characteristics, attributes, strengths and drivers of the regional economy, community and environment.

Regional Overview

Physical and Environmental Setting

Representing 20% of Western Australia's land mass, the Pilbara is a vast, diverse region of mountain ranges, deserts, plains and numerous offshore islands. While at its southern edge the Pilbara is located approximately 1,200km north of Perth, the Pilbara extends over an area of 507,896km² from the Indian Ocean to the west, north to the Kimberley, and east across the Great Sandy Desert to the border of the Northern Territory.

The landforms of the region are ancient, yielding a range of mineral deposits and producing unique and dramatic landscapes as found in the Karijini National Park and the Chichester Ranges. The diverse landscapes have created habitats that support an array of mammal, reptile, bird and invertebrate species.

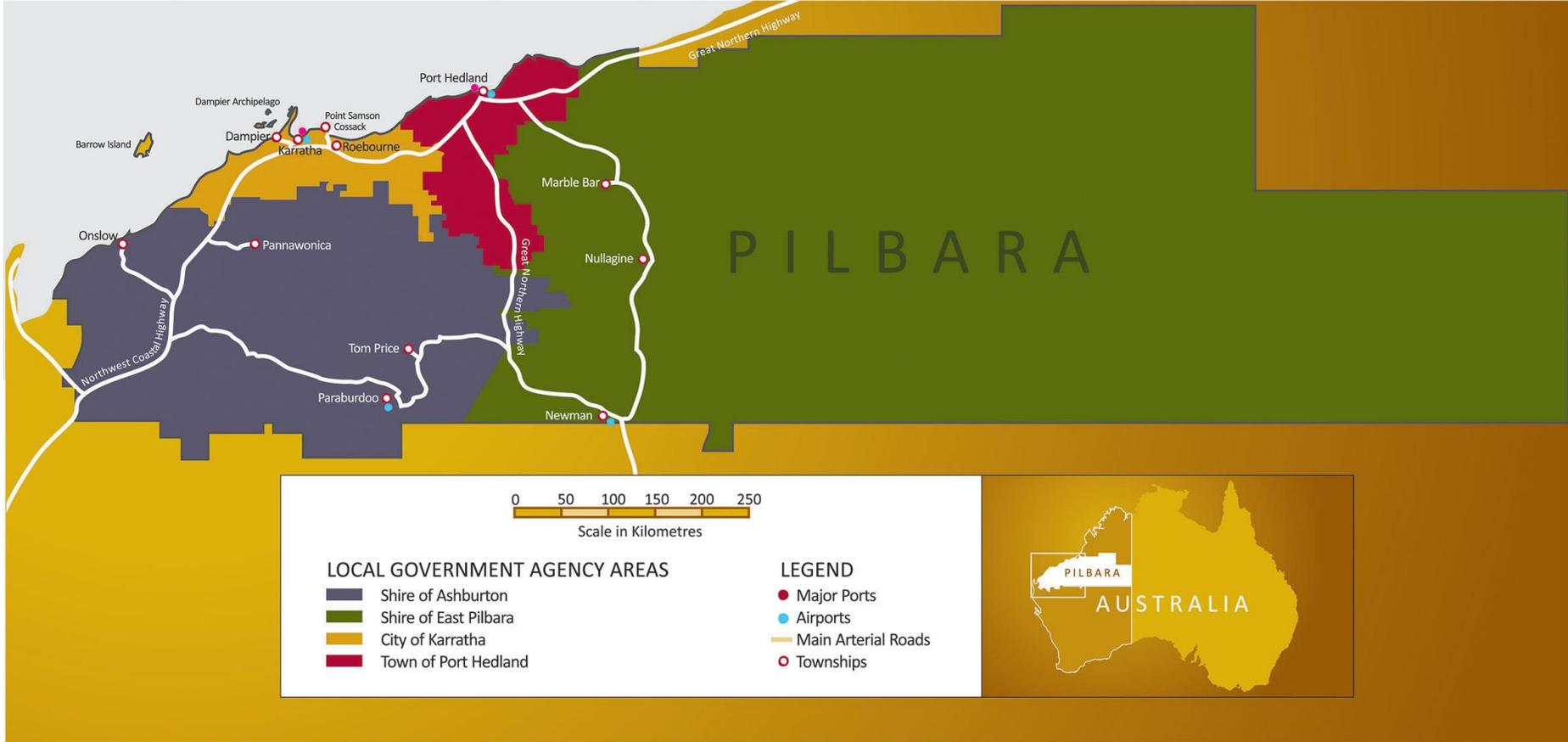
The Pilbara, from its southern border to Port Hedland has approximately 200 significant islands, which include the Dampier Archipelago, Barrow Island, the Montebello Islands and Thevenard, Lowendal and Depuch Islands. The islands vary in size and form, from Barrow Island (200 km²) to small rocky islets. The islands support a variety of flora and fauna and accommodate a range of land uses, including recreation, conservation and oil, gas and mining leases.

The region's near shore coastal waters support significant mangroves, coral reefs, sponge gardens, seagrass beds, seaweed meadows, lagoons and sandy beaches. It is inhabited by marine turtles, dugongs, whales, dolphins, seabirds, fish and colourful invertebrates. Four of the world's seven species of marine turtle nest in the Pilbara, including the rare and endangered loggerhead turtle and the flatback turtle - which only nests on the northern beaches of Australia.

Climatically, the Pilbara is defined as semi-arid, having periods of high temperatures, low and variable rainfall and high evaporation. The average day time temperature in the months from October to April reaches or exceeds 32°C while night time temperatures remain above 25°C. The months of June, July and August are the coolest³ with night-time inland temperatures during the winter months often falling below 0°C.

Peak rainfall occurs in the summer months between January and March, associated with tropical low pressure systems, which may result in cyclonic activity, and thunderstorms. Small amounts of rain falls during the cooler months. The coast from Port Hedland to the Exmouth Gulf is considered the most cyclone-prone area in Australia⁴. In general, the cyclone season lasts from the beginning of November to the end of April, although tropical cyclones do occur outside of this window whilst in some years there are none.

Figure 5 Pilbara Regional Context



Historical Perspective

The region's history dates back as far as 40,000 years ago with evidence of the Aboriginal population living off the land. Over 700 historic Aboriginal archaeological sites have been found in the Pilbara and over 10,000 rock engravings. The region, and most notably on the Burrup Peninsula which is recognised as one of the richest petroglyph sites recorded, is a major rock engraving area and features a greater number and variety of figures than anywhere else in Australia, many dating back 30,000 years or more.

The Aboriginal population lived predominantly alone in this area until around 1861 when European explorers first came to settle in the Pilbara. Early European settlement occurred at Roebourne and the port of Cossack. Early industry was largely pastoral, gold mining and pearling. Until the advent of iron ore mining in the 1960s, the only towns were Onslow, Roebourne, Point Samson (having replaced Cossack as the port servicing Roebourne), Wittenoom, Marble Bar, Nullagine and Port Hedland.

The increase in activity had a dramatic impact on Aboriginal society. Enforced labour, introduced diseases and conflict displaced Aboriginal people from their country and claimed many lives. Between 1946 and 1947 there was a widespread walk off by Aboriginal pastoral workers (still known as the 1946 pastoral strike) demanding better pay and conditions and access to their traditional lands. This movement led to the establishment of Aboriginal communities on a number of stations, notably Strelley and later Yandeyarra. It also brought the issue of Aboriginal rights into prominence and resulted in a social movement to fight for this cause.

The removal of Commonwealth restrictions on the export of iron ore in response to a growth in world demand, particularly from Japan, changed the region dramatically. The Pilbara had long been known to contain immense deposits, and the commencement of exports sparked the establishment of nine new towns in the region by 1970 (Dampier, Tom Price, Paraburdoo, South Hedland, Newman, Wickham, Pannawonica, Goldsworthy (now closed) and Shay Gap (now closed)). Almost overnight the Pilbara's population increased tenfold.

In the 1960s and 1970s, discoveries of oil and natural gas off the North West Shelf were also made, and in the 70's and 80's the development of these resources expanded the region's economy and population. With major new LNG projects, and the rapidly expanding demand from China for gas and iron ore, the beginning of the new millennium has seen yet another major expansion phase throughout the Pilbara.

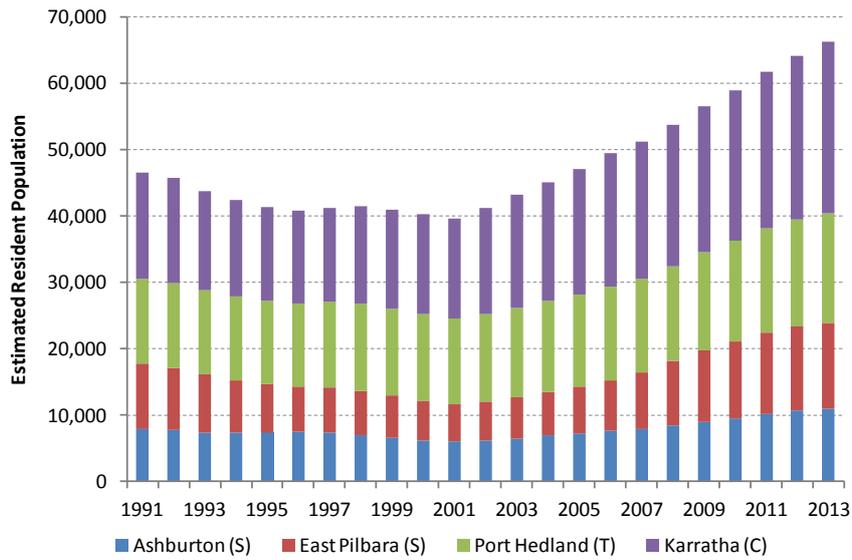
Regional Population

The population in the Pilbara has grown from a few thousand in 1966 to around 66,300 in 2013⁵. This growth, which has been largely associated with the development of mining and energy projects in the region, has been a significant catalyst for the establishment and growth of settlements like Karratha, Port Hedland, Newman and Tom Price.

The 53.5% rise in population experienced between 2003 and 2013 was markedly greater than the preceding decade which included a period of population decline in the Shires of Ashburton and East Pilbara. In comparison, regional Western Australia's population growth was only 19.8% over same 10-year period, demonstrating the magnitude of recent population growth in this region.

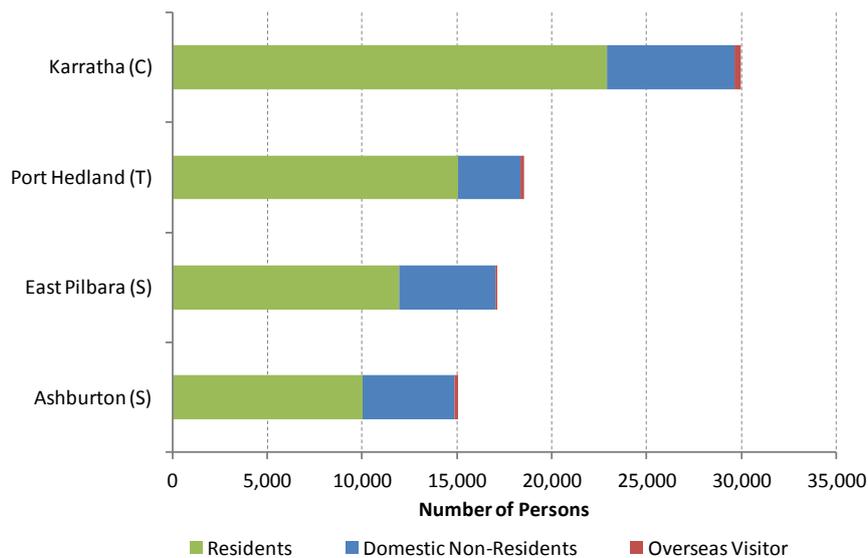
This population growth has been a driver of economic, social and environmental change. As local populations increased, their demand for resources such as water, energy and food, as well as space and infrastructure also increased. This fifty per cent increase in population has resulted in high demand for housing, health, education, transport and recreation facilities.

Figure 6 Historical Population by Local Government Area, Pilbara⁶



The Pilbara also hosts a substantial non-residential population made up generally of industry fly-in-fly-out (FIFO) construction and production workforces. The FIFO worker population has predominantly been used for construction projects in the region which vary from several months to years. Therefore determining the level of FIFO population at any point in time is fraught with difficulties. The 2011 Census of Population and Housing however provides a snapshot of the service population in the Pilbara. There were around 20,000 respondents in the Pilbara on Census night which claimed to have a usual residence outside of the Pilbara⁷. While significant non-resident populations were recorded across the region, one third of the non-resident population were in the City of Karratha on Census night.

Figure 7 Indicative Service Population by Local Government Area, Pilbara, 2011⁸



It should be noted that estimates of the FIFO population have varied considerably. For instance, in 2010, local governments in the Pilbara recorded that there were in excess of 38,000 single person transient workforce dwellings⁹.

Estimating future population in the Pilbara is a difficult exercise due to the presence of a large transient workforce, fluctuating construction cycles and a lack of accurate data collection methodologies. Based on historical trends, the Western Australian Government forecast the population of the Pilbara to reach between 46,200 and 59,500 persons by 2026 but even the top end of this range was surpassed in 2011¹⁰. In 2012, the Chamber of Minerals and Energy forecast that the population of the Pilbara will reach 72,600 by 2020 based on regional projects identified at the time and their workforce requirements¹¹. This represents an average growth rate of 1.3% per annum to 2020 – well below the 4.4% average rate achieved over the last decade.

In contrast to the above predictions, the Western Australian Government's Pilbara Cities Vision policy is built on the foundation of doubling the overall residential population of the Pilbara to 140,000 by 2035¹². This includes the transformation of Karratha and Port Hedland to 'Pilbara Cities', each with populations of approximately 50,000. Other Pilbara towns including Newman, Tom Price and Onslow are also predicted to grow to become larger towns and communities. Reaching this target requires an average growth rate of 3.5% over the next two decades.

Some of the growth will come from FIFO workers who choose to become permanent residents as the level of services and facilities and general level of amenity in the Pilbara increases. Growth is also dependent on increased levels of diversification of the region's economy.

Pilbara Sub-Regions

The municipal functions of the region are administered and delivered by four local government authorities: the Shires of Ashburton and East Pilbara, the City of Karratha and the Town of Port Hedland. The region is also home to fifth statutory local government – the Pilbara Regional Council – which encompasses the four local government authority boundaries.

Table 2 Local Government Key Indicators, Pilbara¹³

	Shire of Ashburton	Shire of East Pilbara	City of Karratha	Town of Port Hedland
Size (km ²)	101,240	379,571	15,882	10,587
Resident Population (2013)	10,959	12,960	25,907	16,472
Aboriginal Population (%)	9.3%	17.0%	8.8%	14.8%
Population Growth (2003-2013)	69.5%	110.0%	21.5%	52.4%
Median Age	33	32	32	31
Major Town(s)	Tom Price Onslow Paraburdoo Pannawonica	Newman Marble Bar Nullagine	Karratha Dampier Wickham Roebourne Point Samson Cossack	Port Hedland South Hedland

Shire of Ashburton

The Shire of Ashburton (SoA) is the most southern of the Pilbara shires. Comprising over 100,000 square kilometres, it stretches from the coastal beaches, rocky headlands and mangroves around Onslow, across the Stewart Hills to Pannawonica and the Hamersley Ranges to Tom Price and Paraburdoo. The SoA also includes the well-known Karijini and no less impressive but lesser known Millstream-Chichester National Parks. Although the regions towns contain the majority of the Shire's population of 11,000 residents, many aboriginal people reside in the communities of Bindi Bindi, Wakathuni, Bellary (Innawonga), Youngaleena and Ngurrawaana.

The SoA is home to immense cattle stations which coexist with substantial mining operations. Its economy also comprises tourism. Growth in the Shire of Ashburton is currently being driven by the construction of two of the world's largest LNG projects: Chevron's Gorgon and Wheatstone LNG plants, which are being constructed on the western coast.

Shire of East Pilbara

The Shire of East Pilbara (SoEP) is the largest municipality in the southern hemisphere, covering approximately 380,000 square kilometres, which is larger than the state of Victoria. The largely inland Shire located east of the Town of Port Hedland and SoA boundaries boasts some of Western Australia's most spectacular scenery, such as that found at Karlamilyi National Park and Carawine Gorge. It also has a history rich in mining and pastoral activities.

Its main urban centre is Newman which is the home of BHP Billiton's major Pilbara mine Mt Whaleback – one of the largest open-cut iron ore mines in the world. Other key settlements in the Shire include Marble Bar, Nullagine and the Aboriginal communities of Jigalong, Punmu, Parnngurr, Irrungadji, Parnpajinya, Warralong, Strelley and Woodstock.

The SoEP's resident population has grown considerably to 13,000 and is expected to continue to increase. Under the Western Australian Government's Pilbara Cities Vision, it is envisaged that Newman will grow into a town of up to 15,000 people by 2035.

City of Karratha

The City of Karratha, formerly the Shire of Roebourne, forms the central coastal part of the Pilbara region. With an area just over 15,000 square kilometres, it is bounded by the Indian Ocean in the north and west, the Town of Port Hedland in the east, and the Shire of Ashburton in the south. Settlement is largely confined to a string of towns along the coastal strip and the North West Coastal Highway and include Karratha, Dampier, Wickham, Roebourne, Point Samson and Cossack and the Aboriginal communities of Cheeditha, Mingullatharndu, Cooya and Pooya.

The City of Karratha has a rapidly growing population of 26,000 residents, largely due to iron ore export facilities, and oil and gas operations and export facilities. Continuing expansion of these operations, new projects, such as nitrate production, and investment in infrastructure are expected to drive further population growth in the City. The Port of Dampier is the second largest in the region and not only exports the aforementioned iron ore and LNG, but also salt and ammonia. Within the City of Karratha boundaries is the Burrup Peninsula with its world-renowned Aboriginal rock art.

The potential for growth in the City of Karratha has been recognised by the Western Australian State Government and it forms a key component of its Pilbara Cities Vision. Under this Vision, the Western Australian Government aims to develop Karratha into a city of 50,000 residents by 2035.

Town of Port Hedland

The Town of Port Hedland comprises nearly 11,000 square kilometres between the City of Karratha and SoEP. It has a large expanse of coastline and generally follows the catchments of the Yule and Turner Rivers. Port Hedland is well known for its enormous iron ore and salt stockpiles, which are transported out of the world's largest bulk export commodity port.

Its resident population of just over 16,000 resides in two neighbouring centres, Port and South Hedland, as well as in a number of remote Aboriginal communities which include Jinparinya, Marta Marta, Yandeyarra, Punju Njamal and Tjalka Boorda.

Growth in Port Hedland is highly dependent on the resources industry and the world's demand for steel. It has seen enormous growth pressure in the last ten years, evidenced by the State Government's vision for Port Hedland to become one of the Pilbara's two regional cities, with an ultimate population of 50,000.

Pilbara Regional Council

The Pilbara Regional Council (PRC) was established in 2000 under the WA Local Government Act 1995. The PRC is a collaborative partnership between the four Pilbara LGAs to give a greater voice to the Pilbara region, and to attract increased investment opportunities for the benefit of Pilbara communities. The four local governments are represented by the eight-member Pilbara Regional Council. Two Councillors are nominated from each member local government, governing for the interests of their town or shire and for the broader Pilbara region. They work across the four LGA's in the following areas:

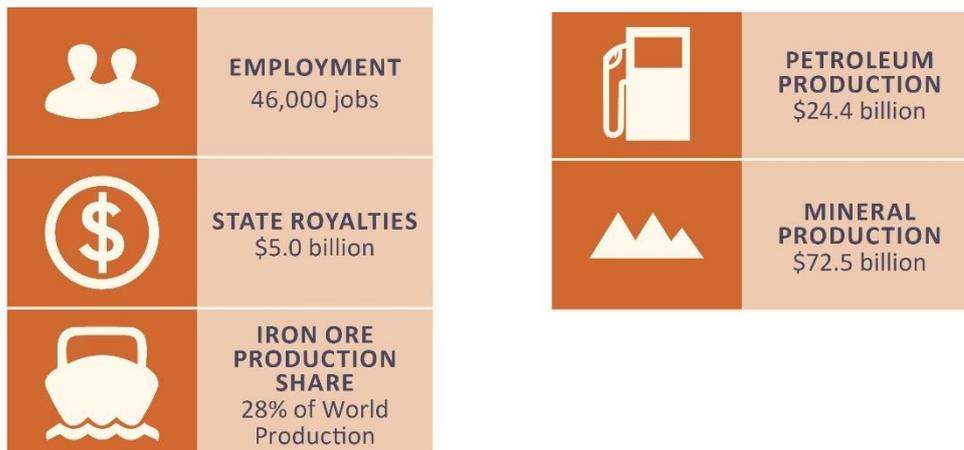
- Regional Service delivery – working with our members to improve efficiencies across the region, through a best-practice approach to bureau service delivery;
- A Voice for the Pilbara – provide regional advocacy for the Pilbara to facilitate positive change in the region and champion the interests of our member councils;
- Efficiency and Effectiveness – effective and efficient in project management, local government compliance and engagement with members; and
- Economic Value – deliver economic value by identifying opportunities for economies of scale and targeted funding to enhance member councils' compliance, capacity and capability.

The Economy

Economic Significance of the Pilbara

The Pilbara has been the centre of the most rapid expansion of iron ore production in history and the construction of some the largest gas projects in the world. The economic activity associated with these projects has substantially increased the importance of the Pilbara to both the Western Australian and Australian economies.

In the space of a couple of years, the Pilbara's economy increased fourfold, from \$14.0 billion in 2010/11 to \$56.6 billion in 2012/13¹⁴. At the same time as the Pilbara economy increased by \$42.6 billion, the nation's economy increased by just \$113.1 billion¹⁵.

Figure 8 2Contribution of Pilbara Economy¹⁶

The rapid expansion and ramping up of iron ore production to meet Asia's growth needs has been the most significant attribute of the Pilbara's recent growth. The region produces approximately 93% of Australia's iron ore (or 28% of the globe's production), supporting Commonwealth tax receipts and generating around \$5 billion in royalties for the Western Australian Government during 2013/14¹⁷. In addition, the Pilbara services the offshore Carnarvon Basin, Australia's largest known oil and gas reserve, which earned \$24.2 billion in 2013/14 and this is expected to increase substantially when the Gorgon and Wheatstone LNG projects come on-stream by 2016. Overall the region supported \$96.7 billion of mineral and energy production in 2013/14, representing 6.2% of Australia's Gross Domestic Product (GDP) or more than the GDP of 125 nation states¹⁸.

Employment

The labour market in the Pilbara has been one of the strongest in the country, with sustained low levels of unemployment over the last two decades. Since 2003, the Pilbara has experienced an average unemployment rate of just 3.1% compared to 5.2% across the nation¹⁹. The low unemployment rate is partly a reflection of employment generally being sourced before workers move to the area.

The Pilbara has historically been a high income region. However, the high levels of labour demand in recent years have led to significant increases in average incomes across the region in excess of growth across Australia. The Pilbara's average wage and salary income increased by 81.1% between 2001 and 2011 compared to the 54.5% increase across the nation over the same period²⁰. The average annual wage and salary at \$82,500 in 2010/11 was 59.0% more than the national average. The high wage flows through to higher business costs and thus the higher cost of living in the region.

Figure 9 Unemployment, Pilbara and Australia²¹

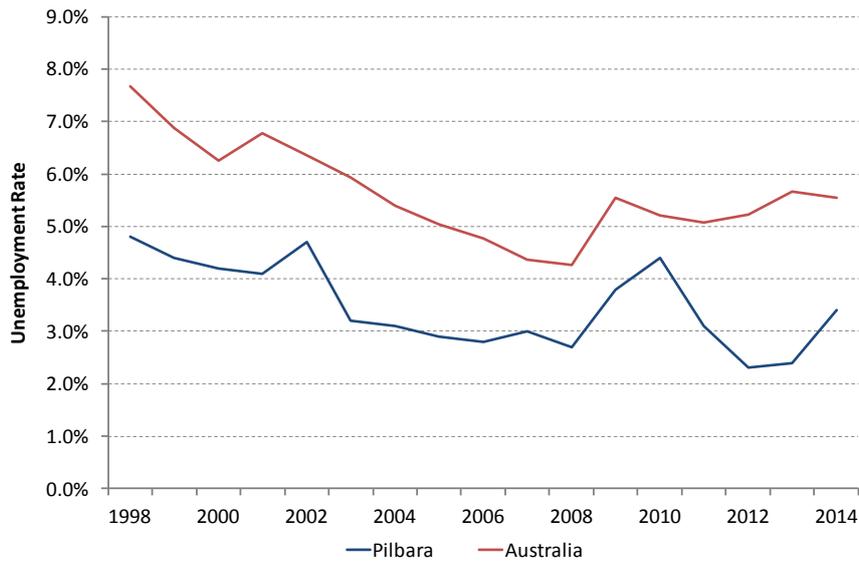
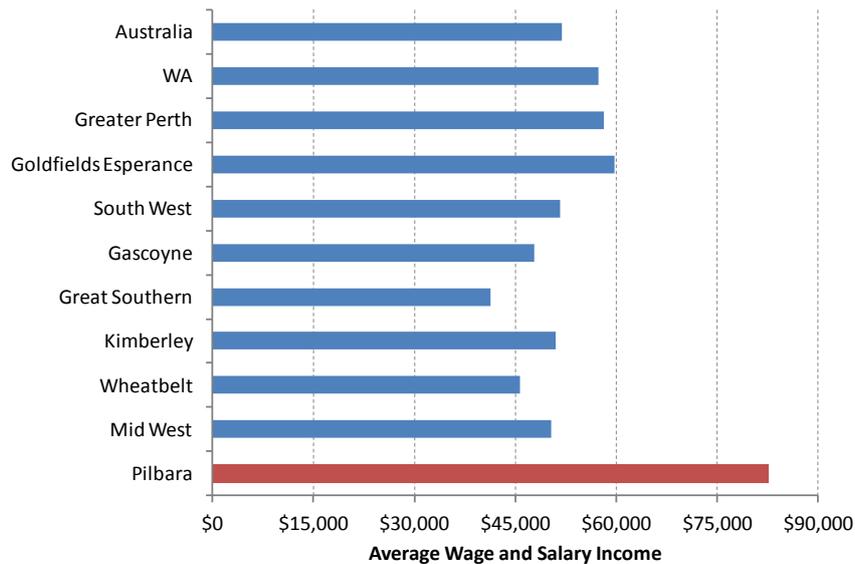
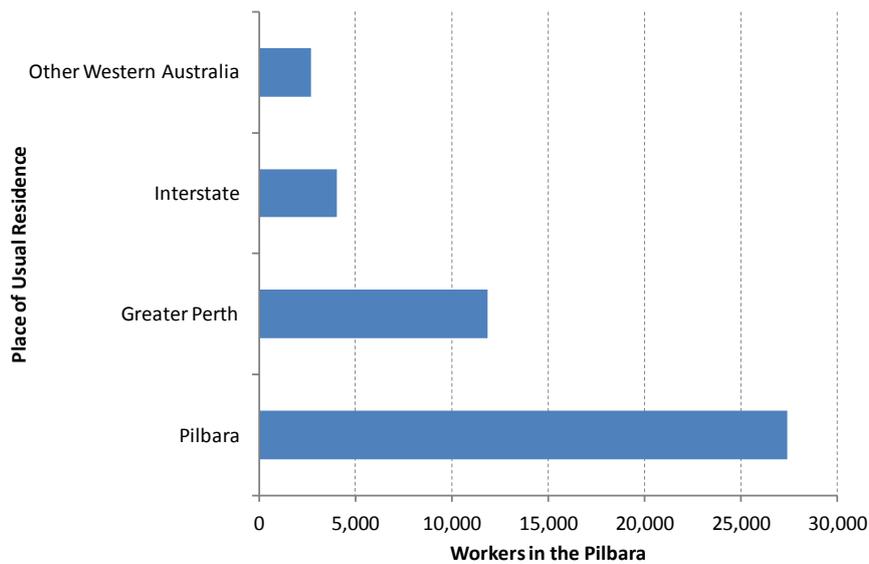


Figure 10 Annual Wages and Salaries by Region, 2010/11²²



There were around 46,000 people employed to work in the Pilbara in 2011. This included approximately 27,400 local residents and 18,600 people based around Australia²³. Workers from outside the Pilbara are predominantly based in Greater Perth, followed by Queensland, the South West, New South Wales and Victoria. There are also several hundred residents of neighbouring regions who are employed in the Pilbara.

Figure 11 Pilbara Workers Place of Residence²⁴

The mining and construction sectors accounted for the majority of employment in the Pilbara, with 60% or 27,500 workers in these two sectors in the region compared to 10.0% at a national level during 2011. Overall, 10.7% of Australia's mining workforce was employed in the Pilbara.

Looking at the top ten industries of employment, the majority of top industries are mining related, with metal ore mining representing close to 14,000 or 30% of Pilbara jobs. Compared to levels across the nation, there is a considerably smaller proportion of population servicing workers such as health care specialists, education, retail and social services.

Table 3 Jobs by Top Industries, Pilbara²⁵

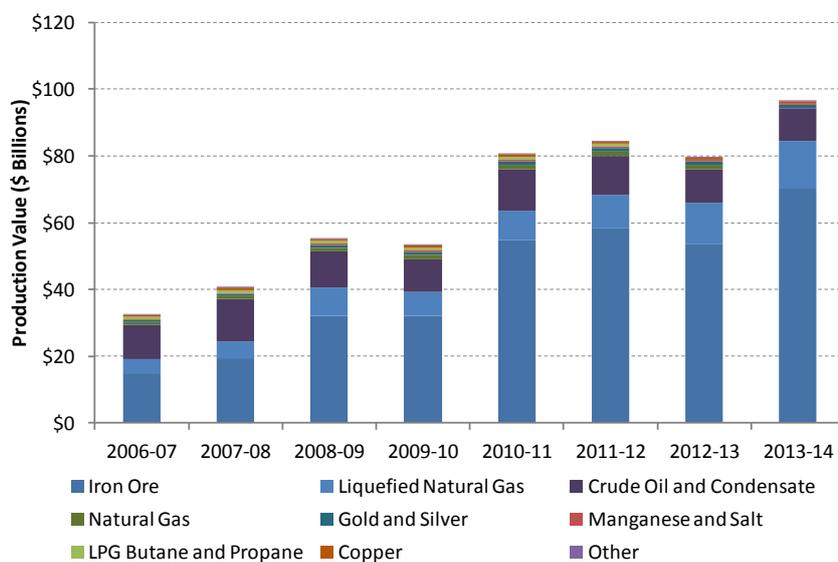
Top Industries	Pilbara	Nation
Metal Ore Mining	30.22%	0.62%
Construction Services	7.32%	4.84%
Heavy and Civil Engineering Construction	7.14%	0.83%
Exploration and Other Mining Support Services	5.94%	0.32%
Food and Beverage Services	3.37%	5.38%
Building Construction	3.32%	2.56%
Oil and Gas Extraction	3.04%	0.19%
Professional, Scientific and Technical Services (except IT services)	2.97%	6.00%
Preschool and School Education	2.60%	5.09%
Road Transport	2.36%	2.37%

The Extractive Industry

Minerals and energy extraction defines the Pilbara's economy. The region is uniquely home to an abundance of iron ore, gold, copper, nickel, uranium and offshore and onshore petroleum within several hundred kilometres of each other. The exploration and extraction of these resources through well-established supply links with Asia underpins the prosperity of the region.

In recent years, the quantity and value of mineral and energy production increased substantially. The combined value of mineral and petroleum production has increased from \$32.5 billion in 2006/07 to \$96.7 billion in 2013/14, with the Pilbara responsible for 35.9% of the nation's merchandise exports²⁶.

Figure 12 Value of Minerals and Petroleum Production, Pilbara²⁷



Iron Ore

Ever since the establishment of the Pilbara's first iron ore mine in 1965, the region has been synonymous with 'red gold'. Numerous discoveries have been made and operations subsequently established, particularly over the last decade. The production and export of iron ore has had significant flow on effects to the region, state and nation, and has also been integral to the industrialisation and urbanisation of developing Asia.

Over the past ten years, the iron ore industry has experienced a period of unprecedented growth fuelled by China's demand for steel. On average, the annual growth in the value of sales from Western Australia's iron ore industry during this period has been 27% per annum whilst output has increased 11% per annum²⁸. Approximately 600 million tonnes of iron ore valued at \$70.1 billion was produced in 2013/14, with China accounting for three quarters of iron ore shipments (other major markets include Japan and South Korea). Major iron ore miners in the region have made commitments to continue to expand production to more than 750 million tonnes over the next few years²⁹.

BHP Billiton Limited (BHPB) and Rio Tinto (RTIO) Limited (together with various joint venture partners) dominate the industry in the Pilbara and account for more than 70% of the region's iron ore production volumes. RTIO is the largest iron ore producer in the Pilbara region and is the second largest iron ore producer in the world. It exports iron ore out of two locations: Cape Lambert and Dampier. BHPB operates seven mine sites across the Pilbara and exports exclusively from Port Hedland.

Fortescue Metals Group (FMG), with its Chichester Ranges Cloud Break and Christmas Creek mines and the new Solomon Firetail mine, is the third-largest mining company in the Pilbara. FMG exports ore through their Herb Elliott port at Port Hedland.

A number of smaller producers complete the mining picture:

- Atlas Iron Limited has three iron ore operations in the Pilbara region: Pardoo (approximately 75 kilometres east of Port Hedland), Wodgina (approximately 100 kilometres south of Port Hedland) and Mt Dove. These operations use road haulage and ship through Port Hedland.
- Mineral Resources Limited operates two mines: Poondano (30 kilometres southeast of Port Hedland) and Phil's Creek (100 kilometres northwest of Newman).
- BC Iron Ltd's Nullagine project (a 50:50 joint venture with FMG) utilises FMG's rail infrastructure, which is located 50 kilometres south of the mine, to export its product through FMG's Herb Elliott port.
- Moly Mines Ltd's Spinifex Ridge molybdenum–copper project (located 170 kilometres east of Port Hedland) is one of the smaller operations, currently recognised as an iron ore mine producing around 1.0 Mt/a of iron ore fines.

The development of the 55 Mt per annum Roy Hill iron ore project (277 kilometres south of Port Hedland) is underway, with plans to commence exporting by 2016.

For the past 40 years, all iron ore mined in the Pilbara had been hematite ore or direct shipped ore (hematite ore does not have to undergo costly concentration to make it saleable). However the Pilbara also has massive resources of magnetite ore. In December 2013, CITIC Pacific's Sino Iron project, located 100km southwest of Karratha at Cape Preston, exported the first shipment of magnetite concentrate from the Pilbara.

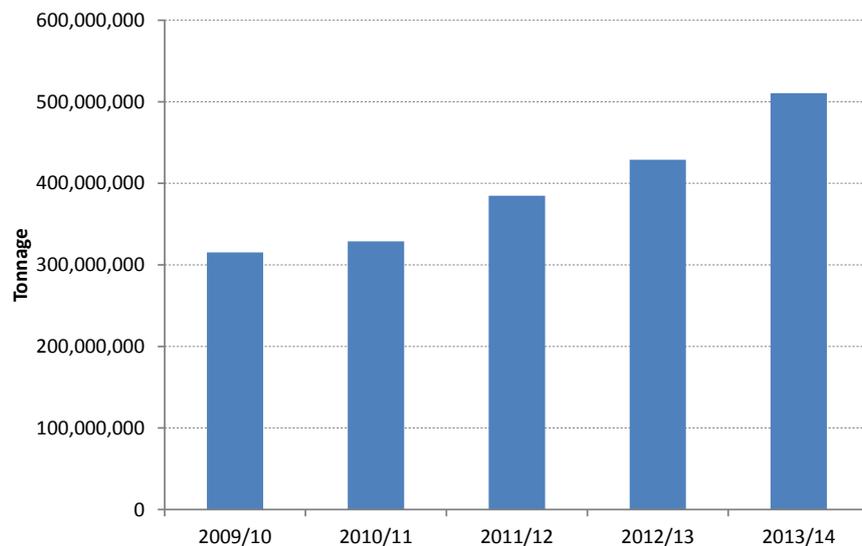
In 2014, the iron ore sector experienced softening conditions. Spot prices have fallen dramatically over the past year, from US\$136/tonne in December 2013 to US\$68 in January 2015. Slowing economic growth in China, combined with deteriorating economic conditions in major economies such as Japan and Europe has contributed to reduced demand for iron ore and lowered the price.

Figure 13 Iron Ore Spot Prices, \$US per Dry Tonne, by Month, 2011 to 2015³⁰



At the same time, the shift of the Pilbara iron ore sector, a major global producer, from construction to production phase has supported considerable increases in iron ore exports to the global market. This is reflected in Pilbara port throughput of iron ore which accelerated dramatically in 2013/14 despite falling spot prices. In 2013/14 the ports of Dampier and Port Hedland together exported more than half a billion of tonnes of iron ore, up from 300,000,000 tonnes in 2009/10.

Figure 14 Iron Ore Port Throughput, Port Hedland and Dampier Ports, 2009/10 to 2013/14³¹



Current estimates are for iron ore prices to stabilise above US\$60 per tonne in 2015 and remain at below average price levels in the short-term (1-3 years). This is expected to have a significant impact on global iron ore production as lower price points impact the competitiveness and viability of smaller iron ore producers as well as major Chinese mines (which traditionally operate at a higher cost). This has already resulted in withdrawals of supply by domestic Chinese, African and South American producers. This is resulting in increased global market shares for major Pilbara-based iron ore producers, positioning the sector well to benefit from medium term price recoveries.

Despite the short-term volatility and its impact on mine viability, it is expected that iron ore will continue to be the foundation industry in the Pilbara region in the medium and long-term. The size of the resource endowment of the region, coupled with its strategic proximity to major and emerging global markets, means that the Pilbara will continue to benefit from the expected structural uplift in iron ore demand in the long-term as developing countries in Asia and Africa continue to industrialise.

However, the short-term volatility of iron ore has the potential to adversely impact the Pilbara economy and community, undermining its sustainability. Effort must therefore be made to reduce the Pilbara's almost singular reliance on iron ore investment, production and exports, through increased investment in other extractive industries (e.g. other minerals and energy commodities) and broader diversification of the Pilbara economy. Only when this is achieved can the Pilbara truly benefit from its role as the world's most significant iron ore extraction and exporting region without impacts on sustainability, prosperity and community wellbeing from global economic and market volatility.

Oil and Gas

The region is a significant producer of energy, with the Pilbara servicing Australia's largest known oil and gas reserves of the North West Shelf. The value of Western Australian petroleum sales (including LNG), the majority of which is extracted offshore in the North West Shelf, amounted to a record \$26.5 billion in 2013/14³². Energy production of the North West Shelf services both domestic and export markets, with the majority of petroleum exports destined for Japan, with other markets including China, South Korea and Singapore also prevalent.

The majority of petroleum production is liquefied natural gas (LNG), which is second only to iron ore in terms of sales value to Western Australia. Over the past seven years, the value of Western Australia's LNG sales has increased on average by 19.1% each year³³. This impressive record of growth is set to continue as large projects are developed off the State's northwest coast to meet Asia's growing energy needs. These projects include Woodside Energy's Pluto LNG processing hub which commenced mid-2012 and the recently commissioned Macedon project of BHP Billiton. Chevron's \$52-billion Gorgon Project and \$29-billion Wheatstone Project are expected to come on-stream by 2016.

Other Minerals

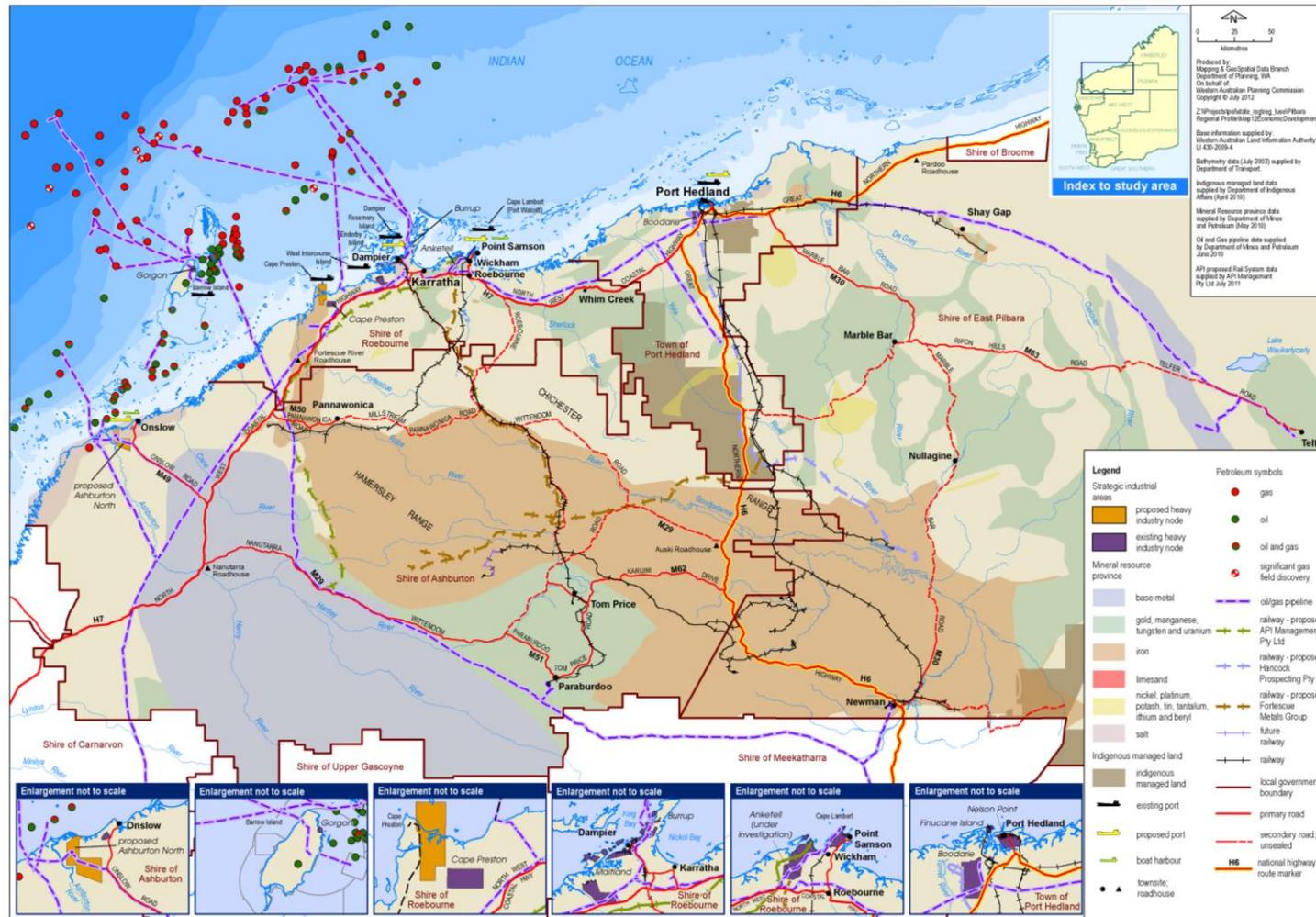
Aside from iron ore and petroleum, the region has significant gold deposits as well as copper, manganese, nickel and uranium. Some of these minerals will become increasingly economic to mine, in particular uranium, as energy demand increases globally.

The value of gold production in the Pilbara has been relatively steady in recent years, averaging close to \$1.0 billion per annum³⁴. Newcrest Mining's Tefler mine, located 310 kilometres northeast of Newman, is one of Australia's largest gold mines. Gold exported from the Pilbara predominantly goes to China, India and the United Kingdom. Thailand, Singapore and Turkey are also notable recipients.

Copper is another important base metal exported from the region. The Birla Nifty Copper Operation, located 350 kilometres east of Port Hedland, is the state's second largest copper mine. The concentrate product is trucked to Port Hedland for shipping to Hindalco Copper's Dahej facility in India. Newcrest Mining's Telfer mine also produces copper in concentrate.

The region also has considerable coastal salt fields, with large ventures operating out of Onslow, Dampier and Port Hedland. With anticipated growth in China and India, world demand for salt is projected to increase in the next three years from 290 million tonnes to around 327 million tonnes³⁵

Figure 15 Mineral and Energy Regions, Pilbara³⁶

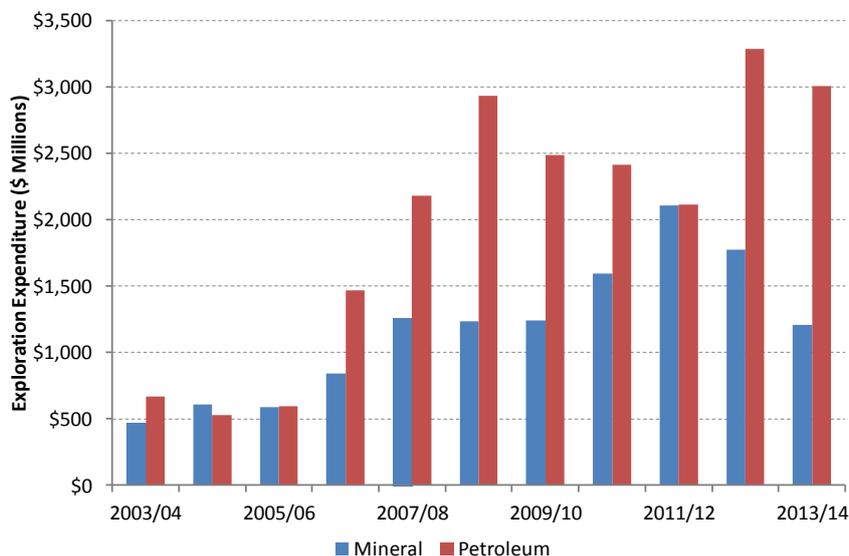


Exploration

From large commercial onshore and offshore exploration is a considerable contributor to the region's economy. As commodity prices increased in recent years, so too did expenditure on exploration, which surpassed \$5.0 billion in 2012/13³⁷. Over the last ten years exploration expenditure has increased fourfold across Western Australian. However, in recent years the amount spent on mineral exploration has dropped significantly.

The bulk of Australia's mineral exploration activity occurs in Western Australia and the majority of this is iron ore exploration. Western Australia is also home to the majority of expenditure on petroleum exploration, which is largely spent offshore in the North West Shelf. Prospecting is also a popular pastime for tourists and hobbyists who look for gold and gemstones such as jasper, amethyst, and garnet.

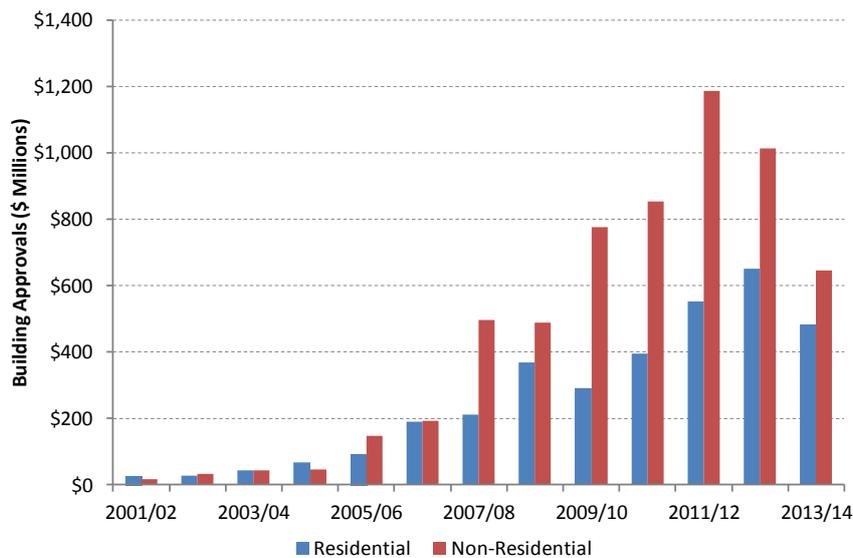
Figure 16 Exploration Expenditure, Western Australia³⁸



Construction

The construction sector is the second largest economic contributor to the region after mining. In 2012/13, construction related activity represented 10.7% or \$6.0 billion of the Pilbara's economy³⁹. The vast majority of construction related activities related to investment in increased mineral extraction and infrastructure capacity. FIFO employment represents a significant proportion of construction related employment in the region given its short timeframes and often remote locations.

In urban areas, increases in the population and workforce has required significant investment in housing, commercial and retail buildings and recreational and community facilities. Despite declining 35.1% from 2011/12 levels, the value of building approvals in the Pilbara was more than \$1.1 billion in 2013/14, which represents a 1,200% increase on levels 10 years earlier⁴⁰.

Figure 17 Value of Building Approvals, Pilbara⁴¹

Manufacturing

The manufacturing sector is significant in the Pilbara yet accounts for a relatively modest proportion of the region's total economic activity. As a function of economic output, manufacturing related activities contributed 3.1% or \$1.7 billion to the economy's \$56.6 billion output in 2012/13⁴². This compares to the 8.2% contribution of manufacturing to the nation's economy⁴³.

Most current manufacturing capacity is directed towards servicing the mining industry and is dominated by chemical manufacturing, machinery and equipment manufacturing and fabricated metal products. Basic chemical manufacturing represents close to half of the Pilbara's manufacturing output. This includes the fertiliser and explosive sub-categories representing businesses such as the Yarra Pilbara Nitrates Technical Ammonium Nitrate Production Facility in the City of Karratha. Other significant manufacturing activities include iron and steel manufacturing which occurs largely in the Town of Port Hedland. Of note, the Pilbara has little or no presence in food and beverage manufacturing⁴⁴.

The sector currently suffers from limited local supply chains which affect input costs, the inability to create economies of scale because of the limited domestic market, distance to external markets and high labour costs.

Manufacturers in the region are being assisted by government policies aimed at increasing the level of Australian content such as public disclosure of tendering arrangements over \$2 billion (a Commonwealth Government initiative) and the Western Australian Government's Industry Facilitation and Support Program (IFSP). The IFSP is designed to support projects which will assist small-to-medium manufacturing and service companies based and headquartered in regional Western Australia to pre-qualify, or increase their competitiveness, as suppliers of products, services and works to Western Australian Government agencies and resource projects in Australia and overseas through small grants for temporary expert assistance, improvements to internal business infrastructure and training.

Case Study: Pilbara Fabrication and Services Common User Facility
Regional Pillar: Core Infrastructure and Facilities

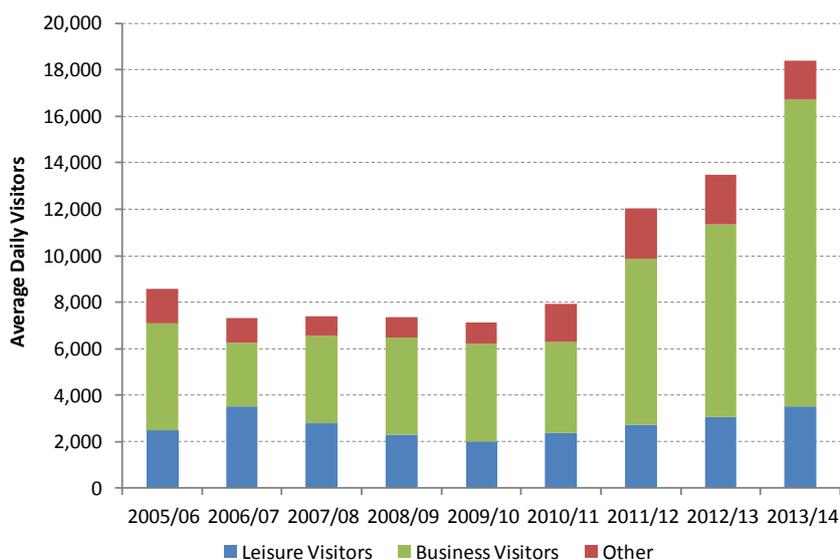
The State Government through the Pilbara Cities initiative has invested \$5 million towards a feasibility study and early engineering design for a coastal installation at Lumsden Point in Port Hedland that will provide a large scale fabrication and assembly facility that will be available on a pay-per-use basis by industrial companies. Modelled on the successful Australian Marine Complex in Cockburn near Fremantle, the proposed Pilbara Fabrication & Services Common Use Facility (PFSCUF) will provide access to infrastructure that enables a range of key industries, including housing, construction, marine, defence, paramilitary, minerals and oil and gas, to maximise the economic development opportunities in the region. It will encourage further economic diversification and specialisation by targeting the resource extraction, marine engineering, and emergency management industry.

Lumsden Point, in the Town of Port Hedland, has been identified as a potential location for the PFSCUF. This transformational project is consistent with the State Government’s Pilbara Cities initiative to attract a greater population to the region by creating new employment opportunities.

Tourism and Visitation

Tourism and visitation is a secondary but valuable contributor to the Pilbara economy. It represented an estimated \$404.6 million of the Pilbara economy in 2012/13, though a large portion of this economic activity is associated with servicing business visitors which represent the majority of total visitation to the region⁴⁵. In 2013/14, there were an average of 18,400 visitors to the Pilbara per day, of which three quarters were business travellers, not including FIFO workers⁴⁶. Leisure visitation represented 19.1% of visitation.

Figure 18 Average Daily Visitation, Pilbara⁴⁷



The dominance of business visitation and the general undersupply of short-stay accommodation due to the dominance of the resources industry in recent years have been considered barriers to growth for the tourism industry⁴⁸. Accommodation providers, for instance, have focussed in recent years on the substantial growth in business and transient worker needs. The availability of affordable accommodation in particular limits the length of stay of leisure visitors as well as discouraging new and repeat visitors.

Nonetheless, there are numerous leisure based tourism segments in the Pilbara. The recently completed *Pilbara Tourism Product Development Plan* identified the following tourism segments⁴⁹.

- Older couples: Travelling for leisure purposes and often participating in caravanning.
- Backpacker market: Backpackers are important to the Pilbara as they provide a source of key service workers – the estimated number of backpackers has grown by an average annual rate of 13.6% from 2008.
- International couples: These visitors are a relatively small group, representing roughly 8,000 visitors per annum and they are likely adventure seekers attracted by the natural environment of the Pilbara.
- Arts/heritage/culture: These visitors include those that visited museums, art galleries, heritage sites, Aboriginal experiences, etc.
- Nature-based: These visitors include those that visited beaches, national parks, went fishing, scuba diving, snorkelling or went bushwalking.
- Cruise ship passengers: While currently very small, cruise shipping which utilises the port infrastructure of the region is one of the fastest growing areas of tourism and the Pilbara is uniquely located to service cruise ships, in particular boutique adventure cruising.

Industrial tourism in the mining and energy sectors is also a small but growing market segment in the region. In addition to general hobby prospecting, visits to mine sites and other large infrastructure are undertaken (e.g. Mount Whaleback, port tours and Karratha Gas Plant).

Case Study: Naturebank
Regional Pillar: Tourism

The Pilbara is an ancient land, home to a number of magnificent natural attractions that would support further development of the region's tourism industry and offers exciting prospects for diversifying the regional economy. Naturebank is a Western Australian government initiative that aims to prepare sites for development of quality environmentally sensitive tourism accommodation experiences in the State's national parks. Naturebank works by identifying potential sites in selected national parks and undertaking the pre-release development clearances required to present them to market as an opportunity

One of the Naturebank sites identified is the Millstream Chichester National Park (the Park) some 120km south east of Karratha which attracts up to 20,000 visitors per year. The Park covers an area of approximately 200,000 hectares around the Fortescue River which is the heartland of the Yindjibarndi people; a lush oasis of deep gorges and palm-fringed rock pools providing a stark contrast to the surrounding landscape of rocky escarpments and rolling spinifex-covered hills. Pilbara Cities funding has been made available to the Department of Parks and Wildlife to undertake the necessary work to prepare a site in the Park for inclusion in the Naturebank program.

Agriculture, Aquaculture and Fishing

Agriculture, aquaculture and fisheries production is underdeveloped in the Pilbara despite the presence of a natural environment conducive to a number of agriculture and aquaculture operations and products.

Agriculture production was valued at \$61.3 million in 2010/11 and this consisted predominantly of livestock production and exports, namely cattle and calves⁵⁰. Cattle are mainly exported to Indonesia and Malaysia with some occasional trade to smaller markets⁵¹. The Indonesian export ban in 2011 devastated the sector and recovery has been slow.

Opportunities to expand agricultural production in the region are currently being explored. A small number of pilot projects have been carried out by both mining and private companies, capturing the excess water from mines and using it for producing feedstock crops. For example, RTIO produced 3,000 hay bales in the first harvest in January 2012 of its Hamersley Agricultural Project (HAP), using surplus water from mine dewatering⁵².

The Western Australian Government's Water for Food initiative is aimed at expanding agriculture employment and economic output by using water source discoveries to develop new irrigation areas and increase the size and productivity of existing irrigation districts. The first of four projects entails a \$15.5 million investment to develop a policy framework to smooth the way for pastoralists to change parts of their leases to more flexible, investor-friendly land use tenure.

Numerous pearling and aquaculture leases and licences have been issued for the Pilbara coast and include Dampier Archipelago, Port Hedland, Dampier and the Montebello Islands. However, to date, aquaculture production has largely been limited to pearling, which represented an estimated \$13.5 million in 2008/09⁵³. However, while the leases remain, there are currently no operating pearl farms in the region.

The fishing industry was historically a secondary economic contributor in the region however competition from the mining sector for marine facilities forced the closure of processing operations in the Pilbara. The Pilbara fishing industry today is serviced in Exmouth in the Gascoyne region.

Case Study: Pardoo Station Irrigated Fodder Project **Regional Pillar: Agriculture and Aquaculture**

In 2010 at Pardoo Station some 150km north of Port Hedland a trial project was undertaken to test the ability for growing crops in the harsh Pilbara environment. With the assistance of \$150,000 from the Pilbara Development Commission's Royalties for Regions Regional Grant Scheme program, the Pardoo Station Irrigated Fodder Project was initiated with the sinking of a 260m bore to access an underground water source, which proved successful. Since that time Pardoo Station has been allocated 10 gigalitres of water and is currently growing sorghum – on two 40 hectare lots under centre pivot technology, mainly as cattle fodder. Given the amount and pressure of the water, the bore is sufficiently powerful to run the irrigation centre pivot realising a significant saving to the station in diesel costs.

Pardoo management has plans to expand the project substantially to up to 17 pivots with potential for bio fuel production as well as fodder to add value to the Pilbara's growing beef industry. The project is regarded as a model for future development on other pastoral leases in the region and has been possible as a result of the confluence of a high yielding aquifer with extreme pressure, good Pilbara soil in a sunny climate driven by an extremely motivated and innovative developer.

Local Business Sector

The local business environment is changing as business expenditure and investment shifts from predominantly a construction focus to operations and maintenance. Small and medium enterprises are focussing on a greater capacity to service the needs of a growing population and large resource extraction operations.

The Pilbara business sector is however still characterised as uniquely having a significant presence of global and national organisations operating in the region complemented by a relatively small, stable local business sector. Most of the local businesses are classified in the construction, rental, real estate, warehousing and logistics industries, which are areas closely associated with the mining and energy sectors. Businesses in the media, education, training and wholesale trade sectors meanwhile are underrepresented in the Pilbara compared to regions of comparable size while there is a lack of diversity and choice in professional services and retail.

Although the cost of operating a commercial business, on average, has declined in Pilbara towns since 2013, the absolute level of costs remains one of the highest in Australia overall, with significantly higher wages, rents and other operating expenditures⁵⁴. The high cost structure in the Pilbara, combined with difficulties associated with the availability of appropriately skilled staff and commercial, retail and industrial land, has expressed itself as low new business development. In 2010/11, the Pilbara had approximately 255 businesses per \$1 billion in Gross Regional Product (GRP), which is the lowest in Western Australia by a substantial margin⁵⁵. By contrast the Kimberley region had 1,133 active businesses per \$1.0 billion GRP and the Wheatbelt region had 2,308. On a per capita basis, as of June 2013, there were nearly three times as many small businesses across the nation than in the Pilbara⁵⁶.

Small business in the Pilbara requires a greater focus on incubation, support and adequate and affordable property and industrial land supply.

Table 4 Business Counts by Industry and Employment, Pilbara, 2013⁵⁷

Industry	Sole Traders	1-4	5-19	20-199	Total
Information Media and Telecommunications	0	0	3	0	3
Electricity, Gas, Water and Waste Services	6	3	0	0	9
Arts and Recreation Services	6	3	3	0	12
Public Administration and Safety	10	3	3	0	16
Education and Training	9	10	0	0	19
Mining	18	9	0	3	30
Wholesale Trade	14	8	15	0	37
Health Care and Social Assistance	41	16	10	3	70
Manufacturing	49	24	11	9	93
Accommodation and Food Services	23	26	32	17	98
Agriculture, Forestry and Fishing	66	15	12	12	105
Financial and Insurance Services	98	6	3	0	107
Other Services	61	40	22	0	123

Industry	Sole Traders	1-4	5-19	20-199	Total
Retail Trade	44	41	35	15	135
Professional, Scientific and Technical Services	72	47	17	6	142
Administrative and Support Services	81	37	27	8	153
Unknown	159	21	3	0	183
Transport, Postal and Warehousing	89	60	25	12	186
Rental, Hiring and Real Estate Services	191	41	16	13	261
Construction	342	184	55	18	599

Alternative Energy Production

Renewable energy production contributes only a very small proportion of total energy generation in the region presently, but offers great potential as a low-cost future energy source. Presently renewable energy, all solar, accounts for less than 0.1% of total off-grid generation in the Pilbara region.

Biofuel crops are currently being tested in East Pilbara under the pilot Pilbara Hinterland Agricultural Development Initiative (PHADI). PHADI is a \$12.5 million trial of irrigation systems in the East Pilbara using surplus mine water to grow food and biofuel. Sorghum is being grown at Woodie Woodie on Warrawagine Station that can be then used for biofuel in the mining industry, as well as cattle fodder. The Woodie Woodie mines, 120km east of Marble Bar, are licensed to discharge up to 60GL of groundwater a year. The trial has started under the supervision of the WA Department of Agriculture and Food with a 150ha farm operation and could be expanded to several thousand hectares with private sector participation.

Ashburton Aboriginal Corporation operates a small operation utilising waste cooking oils by turning it into biofuels for industry.

Fundamental to the viability of renewable energy is a competitive energy market through an integrated transmission network.

Case Study: **Karratha Airport Solar Farm** Regional Pillar: **Energy**

The Pilbara is a complex energy area with a heavy reliance and focus on traditional generation technologies involving gas and diesel. There are valid reasons for this principally around reliability, practicality and cost. However, Australia has the highest solar radiation per square metre of any continent on earth and within country the area around the Pilbara has the highest nationally. As such there is great interest in the solar resource and solar technologies in the Pilbara.

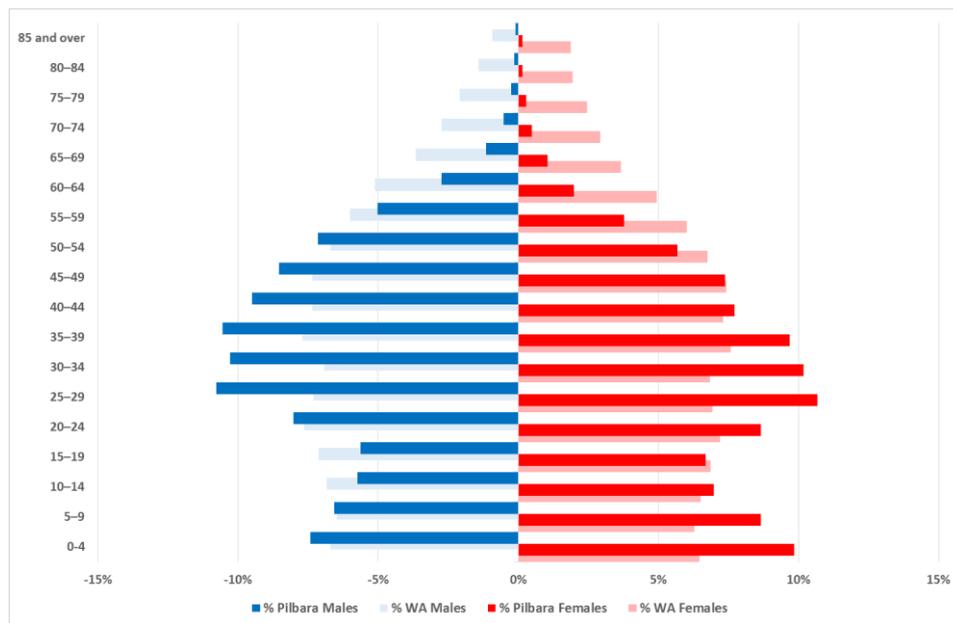
The City of Karratha has taken a bold step into the solar energy realm and is planning the development of a solar farm to address the energy needs of the Karratha Airport into the future. The City is planning the development of a significant solar farm to fuel a significant proportion of its power needs with construction due to be completed in late 2015. The project will be on Karratha Airport land with this first of a kind solar farm connecting into and supplying the Airport as the major customer of the project. The project is an exciting environmental initiative for the region and the first of its kind for an Australian Airport with the solar farm being constructed primarily to service the power needs of the Karratha airport.

Community and Culture

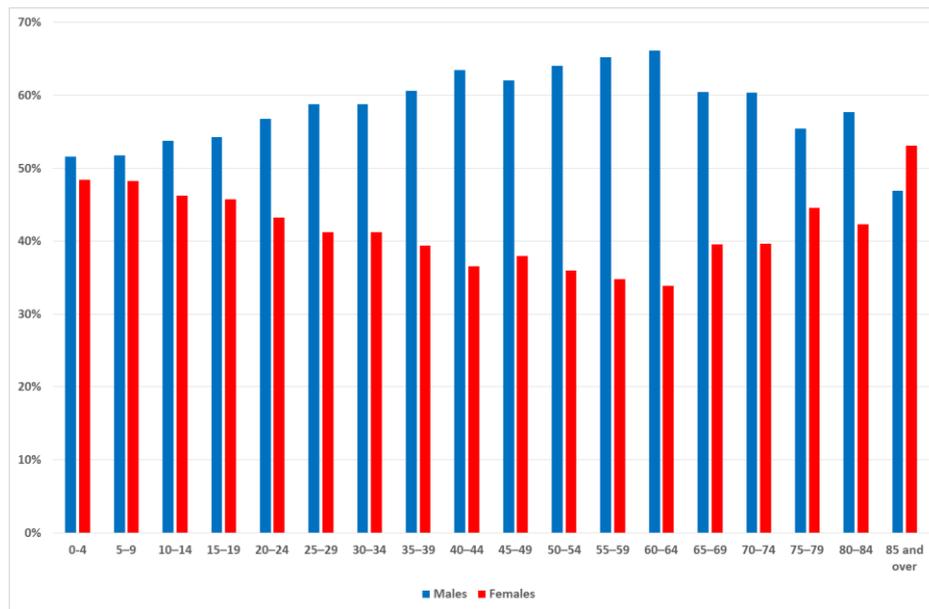
Demographics

The transient nature of the Pilbara workforce with additional influences from the FIFO workforces have resulted in a unique gender and age profile. Across the Pilbara the median age was just 32 in 2011, compared to 37 across the nation⁵⁸. The proportion of males between the ages of 20 and 59 and females between the ages of 25 and 34 are inordinately higher than the national proportion. This is primarily due to the resources activity in the region attracting a larger proportion of working age persons, with the proportion employed in the mining or construction industries increasing substantially over the previous decade.

Figure 19 Age and Gender Profile, Pilbara compared to Western Australia, 2013⁵⁹



There is also an inordinate number of males in the Pilbara compared to females at any one point in time due to the prevalence of mining and construction workers. In 2011, the comparative ratio of males to females was 160:100 increasing from 145:100 in 2006 and 128:100 in 1996⁶⁰.

Figure 20 Percentage of Males and Females, Pilbara, 2013⁶¹

The historical lack of amenity and appropriate services has discouraged the retention of aged residents. Only 2.3% of residents as of June 2013 were older than 65 years compared to 12.5% of Western Australian residents⁶².

Overall, there is a high proportion of young families. Almost half of households are families with children and this is reflected in a high proportion of children in the region being under 12 years of age. The profile of families in the region rapidly changes though once children reach upper secondary school age. The region has a shortfall of some 2,000 15-19 year olds compared with other similarly sized regions because of the trend of families leaving once children reach high school age, a reflection of the perceived limited opportunities in high school and post-compulsory education⁶³.

Housing

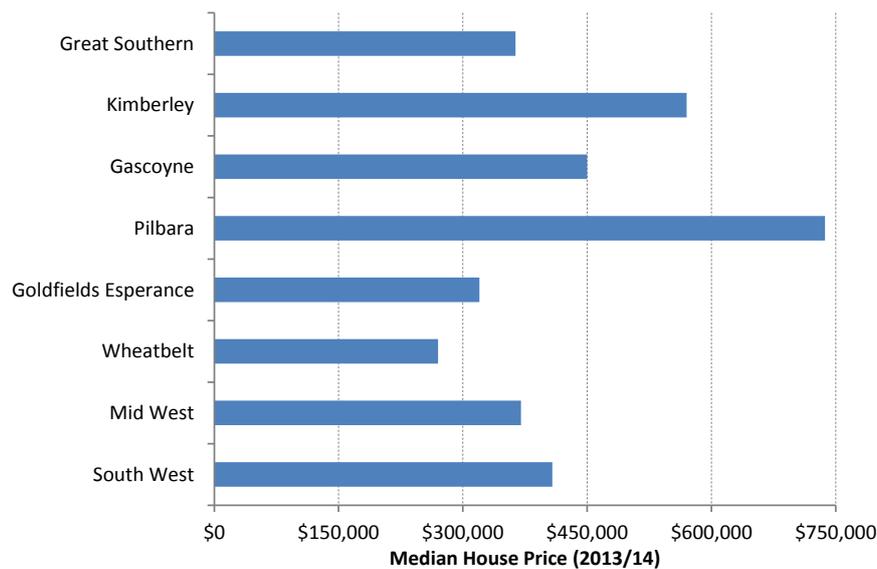
As incomes and population grew strongly in the Pilbara, demand for housing was particularly acute. Home prices and rents grew quickly as supply was unable to come to market at sufficient pace. Housing in the Pilbara subsequently became one of the most expensive in country.

A significant worsening of affordability led to considerable Western Australian Government investment being spent developing housing and land supply projects with private, joint venture partners. The lift in land and housing supply, supported by Western Australian Government investment, combined with easing resource sector investment has helped to address affordability challenges, but the cost of housing still remains high and is a barrier to the attraction of new residents and a business cost as accommodation expenses are typically supported by local employers.

However, contraction and price reductions are now characterising Pilbara housing markets. Sales and leasing activity is limited and supply has multiplied. As a result of significantly reduced investor appetite for property in the region, prices are starting to reflect local fundamentals such as resident affordability which is in line with a continued normalisation of property markets across the Pilbara.

It is important to note that unlike regional areas with comparable populations, housing constructed in the Pilbara has included a growing portion of medium density dwellings. The combination of land supply constraints which restricted the availability of developable land and the general housing preferences of a young, high income, transient adult workforces enabled the development of units, apartments and townhouses which are generally more applicable in larger urban localities. During 2012/13, around 40.0% of dwellings approved for construction were medium density dwellings compared to less than 2.0% ten years earlier. This diversity of housing is an important and unique attribute to the Pilbara compared to neighbouring regional areas.

Figure 21 Median House Price, Regional Western Australia, 2013/14⁶⁴



Case Study: Service Worker Accommodation
Regional Pillar: Core Infrastructure and Facilities

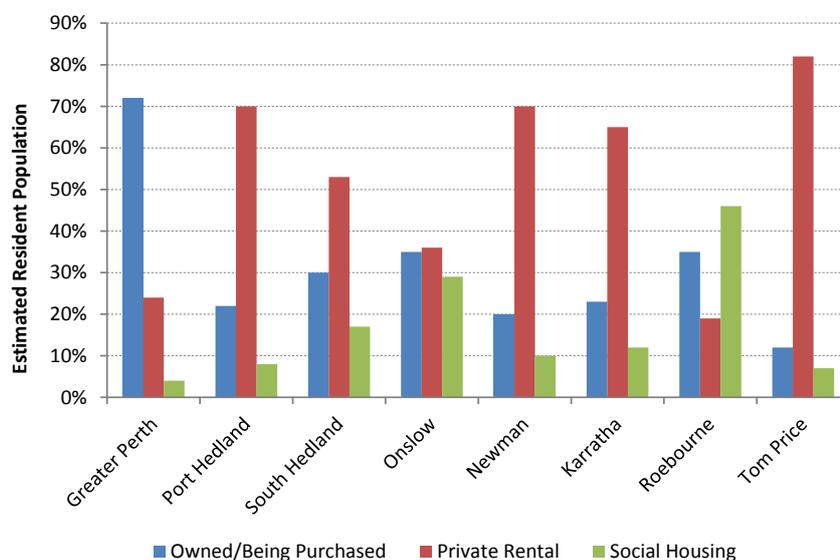
At the peak of the recent and unprecedented growth in the Pilbara’s resources sector, the high cost of living and lack of affordable accommodation were significant deterrents to attracting and retaining skilled workers in the region. Small business, service providers and not for profit organisations were particularly affected as they struggled to compete with higher salaries and incentives offered by the resources sector and some levels of government. The cost of providing accommodation was also prohibitive with rents in excess of \$1500 per week in a number of towns. This resulted in a number of businesses and not for profit organisations having to reduce their services or in some cases close which in turn impacted the quality of life for people living in the region.

In an effort to normalise the housing market, the State Government committed over \$60m from its Royalties for Regions program to establish affordable high quality accommodation in the region for key service workers and not for profit employees. Warrambie Key Worker Estate in the Karratha CBD was the first development with accommodation for up to 250 residents in one, two and three bedroom properties. Further development have been undertaken in South Hedland, Newman and Onslow. The accommodation is offered at affordable prices and has assisted in stabilising the housing market, making it more affordable for small businesses and

non-government organisations to retain and expand their services to meet the demands of a growing population during a critical period of economic expansion for the region.

Whilst market conditions have eased and the supply of residential land has increased, the housing market in the Pilbara has not yet normalised. Notably, there is high level of corporate and private investor ownership, low levels of owner occupiers and relatively high social housing needs. In Port Hedland, for instance, 70% of households rent and just 22% own or are purchasing their home. This compares with 24% renting and 72% who own or are purchasing their home in Perth. It is common for employers, both government and private sector, to provide housing to attract and retain staff. Within mining towns in the Pilbara, it is also not uncommon for mining companies to own the majority of housing within a community.

Figure 22 Housing Tenure by Urban Area, Pilbara, 2011⁶⁵



The high proportion of business and investor owned residential dwellings in the Pilbara adds to the volatility of the housing market in the region. Where housing costs are a business or investment expense rather than a household expense, decisions are based on financial and opportunity costs rather than household needs and budgets. Businesses have a fluid movement of capital and are often willing to write off losses on housing if a greater profit is able to be made elsewhere. Investors too will look at rental yields and capital growth and will withdraw from the market if greater returns are able to be made elsewhere.

Aboriginal Engagement & Participation

Aboriginal people have an important stake in the development of the region as custodians of country. Aboriginal Australians make up 12% of the Pilbara's population compared to 2.5% of the nation's population⁶⁶. The Pilbara has the second highest proportion of Aboriginal people in the state after the Kimberley. The approximately 7,200 Aboriginal people living in the Pilbara as of 2011 were residing in a number of towns and small communities across the Pilbara. The Shire of East Pilbara had the highest proportion of Aboriginal residents at 21.8%, followed by the Town of Port Hedland at 14.8%.

The Pilbara's strong and expanding resources sector has provided significant opportunities for Aboriginal employment and business development. The establishment of State Agreements for resource projects have

enabled traditional owners to negotiate a range of social and economic outcomes for their communities. Funds administered by Native Title Trusts represent a pool of investment capital that has the potential to provide mutual benefit for Aboriginal communities and the wider community and region through productive, growth generating investment. These funds provide an opportunity for Aboriginal people to secure their economic future by investing in assets that can generate income streams and employment opportunities for the long term economic, social and cultural benefit of Aboriginal communities. A number of significant strategic partnerships have been established across the region, targeting and promoting Aboriginal economic participation and employment.

Case Study: Karijini Eco-Retreat
Regional Pillar: Tourism

The Karijini National Park (formerly Hamersley Range) is located approximately 1400km north of Perth around 80km's north-east of Tom Price, in the heart of the inland Pilbara. Karijini National Park is the 2nd largest national park in Western Australia receiving over 100,000 per visitors per year and is ranked in the top 5 visitor experiences for the State. The Karijini National Park is the traditional home of the Banyjima, Kurrama and Innawonga Aboriginal people with evidence of early Aboriginal occupation dating back more than 20,000 years.

The Karijini Eco Retreat was developed by the Gumala Aboriginal Corporation in partnership with the Department of Parks and Wildlife with a \$2m contribution from the Pilbara Development Commission. The Karijini Eco Retreat opened in 2007 as the first and only permanent up-market, luxury accommodation in the Karijini National Park offering a range of environmentally friendly accommodation and camping options including campsites, upmarket eco tents with ensuites, 'Dorm Style' eco tents and cabins and an alfresco restaurant. The success of the Karijini Eco Retreat has led to further developments at the site including a new amphitheatre for cultural and other events and further amenities to support educational visits to the Karijini National Park.

There is an emerging Aboriginal arts industry which is rapidly gaining national and international attention. In addition, a number of Aboriginal people are employed in the pastoral, tourism, land management industries and in the service sector.

However, Aboriginal Australians in the Pilbara, as across Australia, still face significant disadvantage, including much higher rates of preventable health conditions and a shorter life expectancy than much of the developed world (more than 20 years less than the non- Aboriginal population)⁶⁷. Social problems are also evident amongst some Aboriginal communities.

The rate of homelessness in the region – almost all of it Aboriginal peoples – at 170 per 10,000 people is the second highest in Western Australia after the Kimberley region⁶⁸. Youth unemployment – representing almost half the Aboriginal population under 19 years of age – also remains much higher than the regional average⁶⁹.

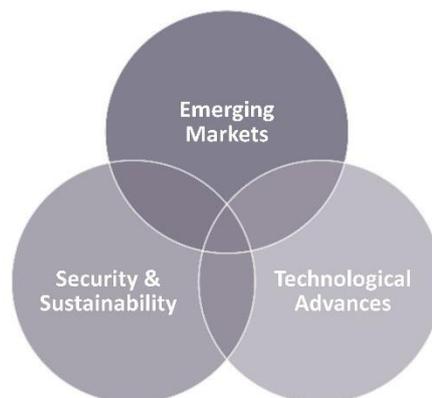
4.0 Regional & Global Influences

Regions are increasingly confronted with changing global megatrends shaping the economic landscape. A megatrend or substantial shift in conditions – social, economic, environmental, technological and political – may reshape the way an industry operates or communities and economies develop in coming decades.

Megatrends are of particular importance to the Pilbara which is linked to the global economy through considerable mineral and energy exports and proximity to growing markets. A resilient future Pilbara will be one which anticipates and reacts to these global influences, exploiting emerging trends to its advantage by capturing market opportunities. This involves business and government collaborating to systematically spot and act on emerging trends, test risks and spur opportunities.

Each of these overlapping megatrends detailed below will influence and shape the future of the Pilbara. This section describes these megatrends and opportunities broadly with specific opportunities expanded upon later in the Blueprint.

Figure 23 Global Megatrend Relationship



Emerging Markets

Urbanisation

Across the globe, the continued shift from rural to urban living will be profound. The world's urban population is now close to 3.9 billion and is expected to reach 6.3 billion in 2050⁷⁰. This will be a strong influencing factor on market demand in an array of areas.

Rapid urbanisation in China, and to a lesser extent in Thailand, Vietnam and Indonesia, has already been a key driver of global copper, aluminium and steel demand and therefore demand for iron ore. The urbanisation rate in China increased rapidly from 19% in 1980 to 50% in 2011, encouraging an unseen expansion of urban infrastructure such as roads, railways, sewerage systems and electricity generation, as well as an expansion of commercial and industrial property⁷¹. Between 1985 and 2012, the level of building floorspace completed in China increased from 171 million square metres to 3.6 billion square metres - residential construction alone

during 2012 was larger than Australia's total housing stock⁷². With its rapid growth, intensive use and sheer scale, China has become the world's largest consumer of steel, aluminium, and copper, accounting for around 40% of global consumption for each⁷³.

The expanding cities in emerging economies will spend the vast majority of global investment in coming decades as they strive to meet the surging demand for infrastructure and building capacity. For example, cities are estimated to need to construct floorspace equivalent to 85% of today's residential and commercial stock by 2025⁷⁴. This new building capacity is part of the estimated doubling of capital investment in cities globally to more than \$20 trillion per year by 2025⁷⁵.

Demand for agricultural produce is also a key outcome of increased urbanisation as more food is demanded by a growing population of net food buyers. Additionally, agriculture production is challenged by large scale conversion of farm land to urban centres and increased water usage, placing an increased strain on food production capabilities⁷⁶. Food demand in growing, urbanising populations will have to be met by increased farm productivity and/or food imports.

Figure 24 Projected Urban Population by Region⁷⁷



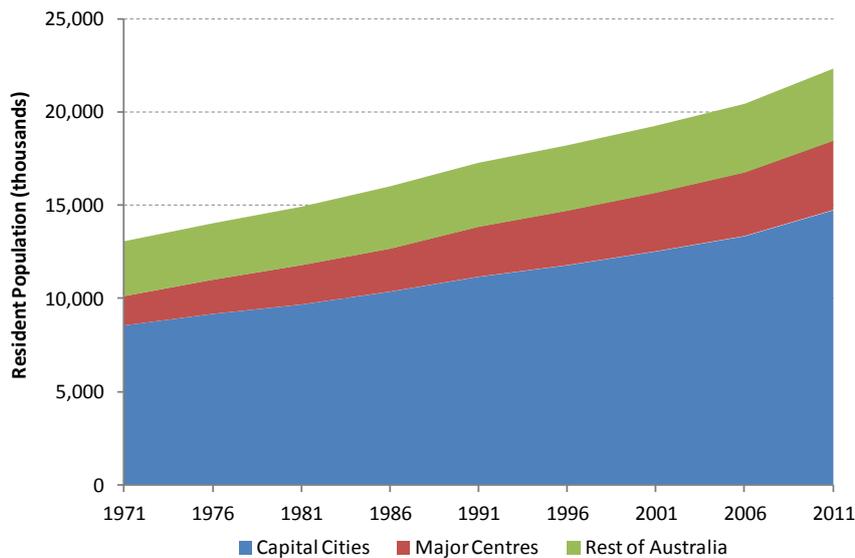
The geographical implications of urbanisation are of key importance to the Pilbara. Of the additional 2.4 billion persons added to the urban population by 2050, 90% will be concentrated in Asia and Africa.

New markets will provide growth opportunities. For instance, more than twice as many new urban residents will be located in Africa than China between 2010 and 2050. India, Pakistan, the Philippines, Indonesia and Bangladesh will contribute to more than half of the new urban population in the fastest growing region – Asia and Middle East.

A resilient Pilbara will develop deeper connections with these emerging economies to benefit from new waves of growth over the coming decades. This means supporting relationships and regional marketing into these growing markets which will support the Pilbara's existing extractive industry advantages and enable new sectors to grow and develop, such as agriculture exports.

The Pilbara itself will also be challenged by urbanisation. Aside from the city states like Singapore and Monaco, Australia is the most urbanised nation on earth⁷⁸. Capital cities were the main beneficiaries from rapid urbanisation in Australia, almost doubling their share of the population during the first seventy years of the twentieth century. However, since then their share of Australia’s population has remained stable at 66% over the last four decades as several coastal centres developed on the back of significant population growth, such as the Gold Coast, Sunshine Coast, Hervey Bay, Cairns, Mackay, Bunbury and Busselton (the Bowral/Mittagong urban area is the only non-coastal centre to experience the same levels of growth over the past four decades)⁷⁹.

Figure 25 Historical Population by Urban Centre Size, Australia⁸⁰

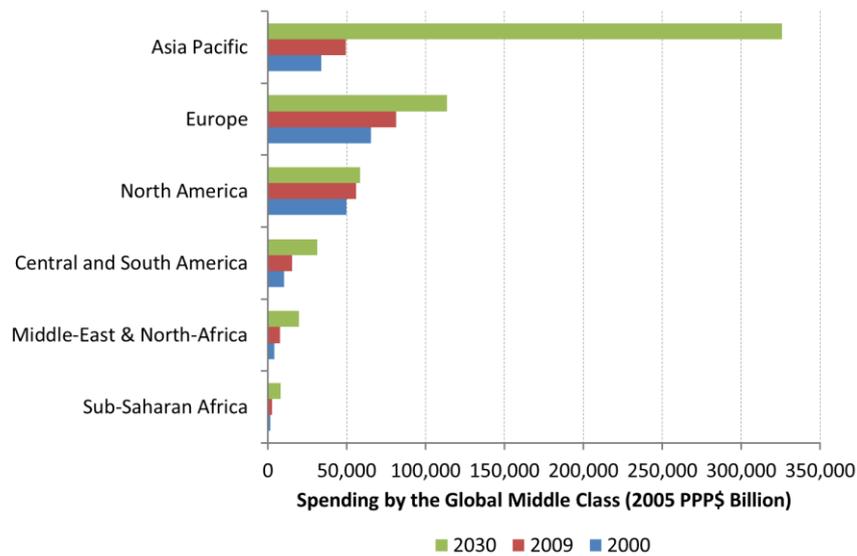


In order to attract a growing share of Australia’s population growth over the next few decades, Pilbara communities will have to continue to create liveable spaces and communities through the provision of affordable and diverse housing, high quality public amenity and community infrastructure, easy access to quality health and education services and appropriate retail, entertainment and recreation choice.

Rising Middle Class

The extraordinary growth of affluence and the reduction in absolute poverty across the globe has brought sweeping economic and social change and it’s not over yet. The size of the middle class is expected to increase from 1.8 billion in 2009 to 4.9 billion by 2030⁸¹. Almost all of this growth (85%) will come from Asia.

Equally striking is the growth in purchasing power of the middle class. Globally, demand from the middle class may grow from US\$21 trillion to US\$56 trillion by 2030. Again, over 80% of the growth in demand will come from Asia.

Figure 26 Projected Expenditure of Global Middle Class by Region⁸²

Continued strong growth in the size and diversity of the global middle class is expected to be disruptive but also present enormous opportunities for not just early movers keen to gain lasting advantage but also regions poised to cater for the emerging needs of this cohort.

The more immediate disruptive challenge to Australia is the productivity imperative. The rise of more affluent, educated workers in neighbouring regions presents challenges for high wage economies and regions such as the Pilbara to remain competitive. The environment therefore needs to be more conducive to innovations which accelerate productivity.

The emergence of the “meganiche” presents both challenges and opportunities. Armed with better information, strategies that succeeded in the past may no longer be appropriate as an increasing portion of the market become more sophisticated consumers, demanding differentiated products and experiences. These meganiches are however beyond our traditional idea of a niche, with markets of 50-300 million people⁸³. This provides opportunities for regions which can offer a product from a well-regulated environment with a focus on quality.

Although there are numerous opportunities for economies to benefit from a growing middle class with changing consumer preferences, the Blueprint has identified four examples which could influence the development of the Pilbara by 2050:

Figure 27 Global Middle Class Product Opportunities



Global Food Consumption

The world’s population is expected to increase by more than 25% to 9.1 billion by 2050. At the same time, the world will have to produce more food and fibre with a smaller rural workforce and less arable land, adopt more sustainable methods to adapt to climate change, and adapt to changing food preferences. The UN Food and Agriculture Organisation predicts that feeding a world population of 9.1 billion in 2050 would require raising overall food production by 60% between 2007 and 2050⁸⁴. Production in developing countries would need to double over this period. This implies significant increases in several key commodities. The production of biofuels will have an additional impact, competing against food products for land and resources.

Figure 28 Projected Agriculture Consumption by Region⁸⁵

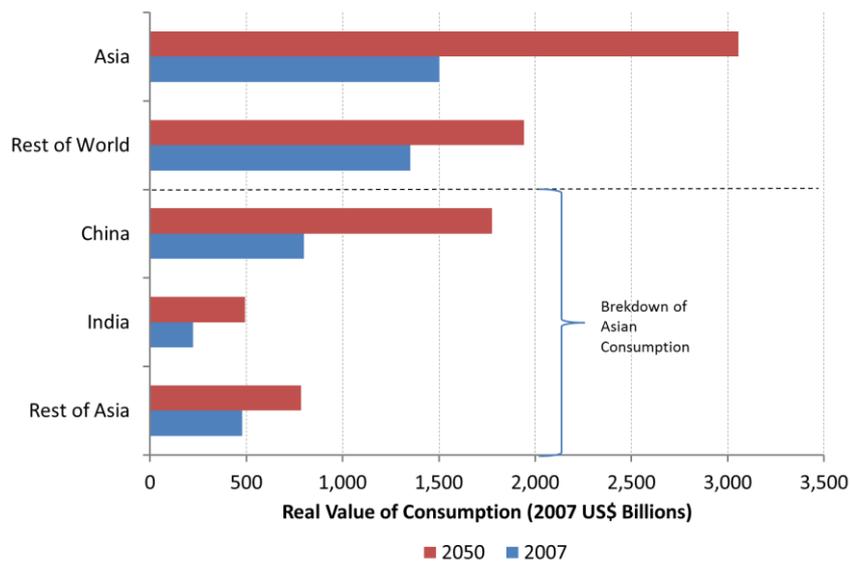
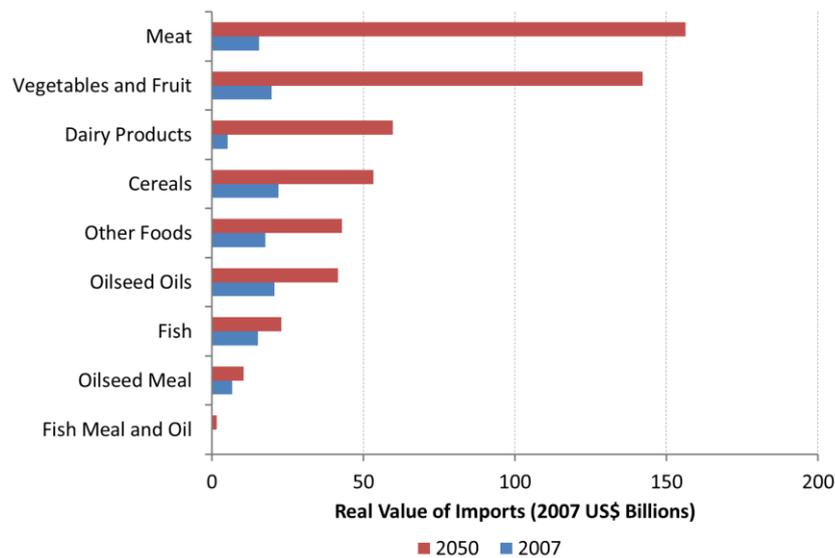


Figure 29 Projected Agriculture Imports by Commodity, World⁸⁶



The Australian Government has forecast that there will be substantial growth in the trade of meat, dairy and fresh produce to feed a growing and more affluent global consumer. It expects Australian exporters to capture an increasing share of global food exports due to its geographical proximity – lower transport costs – advantage in the production of several commodities and its reputation as a stable provider of quality produce.

The expected increase in global demand for food has the potential to change the economic viability of food production in the Pilbara. Currently high costs, lack of access to land and export infrastructure capacity limit agricultural food production. Nonetheless, the changing global environment combined with targeted strategies has the potential to change this towards 2050.

Emerging Pilbara livestock markets can be the obvious beneficiaries, but so too aquaculture products and crops. The rise of the Asian middle class will also open opportunities for niche, high quality produce and processed foods with attributes such as whole, organic and environmentally friendly.

Case Study: Pilbara Hinterland Agricultural Development Initiative
Regional Pillar: Agriculture and Aquaculture

Economic diversification of the Pilbara’s economic base is critical to its future sustainability. Recognising the potential to expand the agricultural industry in the Pilbara, the State Government has initiated the Pilbara Hinterland Agricultural Initiative that is targeting the use of mine de-water from the resources extraction industry and artesian water for agricultural purposes. By focussing on the economic productivity of the resources extraction industry in relation to its need to manage mine-dewater, and the government’s aspiration to intensify agriculture production in the Pilbara, this initiative is part of the larger State Government policy to increase high-value agricultural production.

Security & Sustainability

Climate Change & Water Security

Regions around the globe face significant environmental and economic impacts from climate change, with changing temperatures, weather patterns and extreme events impacting on biodiversity, agriculture, infrastructure, coastal communities and water supply.

CSIRO climate scenarios for the Pilbara generally point towards a hotter and dryer climate for the Pilbara⁸⁷. The largest reductions in rainfall are projected for the western portion of the Pilbara, whilst there are small pockets of potential rainfall increases further inland.

Despite evidence of vast underground water resources in the Pilbara, increased evapotranspiration and less rainfall will put additional stress on the water resources available, suggesting that both local organisations, local communities and industry will need to adapt their practices to use water more efficiently and cope in the hotter extremes. It is also projected that the severity of extreme weather events or storms could increase, including an increase in the strength of tropical cyclones impacting the Pilbara. Sea level rises are also expected to impact the region's natural and man-made assets along the coast.

Case Study: Water Security
Regional Pillar: Core Infrastructure and Facilities

A lack of a known sustainable water supply has been a significant impediment to the development of the Pilbara beyond the mining industry. The State Government has initiated a four-year Water Discovery Program concentrating on the Sandfire area of the West Canning Basin, which covers 10,000sqkm east of Port Hedland. The West Canning Basin (WCB) is part of the Canning Basin, one of the largest artesian basins in Australia. The WCB program is funded under the State Government's Royalties for Regions, Pilbara Cities water availability project and is part of the State Government's effort to secure the Pilbara's future water supply and will be a critical enabler of the economic diversification of the region.

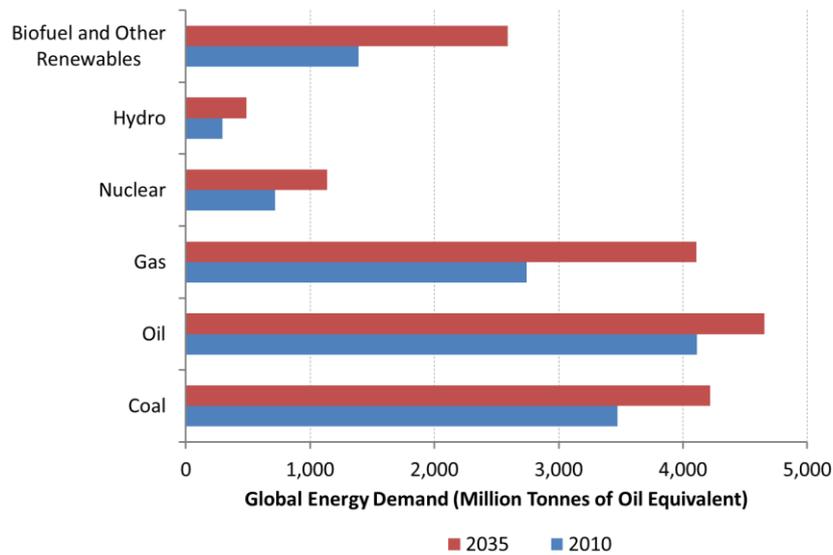
The WCB program has already revealed massive underground reservoirs with the potential of delivering up to 100 gigalitres per annum capable of supporting bold plans for diversifying the regional economy with potential for industrial applications and irrigated agriculture as well as providing a sustainable water supply to towns to support population growth.

Low Carbon Future

Climate change, and policy and social action directed at responding to climate change, is creating economic opportunities and challenges. It is shifting incentives towards lower carbon energy sources and industrial processes. It is also expanding market demand for carbon-reducing technologies and environmentally friendly products.

Global energy demand is expected to increase by 35% between 2010 and 2035⁸⁸. Although coal is expected to account for 59% of the increase in demand, the fastest growing gas, nuclear, hydro and renewable energy sources are expected to increase at a faster rate. Gas is expected to increase 49.9% from 2010 to 2035. Biofuels and other renewable energy sources are expected to increase 86.5%.

Figure 30 Projected Energy Consumption by Source, World⁸⁹



One of the more notable opportunities for the Pilbara is the development of an industry around renewable energy. The region possesses a number of natural assets such as abundant tidal movement, sunshine, and geothermal energy. The region is also home to a considerable stock of natural gas, which is considered a low carbon alternative to coal power.

The global shift towards the green economy can mean that new industries, small and large, that seek to assist the economy in reducing its carbon and environmental footprint, could find a niche in the Pilbara.

Case Study: Renewable Hydrogen Export
Regional Pillar: Energy

The Pilbara offers the land, solar resource, infrastructure, proximity to Asia and political stability to support renewable solar energy generation for export, on an industrial scale capable of driving transformational change in the supply chain for Asian energy and agriculture. The unique attributes of the Pilbara together create an export opportunity unmatched anywhere in the world.

The Pilbara Development Commission has partnered with the private sector to examine deliver the establishment of hydrogen export facility through the capturing of renewable resources such as sun light and sea water. Targeting the emerging hydrogen economy in Japan, the pilot plant has the potential to lead to commercial scale investments and has been identified as a further opportunity for transformational reform in the region’s economy through the export of renewable energy resources.

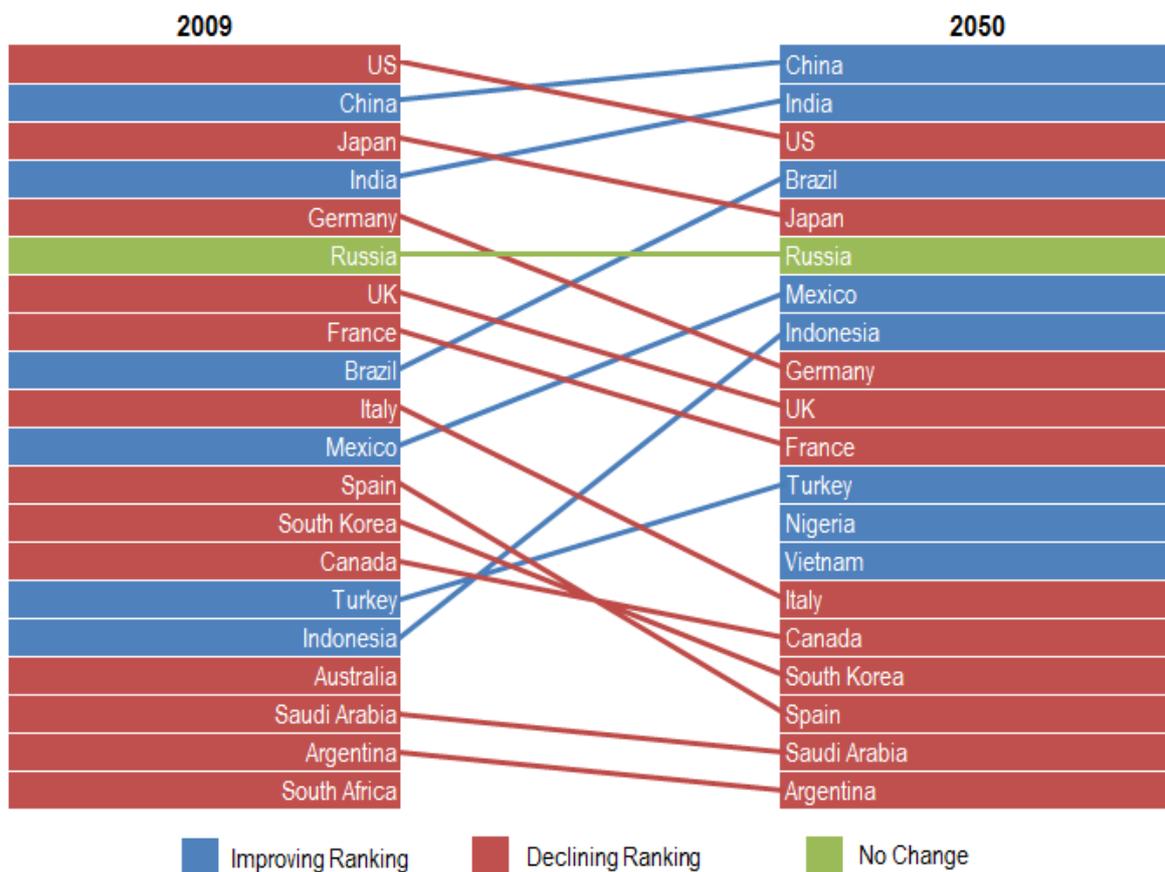
Shift in Economic & Military Power

Emerging economies are lifting millions out of poverty while also exerting more influence in their region and across the globe. This geographical shift in economic and military power presents new challenges and opportunities for Australia and the Pilbara.

On current trends, the aggregate purchasing power of the ‘E7’ emerging economies – Brazil, China, India, Indonesia, Mexico, Russia and Turkey – will nearly double that of the G7 by 2050⁹⁰. These growth countries will shift from centres of labour and production to consumption. They will become exporters of capital, talent and innovation, competing against an array of developed economies.

Such global shifts are remarkable not only for their scale, but also for their sheer speed. As a result, the global economic landscape will be vastly different in 2050 from that of today.

Figure 31 Country Gross Domestic Product Ranking⁹¹



A new global landscape presents new security challenges for Australia and the Pilbara. The diffusion of power among countries will have a dramatic impact by 2030 when Asia will have surpassed North America and Europe combined in terms of global power, based upon GDP, population size, military spending, and technological investment⁹².

Whilst geo-strategically Australia currently enjoys the status of being one of the world's most secure nations, new security risks may arise from the potential impact of climate change and resource security issues, involving future tension over the supply of energy, food and water⁹³. The Pilbara, in particular, has considerable strategic infrastructure of national significance. Future risk planning strategies need to ensure that the region is able to withstand new potential security threats and challenges. Increasingly, the growing number of offshore strategic assets and the changing geo-political balance in the Indian Ocean region will compel serious consideration of an expanded military presence in the region. Additionally, an underlying issue for net energy importers is security of supply. Australia is currently a stable and trusted supplier of energy and merchandise exports however potential conflicts in key trade routes could put this reputation at risk. While a defence presence in the Pilbara has been ruled out in the short term, these global security factors may require reconsideration in the future.

Technological Advances

Digital Connectivity

Countries which have achieved advanced levels of digital connectivity have realised significant benefits in their economies, societies and the functioning of their public services and this trend is expected to continue⁹⁴. By 2020 there will be 50 billion networked devices that will impact on issues such as labour mobility, the future of urban development and design and investment in digital infrastructure, amongst others. Increasing digital connectivity will stimulate the emergence of new services and tradable commodities through improved access to markets, improved learning and trading platforms and increased mobility through a connected world that will help break down the financial and social costs of remoteness and isolation.

Forward looking research by IBM showed that expanded telecommunications capacity and new communication mediums will provide new economic, social and community benefits and opportunities to regional areas⁹⁵. For instance, teleworking will continue as a key trend, with possibly one in four people in the workforce working at least partially from home if not full-time by 2050. Teleworking will enable jobs centred in capital cities to be relocated to regional areas.

Increasing digital connectivity will also impact on business models. Digital technology is lowering barriers of entry and expanding market reach. It is enabling tasks to be completed remotely, generating competitive advantages and productivity improvements. Businesses can reach new and emerging markets which were once out of reach.

Underpinning this trend is the provision of high speed broadband. It is considered a vital enabler for regional economies, especially the Pilbara, to remain globally competitive. Adequate digital infrastructure is necessary not only to support the mining industry but also to support new industries, diversification and regional liveability.

Automation

The take-up of industrial automation technologies in recent years has been rapid. Over 178,000 industrial robots were sold in 2013, up from 80,000 in 2003⁹⁶. Sales are projected to continue to increase and lift the worldwide stock of industrial robots from 1.4 million to 1.9 million by 2017.

Whilst industrial automation is historically focussed in process manufacturing – refining raw materials – and discrete manufacturing – assembling/building parts – it is permeating into other areas of the economy on the back of recent technological advances and rapidly reducing costs. In the Pilbara, the future of automation in

mining is already upon us. Advances in computing, signalling and sensing technology have brought driverless trucks and trains, automated drills and other pieces of equipment to the Australian mining scene.

Whilst there are still many challenges to overcome, Pilbara iron ore miners are pushing towards fully automated 'pit to port' operations in their quest to boost productivity, reduce costs, improve safety and remain globally competitive.

Future advances in technology and their application have the capacity to substantially redefine industrial and social landscapes and the competitiveness of regions. These technological advances will help to reduce and avoid costs, and also innovate and access new markets. In the Pilbara, this means overcoming high costs and geographical and logistical challenges to open up new opportunities. There are also broader export opportunities as the specialisation in the deployment of automation technologies increases.

The key challenge for the Pilbara will be enabling these opportunities whilst limiting the negative impacts such as adverse employment outcomes.

5.0 Regional Capacity for Growth

Fundamental to the Blueprint is a focus on harnessing the capacity of the Pilbara's physical, social, economic and environmental strengths. The challenge is to successfully link and leverage these competitive advantages and regional assets, ensuring maximised social, environmental and economic returns to the region, state and nation.

It is useful to investigate the prospects for the Pilbara through the prism of its economic, social and physical attributes and performance within a regional and global context. The Blueprint has undertaken an assessment of the capacity for growth in the Pilbara using the "Four Cs Assessment" approach for regional economic development. The four "Cs" approach provides the critical analysis required to identify and understand the strength and direction of each region's economy. The four "Cs" are:

Capital – human capital, particularly skills and education;

Communities – economically, environmentally and socially sustainable communities and population growth;

Connections – access to international, national and regional markets; and

Competitiveness – business competitiveness.

A benefit of this approach is that it enables the identification of comparative advantages to exploit and impediments to regional development to overcome. This is fundamental to the identification of current and emerging opportunities and priorities.

The analysis is founded on key input from a range of stakeholders in and outside the region working across myriad fields and sectors as well as desktop research.

Human Capital

Human capital refers to the skills, knowledge and experience possessed by an individual or population and is viewed in terms of the value people contribute to the development and growth of communities and organisations. It is a fundamental input to economic activity and crucial to regional competitiveness and resilience.

The availability of a highly skilled and educated workforce enables businesses and organisations to respond to changing environments, address challenges and pursue commercial opportunities. Conversely, a lack of access to appropriate human capital can constrain the growth of local enterprises and discourage new business creation.

It is imperative that, in order to provide for existing economic needs and to prepare for future and long-term economic growth and sustainability, a region must support the development of its human capital. Getting the balance right and increasing a region's knowledge capacity and skill set can provide a stimulus for substantial economic and socio-economic shifts.

The *Pilbara Workforce Development Plan 2013-2016* (the Plan) recognises the region's unique challenges. It is a joint industry, community and government initiative to develop a skilled workforce to drive growth and diversification of the Pilbara economy. The Plan recognises a number of constraints, including lower education

participation, retention and achievement outcomes, the need for more employment and training pathways for students and the need for a broader range of housing and childcare services to improve workforce attraction and participation. The Plan identifies a range of priority actions to address these issues and these are currently being implemented and monitored by the Department of Training and Workforce Development and Pilbara Workforce Development Alliance, which includes representation from industry groups, local governments and relevant government agencies. However, the Plan is predominately focused on the needs of the resources and energy sector. The Blueprint suggests a different approach will need to be developed in order to meet the needs of a diversified Pilbara economy.

Drawing from this Plan and Blueprint stakeholder consultation, it was recognised that the ability to provide a skilled and educated resident workforce to drive an increasingly sophisticated and diverse economy in the Pilbara will depend on addressing challenges and enabling opportunities in three key areas:

- Workforce participation;
- Local workforce skills; and
- Education and training outcomes.

Table 5 Human Capital Indicators, Pilbara⁹⁷

Area of Focus	Indicator	Pilbara	Nation
Workforce Participation	Adult Participation Rate	86.5%	65.6%
	Adult Female Participation Rate	75.4%	59.2%
	Aboriginal Adult Participation Rate	57.3%	53.3%
Skills	Year 12 Qualified	42.5%	46.1%
	University Qualified	10.8%	22.8%
	Technical Qualified	33.1%	31.6%
	English Proficiency	79.7%	92.0%
Education and Training Outcomes	Year 12 Completions	56.2%	75.3%
	Learning or Earning	61.1%	80.1%
	Primary School Performance	44.2%	62.8%
	Secondary School Performance	21.9%	37.4%

Workforce Participation

The region is characterised by a high level of workforce participation, with relatively fewer disengaged or underemployed residents. A key contributing factor is the historically strong economic activity in the region which has encouraged employment migration. The demographics of the Pilbara also support a high participation rate, with few aged residents and a disproportionate number of males.

Although the strength of the Pilbara economy has generated significant opportunities for employment and business development, there is still great potential to unlock and harness the latent human capital of the Pilbara. For instance, more than 40% of working age Aboriginal adults are not in the workforce. Encouraging a

portion of these adults into full-time employment would reduce dependence, enhance the quality of life for individuals and support long-term economic growth.

The Western Australian State Government's *Aboriginal Economic Participation Strategy 2012 – 2016* and *Training together – Working together*, an Aboriginal workforce development strategy aims to increase the potential for Aboriginal people to participate more fully in the State's economy, through effective workforce participation. The strategies endeavour to strengthen Aboriginal culture and society and to ensure Aboriginal people have the same opportunities in life as non-Aboriginal people.

There is a high proportion of youth in Aboriginal communities and considerable capital held by Aboriginal land holders through native title settlements. There is an opportunity to further expand successful partnership models to programs to support skills and enterprise development for Aboriginal youth and leadership programs and economic asset development which can provide a sustainable asset base and employment and skills base for Aboriginal communities whilst contributing to regional development.

Skills Development

The appropriate skilling of the workforce is a major aim in the Pilbara. The region's workforce requirements are changing, moving away from construction and labour employment towards industries to support the operations of mining and energy projects. Moreover, increased diversification in the region and changes in business practices and associated technology require a workforce which is innovative and responsive to these changing needs.

Although there has been an improvement in the number of people in the region who hold a bachelor's degree (12% in 2011 compared to 9.5% in 2006), it is still significantly less than the Western Australian proportion (23%)⁹⁸. One of the largest gaps occurs at this level with only 2% of the Aboriginal people in the Pilbara region holding a bachelor's degree.

The lower rate of higher education participation is partly due to the characteristics of the labour market in the area. There are high levels of demand for trades people, transport workers and other occupations where higher education qualifications may not be required. Therefore, there may be fewer incentives for residents to undertake higher education studies. The lower rate however also reflects relatively less access to tertiary studies at the regional level, requiring students to travel interstate or intrastate or to study externally if they wish to remain local.

Access to tertiary and further education is improving noticeably in the Pilbara. Two universities have a regional base in the region: The Rural Clinical School of the University of Western Australia (UWA) is located in Port Hedland and Karratha; and Curtin University delivers select courses in humanities and business through Karratha and Port Hedland. Other tertiary studies can be undertaken through external or flexible study – for instance, the University of Central Queensland will deliver distance education through the Karratha Distance Education Hub from 2015. The campus style tertiary education experience for numerous courses however requires students to leave the region and attend universities in major rural or metropolitan areas.

The Pilbara Institute is a major vocational training provider in the region offering a range of courses through its campuses in Karratha, South Hedland (including Pundulmurra campus), Tom Price, Roebourne and Newman. The Pilbara Institute offers training in over 118 qualifications such as community services and health including nursing and aged care, business services, horticulture and trades training to apprentices and trainees. Pathways programs are offered to school students and those students keen to gain relevant skills for employment.

Challenges for the Institute and the communities it serves include offering training in the current economic environment where the resource sector projects shift from construction to production. Work placements and support from industry to enable experiential learning on the job remain key challenges for both the Institute and students. Additional challenges in the region for VET delivery include the small number of full-time enrolments, the impact of FIFO rosters around training delivery options, and literacy and numeracy levels of students⁹⁹.

Moreover, on the job training and professional development programs have historically been difficult to supply for industries outside the high wage resource sectors. This has especially been the case for small industries where there may not be the capacity to share the costs of flying a trainer in to the region for a few days.

Incentivising skilled and business migration is another important objective for the region. This will require a coordinated and multifaceted strategy through potentially financial (or taxation), social and regulatory instruments which can attract and ultimately incentivise migrants to remain in regional areas. Addressing housing, quality of amenity, recreation, entertainment and cost of living issues will be fundamental to sustaining skilled migration to the region amid cyclical downturns in mining related investment. However it should be noted that the State Government's first workforce development priority is training and preparing Western Australians for the workforce.

The State Government's response to the skills challenges faced by Western Australia is contained in *Skilling WA – A workforce development plan for Western Australia*. It provides a framework for workforce planning and development and includes five strategic goals: workforce participation; attraction and retention of a skilled workforce; a flexible and innovative education and training system; targeted skilled migration; and planning and coordination between government industry and community stakeholders.

Case Study: **Specialist Learning Centres**
Regional Pillar: **Education and Training**

In an effort to address the need to provide professional training and skills development in a local environment, the Pilbara Institute (PI) is progressing the development of two new Centres of Specialisation with a focus on delivering high quality training in the electrical and health vocations in the Pilbara. The facilities will enable students to undertake training and skills development locally, avoiding the need to travel long distances for training. The facilities are being established with the assistance of funding from the Pilbara Cities initiative's Pilbara Education Partnership Fund.

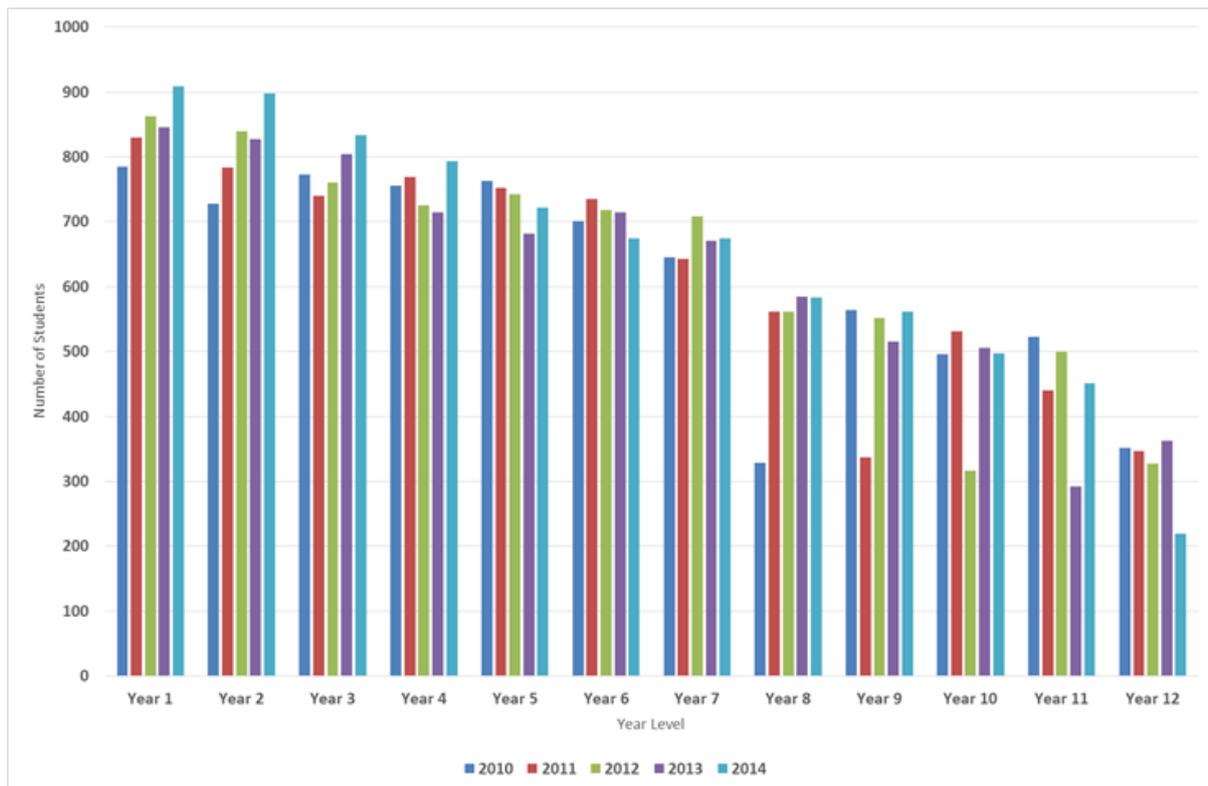
The Electrical/Instrumentation Centre of Specialisation will be located at PI's Karratha campus and will support vocational training in the electrical trades and post-trade in electrical engineering. The facility will enable PI to expand its delivery into covering aspects of electronics, communications, renewable energy, signaling and electro-technology maintenance.

A state of the art Health and Community Services Training Centre is being developed at the Pundulmurra campus in South Hedland to improve the delivery of nursing, education support and early childhood education and care training and skills development. The new facility will comprise a replicated hospital ward, emergency settings and clinician rooms and will utilise the existing partnership PI has established with Curtin University to provide high level audio visual facilities to aid in real time, remote training.

Education and Training Outcomes

Investment in adequate education and training is important to enhancing human capital and supporting long-term economic growth. A key message that came out of the consultation process across region was the challenge in retaining children in schools beyond Year 7. Specifically, there is a perception that the quality of education, namely secondary education, is not comparable to larger urban areas. Additionally, education outcomes in the Pilbara are impacted by below average attendance levels, particularly at high school level¹⁰⁰.

Figure 32 Pilbara School Enrolments, 2010-14.¹⁰¹



One of the key areas of underperformance in the Pilbara is the lack of young adults going into either employment or training. Nearly 40% of 15 to 19 year olds in the Pilbara were not engaged in study or employment in 2011 compared to less than 20% across the nation¹⁰². School performance in the Pilbara is also well below national levels, with only 21.9% of secondary school NAPLAN results in the high bands – nearly half the national average.

Partnerships between industry and government to support educational and training outcomes are considered an important initiative in the region. Current partnerships are generating positive outcomes. Investment, such as apprenticeships, in developing human capital and skilling the Pilbara population to provide a ready-made, capable workforce for industry and new economic opportunities emerging in the region has the potential to provide long lasting benefits. The benefits of these investments will be accrued through greater retention of youth and resident populations, expanded local capacity and specialised education and employment opportunities.

Improving education and training outcomes will require appropriate staff and facilities as well as infrastructure to ensure that access and social programs which encourage greater participation are adequately supported and targeted.

Case Study: Pilbara Institute Learning Hubs
Regional Pillar: Education and Training

Access to tertiary education and higher learning opportunities in the Pilbara are limited with no “stand alone” university facilities in the region. In addition many people undertaking higher education studies via distance education or online do not benefit from a “campus” experience or direct interaction with lecturers or other students. In an effort to provide more flexible learning opportunities the Pilbara Institute (PI - formerly TAFE) is taking a progressive approach in establishing Education Hubs at two of its key campuses in the region.

In Karratha PI has established a partnership with CQ University Australia (CQUni) to establish a Distance Education Study Hub at its Karratha campus to link students studying with the university remotely with its systems and networks as well as providing information on distance education to encourage prospective students. This partnership enables students to consider their options, study locally including the opportunity for networking with students not only in their home town but also with students enrolled across regional Australia.

PI is planning a Flexible Learning Hub for its Pundulmurra campus in South Hedland to ensure the long term viability of training delivery for the Hedland area and the provision of a contemporary and industry relevant training campus.

Sustainable Communities

Sustainability is the capacity to endure. A sustainable community is one that has diversity and resilience. It does not rely on one industry alone but leverages from the economy’s mix of industries, human capital quality, its natural assets and comparative advantage to become competitive and buoyant. Sustainable communities are inclusive, accessible, healthy and safe with access to a range of employment, housing, cultural, educational and recreational opportunities. In essence, a sustainable community is a place where people want to live and work, now and into the future. The objectives of sustainable communities can be grouped under three key areas:

- Economic sustainability;
- Community vibrancy and diversity; and
- Health and educational access.

Table 6 Sustainable Community Indicators, Pilbara¹⁰³

Area of Focus	Indicator	Pilbara	Nation
Economic Sustainability	Businesses (per 1000 residents)	35.9	89.9
	Unemployment	3.1%	5.2%
	Economic Diversification	0.13%	0.56%
	Occupation Diversification	75.0%	100.0%
	Welfare Dependent Families	9.74%	9.8%
	Industry Diversification	21.1%	42.1%
	Regional Price Index	118.6	100.0*
Community Vibrancy and Diversity	Leadership Capacity	20.0%	34.9%
	Volunteer Activity	14.4%	17.7%
	Aged Residents (65+)	2.1%	14.2%
	Family Households	76.0%	71.5%
Health and Educational Access	Access to Hospital Services (per capita)	0.04	0.11
	Access to GP Services (per capita)	0.023	0.054
	Adult Health	53.5%	55.5%
	Access to Allied Health Services	4.1%	11.0%
	Child Development Vulnerability	48.3%	24.3%
	Distance to Medical Facility	33.9km	38.9km
	Distance to Primary Education Services	37.5km	24km
Distance to Secondary Education Services	92.2km	23.3km	

*Compared to Perth

Table 6 demonstrates there are a number of areas where the Pilbara performs significantly lower than the national average. Bringing the Pilbara closer to the national average will deliver many positive benefits to the region. For example, increased small business numbers and economic diversification will support employment growth. The provision of a greater array of businesses will also importantly improve the liveability of the region and support population growth and retention.

Economic Sustainability

The Pilbara has a strong economic base in the minerals and energy sectors which has sustained high wages and low unemployment in recent times. The mono-economic structure of the economy is however linked heavily to the fortunes of commodity prices set on the international stage. Industry, occupation and overall economic diversification of the Pilbara are well below national averages, as well as comparable mining regions.

Pilbara towns are typically based on production economies, where the majority of the employment is concerned with the direct operation of mining and oil and gas projects, together with the support operations. The employment structures of the region's towns are heavily oriented towards driver/export projects and the associated producer services that support them.

Relying heavily on one industry to support an economy can heighten risk in terms of impact to communities and quality of life for residents if a downturn in that sector occurs and it is not managed well. For example, the impact of fluctuating prices can cause considerable impact on new investments and existing operations, and this has been experienced to a degree with the recent decline in iron ore price. The employment and other economic impacts of mine development in the region are not just those that come directly from the mine development and operation. Businesses that supply services to mining companies, including drilling, surveying, environmental management, construction, transport, human resources and training are also vulnerable.

Community Vibrancy and Diversity

The Pilbara contains a young population, with a high proportion of males of working age and families with young children. The imbalance of males to females and young to old has notable impacts on community development.

For instance, older residents are important contributors to communities as they are often in a better position to contribute to the community due to working less hours, identifying strongly with the local community and having extensive networks built up through years of residency¹⁰⁴. Older residents contribute to both formal and informal volunteer roles such as community service and recreation groups and familial childcare.

The importance of encouraging intergenerational families is especially important for the long-term prosperity of the Pilbara given it is characterized by a high percentage of young families. The lure of high income for young workers (20-40 year olds) engaged in the resources sector reflects this high proportion of children as typically this group spend a large part of their childbearing years in the Pilbara.

Families in the Pilbara face a number of issues. There is a high demand for quality obstetrics and gynaecological services which places pressure on local health services. A further major challenge is the availability of childcare places. Whilst significant investment has been made by the public and private sectors in expanding childcare places there is a need for additional playgroups and childcare places, especially in inland communities, to accommodate a growing, young population¹⁰⁵. Childcare allows the primary care giver the opportunity to re-join the workforce, thus increasing the size of the local labour force without the need for additional housing. Furthermore, it enables the primary care giver to retain and maintain their professional skills and continue to contribute to superannuation. This has direct productivity and cost saving benefits for industry.

Significant investment has been made in sport and recreation infrastructure and amenity over the past five years. Each major population centre in the region has a well-equipped and maintained sports field complex which are irrigated and lit for evening use. Water parks have been funded in Karratha, Onslow and South Hedland. Multi-purpose indoor recreation centres have also recently been built under the Pilbara Cities Vision in Karratha, Onslow and South Hedland and a number of public open space and beautification projects have improved the quality and access to recreational amenities in major towns. These investments provide important mediums for community engagement and social interaction. Organised sport and recreation activities provide an important mechanism to engage the region's youth population and provide positive role models and lifestyle and leadership skills. Further investment is however required to expand and diversify currently limited recreation and leisure options. For instance, communities have a lack of community services to cater and attract a broader range of people to the area (e.g. theatre and art galleries).

The Pilbara has a rich cultural history. The region is home to over 31 distinct Aboriginal language groups and several cultural hubs and art centres, including Martumili and the Roebourne Art Group. The Pilbara's Aboriginal cultural assets and resources is exemplified by the unique artwork of the region's Aboriginal artisans which have a growing international prominence.

Development of cultural and heritage infrastructure particularly around maritime and industrial history and rehabilitation and restoration of key original settlements and current cultural hubs such as Cossack and Roebourne provide a number of opportunities to further develop and highlight the region's unique living cultures.

Case Study: Community Sporting, Recreational and Cultural facilities
Regional Pillar: Health and Wellbeing

Under the Pilbara Cities initiative, a key focus of State Government has been to provide high level, contemporary community facilities to create Pilbara towns that people are keen to make their long term home to support targeted growth in the regional population. Significant government funding together with strong support from the resources sector has realised significant transformation of community amenity in Pilbara towns.

The \$65m Karratha Leisureplex was opened on 1 July 2013, signifying a new era in community amenity for the region. Funded by the State Government's Royalties for Regions Pilbara Cities initiative and Country Local Government Fund, the Australian Government's Regional Development Australia Fund, the Department of Education, LandCorp, Lotterywest, Finbar Group Limited, Woodside, Rio Tinto and the City of Karratha the Leisureplex has been instrumental in Karratha's transformation to a major regional city. The Leisureplex offers a range of recreation and leisure facilities including swimming pools, gymnasium, indoor and outdoor multipurpose courts, function and meeting rooms, offices, Café, crèche, mini-golf and BBQ areas.

Since opening, the Karratha Leisureplex has shown a 64% increase in attendance for aquatic facilities, a 194% increase for group fitness class attendance and 226% increase in gym attendance and recorded more than 350,000 visits throughout its first year. The Karratha Leisureplex is an outstanding example of what can be achieved through a multi-agency, cross sectorial, collaborative planning and partnership approach. The quality and success of the Leisureplex is further evidenced through the number of Awards it has received.

The \$35.3m Wanangkura Stadium in South Hedland was opened in July 2012 and is a 4,500m² stadium featuring a 400-seat indoor stadium with the capacity to host sporting, cultural and social events. The Stadium features include internal multi use court and external netball and basketball courts, gym and fitness rooms, squash courts, kiosk facilities, crèche, club change rooms and an international standard indoor stadium. The Stadium was funded under the State Government's Royalties for Regions program and BHP Billiton with further contributions from local businesses and government organisations.

The Stadium provides the local sporting community with a sense of place and identity and in addition to its practicality it has been acclaimed for its architectural beauty. It is one of many public/private partnership projects in Port Hedland aimed at providing high-quality community facilities as part of the Town of Port Hedland's growth into Pilbara's Port City.

The East Pilbara Arts Centre is being developed in response to the needs and aspirations of Newman's diverse and growing population for more community infrastructure, multipurpose hubs, affordable space and public art and to accommodate the continued and growing success of the Shire of East Pilbara's Martumili Artists program. The total cost of the Centre is \$8m and is being funded by the State Government through the Royalties for Regions Pilbara Cities initiative and BHP Billiton.

The East Pilbara Arts Centre is a contemporary design that will contribute positively to the built form of the Newman townsite whilst promoting sustainable design and construction elements. The Centre incorporates a range of community facilities and features including events space, meeting rooms, commercial kitchen and office accommodation. The Martumili Artists program which is realising significant national and international acclaim will benefit from larger and more appropriate gallery and retail spaces and artists' studios and workshop areas. The new civic building is another example of Newman's transformation into a mature sub regional centre within the Pilbara region and will not only service local residents but also be an attraction for tourists to the town, generating new employment and economic opportunities.

Health and Education Access

According to the *Pilbara Education Study* commissioned by the Pilbara Development Commission in 2011, access to quality education and training across all sectors is regularly identified as critically important in attracting and retaining people in the region. Surveys undertaken by the region's four local governments and other stakeholders have identified access to quality education as one of the main reasons why many people are reluctant to move to and remain in the region.

Whilst the quality of education is considered to be at a reasonable level, there is a prevailing view that education in the metropolitan area and other large regional centres is of a higher quality, with greater choice and opportunities than in the Pilbara. The data in Table 4 seems to suggest that the education outcomes in the Pilbara are not as good as the rest of the nation.

Similarly with health services, perceptions around the quality and range of health services available in the region have been identified as a challenge to attracting and retaining people in the region. It is also an inhibitor to attracting and retaining resident senior populations. Health outcomes in the region are also a major concern, in particular the significantly higher rates of child development vulnerability in the region. Moreover, remote communities do not have the population threshold to support improved provision of health services.

Although the Western Australian State Government has overseen significant investment in renewal of education and health infrastructure in the region over the past four years, attracting and retaining doctors, teachers and other professionals in regional towns is a major challenge for government and the communities.

There has also historically been a range of programs and activities funded by the private and community sectors to improve the delivery of education and health in the Pilbara and enhance its outcomes and pathways. However, many have been undertaken in individual towns or schools through individual stakeholder arrangements and not as part of an integrated sector-wide plan.

Disability care availability is limited however the National Disability Scheme is expected to approximately treble the government funding available to provide services to help people who have a significant and permanent disability and who need assistance with every day activities.

Case Study: Improved Health Services
Regional Pillar: Health and Wellbeing

High quality and equitable health services, programs and facilities are fundamental to growing prosperity and well-being in communities and critical in supporting the aim of the Pilbara Cities initiative to make the Pilbara an attractive place to live and work. Through the Royalties for Regions program, the State Government continues to make substantial investments into health services in the Pilbara to improve primary and emergency care and Aboriginal health and to provide high functioning hospital services across the region.

In 2010, the state of the art \$138m Hedland Health Campus (HHC) opened its doors to patients and was at the time the most contemporary regional hospital in Australia. Built on the perimeter of the South Hedland CBD and adjacent to the Karlarra House Residential Aged Care facility, the HHC brings together an array of primary and allied health related services which were previously spread over a number of sites in South and Port Hedland. The HHC was the original pilot project for the regional health care hubs initiative, with further health campuses planned for roll out across regional Western Australia, including in Karratha.

The HHC is a modern, purpose-built facility, providing a range of inpatient and outpatient facilities and primary health services including 24 hour emergency department, operating suite with two theatres, day surgery, inpatient beds, special care nursery, dedicated ward areas for medical/surgical, obstetrics and paediatrics and high dependency unit, renal dialysis and consultation facilities for primary health and mental health, drug and alcohol services, outpatient and allied health services such as child health, physiotherapy, occupational therapy, speech pathology and home nursing services, visiting specialist services such as adult and paediatric cardiology, echo cardiology, ear nose and throat, ophthalmology, orthopaedics, podiatry, nephrology, respiratory medicine, rheumatology, urology, obstetrics and gynaecology, paediatrics and anaesthetics.

Following on from the success of the HHC, in 2012, the State Government committed to the largest ever investment in health infrastructure in country Western Australia through the announcement of the development of the \$208m Karratha Health Campus (KHC). The KHC will provide primary health care services to residents of the City of Karratha as well as acting as a hub to smaller communities such as Roebourne, Wickham, Tom Price, Onslow and Paraburdoo. Work commenced on the new facility in 2014 which will be located in the Karratha CBD and largely funded under the Royalties for Regions Pilbara Cities initiative.

The KHC will replace the ageing Nickol Bay Hospital and include an expanded emergency department, a CT scanner, a surgical centre, delivery suites and maternity wing, expanded outpatients and essential services such as child health and medical imaging, all under one roof. Featuring future on-site patient and visitor accommodation, the KHC will bring together a range of services such as mental, allied and community health services under an integrated model of care.

Connectivity

Access and connection with global markets is critical to the growth of business, employment, incomes and the broader economy. Trade with other locations within the state, nation and around the world is the most effective way for a region to exploit its comparative advantages and competitiveness to generate prosperity for local residents.

Access to markets comprises both physical access, including through efficient transport infrastructure, as well as business relationships and networks including trading partners, clients and labour. Improving access to markets broadens trade, allows competitive industries to grow and can increase the availability of goods and services.

Broadly, connectivity to global markets can take a number of forms, for instance ports, airports, personal connections and broadband communication. The Blueprint has assessed the level of connectivity of the region to identify relative strengths and weaknesses of three key areas:

- Digital connectivity;
- Movement of people; and
- Freight infrastructure access and capacity.

Table 7 Connectivity Indicators, Pilbara¹⁰⁶

Area of Focus	Indicator	Pilbara	Nation
Digital Connectivity	Broadband Connections	74.7%	62.5%
	Mobile Coverage	38.0%	80.0%
	Mobile Internet	260.0%	310.0%
	Internet Connectivity	82.9%	79.0%
Movement of People	Airport RPT Usage (per capita)	27.6	6.3
	Overseas Born Residents	38.5%	30.2%
	Population Turnover	159.9%	46.2%
	Airport Access	41km	79.7km
	International Merchandise Exports (per capita)	\$1.48m	\$0.012m
Freight Infrastructure Access & Capacity	Port Access	108.1km	141.6km
	Road Infrastructure	17.9km	19.4km
	Rail Infrastructure	29.0km	35.6km

Digital Connectivity

Telecommunications services for households and businesses in the region are generally of a lower standard than in urban locations in the south west of the state. Universal access to high speed broadband is also lacking in the region. Broadband access is problematic away from the major towns, with slower and less reliable satellite broadband often the only alternative. Resource companies close to the optic fibre cable that passes through the region have good access to capacity for data and telephony, but at remote sites capacity is limited.

Case Study: Regional Mobile Communications
Regional Pillar: Innovation and Advanced Technology

The Regional Mobile Communications Project (RMCP) is a successful state-wide initiative that has extended mobile coverage along key transportation routes and in regional communities, expanding mobile phone coverage by up to 22 percent of the Western Australian land mass.

Within the Pilbara, it has extended coverage along the North West Coastal and Great Northern Highways, providing almost unbroken and continuous mobile coverage along these key transportation routes. The project has delivered terrestrial mobile, voice and high speed wireless data broadband that will enhance convenience for people living, working and holidaying in regional WA; make available a self-sustainable, affordable wireless broadband and mobile telecommunications service across vast distances along major transport corridors to regional Western Australian communities and towns and support public safety. The delivery of extended coverage in the Pilbara is also seen as a critical resource for Emergency Services agencies including Fire and Emergency Services and WA Police Service who are often required to respond to accidents and emergencies requiring urgent medical intervention in very remote locations.

The poor quality of mobile phone network coverage has similarly long been a problem in the region. Mobile phone coverage is being progressively addressed however through Royalty for Regions funding under the Regional Mobile Communications Project (RMCP), which is boosting mobile phone coverage through additional relay towers in the region.

Improvements to broadband capacity through the rollout of a new sub-sea telecommunications cable in 2015 and delivery of the National Broadband Network (NBN) by 2016 will stimulate productivity and new enterprise and learning capabilities. Coupled with ongoing improvements to mobile phone coverage and digital telecommunications applications through the Pilbara Digital Flagship Project there is expected to be a dramatic improvement in the function, access and reliability of telecommunications services in the region.

Case Study: Fibre Optic Cable Investments
Regional Pillar: Innovation and Advanced Technology

The private sector is investigating a number of proposals that would expand the optic fibre footprint in the Pilbara. These proposals involve the construction of new fibre optic cable linking the Pilbara to Singapore, Darwin and Perth, targeting to service the resources extraction industry, including off shore projects.

Separately, the State Government is also evaluating the feasibility of an inland fibre optic cable connecting the Pilbara to Kalgoorlie via the Midwest region. The Department of Regional Development is coordinating the feasibility in conjunction with the Pilbara, the Midwest and the Goldfields-Esperance Development Commissions. A number of data centres are also being proposed. These expanded digital infrastructures will improve the Pilbara's connectivity nationally and internationally, augmenting the government's investment through the National Broadband Network.

Movement of People

The Pilbara is serviced by four main public airports located at Karratha, Port Hedland, Newman and Paraburdoo (there is a small airport at Onslow and Solomon Hub), three airports associated with resource operations located at Barrow Island, Telfer and Coondewanna and numerous smaller airstrips. Karratha, Port Hedland and Newman have the capacity to accommodate Code 4C (B737/A320) jets but none can yet adequately accommodate large wide-body jets (B767, A330). Port Hedland operates as the region's international airport, although Karratha is currently refurbishing its terminal to gain international capability.

Throughput passenger traffic has increased significantly over the past five years at all airports, especially Karratha, particularly as a result of FIFO traffic associated with construction activity in the mining sector. Karratha is Western Australia's second largest airport for passenger movements with over 850,000-passengers each year. Recent increases in the number of carriers operating in the region and increased connectivity between the region's airports and other Australian population centres on the eastern seaboard will likely see air passenger movement in the region increase.

The *Western Australian State Aviation Strategy* recognises that regional airports in the Pilbara are critical to the efficiency of the resources industry and to regional growth. Pilbara airports have been identified as potential beneficiaries of runway extension and expanded aprons and taxiways capacity to accommodate for wide-bodied flights from the east coast and, potentially, more international destinations.

As with other transport infrastructure in the region, the ability to cater for increasing demand and utilisation of air transport remains a challenge. Providing better intra-regional connectivity, increasing the capacity of Karratha and Port Hedland airports to receive larger, bulk carrying aircraft and increasing the number of international flights and connections with Asia, which is currently limited to Bali in Indonesia, would markedly improve the effectiveness and efficiency of air transport networks. It would also provide a viable means for the movement of goods and people intra- and inter-regionally and internationally, particularly as a means of exporting high value agricultural perishable produce that requires rapid transit to destination.

Freight Infrastructure

The Pilbara has a considerable network of freight infrastructure which supports the largest and most sophisticated bulk exports program in the world. The three major ports at Port Hedland, Cape Lambert and Dampier are supported by numerous marine facilities and offshore petroleum terminals. In addition there are number of ports in various stages of development and should they proceed will add to the region's export capacity.

Port Hedland is Australia's largest port by annual throughput and the largest bulk export port in the world. Iron ore, mainly mined by BHP Billiton and Fortescue Metals Group, dominates exported goods at 364 million tonnes (Mt) in 2013/14. Exports of salt, manganese, copper and chromite are noteworthy and although livestock and general/containerised cargo also exported from this terminal, it represented less than 2,000 and 4,000 tonnes respectively in 2013/14. The vast majority of imports are fuel and oils, representing just 1.7Mt in 2013/14.

The region's second largest port at Dampier, recorded an overall throughput of 177Mt in 2013/14. The Port of Dampier is the heart of a logistics network that extends 350 kilometres inland to the iron ore deposits of the Pilbara and 200 kilometres seaward to the oil and gas fields of the North West Shelf. The principle exports from the Dampier Port are iron ore, energy based exports (e.g. LNG, liquefied petroleum gas (LPG) and condensate), nitrates and salt. Dampier's port facilities include some production and logistic operations such as Rio Tinto iron ore exports, Dampier Salt exports, Woodside Energy's Karratha Gas Plant and Woodside

Energy's Pluto Gas Plant. A floating deck is currently under construction which aims to facilitate the importation of large, modular and containerised cargo, as well as opening up the area for direct shipment and commercial opportunities for the Port and local community.

RTIO's Cape Lambert port facility, Port Walcott, is Australia's third largest iron ore port. The port processes and exports iron ore from its mining operations and joint venture companies. Iron ore exports from Cape Lambert rose 42% to 111 million tonnes in 2013-14.

The immense scale of trade growth, through the expansion in iron ore mining and natural gas production and increasing cargo imports, has necessitated expansions at existing Pilbara ports and the development of greenfield ports. The Pilbara Port Authority has been created to oversee significant growth at Port Hedland, Dampier, Cape Lambert, Cape Preston, Onslow and potentially a new multi-user port at Anketell. Anketell is planned as the future site for a multi-user, deep-water port in the Pilbara region, capable of expanding to at least 350 million tonnes per annum, with the potential to relieve pressure on existing port infrastructure and provide additional capacity for non-mining exports.

Ashburton North Strategic Industrial Area at Onslow is planned as the future site for a hydrocarbon and general cargo port in the Pilbara. It is expected that the site will have an ultimate export capacity of up to 50 million tonnes of liquefied natural gas per annum

The region has seen considerable development of the road network in recent decades to support the freight movement of goods and produce from the mines and communities in the inland areas of the region where most major iron ore mines are located. Although the bulk of the mining produce is transported by rail, there is still a substantial road transport load for some mining outputs and almost all mining inputs. Significant sections of the road network are now sufficiently old that there is the need for continuing maintenance and rehabilitation. Further expansion of the resource industry in the eastern Pilbara will require the upgrading of inland roads in that part of the region.

Pastoral leases cover one third of the Pilbara and accordingly the industry is reliant on road transport for transport of livestock to abattoirs and ports. Historically up to half of the road transport of livestock each year is to the port of Port Hedland. The remainder of the livestock transported by road travels to Perth along North West Coastal Highway and Great Northern Highway.

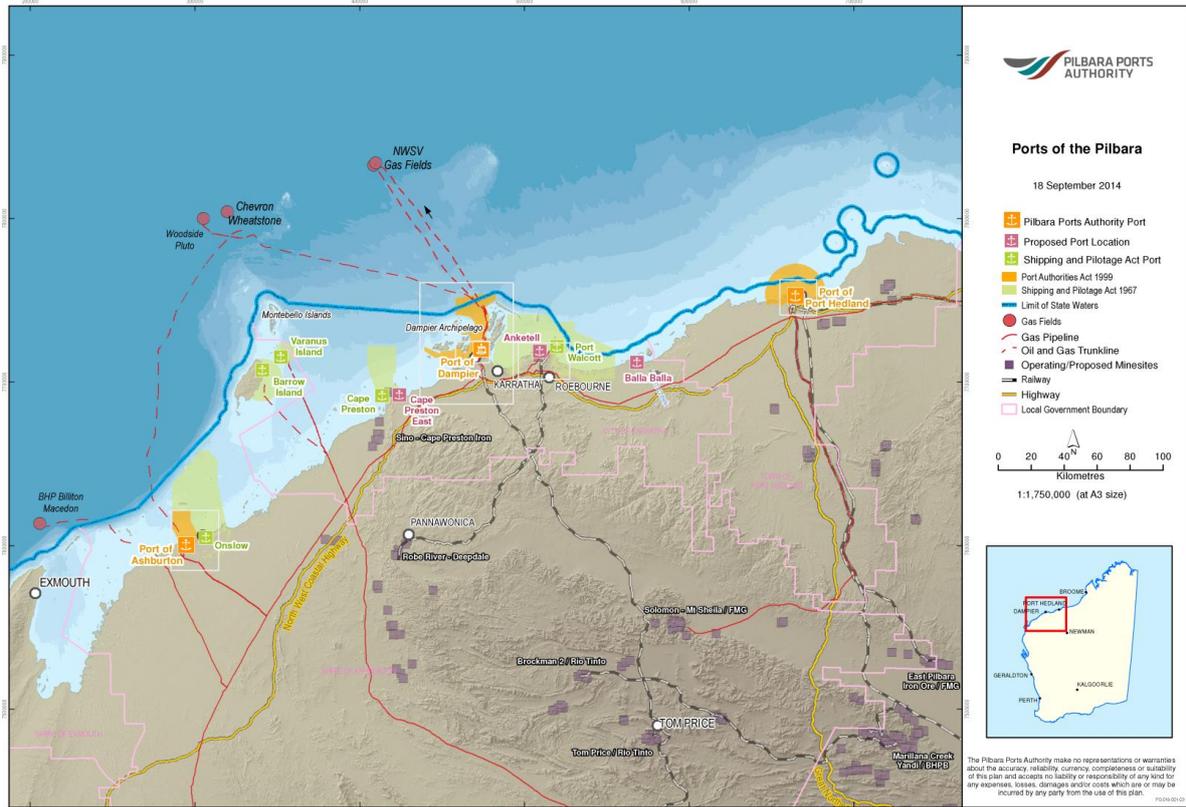
The Western Australian State Government *Regional Freight Network Plan* anticipates a significant increase in freight movement in the Pilbara along North West Coastal Highway, Marble Bar Road, the Karratha-Tom Price Road and the Nanutarra-Munjina Road, as cargo is moved from port to new processing plants and industrial estates along the coast, or to the expanding network of mines located inland.

The rail network in the Pilbara is privately owned comprising approximately 1,525km of rail on the four main lines of Hamersley and Robe River railway (RTIO), Mount Newman railway (BHPB), Goldsworthy railway (BHPB) and Fortescue railway (FMG). Due to the private ownership nature of rail in the region, potential investors without sufficient capital to develop new railways are deterred from the region.

There are a number of challenges in relation to the efficient operation of rail networks in the region including achieving multi-user access to rail infrastructure, reducing the impacts on road traffic at grade crossings caused by frequent and longer iron ore trains and preventing port access bottlenecks caused by convergence on multiple rail networks at port. In Port Hedland the recently opened Great Northern Highway Realignment and Wallwork Road Bridge has alleviated many of the delays experienced by the intersection of road and rail.

The Western Australian State Government advocates for common use infrastructure in the region but there is no deliberate strategy – such as employing of State Agreements - to bring about this outcome. There is also no strategy in place which considers the future of mining related infrastructure – roads, rail, airports, power, energy and telecommunications - post-mining operations.

Figure 33 Port Locations, Pilbara¹⁰⁷



Business Competitiveness

Countries, regions, communities and organisations must become more competitive if they are to maintain their economic position and respond to challenges such as perceived productivity gaps, competition for mobile investment, rapid adoption of new technology and electronic commerce.

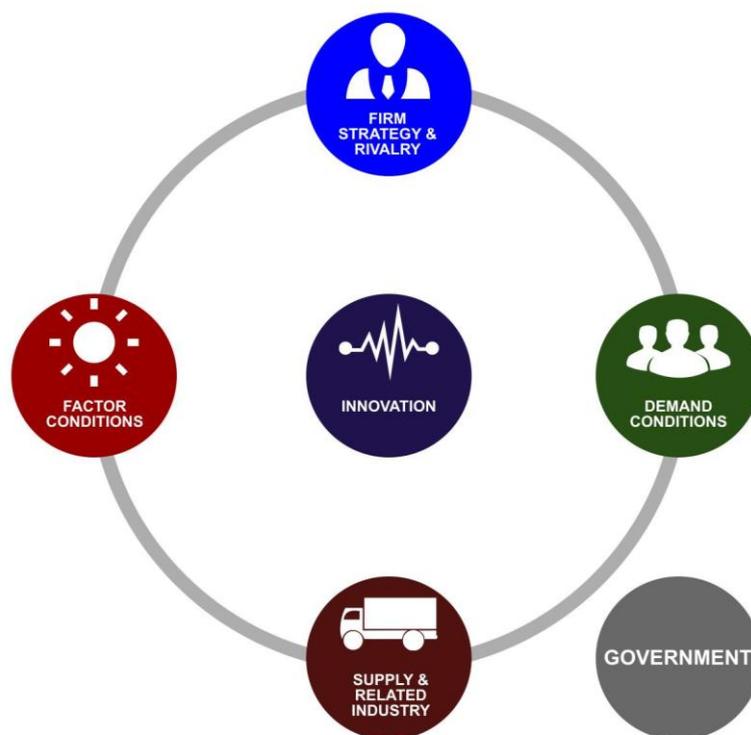
The Organisation for Economic Co-operation and Development (OECD) defines a competitive region as one that can attract and maintain successful firms and maintain or increase standards of living for the region's inhabitants. This means that skilled labour and investment will gravitate away from uncompetitive regions towards more competitive ones.

Diamond Model Assessment

The competitiveness of a region can be readily assessed through the application of Porter's Diamond Model of Competitive Advantage. Developed by Michael Porter in his book, *The Competitive Advantage of Nations*, the Diamond Model represents a form of economic SWOT analysis. The Diamond Model was originally developed to analyse competitiveness at a national level but has since been widely applied to regions and industry clusters.

Adjustments have been made to this model to reflect the assessment of a region, rather than a nation or organisation. This adjusted model is illustrated in the following diagram.

Figure 34 Adjusted Porter's Diamond



The adjusted Diamond Model applied in this Blueprint is comprised of five core, interrelated determinants of regional competitiveness:

Factor Conditions – refers to the factors of production such as land, climate/environment, resources, labour and infrastructure and their relative quality, accessibility and suitability;

Demand Conditions – refers to the state of the market for the goods and services. Strong markets with sophisticated and quality focused consumers provide businesses with incentive to innovate and grow into exporting firms while access to enabling infrastructure (e.g. ports, airports, roads) provides businesses with access to regional and international markets;

Related and Supporting Industries – refers to the depth and diversity of businesses that input into the supply chain of the principal activity. Can include direct inputs to production as well as activities that enhance business performance and operation (e.g. a high amenity location that supports the attraction and retention of skilled labour);

Firm Strategy, Structure and Rivalry – represents the impact of local competition on propensity of businesses to innovate and the suitability of their strategies and corporate structures to facilitate this innovation; and

Innovation – includes core facilities, technologies, processes and services that support innovation by industry such as proximity to research and development capacity (like a university), access to quality telecommunications technology and the emergence of new business models (such as ecommerce, crowd sourced financing and cloud computing).

Government also plays an important role in supporting and facilitating the economic competitiveness of a region.

The results of the competitiveness assessment for the Pilbara are outlined in the following table.

Table 8 Business Competitiveness Summary, Pilbara

	Advantages	Challenges
Factor Conditions	<ul style="list-style-type: none"> Expansive geography and underutilised land Ocean, islands and coastal land Large and developed port infrastructure Multiple regional airports High number of hours of sunlight per day Spare capacity for urban water and waste (approx. 10-15 years) Mine de-water and underground water availability associated with quality soils suitable for agriculture Globally significant iron ore deposits and petroleum resources Proximity to major South East Asian markets Extensive transport infrastructure 	<ul style="list-style-type: none"> Limited capacity for new operations to access existing rail and port infrastructure Limited freehold land availability Lack of inbound shipping facilities Commercial property affordability Weather challenges Low average rainfall Capturing and storage of water

	Advantages	Challenges
Demand Conditions	<p>Strong presence of large mining corporations and associated expenditure</p> <p>High incomes and wages and resident purchasing power</p> <p>High levels of inter-regional and inter-state travellers to the region</p> <p>Established export relationship with rapidly growing global markets</p>	<p>Small residential population and workforce</p> <p>Low levels of population retention, particularly during mature family and retiree stages of household lifecycle</p> <p>Above average cost of living and cost of doing business</p> <p>High levels of competition for skilled workers</p> <p>Cyclical/project-based demand</p>
Related & Supporting Industries	<p>Robust construction and transport and logistics sectors</p> <p>Presence of first and second tier mining support firms and businesses</p>	<p>Local professional services sectors</p> <p>Café, restaurant and food and beverage availability, particular after hours</p> <p>Short-stay accommodation capacity and affordability</p> <p>Foreshore or public realm amenities in many locations</p> <p>Reliance on imported skills and labour from other regions/States</p>
Firm Strategy, Structure & Rivalry	<p>Strong local, state and federal government structure</p> <p>Strong presence of major national and international businesses</p>	<p>Ability to finance infrastructure and commercial enterprise investments (general payback period of 10 years, 20% min deposit)</p> <p>Complicated native title processes and constrained arrangements of use</p> <p>Insurance costs</p> <p>Below average numbers of small local businesses</p>
Innovation	<p>Research and innovation levels high in mining sector</p> <p>Strong reliance on machinery, equipment and technology in major sectors</p> <p>Health and education services have some tele-service delivery</p>	<p>No research organisation and/or university campus presence</p> <p>Significantly underrepresented research and development professionals</p> <p>Few technology-related local businesses</p>

6.0 Comparative Advantages

The growth and development of Pilbara will be driven by leveraging off its comparative advantages. The Pilbara's comparative advantages are determined by the region's location, natural resource endowment, settlement pattern and industrial advances.

Geographical Proximity to Asia

The Pilbara sits on the doorstep of Asia, with both Karratha and Port Hedland less than 3000km and four hours by air from Singapore and less than three hours from Jakarta. WA also shares the same time zone with China and large parts of East Asia. The region has well-established sea and air connectivity with Asia.

The region's geographical proximity to Asia has to date advantaged the trade of minerals but there are considerably more opportunities that could be developed to capitalise on the established bilateral relationships and growing international profile of the region.

Other industries have the potential to exploit this advantage of location to provide new products to growing Asian markets. The Pilbara is already an international gateway for trade. If ports, airports and road transport capacity can be improved and expanded, other industries such as agriculture and tourism have the opportunity to benefit from the region's geographical proximity to Asia.

Natural Environment and Resources

A range of regional competitive advantages come from the Pilbara's natural environment:

- **Mineral wealth** – the Pilbara has significant deposits of offshore petroleum and natural gas, iron ore, nickel, copper, manganese, gold, rare earths and uranium. Recently coal has also been discovered.
- **Sunlight** – the Pilbara averages 11 hours of sunlight a day with some the highest levels of solar radiation on the planet. Agriculture, algae, and solar based energy systems can potentially achieve production levels higher than almost anywhere in the world.
- **Vast underground potable water** – mining activity currently disturbs close to 180 GL's of water annually. Much of this water is disposed of into creek systems with ecosystems established for seasonal, random flood events not permanent water ways. This water has the opportunity to grow fodder for the beef industry and for food production.
- **Rich soils** – many areas are highly suited to agriculture.
- **Geothermal Energy** – the Pilbara has a number of locations where geothermal energy is accessible.
- **Natural beauty** – the Dampier Archipelago is a marine paradise of 42 islands and extending north and south 80 Mile Beach adjoining the renowned Kimberly attractions and south to 40 Mile beaches and connecting to Exmouth and the Ningaloo: four National Parks, Karlamilyi, Karijini, Millstream – Chichester and Murujuga, boasting extraordinarily beautiful and unique landscapes from the oldest rocks on the planet and oldest fossilised life forms to the largest and prolific collection of petro glyptic art in the world, from desert to overground aquifers and springs to the ocean. These natural assets and others are largely undeveloped for tourism.
- **Ocean and coastal land** – The Indian Ocean laps at the shores of the Pilbara coast, with tides of up to 6 metres, and vast areas of coastal land.

Case Study: Algal production in the Pilbara
Regional Pillar: Agriculture and Aquaculture

Aurora Algae utilised a pre-existing algae farm near Karratha as a working laboratory to prove the science and technology of growing algae. The farm had previously been used for the production of pharmaceutical grade beta-carotene. The test facility allowed the company to establish new and innovative growth, harvest and processing methods which will enable future commercial operations.

Aurora Algae demonstrated the ability to capture 100% of the product for four main crops: pharmaceuticals (eg Omega-3), Health Foods and Beverages (protein shakes and bars), Fish Feed (natural food for fish farming) and Renewable Energy/Fuels (variety of energy applications including transport). The project demonstrated that the Pilbara's characteristics of abundant solar energy, low lying arid land, seawater and nearby industries with significant carbon by-product has the potential to create the perfect environment for prodigious algal growth and production as an economic diversification opportunity for the region.

Location of Major Industrial Activity

Arguably the most evident regional comparative advantage emanating from the Pilbara is the established presence of major industrial activity focused on natural resource extraction. The presence of multi-billion dollar resource extraction activity naturally generates synergistic development and supply opportunities through the demand for goods and services, maintenance and operation capacity and the viability of downstream processing utilizing natural resources and extraction by-products.

Bi-products from the resource sector produced by local industry such as carbon dioxide can be essential inputs into other industries such as algal farming and other emerging bio-fuel opportunities.

The Maitland and Boodarie Estates together with the Explosives Reserve Port Hedland are three of the limited sites in Australia zoned to accommodate heavy industry unsuited to more populated areas. Ports in the Pilbara are among the highest tonnage bulk export ports in the world and have potential for intermodal transport functions with Port Hedland already having, and Karratha building, an international airport which can accommodate freight movement. The region is also home to major ground transport routes commonly used for some of the largest freight movements in the Australia.

Aboriginal Culture and Heritage

The Pilbara has a unique Aboriginal culture and heritage with the region's Aboriginal peoples maintaining over 40,000 years of continuous connection to country in the region. The Burrup Peninsula and surrounding Dampier Archipelago have the highest concentration of rock art in the world. Associated with the art is a rich archaeological record, including campsites, quarries, shell middens and stone features.

The region is home to over 31 distinct language groups and several cultural hubs and art centres including Martumilli and the Roebourne Art Group. The Pilbara's Aboriginal cultural assets has a growing international prominence and has the potential to develop markets for lifestyle and adventure tourism.

The region's rich Aboriginal culture could provide new opportunities in tourism, commercial art plus the documentation and application of Aboriginal natural resource management knowledge.

Export Infrastructure

The Pilbara enjoys strong access to markets and is a globally recognised export hub. This includes physical access through ports and airports, as well as business relationships and networks including trading partners, clients and labour.

The Pilbara has a considerable network of freight infrastructure which supports one the largest and most sophisticated bulk exports program in the world. The three major ports at Port Hedland, Cape Lambert and Dampier are supported by numerous marine facilities and offshore petroleum terminals. In addition there are number of ports in various stages of development and should they proceed will add to the region's export capacity.

The region also has a considerable road network supporting the freight movement of goods and produce from the mines and communities in the inland areas of the region where most major iron ore mines are located.

Unlike other regions with limited export infrastructure, new industries are able to leverage off significant investment that has already occurred in the region. This will broaden trade and allow the region to grow and diversify.

Political Stability

Across the globe, unfavourable economic and social conditions have led to social and political unrest and the risk that this instability will last for years to come. The Economist Intelligent Unit's measure of social unrest indicated that 65 of the 150 countries analysed are at either a high or very high risk of social unrest. Compared with five years ago, 19 more countries are now in the high-risk categories. This has important implications on economic conditions, business operating environments and social cohesion.

At the other end of the spectrum, at a national level Australia is one of six countries not considered to be vulnerable to social unrest. It also has low sovereign risk and a regulatory environment relatively conducive to business operation. Western Australia and the Pilbara are also politically stable, with favourable global profiles.

A Unique Combination

Inherent within the comparative advantages listed is the fact that many of them can be combined to create a unique set of imperatives for the establishment of new industries that few, if any other regions anywhere in the world can compete with to the same degree.

The unique advantages give the Pilbara a strong global competitive edge to attract new types of industries, as well as support the expansion of existing businesses.

7.0 Pilbara Vision

Pilbara @ 2050

In 2050 what could the Pilbara be contributing to the global economy? How will the people of the Pilbara be living and, most importantly, what transformational changes are required now and over the short and medium term to ensure that the Pilbara achieves its potential for growth and prosperity?

The Pilbara Regional Blueprint seeks to answer some of those key questions but to begin we must cast our minds into the future, to 2050, and ask, what could the Pilbara look like?

In a world of over 9 billion people, where the global economic and military power has shifted, new unknown technologies exist and climate change has altered global weather, what place will the Pilbara take on the world stage?

On a global scale the Pilbara is known today as a remote, sparsely populated, even hostile, slice of north Western Australia, generally considered attractive only for its highly sought after mineral and energy deposits. A global mining hotspot, the Pilbara, while being described as Australia's economic powerhouse, is known outside the region, for little else.

So, in 2050, imagine two vibrant modern cities, Karratha and Port Hedland, where children enjoy high standards of education, there are diversified economies with career choice, affordable living, arts, culture, strong sporting networks and recreational facilities. Newman is a third major regional centre and these support growing towns of Marble Bar, Tom Price, Paraburdoo and Onslow. The Pilbara boasts a population of close to 200,000 people with 150,000 of these likely to be located in Karratha and Port Hedland.

Families are afforded educational choice of equivalent standard to metropolitan centres. Tertiary education offers choice in higher education to local people and centres of excellence specialise in post graduate research across a broad range of fields.

Aboriginal people contribute and share in the region's prosperity and are actively engaged in the community. They have educational and career choice while maintaining strong links to culture.

Residents are engaged with their community participating in numerous arts, cultural, sporting and recreational activities. People are proud to call the Pilbara home. Normalised housing costs and aged care options have ended the necessity for people to leave the region post retirement and inter-generational residents are now common.

Two international airports provide daily direct links with major Asian trading partners and recreational visitors sit side by side with business travellers.

Mining resources and energy extraction and processing continues to be a major source of employment but the regions industrial estates are also thriving with manufacturing and downstream processing and renewable energies are reducing our environmental footprint and carbon emissions.

Use of water from mining activity and underground sources has developed the beef industry from seasonal to year round production. There is a thriving cattle backgrounding industry and an internationally competitive abattoir. Additionally, the region grows premium fruits and vegetables for local and regional markets and the

region exports directly into Asian markets crying out for safe, premium, clean, green produce. A wide range of fish and crustaceans are also exported from on and off-shore aquaculture ventures.

The road networks have connected the Pilbara's inland centres and improved linkages with the Northern Territory and eastern states. General cargo ports have expanded allowing the Pilbara to export a greater range of products than ever before.

Based on this future, the Vision for the Pilbara is:

"In 2050, the Pilbara will have 200,000 citizens living in vibrant, modern and inclusive cities and communities which offer quality services, career choice, affordable living and a thriving civic life. The economy will feature diverse, innovative and resilient local and international firms underpinned by the resources and energy industries."

Achieving this Vision is critical to ensuring the economic, social and environmental potential of the Pilbara is realised and appropriate investment, from both public and private sectors is attracted.

Aspirational Population Targets

Benefits and Challenges of Growth

The Pilbara region, and its major centres and towns, currently lacks a critical mass of residents. Such a critical mass is essential to realising the economic, social and environmental potential of the region. Greater residential population size provides a range of benefits for a region, such as:

- Improved viability of community facilities and services;
- Increased size and diversity of the local labour force and skills base;
- Increased size of markets for local retailers and businesses; and
- Deepening local housing and property market demand.

Population growth should never be pursued simply for the sake of growth itself. A region can experience unintended impacts and outcomes from rapid population growth if it's not pursued in a strategic and effective manner. This can include rising cost of living, reduced amenity and quality of life, poor access to essential services and declining population retention and attraction. Instead, a balance must be continually struck between economic, social and environmental sustainability if the quality of living and prosperity of residents and businesses is to be maintained and enhanced.

Growth Scenarios

The historical profile of the Pilbara population has been characterised by periods of rapid growth, interspersed by periods of stagnation and occasionally decline. This has mirrored the dynamics of the mining sectors, reflecting the fact that employment-based migration has been the primary driver of regional population growth over the past two decades. The continuation of this historical population growth trend in the Pilbara, in the absence of any intervention by Government, would likely see the Pilbara home to approximately 140,000 residents by 2050. This "business as usual" scenario assumes that the mining and energy sectors remain the only driver of regional population growth and that there are no significant technological advancements which

discourage the need for having a local workforce. Under this scenario the Pilbara will likely experience periods of volatility and uncertainty, limited economic diversity, structurally high costs of living, and high levels of FIFO workforce movement patterns, particularly during construction cycles. This is not regarded as a desirable outcome for the Pilbara's future.

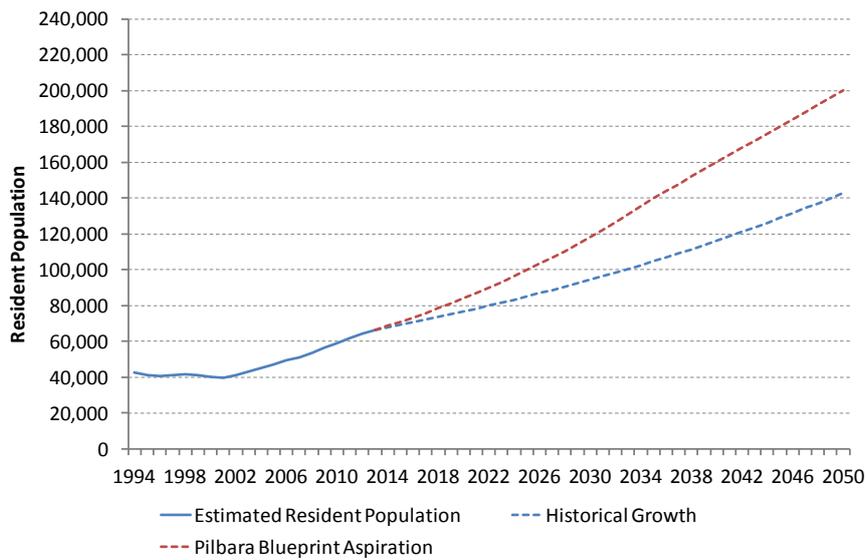
The Pilbara Cities initiative represented a major intervention by the State Government in the future growth profile of the regional population. The Pilbara Cities Vision explicitly established an aspirational target for the residential populations of towns and cities in the Pilbara.

The Pilbara Cities Vision is to build the population of Karratha and Port Hedland into cities of 50,000 people, and Newman to 15,000 people by 2035, with other Pilbara towns growing into more attractive, sustainable local communities.

Across the Pilbara, this is expected to equate to a total residential population of 140,000 by 2035, or some 15 years sooner than under the business as usual scenario. This reflects the significant recent investment, both directly by Government as well as leveraged private sector expenditure, on improvements in the residential amenity, liveability, cost of living and prosperity of the region's major centres. However, maintaining this growth rate beyond 2035 will require extending the focus of public and private investments from liveability to economic diversification and employment generation. The Pilbara Cities Economic Diversification Framework established a series of high level guidelines to support this diversification, supported by the allocation of \$30 million in Royalties for Regions funding over three years. This Blueprint builds upon this investment to establish a strategy to sustain the target growth rate under Pilbara Cities beyond 2035 into the long-term.

Based on this, the Blueprint establishes an aspirational residential population target for the Pilbara region of 200,000. Analysis of the population growth rates required to achieve this target allow for a slight slowing of the rate of growth (3.0% per annum) in the Pilbara post 2035, as the size of the base gets larger. If the rate to 2035 is maintained (3.5% per annum), the Pilbara could reach as high as 230,000 residents by 2050. Regardless, a target of 200,000 residents represents an additional 60,000 residents in the Pilbara in 2050 than would be supported under the business as usual scenario and an additional 135,000 residents than in 2013.

Figure 35 Population Scenarios and Targets, Pilbara¹⁰⁸



Aspirational but Achievable

While a target of 200,000 residents in the Pilbara by 2050 is regarded as aspirational, the maintenance of the required growth rates over this period would not be unique in Australian, let alone Western Australian history. A range of major regions around the country have maintained population growth rates in excess of 3.0% for a forty year period. These include areas such as the Gold Coast (Qld), Sunshine Coast (Qld), Cairns (Qld), Mackay (Qld), Bunbury (WA) and Coffs Harbour (NSW). Each of these regions has unique drivers and characteristics that have underpinned their growth. Some are closer to their respective capital cities, while others are more regional and remote with strong exposure to mining, agriculture, tourism and lifestyle migration drivers.

Figure 36 What Does an Extra 135,000 Residents Mean?¹⁰⁹



Different Approaches to Growth & Development

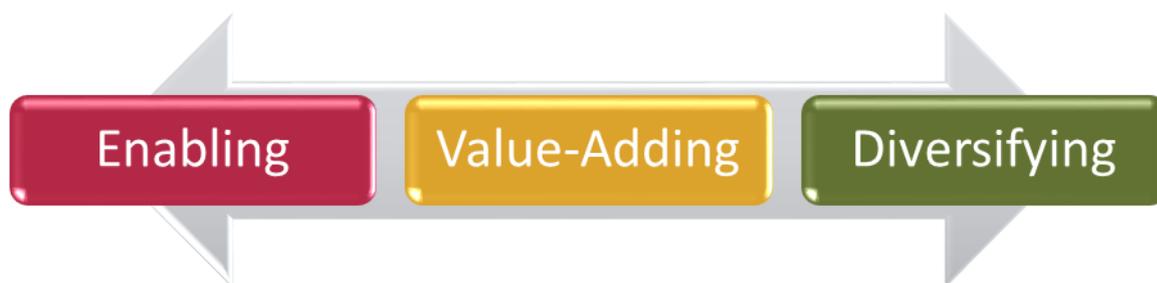
Shifting the Pilbara’s population and economic growth from “business as usual” towards a more transformational future requires a comprehensive, consolidated and integrated approach to the growth and development of the region.

There are a range of ways to foster and promote the growth of a regional economy and community. Different initiatives generally fall into three broad categories:

- **Enabling Initiatives** – investment in activities, infrastructure, facilities and services that catalyse and enable the private sector and the community to grow and prosper in a region.
- **Value Adding** – building upon and adding value to the strengths of the foundational industry to deepen regional economic activity. This can include physical value adding to raw materials, increased capture of upstream supply chains expenditure in the region or innovative use of existing infrastructure and economic capacity.
- **Diversification** – broadening of the economic base of a region through the promotion, fostering and growth of new industries and businesses. These businesses are generally separate from the value adding activities associated with the foundational industry, drawing upon the region’s competitive advantages, innovation, research and entrepreneurship to drive new business and industry growth.

These three approaches to growth and development require different levels of intervention from government and stakeholders, but also provide different scales of benefits and impacts. Enabling investments are the most passive of the approaches. They are critical to de-constrain business investment and community development, but do not necessarily directly generate substantial new activity and benefits. In contrast, diversification actions have the largest impact, supporting the creation and development of new industries and sectors. However, such actions require significant up-front investment and intervention to foster.

Figure 37 Spectrum of Approaches to Regional Growth and Development



These approaches can be pursued individually but are most effective when implemented in concert. By pursuing enabling, value adding and diversifying activities and investments, the Pilbara @ 2050 will be characterised by levels of population, employment, business activity and investment greater than the “business as usual” profile of the region.

Regional Pillars

Realising the Vision for the Pilbara @ 2050 will entail the development and growth of a regional economy founded on a range of competitive economic strength or “pillars”. These pillars represent those areas of the Pilbara region’s economy and community where public and private investment should be focused in order make the Vision a reality. They build upon and complement the core foundation industry of mining and resource development, which currently underpins the prosperity of the region.

Nine regional pillars have been identified and profiled. These pillars were identified by the Pilbara Development Commission in consultation with key stakeholders and draw upon the results of analysis of the Pilbara economy and community in this Blueprint. These regional pillars cover each of the three different broad approaches to growth and development identified in this Blueprint.

Figure 38 Regional Pillars by Approach to Growth and Development



The nine regional pillars include:

- **Land Access, Core Infrastructure and Facilities:** The provision of suitable land, infrastructure and facilities has been a barrier to the development of the Pilbara. Therefore, continuing investment in land access and infrastructure, such as energy, water (both potable and for agriculture and industry), waste, digital communications and transport will be required. Overcoming land tenure challenges and improving access to quality services, markets and communities will improve the attractiveness of the region to households and investors, catalysing new industries and businesses in the region.
- **Education, Training and a Skilled Workforce:** The growing global middle class with higher levels of education will mean that the Pilbara will need to maintain a high level of skills and knowledge in order to compete. Therefore, quality secondary and tertiary education, training facilities and services and migration strategies are needed to educate and develop the skills and capabilities of the region's current and future workforce. Increased access to educational services, from childcare to university, will encourage local residents to live and study in the region and provide opportunities for industry-specific research and development and innovation to be generated. The Pilbara's high level of industrial activity provides the opportunity for the region to be a significant influence in education, training and knowledge in these areas.
- **Health & Community Wellbeing:** In order to make the Pilbara an attractive place to live, work, invest and visit, health and community services and facilities to maintain and enhance the quality of life of the region's residents will be required. Further investment will encourage community vibrancy, celebrate the Pilbara's unique Aboriginal culture and history, and overcome isolation and remoteness challenges.
- **Marine & Resource Engineering and Supply Chains:** Opportunities exist to leverage the region's industrial activity, advancements in technology, existing local skills and infrastructure base and growing population to promote and encourage a globally competitive engineering sector to service onshore and offshore industry needs, including defence support and emergency management. Greater levels of locally provided services to the existing mining and energy supply chains will improve the local capacity in the supply of maritime services, equipment and materials fabrication, assembly and technologies.
- **Innovative & Advanced Technology:** Capitalising on technological change, including micronisation, automation, telecommunications capacity and new communication mediums, will unlock opportunities in the Pilbara across both the foundation mining base and new industries. The research, development and integration of new and advanced technologies will improve access to learning and commerce opportunities, drive productivity growth and support the resilience and sustainability of communities, businesses and industry. In partnership with the region's education and training providers, the Pilbara can be a global leader in innovative and advanced operations technologies associated with the mining, resource and new and emerging industries.
- **Diverse & Robust Small & Medium Businesses:** Currently underrepresented in the Pilbara compared to national averages, the Pilbara's small and medium business sector will need to be the heart of the Pilbara's diversified economy. Diverse, robust and resilient small and medium businesses can take advantage of a growing population base to be innovative, entrepreneurial and use technologies to address operational challenges and access new markets. Local businesses will fully incorporate into mining and major project supply chains, leverage off the region's reputation as a quality and reliable supplier and will actively targeting opportunities in Asia. A thriving small and medium business sector will support communities during mining downturns and provide a diversity of career choices for local residents.
- **Agriculture & Aquaculture:** Amid changing climates and increased water security challenges, the natural comparative advantages of the Pilbara in food production will be promoted. With considerable mine de-water and ground water opportunities, and vast amounts of sunlight and suitable soils for agriculture, the

region is in strong position to utilise existing local export infrastructure and expertise to capture existing and emerging food markets. Optimal environmental conditions make local algae production – namely for use as biofuel – highly attractive while the coastal orientation of the region allows for the development of both onshore and offshore aquaculture.

- **Energy:** The Pilbara’s latent energy resources (particularly in LNG) and expansive and underutilised land and natural assets will be developed for local, national and global markets. Proximity, political stability and export infrastructure advantages will be exploited with targeted investment in traditional and innovative alternate energy production opportunities, including geothermal, algae and crop based biofuel, hydrogen, tidal and other stationary and mobile energy sources. This energy production will help to support the growth of the regional population as well as provide new export opportunities to major and emerging global markets.
- **Tourism:** By leveraging the Pilbara’s unique environmental and cultural assets, current strong regional visitation for business and employment reasons will be fostered and diversified to increase travel and expenditure for education, leisure and “visiting friends and relatives” visitation. The Pilbara will capitalise on its proximity to Asia and emerging middle class markets and its airport infrastructure to realise the tourism industry’s potential. Greater investments in the 4As of tourism activity – accommodation, accessibility, amenity and attractions – will be pursued.

For each of the Pillars, a set of short, medium and long term objectives have been identified. These objectives will guide the identification of actions as well as investment across the region.

The objectives are illustrated in the table on the following page.

Table 9 Pillar Outcomes

	Pillars	Outcomes		
		2020	2035	2050
Enabling	Land Access, Core Infrastructure & Facilities	<p>Volatility reduced in housing and commercial property markets.</p> <p>Housing markets are characterised by a higher proportion of owner occupiers.</p> <p>Construction costs have stabilised and begin to converge with other parts of regional WA.</p> <p>Land tenure frameworks and processes established to support appropriate land use.</p> <p>Competitive markets are being established for water, energy, waste and recycling services and telecommunications (including remote mobile phone coverage and NBN)</p> <p>Intra-regional connectivity improved through the development of improved urban transport networks.</p> <p>Utility infrastructure and facilities, developed in accordance with the Pilbara Planning and Infrastructure Framework, provide sufficient capacity to support future, sharp increases in demand.</p> <p>Increased water efficiency and recycling amongst residents and business.</p> <p>Improved communal waste water services in the region's Aboriginal communities.</p> <p>Transient worker accommodation, where appropriate, is integrated into urban centres.</p>	<p>All property markets normalise with a range of affordable housing options and lifestyle choices for all its residents and a pipeline of de-constrained land that is investment ready.</p> <p>Increased private investment through competitive market structures for utilities.</p> <p>Pilbara long-term water supplies are secured.</p> <p>Improved inter and intra-regional road safety and reduced travel costs through road sealing and road-rail intersection upgrades.</p> <p>Accessible multi-user mine to port transport infrastructure.</p> <p>Increased passenger and freight aviation services to interstate and international markets.</p> <p>Provision of community bus and taxi services in the Pilbara has increased and is comparable to other regional areas.</p> <p>Pilbara cities and towns are characterised by modern, attractive and vibrant urban centres which provide community services, shopping, recreation, work and residency that the community will want to visit, stay in and enjoy.</p>	<p>Investments are not impeded by a lack of land availability and access.</p> <p>Utilities are able to respond to market needs and demands in a competitive and efficient market environment.</p> <p>Low cost utility services provide a competitive advantage for the region and encourage investment.</p> <p>The Pilbara has a fully integrated public and private transport network of roads, rail, sea and airports which support development.</p> <p>Urban environments are attractive and promote a strong sense of place.</p>

	Pillars	Outcomes		
		<p>Pilbara Planning and Infrastructure Framework has been reviewed.</p> <p>Land has been substantially de-constrained and Lazy Lands program is complete.</p> <p>Ports, including multi-use general cargo facilities are developed subject to demand</p> <p>Increased private investment in airport upgrades, including freight support.</p> <p>Service worker accommodation is provided, where appropriate, for key skills and occupations.</p>		
<p>Enabling</p>	<p>Education, Training and a Skilled Workforce</p>	<p>Education is enhanced and improved through greater curricula choice, gifted and talented student programs, specialist school offerings, distance education, improved remote Aboriginal education, boarding schools, private education, childcare and playgroup centres.</p> <p>The workforce is responsive to economic diversification, Aboriginal participation and health and education services.</p> <p>Residents access a full range of tertiary education courses through online delivery models.</p> <p>Vocational and technical education services, that are industry integrated, are accessible across the region.</p> <p>A research-based tertiary education centre is established.</p>	<p>Secondary school participation and completion levels meet State averages.</p> <p>TAFE campus(s) offer full range of courses for local residents, including mining technology such as automation and automation support.</p> <p>Normalised youth retention rates in high school.</p> <p>Families choose to stay in the Pilbara with access to a full choice of quality childcare, preschool, primary and secondary education options.</p> <p>Education facilities at all levels meet demand.</p> <p>The Pilbara provides a diverse range of life-long education services, including a remote university campus, which contributes to population growth.</p> <p>Regional residential workforce size doubles.</p>	<p>A full choice of quality vocational, technical and tertiary education options are available across the region, including a university campus.</p> <p>Education levels of the workforce are in line with regional Australian averages.</p> <p>Pilbara attracts and retains national and international migrants.</p>



	Pillars	Outcomes		
		<p>Local employment and FIFO is appropriately balanced.</p> <p>Increased skills and occupational diversity</p>		
Enabling	Health and Community Wellbeing	<p>Major upgrades or replacement of all current health (hospital, clinic, and emergency) infrastructure, including provision of co-located and integrated multidisciplinary services, paediatrics and virtual health services.</p> <p>Population of persons aged 65+ increases and the male to female ratio declines.</p> <p>Improved access to primary and allied health and disabled services.</p> <p>Private and not for profit age care and support services provide residential housing choice, with a mix of high and low need and culturally sensitive accommodation places available.</p> <p>Health service availability is in line with that experienced by comparable regional centre residents.</p> <p>Tenure and social issues in Aboriginal Town Base Reserves' have been resolved to deliver better outcomes for all stakeholders.</p> <p>NGO sector has appropriate and affordable office accommodation and is providing services to the region's communities which complements government service delivery</p> <p>Improved participation and use of</p>	<p>Upgrades, expansion or replacement of health infrastructure are completed in line with targets identified in the Pilbara Planning and Infrastructure Framework.</p> <p>Older Australians choose to retire in the Pilbara with access to health, lifestyle options, affordable accommodation and community support services that promote independent and healthy living.</p> <p>Improved economic, social, housing and health outcomes for Aboriginal people in the Pilbara as outlined in the Commonwealth's Closing the Gap program.</p> <p>The Pilbara is recognised for its quality and diverse community, civic, sport, recreation, art and culture facilities that promote community engagement and civic life.</p>	<p>Age and gender profile fully balanced.</p> <p>Aboriginal residents are fully integrated into the Pilbara community, participating fully in the economy and community while preserving and celebrating their unique culture.</p> <p>Residents can access quality advice and services comparable to metropolitan markets using innovative delivery methods.</p> <p>Resident health and wellbeing in line with metropolitan average.</p> <p>Sustainable community and NGO sectors promoting community well-being and civic life through sports, recreation, arts, and culture.</p>



	Pillars	Outcomes		
		community, civic, sport, recreation, art and culture facilities that promote community engagement and civic life.		
Value-add	Maritime & Resource Engineering & Supply Chains	<p>Pilbara businesses support an appropriately sized defence force presence.</p> <p>Maritime safety and emergency management services are being delivered locally.</p> <p>A Pilbara Fabrication and Services Common Use Facility (PFSCUF) built with investment attracted.</p> <p>Businesses have expanded their ability to participate in mining, oil, gas and infrastructure project supply chains.</p> <p>Increased local procurement.</p> <p>Pilbara businesses are utilising and value-adding local energy sources</p>	<p>Internationally significant emergency management and support centre established and operational.</p> <p>PFSCUF supporting the development of large scale manufacturing and support mining, oil, gas and infrastructure projects.</p> <p>Pilbara businesses are comprehensively supporting a defence force presence in Australia’s North West.</p> <p>The majority of mining, oil, gas and infrastructure project supply chain opportunities are sourced locally.</p>	<p>Pilbara is recognised for maritime safety and emergency management, exporting the expertise to other regions.</p> <p>The Pilbara is recognised as a world class industrial fabrication and technology producer, exporting technology and services throughout Asia.</p> <p>The region’s resource and infrastructure assets and supply chain networks are utilised to support defence and emergency response operations for Northern Australia and South East Asia.</p>
Value-add	Innovation and Advanced Technologies	<p>NBN usage is in-line with regional Australian averages.</p> <p>Businesses are using emerging technology to improve productivity.</p> <p>Digital and data operations of major mining, oil and gas companies have a presence in the Pilbara region, supported by data centres.</p> <p>Automation technologies are tested and serviced in the Pilbara.</p>	<p>Industry are utilising digital technologies to access regional and global markets</p> <p>Businesses are exporting services using digital technology.</p> <p>Mining, construction and manufacturing sectors have established automation control centres in the Pilbara.</p>	<p>Businesses in the Pilbara are fully integrated into the global digital economy and are using advanced technologies.</p> <p>Automation technologies are developed, tested and serviced in the Pilbara.</p> <p>Advanced technologies and services are exported to other regions</p>

	Pillars	Outcomes		
Value-Add	Diverse and Robust Small & Medium Businesses	<p>The cost of doing business and market barriers to entry have reduced.</p> <p>Regulatory requirements for businesses in the Pilbara are coordinated and streamlined, potentially with the use of special enterprise zones.</p> <p>Tailored and targeted small business incubators and accelerators have been established.</p> <p>Taxation reforms encourage investments and residential settlement in regional Australia</p> <p>Business development support services are available across the region.</p> <p>Entertainment precincts developed, including restaurants, cafes, cinemas, nightclubs, bars, theatres and amusement facilities.</p>	<p>Small and medium sized businesses across all sectors provide choice to residents and are sustainable and profitable, with strong growth prospects.</p> <p>Regulatory costs are minimised to facilitate investment, particularly international investment.</p> <p>The Pilbara has market barriers to entry and business formation levels similar to other regional locations</p> <p>Taxation reforms deliver increased investment and settlement to the region</p>	<p>The Pilbara is recognised internationally as an attractive, safe and stable place to do business, with a supportive regulatory environment that encourages entrepreneurship, investment and exports.</p> <p>A full range of small to medium sized businesses contribute to diverse and vibrant communities comparable to other regional centres.</p>

	Pillars	Outcomes		
Diversification	Agriculture & Aquaculture	<p>Agriculture and horticulture opportunities from mine dewater and ground water sources have been successfully trialled and tested.</p> <p>Pastoralists are diversifying and expanding their businesses</p> <p>Northern food brand established with Gascoyne and Kimberley regions.</p> <p>Land tenure frameworks support agricultural and aquaculture (onshore and offshore) development</p> <p>Agricultural and aquaculture species suited to the Pilbara are being introduced and developed.</p> <p>Double Gross Value Agricultural Production (GVAP).</p>	<p>Pilbara and North Western Australia recognised globally as a high quality food producing region.</p> <p>Highly productive land-based and ocean-based food producers are exporting to local, national and international markets.</p> <p>Algae-based aquaculture producers exporting nutraceuticals and pharmaceuticals to local, national and international markets.</p> <p>Food production features value-adding products.</p> <p>2.5 times GVAP.</p>	<p>Pilbara and Australia's North West contribute significantly to regional and global food security.</p> <p>Triple GVAP.</p>
Diversification	Energy	<p>Land tenure frameworks support energy precinct development.</p> <p>Pilbara businesses are integrating into energy supply chains of offshore and onshore oil and gas, exploration, extraction and export activities.</p> <p>Renewable and alternative energy sources are being utilised, supported by a suitable market framework.</p> <p>Energy export options and technological and market innovations are capitalising on the locational advantages of the Pilbara.</p>	<p>Renewable and alternative energy developments are operating, incentivised by appropriate regulatory frameworks.</p> <p>Energy export facilities are operating, incentivised by appropriate regulatory frameworks.</p> <p>Feasible onshore gas developments are operating and predominately serviced by businesses in the Pilbara.</p>	<p>The Pilbara has a diversified source of sustainable energy including renewable and alternative energy sources.</p> <p>The Pilbara exports diverse energy sources to regional, national and international markets.</p>

	Pillars	Outcomes		
Diversification	Tourism	<p>The Pilbara’s natural and man-made environment is invested in and leveraged off to offer a larger and more diverse range of tourism products, including national parks, trails, adventure, museums, industrial tourism, ocean-based tourism, cultural and old town sites.</p> <p>A larger and more diverse range of accommodation options, such as eco-tourism, are available.</p> <p>Aboriginal cultural attractions are explored, formalised, protected and invested in to ensure sustainable visitation</p> <p>World class iconic cultural facilities such as museums and art galleries are developed.</p> <p>Aboriginal tourism businesses are sustainable and profitable, providing significant employment, training and commercial opportunities for Aboriginal peoples.</p> <p>The Pilbara is fully incorporated into Western Australia and National tourism branding and promotions and is achieving national and international market recognition.</p> <p>There is an increase in regional, national and international leisure visitor numbers.</p>	<p>The Pilbara is recognised as offering quality and diverse tourism products, including national parks, trails, adventure, museums, industrial tourism, ocean-based tourism, cultural and old town sites.</p> <p>Accommodation options, including eco-tourism, hotel and resort products, and costs are equivalent to comparable regional areas.</p> <p>Aboriginal tourism is regarded as an integral part of the region’s broader tourism offering.</p> <p>A network of cultural and tourism centres is established across the region.</p> <p>The Pilbara has international direct flights from a diverse range of destinations</p>	<p>The Pilbara is a recognised tourism destination, attracting a range of visitors with its natural and man-made attractions and delivering a variety of significant economic, social and community benefits to the residents of the Pilbara.</p> <p>Heritage and Aboriginal tourist attractions are recognised by the international market as unique offerings that attract visitors from around the world in their own right.</p>



The Future Role of the Resources Sector

The fundamental role of the resources sector in the Pilbara is recognised in this Blueprint. Promoting and fostering investment in the regional pillars will not displace mining and resource development as foundational industries in the Pilbara economy. In fact, it is expected that the resources sector will be a major beneficiary of the realisation of the Pilbara @ 2050 Vision and the regional pillars. Potential benefits may include:

- Improved access to local skilled workers, through the growth of regional population and labour markets and greater depth and diversity of secondary and tertiary education services;
- Improved retention of high skilled workers, through the provision of higher amenity urban environments, including associated health, education, retail and community services and facilities;
- Improved infrastructure, reducing competition for capacity between resource and non-resource (including residential) sectors of the regional economy; and
- Increased productivity, through enhanced access to local supply chains, including key services, equipment, innovation and research capacity.

The future economic, social and environmental potential of the Pilbara cannot be realised without a robust, dynamic, innovative resources sector in the medium and long-term. It is also in the interests of the Pilbara resources sector, and therefore the broader Western Australian economy, that the region transitions from its current mono-economy structure into a more diversified, integrated and collaborative frameworks that leverages all of the Pilbara's competitive advantages.

Strategic Priorities

Stakeholders have outlined a number of clear strategic priorities for the region during the consultation process. These strategic priorities, while not regional pillars in their own right, were nonetheless considered important to support the Vision of the Blueprint to 2050 and beyond. Many of these aims are shared with other parts of regional WA and Australia, though all are particularly relevant to the Pilbara's current and future development and growth.

The strategic priorities act as a lens through which the pillars, transformational opportunities and projects for each of the regional pillar have been identified and assessed. They allow for projects and initiatives to be assessed not only in terms of their relevance to the pillars of the Pilbara region's future growth, but in their contribution to addressing critical issues and priorities for Pilbara industries, businesses, communities and households. This ensures that scarce resources are allocated in the most efficient way.

The strategic priorities include:

- **Liveability** – enhancing and fostering the attractiveness of the Pilbara as a place for people to live, work and play is critical to attracting new residents to the region. Without improvement in regional liveability, cost of living and quality of life, attracting new residents, workers and businesses needed to drive future growth will be challenging.
- **Aboriginal Development** – The Pilbara has a proud and diverse Aboriginal community. Aboriginal people are an integral part of communities across the region, from remote parts of the East Pilbara to major towns and cities of Karratha, Port Hedland and Newman. However, like many parts of Australia, the socio-economic characteristics of Pilbara's Aboriginal residents are below that of the rest of the population, raising issues of social welfare and equity in the region.

- **Local Employment Growth** – growing diverse employment opportunities represents a major priority of stakeholders. Local employment growth is viewed as a fundamental to supporting prosperous and sustainable communities, maximising residential participation in the workforce and enhancing the resilience of households to economic shocks and rising cost of living.
- **Import Replacement** – the Pilbara economy, businesses and communities import significant goods and services from outside of the region for input into local production. Opportunities to increase the self-sufficiency of the Pilbara economy through local production of a range of inputs are critical to enhancing the dynamism and resilience of the region.
- **Export Potential** – the Pilbara is Australia’s leading export-oriented economy. Its profile in global markets is exemplary and the region is seen as an investment location of choice for national and global businesses in mining and resource development, accommodation and infrastructure sectors. Leveraging this profile to diversify the Pilbara’s export potential was identified as a critical priority for new and emerging sectors, ensuring the Pilbara has a strong exposure to emerging global megatrends.
- **Population Growth and Retention** – the population of the Pilbara currently lacks a critical mass. Shifting the Pilbara’s growth profile from a “business as usual” to a more aspirational profile will provide a larger residential population, which will yield a range of benefits for the region. Community services and infrastructure will be more viable, while businesses will have greater access to customers and workers. Finally, a larger population will allow living costs and property markets to continue to normalise.
- **Environmental Sustainability** – the Pilbara region has a unique natural environment that must be protected. Promoting smart economic and social development that works with and leverages the environmental attributes of the region is viewed as a strategic priority by stakeholders and is critical to ensuring the sustainability and resilience of the Pilbara economy & population.
- **Research and Innovation** – future economic growth will be increasingly dependent on productivity and innovation. This applies equally to established foundation industries, as well as new creative and technologically-oriented sectors. The Blueprint takes a holistic view of research and innovation and promotes approaches that facilitate integrated education/training with industry growth and development and cross-sectoral fertilisation of ideas, concepts, technologies and processes.

8.0 Transformational Opportunities

The capacity of the Pilbara to reach its economic, social and environmental potential in 2050 and beyond is contingent on a range of transformational opportunities being captured and leveraged. Each of the broad regional pillars identified in this Blueprint will be realised through investment in a range of more specific opportunities that enable, add value and diversify the regional economy and community.

Realising the Pilbara @ 2050 Vision

The Pilbara Development Commission, in consultation and partnership with regional stakeholders, has identified a range of potential investment opportunities in the region out to 2050. These opportunities are based on consideration of regional characteristics and attributes (including competitive advantages) within the context of current and emerging global trends.

Figure 39 Regional Pillars



A ‘transformational opportunity’ is defined as:

“A regional project and investment opportunity that will significantly enable, value add and/or diversify the Pilbara and is critical for the future economic and/or social growth of the region.”

Individual investments or developments have not been identified in this Blueprint. Instead, the Blueprint provides a framework for identifying and profiling higher level transformational opportunities. Individual actions, projects and initiatives, required to realise the transformational opportunities will be identified by Blueprint stakeholders in the future. This maximises the flexibility, and therefore longevity, of the Blueprint.

Detailed projects and actions will be captured by the Pilbara Regional Investment Blueprint Implementation and Action Plan.

Transformational Opportunity Profiles

Two transformational opportunities have been identified for each of the nine regional pillars profiled in this Blueprint. This represents six individual transformational opportunities across each of the three approaches to growth and development to be implemented for the Pilbara in this Blueprint.

Table 10 Table Transformational Opportunity Summary

APPROACH TO GROWTH & DEVELOPMENT	REGIONAL PILLAR	TRANSFORMATIONAL OPPORTUNITY
Enabling Initiatives	Land Access, Core Infrastructure & Facilities	Normalised Property Market and Land Access
		Secure and Sustainable Infrastructure Services
	Education, Training and a Skilled Workforce	Lifelong Education
		Workforce Development & Skilled Migration
	Health and Community Wellbeing	Diverse and Intergenerational Communities
		Innovative Local and Remote Healthcare Delivery
Value-Adding	Marine & Resource Engineering & Supply Chains	Maritime Maintenance, Safety and Emergency Management
		Industrial Fabrication, Assembly and Technology
	Innovation and Advanced Technology	Business Digital Connectivity
		Automation Technology & Services
	Diverse and Robust Small to Medium Sized Businesses	SME Support
		Streamlining Governance
Diversification	Agriculture & Aquaculture	High Value Agriculture and Cropping
		Aquaculture, Algae Biofuels and Co-products
	Energy	Energy Production
		Energy Export
	Tourism	Nature Based Tourism
		Heritage and Aboriginal Tourism Development

These transformational opportunities are expanded on below.

This is not a list of all investment opportunities in the Pilbara region. The region is blessed with a diverse range of economic and social drivers that have the potential to generate significant benefit for residents and businesses that call the Pilbara home. The opportunities identified under each of the regional pillars are regarded as the most transformational at the time of preparing this Blueprint.

The Blueprint, and accompanying Implementation and Action Plan, are based on a flexible structure that allow for new transformational opportunities to be identified and explored over time as global megatrends, local competitive advantages or economic and social drivers change. This is a primary driver for the establishment of an ongoing monitoring and review process (refer to the Implementation Overview section), providing the Pilbara Development Commission and key stakeholders with the mechanism to maintain the relevance, longevity and value of the Blueprint.

It is also important to note that the Blueprint does not seek to exclude and constrain opportunities for economic, social and environmental development opportunities not identified below. A dynamic region is one characterised by a myriad of initiatives, actions and projects being implemented by different stakeholders at the same time. As such, opportunities that align and seek to contribute to the implementation of the Pilbara @ 2050 Vision and the identified Regional Pillars should be supported by public, private and community sectors.

TRANSFORMATIONAL OPPORTUNITY 1: Normalised Property Market and Land Tenure	
DEVELOPMENT APPROACH	Enabling
REGIONAL PILLAR	Land Access, Core Infrastructure & Facilities
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Urbanisation • Climate Change and Water Security • Low Carbon Future • Digital Connectivity
COMPARATIVE ADVANTAGES	Not Applicable
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Liveability • Local Employment Growth • Population Growth and Retention
OPPORTUNITY DESCRIPTION:	
<p>The Pilbara region is characterised by myriad different land tenure arrangements. The combination of mineral leases, pastoral leases, Crown Land, state and national parks and reserves, freehold title and native title have implications for the ability for prospective investors to access optimally located land. The land intensity of a range of transformational opportunities – from major tourism developments to alternate energy production – means that investment in activities that will value add and diversify the Pilbara economy is currently significantly constrained. This represents a major opportunity cost for the region, with significant forgone benefits for the Pilbara economy, community and environment.</p> <p>The dynamic nature of the Pilbara economy over the past decade has driven strong demand for a wide range of property types. Constraints on development – including tenure, zoning, infrastructure delivery and construction seasonality – has impeded and constrained land and property development. This has underpinned rapid rental and price growth across housing, retail, commercial and industrial sectors. Speculative investment in property has been the primary source of purchaser activity to the detriment of population and local business attraction/retention. This has resulted in Pilbara property markets structurally decoupling from local household and business purchasing power. Continued effort and resourcing to normalise the residential, commercial and industrial property markets of Pilbara towns and cities as well allowing new types of zones, e.g. lifestyle and hobby/market farm zones, is critical to ensuring the sustainability of future economic and business activity.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Facilitation and attraction of major investment in industrial and business ventures such as tourism, agriculture and energy generation. • Improved housing accessibility and affordability. • Locally grown fruit and vegetables for local markets. • Reduced investment risk profile. • Lower housing costs for Government, business and not-for-profit sectors accommodating key workers. • Mining companies better able to divest residential property holdings and access housing for workers through the market. 	

TRANSFORMATIONAL OPPORTUNITY 1: Normalised Property Market and Land Tenure**CONSTRAINTS AND CHALLENGES:**

- Small local construction capability, including a skilled construction workforce and local sourcing of materials, equipment and machinery.
- Strong competition from mining sector during construction phases when property demand is at its highest.
- Natural volatility associated with global mining cycles cannot be fully mitigated against.
- Construction seasonality.
- Access and cost of insurance.
- The cost of developing property in remote areas.

OUTCOMES

2020	<ul style="list-style-type: none"> • Volatility reduced in housing and commercial property markets. • Housing markets are characterised by a higher proportion of owner occupiers. • Construction costs have stabilised and begin to converge with other parts of regional WA. • Land tenure frameworks and processes established to support appropriate land use.
2036	<ul style="list-style-type: none"> • All property markets normalise with a range of affordable housing options and lifestyle choices for all its residents and a pipeline of de-constrained land that is investment ready
2050	<ul style="list-style-type: none"> • Investments are not impeded by a lack of land availability and access.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • LandCorp • Department of Lands • Department of Planning • Department of Housing • Department of Regional Development • Utility Suppliers • Local Governments • Construction and development sector • Banks and financiers

TRANSFORMATIONAL OPPORTUNITY 2: Secure and Sustainable Infrastructure Services	
DEVELOPMENT APPROACH	Enabling
REGIONAL PILLAR	Land Access, Core Infrastructure & Facilities
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Urbanisation • Climate Change and Water Security • Low Carbon Future • Shift in Economic and Military Power • Digital Connectivity
COMPARATIVE ADVANTAGES	Not Applicable
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Liveability • Aboriginal Development • Local Employment Growth • Export Potential • Population Growth and Retention
OPPORTUNITY DESCRIPTION:	
<p>Strong growth in the resources sector, and associated rapid population growth, has underpinned demand for a wide range of core infrastructure services, including water and waste water, power, road transport and digital telecommunications. The Pilbara Planning and Infrastructure Framework identified a wide range of infrastructure requirements for the Pilbara to support its growth in the short-to-medium term. Major needs include:</p> <ul style="list-style-type: none"> • Water supplies, particularly in coastal townships, which are now climate dependent for water; • Deep sewerage facilities in all Pilbara towns and cities; • Additional power generation capacity within a broader integrated long-term approach to power supply planning; • Waste management, particularly recycling; • Development of a regional road network that provides safe all-weather connections between the region's centres of activity; and • Improved broadband coverage. 	
BENEFITS:	
<ul style="list-style-type: none"> • Improved connectivity to support business incubation and health and education service delivery. • Improved safety and reduced accidents for community and businesses. • Improved access (i.e. reduced travel time and costs) to services, markets and communities. • Support for industrial expansion through reliable and cost effective utility service provision. • Timely property development outcomes during periods of strong demand. 	

TRANSFORMATIONAL OPPORTUNITY 2: Secure and Sustainable Infrastructure Services**CONSTRAINTS AND CHALLENGES:**

- Population critical mass in remote communities and towns.
- Uncertain growth outlook due to cyclical investment cycles.
- Competition for public and private sector funding.
- High risk profile due to cyclonic events.

OUTCOMES

2020	<ul style="list-style-type: none"> • Competitive markets are being established for water, energy, waste and recycling services and telecommunications (including remote mobile phone coverage and NBN).
2036	<ul style="list-style-type: none"> • Increased private investment through competitive market structures for utilities. • Pilbara long-term water supplies are secured. • Improved inter and intra-regional road safety and reduced travel costs through road sealing and road-rail intersection upgrades.
2050	<ul style="list-style-type: none"> • Utilities are able to respond to market needs and demands in a competitive and efficient market environment. • Low cost utility services provide a competitive advantage for the region and encourage investment. • The Pilbara has a fully integrated public and private transport network of roads, rail, sea and airports which support development.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • LandCorp • Department of Lands • Department of Planning • Department of Transport • Utility suppliers • Local Governments • Local construction and development sector • Banks and financiers • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 3: Lifelong Education	
DEVELOPMENT APPROACH	Enabling
REGIONAL PILLAR	Education, Training and a Skilled Workforce
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Urbanisation • Rising Middle Class • Digital Connectivity
COMPARATIVE ADVANTAGES	Not Applicable
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Liveability • Population Growth and Retention • Aboriginal Development • Research and Innovation
OPPORTUNITY DESCRIPTION:	
<p>Productivity is generated through innovation, research and development and a skilled labour force. This means that investment in tertiary education, training and research is critical for any region if the economic and social potential is to be realised.</p> <p>Fundamental to achieving a more balanced economy which can attract and retain enough people to reach a population of 200,000 in the Pilbara is the delivery of quality and appropriate education services which encourage local residents to live and study in the region. The short term focus is on incrementally improving existing services and further developing industry training pathways however there is an inevitable need for a variety of education options to be delivered by 2050 (for example, a tertiary campus) to address education needs. The growth of the Pilbara, both economically and socially, will drive increased demand for tertiary education opportunities.</p> <p>Local post-school education provision will not only position the Pilbara as an attractive location for young adults to live and learn, but also provide opportunities for industry-specific research and development and innovation to be generated. The expansive nature of the Pilbara means it is critical that education leverages telecommunication technologies and decentralised delivery models to service the entire region.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Innovation and expertise will improve productivity, as well as incomes, and enable business development and growth. • Reduced social dislocation and dependence through improved skills development and labour force participation. • Increased local workforce availability. • Retention and attraction of families with teenage children. • Improved professional development and career advancement opportunities. 	

TRANSFORMATIONAL OPPORTUNITY 3: Lifelong Education	
CONSTRAINTS AND CHALLENGES:	
<ul style="list-style-type: none"> • Population critical mass and geographical dispersion to support expanded service delivery. • Digital technology infrastructure access and reliability. • Perceptions of education quality in the region vis-à-vis metropolitan education providers. 	
OUTCOMES	
2020	<ul style="list-style-type: none"> • Education is enhanced and improved through greater curricula choice, gifted and talented student programs, specialist school offerings, distance education, improved remote Aboriginal education, boarding schools, private education, childcare and playgroup centres. • Residents access a full range of tertiary education courses through online delivery models. • Vocational and technical education services, that are industry integrated, are accessible across the region. • A research-based tertiary education centre is established.
2036	<ul style="list-style-type: none"> • Secondary school participation and completion levels meet State averages. • TAFE campus(s) offer full range of courses for local residents, including mining technology such as automation and automation support. • Normalised youth retention rates in high school. • Families choose to stay in the Pilbara with access to a full choice of quality childcare, preschool, primary and secondary education options. • Education facilities at all levels meet demand. • The Pilbara provides a diverse range of life-long education services, including a remote university campus, which contributes to population growth.
2050	<ul style="list-style-type: none"> • A full choice of quality vocational, technical and tertiary education options are available across the region, including a university campus.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • Department of Education • Department of Local Government and Communities • Universities and vocational education suppliers • Department of Training and Workforce Development • Research and development institutions • Resource and energy companies • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 4: Workforce Development & Skilled Migration	
DEVELOPMENT APPROACH	Enabling
REGIONAL PILLAR	Education, Training and a Skilled Workforce
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Rising Middle Class • Low Carbon Future • Shift in Economic and Military Power • Digital Connectivity • Automation
COMPARATIVE ADVANTAGES	Not Applicable
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Local Employment Growth • Population Growth and Retention • Aboriginal Development • Research and Innovation
OPPORTUNITY DESCRIPTION:	
<p>The Pilbara economy has the potential to grow at a faster rate than the local labour force can support. In recent years, this workforce gap has been met through a high proportion of FIFO workers. The combination of a lack of critical mass of local workers, high cost of living and a mono-economic structure has undermined the ability for large mining companies and second-tier supporting firms to attract and retain a residential workforce. It has inhibited business development and growth across a number of industries.</p> <p>While FIFO work patterns are expected to continue to play an important role in the resources sector in the future – particularly during construction phase – evidence suggests that such arrangements have significant social implications. A comprehensive integrated approach to workforce development is required. This is comprised of a combination of strategies which include local skills development and training, education and business integration and skilled and business migration and worker attraction.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Increased workforce availability will improve business resourcing certainty. • Increased business capacity, productivity and regional competitiveness. • Stable and sustainable population growth to support business needs during times of low and high mining sector investment activity. • Improved local procurement capacity. 	
CONSTRAINTS AND CHALLENGES:	
<ul style="list-style-type: none"> • Lack of affordable accommodation for low income sectors. • The permanent retention of skilled migrants. 	

TRANSFORMATIONAL OPPORTUNITY 4: Workforce Development & Skilled Migration	
OUTCOMES	
2020	<ul style="list-style-type: none"> • FIFO and local employment is appropriately balanced. • Increased skills and occupation diversity.
2036	<ul style="list-style-type: none"> • Regional residential workforce size doubles.
2050	<ul style="list-style-type: none"> • Education levels of the workforce are in line with regional Australian averages. • Pilbara attracts and retains national and international migrants.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • Resource and energy companies • Local Governments • Pilbara Regional Council • Regional Development Australia – Pilbara • Department of Education • Department of Training and Workforce Development • Pilbara Workforce Development Alliance • Research and development institutions • Federal Department of Immigration • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 5: Diverse and Intergenerational Communities	
DEVELOPMENT APPROACH	Enabling
REGIONAL PILLAR	Health and Community Wellbeing
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Urbanisation • Digital Connectivity
COMPARATIVE ADVANTAGES	Not Applicable
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Liveability • Local Employment Growth • Population Growth and Retention • Aboriginal Development
OPPORTUNITY DESCRIPTION:	
<p>The residential population profile of the Pilbara is underrepresented in terms of residents aged 65 and over. This reflects the challenges ageing in the Pilbara, particularly post retirement – namely, cost of living, accommodation options, health care access and relative isolation from family and friends. This loss of population has a significant impact on the economic and social character of the Pilbara, reducing the size and skill profile of the labour force due to lower shares of older, more experienced workers, while undermining the ability of the region to retain a residential population. Aged residents also provide important volunteer services within communities.</p> <p>Enhancing the attractiveness and capacity of the Pilbara to accommodate older residents could include lifestyle and retirement villages, service apartments, community care and residential aged care services. Services and facilities to support ‘active ageing’ and ‘ageing in place’ are also important, such as transport and community services.</p> <p>The Pilbara’s employment-related migration trends have also resulted in a significant gender imbalance, with the region characterised by a high male to female ratio. This gender imbalance raises significant social and community development issues, reflecting a predominance of single person households and a below average share of families with children.</p> <p>People identifying as Aboriginal represent an above average share of residents in the Pilbara. This cohort however is underrepresented in the workforce and in education and training and has below average health and socio-economic attributes. This is shared with much of regional Australia and represents a significant social equity and economic opportunity cost to the Pilbara. Improving the integration and participation of Aboriginal peoples in the workforce, business community and society in general must be a priority for stakeholders of the Pilbara region. However, this integration and participation must take place in a way which retains, enhances and celebrates the Pilbara’s unique Aboriginal culture and history, which underpins local multiculturalism and represents significant economic assets for the region.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Increased volunteerism and civic society participation. • Population retention. • Increased workforce availability. • Decreased dependence in Aboriginal communities. • New industry development in remote communities. 	

TRANSFORMATIONAL OPPORTUNITY 5: Diverse and Intergenerational Communities**CONSTRAINTS AND CHALLENGES:**

- Lack of affordable, quality services and housing typologies suitable for an ageing population.
- Extreme weather conditions.
- Cost of living.
- Child care availability
- Skill levels and workforce re-entry opportunity availability

OUTCOMES

2020	<ul style="list-style-type: none"> • Population of persons aged 65+ increases and the male to female ratio declines. • Private and not for profit age care and support services provide residential housing choice, with a mix of high and low need and culturally sensitive accommodation places available. • Tenure and social issues in Aboriginal Town Base Reserves' have been resolved to deliver better outcomes for all stakeholders.
2036	<ul style="list-style-type: none"> • Older Australians choose to retire in the Pilbara with access to health, lifestyle options, affordable accommodation and community support services that promote independent and healthy living. • Improved economic, social, housing and health outcomes for Aboriginal people in the Pilbara as outlined in the Commonwealth's Closing the Gap program.
2050	<ul style="list-style-type: none"> • Age and gender profile fully balanced. • Aboriginal residents are fully integrated into the Pilbara community, participating fully in the economy and community while preserving and celebrating their unique culture.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • Department of Health • Disabilities Services Commission • Department of Housing • Department of Aboriginal Affairs • Department of Commerce • Department of Sport and Recreation • Department of Arts and Culture • Local Governments • Aged care providers • Child care providers • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 6: Innovative Local and Remote Healthcare Delivery	
DEVELOPMENT APPROACH	Enabling
REGIONAL PILLAR	Health and Community Wellbeing
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Urbanisation • Digital Connectivity • Automation
COMPARATIVE ADVANTAGES	Not Applicable
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Liveability • Population Growth and Retention • Aboriginal Development
OPPORTUNITY DESCRIPTION:	
<p>The quality and accessibility of health services in regional Australia is generally below that of metropolitan areas. Smaller residential populations, coupled with dispersed and often isolated towns and communities, have undermined the effective delivery of health care in regions like the Pilbara. This is particularly the case for Aboriginal communities, the residents of which have some of the lowest health outcomes and life expectancies of any group in Australia.</p> <p>To build upon and maximise the benefits of major investments by State and Federal Governments in tertiary health care facilities in the region, increased focus must be afforded to innovative service delivery options. This can range from teleconferencing-based consultations with specialist and mental health experts, to virtual procedures and in the home outreach post-acute care. Support for increased allied and primary health service provision in the Pilbara can also be facilitated through the increased availability of shared consulting facilities. A focus on health outcomes for older residents, Aboriginal communities, workers and primary health should be prioritised.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Improved health outcomes • Increased productivity due to reduced absenteeism • Long-term health cost savings • Population retention and attraction 	
CONSTRAINTS AND CHALLENGES:	
<ul style="list-style-type: none"> • Digital communications infrastructure quality and reliability. • Staffing availability. 	
OUTCOMES	
2020	<ul style="list-style-type: none"> • Major upgrades or replacement of all current health (hospital, clinic, and emergency) infrastructure, including provision of co-located and integrated multidisciplinary services, paediatrics and virtual health services. • Improved access to primary and allied health and disabled services.

TRANSFORMATIONAL OPPORTUNITY 6: Innovative Local and Remote Healthcare Delivery	
	<ul style="list-style-type: none"> • Health service availability is in line with that experienced by comparable regional centre residents.
2036	<ul style="list-style-type: none"> • Upgrades, expansion or replacement of health infrastructure are completed in line with targets identified in the Pilbara Planning and Infrastructure Framework.
2050	<ul style="list-style-type: none"> • Residents can access quality advice and services comparable to metropolitan markets using innovative delivery methods. • Resident health and wellbeing in line with metropolitan average.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • Department of Health • Disabilities Services Commission • Department of Aboriginal Affairs • Local Government • Hospitals and health service providers • Aged care providers • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 7: Maritime Maintenance, Safety and Emergency Management	
DEVELOPMENT APPROACH	Value-Add
REGIONAL PILLAR	Marine and Resource Engineering and Supply Chains
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Shift in Economic and Military Power • Low Carbon Future • Automation
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> • Political Stability • Export Infrastructure • Geographical Proximity to Asia • Location of Major Industrial Activity
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Local Employment Growth • Population Growth and Retention • Import Replacement • Export Potential • Research and Innovation
OPPORTUNITY DESCRIPTION:	
<p>The post GFC period has been characterised by a steady recovery in global trade. Bulky commodities and manufactured goods flow between countries and regions through an extensive network of trade lanes that spread across the globe. Asia and, in particular, South East Asia, has long been a critical part of this trade network, with ports such as Singapore benefiting from their strategic location at the confluence of the Pacific and Indian Oceans. However, in recent decades Asia has also grown as both a destination and origin of trade, further driving the importance of the region in global trade. The Pilbara region is defined not only by its expansive endowment of natural resources but also its extensive export capacity. The port cities of Port Hedland and Karratha (Dampier) service hundreds of Cape Size vessels that transport iron ore and other bulky commodities (namely salt) to Asia and global markets.</p> <p>Additionally, the growth of LNG off the North West Coast of the State will further drive maritime trade activity. LNG demand is projected to grow strongly over the next 20 years. A combination of the short-term reduction in nuclear power in countries like Japan and Germany, coupled with the desire of many parts of the world to enhance their energy mix and security and the lower carbon intensity of LNG compared with coal, is expected to underpin structural growth of the LNG demand in the long-term. The Pilbara is strategically located near major offshore LNG resources. The Pilbara has a competitive advantage in maritime safety and emergency management from its long-term experience with iron ore exports. This presents a major opportunity for the Pilbara to leverage its exposure to growing LNG transport off the WA coast, servicing both extraction and transportation sectors.</p> <p>This combination of iron ore exports, LNG processing and transport and defence and security activities all drive need for a range of maritime safety and emergency management skills and capabilities in the Pilbara. The current competitive advantage of the Pilbara region in providing associated services to the iron ore export sector represents a major opportunity to expand this capability to other sectors. This will have the benefit of generating new employment and business opportunities.</p>	

TRANSFORMATIONAL OPPORTUNITY 7: Maritime Maintenance, Safety and Emergency Management

At the same time, the deterioration of global security has increased the focus of successive Australian Governments on repositioning the country's military assets in more northern locations. The North West of Western Australia is already home to some national (and even international) military facilities and assets (e.g. Exmouth) and the recent commencement of US Marine's through Darwin is further enhancing the growing role of northern and north-western Australia as a strategic military location. The Pilbara's relative proximity to major global assets of strategic interest, coupled with the need for Australia to project power and security over increased trade activity and vessel movements off Australia's coast, supports a greater presence in the region. This could include developing a base and infrastructure, as well as more training exercises and operational activities, planning and civil engagements.

Australia's defence forces are also regularly deployed on humanitarian relief and disaster recovery operations in South East Asia and beyond. As climate change changes global patterns of extreme weather events, the North West region may provide an appropriate base from which to launch deployments. Furthermore, with a growing population and billions of dollars in infrastructure and the Pilbara itself becoming more prone to extreme weather events, there may be a future need for a local defence presence.

BENEFITS:

- Local employment growth and diversification.
- Protection of vital resource assets and regional stability.
- Local businesses supported by defence personnel and service contracts

CONSTRAINTS AND CHALLENGES:

- Oil and gas servicing operations being set-up throughout Asia to service the North West Shelf.
- Capital cost of developing a permanent military presence.
- Strong competition in Northern Australia for new defence establishments.

OUTCOMES

2020	<ul style="list-style-type: none"> • Pilbara businesses support an appropriately sized defence force presence. • Maritime safety and emergency management services are being delivered locally.
2036	<ul style="list-style-type: none"> • Internationally significant emergency management and support centre established and operational. • Pilbara businesses are comprehensively supporting a defence force presence in Australia's North West.
2050	<ul style="list-style-type: none"> • Pilbara is recognised for maritime safety and emergency management, exporting the expertise to other regions. • The region's resource and infrastructure assets and supply chain networks are utilised to support defence and emergency response operations for Northern Australia and South East Asia.

TRANSFORMATIONAL OPPORTUNITY 7: Maritime Maintenance, Safety and Emergency Management

KEY STAKEHOLDERS

- Pilbara Development Commission
- Resource and Energy Companies
- Pilbara Ports Authority
- Regional airports
- National Offshore Petroleum Safety and Environmental Management Authority
- Department of Foreign Affairs and Trade
- Department of Commerce
- Local construction and development sector
- Local businesses
- Regional, state and national Chamber of Commerce and Industry's and other business advocacy groups
- Department of Defence
- Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 8: Industrial Fabrication, Assembly and Technology	
DEVELOPMENT APPROACH	Value-Add
REGIONAL PILLAR	Marine and Resource Engineering and Supply Chains
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> ● Automation
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> ● Political Stability ● Export Infrastructure ● Geographical Proximity to Asia ● Natural Environment and Resources ● Location of Major Industrial Activity
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> ● Local Employment Growth ● Population Growth and Retention ● Import Replacement ● Export Potential ● Research and Innovation
OPPORTUNITY DESCRIPTION:	
<p>Industrial activity, including manufacturing and mining, is a technology and capital intensive sector of the global economy. This capital intensive nature means that advancements in technology and communications can have a significant impact on the productivity, efficiency and profitability of industry businesses and activity. At the same time, the cost base for industrial sectors in the Pilbara have increased in recent years. This has been driven by a combination of rapidly growing labour costs, as well as cost escalations from competition for the use of equipment, services, facilities and infrastructure between resource and non-resource sectors.</p> <p>The presence of globally significant mining activity in the Pilbara presents an opportunity for local businesses and industry to be centrally involved in the supply of equipment and materials fabrication, assembly and technologies. This may include all aspects of equipment and technology development, such as initial research, prototype development, on-the-ground trials, manufacturing and fabrication and ongoing maintenance of operation. This will provide the opportunity for greater shares of mining sector supply chains to be captured in the region.</p>	
BENEFITS:	
<ul style="list-style-type: none"> ● Industrial diversification which supports population growth and local employment. ● Reduced import needs and associated cost savings ● Increased skills development and employment growth. ● Productivity growth through integration of advanced production and communication technologies into industry. 	
CONSTRAINTS AND CHALLENGES:	
<ul style="list-style-type: none"> ● Land assembly ● Coordination to achieve economies of scale and cost efficiencies ● Access to sufficiently skilled personnel 	

TRANSFORMATIONAL OPPORTUNITY 8: Industrial Fabrication, Assembly and Technology	
OUTCOMES	
2020	<ul style="list-style-type: none"> • A Pilbara Fabrication and Services Common Use Facility (PFSCUF) built with investment attracted. • Businesses have expanded their ability to participate in mining, oil, gas and infrastructure project supply chains. • Increased local procurement
2036	<ul style="list-style-type: none"> • PFSCUF supporting the development of large scale manufacturing and support mining, oil, gas and infrastructure projects. • The majority of mining, oil, gas and infrastructure project supply chain opportunities are sourced locally.
2050	<ul style="list-style-type: none"> • The Pilbara is recognised as a world class industrial fabrication and technology producer, exporting technology and services throughout Asia.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • Resource and energy companies • Department of Commerce • Department of State Development • LandCorp • Local construction and development sector • Regional, state and national Chamber of Commerce and Industry's and other business advocacy groups • Department of Defence • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 9: Business Digital Connectivity	
DEVELOPMENT APPROACH	Value-Add
REGIONAL PILLAR	Innovation and Advanced Technology
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Urbanisation • Rising Middle Class • Digital Connectivity • Automation
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> • Geographical Proximity to Asia
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Local Employment Growth • Population Growth and Retention • Export Potential • Research and Innovation
OPPORTUNITY DESCRIPTION:	
<p>Technological transformations driving digital connectivity will increase the interconnectedness of people anywhere and anytime making the obstacle of distance redundant to communication, commerce and social connection. By 2020 there will be 50 billion networked devices that will impact on issues such as labour mobility and urban development. Increasing digital connectivity will stimulate the emergence of new services and tradable commodities through improved access to markets, improved learning and trading platforms and increased mobility through a connected world that will help break down the financial and social costs of remoteness and isolation.</p> <p>Continuing technological change, including micronisation, automation, telecommunications capacity and new communication mediums will unlock opportunities across the Pilbara. Technology which increases the speed, reliability and capacity of communications will help overcome the tyrannies of distance and isolation that currently impact on the viability of accessing and facilitating learning and commerce opportunities.</p> <p>Leveraging this technology to maximise the digital connectivity of businesses requires e-commerce, IT and technology support, as well as increased awareness among small and medium businesses of the Pilbara. Supporting businesses to develop the necessary skills to integrate digital technologies and communication into their operations is essential if new sources of growth are to be found.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Small and medium business development supporting local employment. • Improved access to regional and international markets. • Growth of skilled employment. • Lower business operating costs. • Productivity gains from integration of communication technologies into business and industry operations. • Reduction of “tyranny of distance” challenges to business growth. 	

TRANSFORMATIONAL OPPORTUNITY 9: Business Digital Connectivity**CONSTRAINTS AND CHALLENGES:**

- Digital technology infrastructure access and reliability.
- Technology utilisation acumen and take up.
- E-commerce acceptance and utilisations.
- Local support service availability.
- Global competition.

OUTCOMES

2020	<ul style="list-style-type: none"> • NBN usage is in-line with regional Australian averages. • Businesses are using emerging technology to improve productivity. • Digital and data operations of major mining, oil and gas companies have a presence in the Pilbara region, supported by data centres.
2036	<ul style="list-style-type: none"> • Industry are utilising digital technologies to access regional and global markets. • Businesses are exporting services using digital technology.
2050	<ul style="list-style-type: none"> • Businesses in the Pilbara are fully integrated into the global digital economy and are using advanced technologies.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • NBN Corporation • Digital and Technology companies • Department of Commerce • Local Government • Pilbara Regional Council • Regional, state and national Chamber of Commerce and Industry's and other business advocacy groups • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 10: Automation Technology & Services	
DEVELOPMENT APPROACH	Enabling
REGIONAL PILLAR	Innovation and Advanced Technology
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Urbanisation • Digital Connectivity • Automation
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> • Political Stability • Export Infrastructure • Natural Environment and Resources • Location of Major Industrial Activity
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Local Employment Growth • Population Growth and Retention, Aboriginal Development • Export Potential • Environmental Sustainability • Research and Innovation
OPPORTUNITY DESCRIPTION:	
<p>A range of technological drivers of productivity growth have been trialled and adopted in recent years by the Australian economy. Increased production automation and remote control and management techniques have seen machinery and equipment operated from control rooms in major metropolitan centres, drawing upon advanced communication technologies. Similarly, customised software and IT advancements have improved the capacity of companies and business to manage logistics and major project delivery, saving time, resources and money.</p> <p>In the Pilbara, the mining sector is the most advanced in terms of the adoption of automation technologies and processes. However, other sectors in Australia are increasingly leveraging advanced automation techniques, including remote-controlled dairy farms, port haulage and cargo handling and brick manufacturing.</p> <p>The increased demand for automation technologies and services however raises concerns regarding future job generation in the Pilbara. The growth of more affordable industrial robotics means automation will be increasing cost competitive with human labour. Striking a balance between the adoption and incorporation of advanced robotics and maintaining and accelerating job generation is critical to the future sustainability of the Pilbara economy.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Reduced costs and improved productivity and global competitiveness. • Increased opportunities to extract resources from previously non-economic deposits. • Improved safety and reduced accident costs. 	

TRANSFORMATIONAL OPPORTUNITY 10: Automation Technology & Services	
<ul style="list-style-type: none"> • Research and development flow-on impacts to other industries. 	
CONSTRAINTS AND CHALLENGES:	
<ul style="list-style-type: none"> • Potential for adverse employment outcomes in relevant sectors (e.g. technology replacing workers). • Skills availability. • Need for high capacity ICT infrastructure. • Applied research could take place outside of the Pilbara region. • Remote control operations and centres could be located outside the Pilbara region. 	
OUTCOMES	
2020	<ul style="list-style-type: none"> • Automation technologies are tested and serviced in the Pilbara.
2036	<ul style="list-style-type: none"> • Mining, construction and manufacturing sectors have established automation control centres in the Pilbara.
2050	<ul style="list-style-type: none"> • Automation technologies are developed, tested and serviced in the Pilbara. • Advanced technologies and services are exported to other regions.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • Resource and Energy Companies • Local Government • Local Businesses • Regional, State and National Chamber of Commerce and Industry's and other business advocacy groups • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 11: SME Support	
DEVELOPMENT APPROACH	Value-Add
REGIONAL PILLAR	Diverse & Robust Small & Medium Businesses
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> ● Rising Middle Class ● Digital Connectivity
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> ● Natural Environment and Resources ● Location of Major Industrial Activity ● Aboriginal Culture and Heritage
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> ● Local Employment Growth ● Population Growth and Retention ● Aboriginal Development ● Import Replacement ● Export Potential
OPPORTUNITY DESCRIPTION:	
<p>Small businesses account for the vast majority of Australia’s businesses. They drive regional and national employment growth and are a major source of innovation and entrepreneurship. Small business development has benefited greatly in recent years from advanced telecommunication technologies and processes. Online procurement and ecommerce, virtual freelancing and global supply chains are reducing the cost of establishing small businesses and accessing emerging regional and international market opportunities. However, poor business and financial management skills and understanding of technology constrain the capacity of many small businesses to capture opportunities and operate sustainably in the long-term. Regulatory barriers also constrain small business development.</p> <p>Small businesses are underrepresented in Pilbara region. Business cost pressures, worker housing constraints, a lack of suitable business property and a competitive labour market have all been identified as challenges for the establishment and operation of small businesses in the Pilbara. However, local supply chain and procurement opportunities in the mining and energy sectors, coupled with the Pilbara’s comparative proximity to and profile within Asia, presents major opportunities for the region’s small business community. Leveraging and facilitating the take up of technologies and innovative business and service delivery models is key to circumventing challenges to traditional approaches to running a business and maximising exposure to market opportunities. This will require targeted training and development of the small business community (including incubation and acceleration programs) as well as efforts to promote and foster entrepreneurship in the region. Improved taxation arrangements are also considered necessary to support local business development and growth.</p>	
BENEFITS:	
<ul style="list-style-type: none"> ● Local employment growth and diversification. ● Business development and income growth. ● Increased local procurement. 	

TRANSFORMATIONAL OPPORTUNITY 11: SME Support

- Growth of professional and population services, supporting local residents and businesses.
- Greater innovation and collaboration in the small business sector.

CONSTRAINTS AND CHALLENGES:

- Small business compliance and documentation requirements for resource sector services.
- Capability of local small businesses to bid for large resource sector contracts and procurements.
- Sufficiently skilled personnel.
- Access to affordable land and commercial property.
- Historically high operational costs.
- Cyclical resource sector investment cycle.

OUTCOMES

2020	<ul style="list-style-type: none"> • Tailored and targeted small business incubators and accelerators have been established. • Business development support services are available across the region. • Taxation reforms encourage investments and residential settlement in regional Australia.
2036	<ul style="list-style-type: none"> • Small and medium sized businesses across all sectors provide choice to residents and are sustainable and profitable, with strong growth prospects. • Taxation reforms deliver increased investment and settlement to the region.
2050	<ul style="list-style-type: none"> • A full range of small to medium sized businesses contribute to diverse and vibrant communities comparable to other regional centres.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • Department of Commerce • Regional, state and national Chamber of Commerce and Industry's and other business advocacy groups • Resource and energy companies • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 12: Streamlining Governance	
DEVELOPMENT APPROACH	Value-Add
REGIONAL PILLAR	Diverse & Robust Small & Medium Businesses
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Rising Middle Class • Shift in Economic and Military Power
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> • Political Stability • Location of Major Industrial Activity
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Local Employment Growth • Population Growth and Retention • Aboriginal Development
OPPORTUNITY DESCRIPTION:	
<p>The Pilbara has the highest level of governance representation of any region in the state and arguably the nation. The current population of around 60,000 is represented by four LGAs, the LGA peak body the Pilbara Regional Council (PRC), Federal and State Government parliamentary representatives as well as Federal and State statutory bodies and their regional representatives. Alignment of the objectives of these bodies and close coordination between the tiers of government is critical to the effective governance of the region.</p> <p>The intensity of this governance is a major concern of small and medium businesses in the Pilbara, with regulatory compliance and ‘red and green tape’ regularly sighted as a constraint to business development and growth. The Pilbara Development Commission and other key stakeholders have an important role to play in streamlining government regulations by providing a “one-stop-shop” for all business approvals and requirements. This can include a combination of physical and virtual information and service delivery models tailored to the specific needs of Pilbara business community.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Reduced business costs and regulatory timeframes. • Increased regional competitiveness and business development. • Greater investment and development certainty. • Improved overseas investment attractiveness. 	
CONSTRAINTS AND CHALLENGES:	
<ul style="list-style-type: none"> • Multiple levels of government requiring coordination. • Competing government objectives. • Requires strong bipartisan political support. 	

TRANSFORMATIONAL OPPORTUNITY 12: Streamlining Governance	
OUTCOMES	
2020	<ul style="list-style-type: none"> • The cost of doing business and market barriers to entry have reduced. • Regulatory requirements for businesses in the Pilbara are coordinated and streamlined.
2036	<ul style="list-style-type: none"> • Regulatory costs are minimised to facilitate investment, particularly international investment. • The Pilbara has market barriers to entry and business formation levels similar to other regional locations.
2050	<ul style="list-style-type: none"> • The Pilbara is recognised internationally as an attractive, safe and stable place to do business, with a supportive regulatory environment that encourages entrepreneurship, investment and exports.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Commonwealth, State and Local Governments • Pilbara Development Commission • Pilbara Regional Council • Regional Development Australia - Pilbara • Regional, State and National Chamber of Commerce and Industry's and other business advocacy groups • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 13: High Value Agriculture and Cropping	
DEVELOPMENT APPROACH	Diversification
REGIONAL PILLAR	Agriculture and Aquaculture
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Rising Middle Class; • Global Food Consumption • Climate Change and Water Security
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> • Political Stability • Export Infrastructure • Geographical Proximity to Asia • Natural Environment and Resources
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Local Employment Growth • Population Growth and Retention • Aboriginal Development • Import Replacement • Export Potential • Environmental Sustainability
OPPORTUNITY DESCRIPTION:	
<p>Global food production needs to increase substantially if growing demand in developing countries in Asia, South America, the Middle East and Africa is to be met. Additionally, rising incomes in Asia and the growth of the global middle class is expected to drive demand for higher quality food stuffs and for protein rich foods (namely livestock and dairy). This combination of growing demand and rising incomes presents a significant opportunity for Australia and its regions.</p> <p>Australia is currently the third largest exporter of beef cattle in the world with a national herd in 2012 of 28.5 million head. Beef production accounts for more than 57% of all agricultural activity in Australia and employs approximately 200,000 workers. The vast majority of exports are of live cattle to market such as South East Asia, North Asia and Middle East. Japan, South Korea, the US and Indonesia are currently Australia's largest export markets. There is a desire to supplement live exports with value-added products. However, the proposed China Australia FTA is expected to support further growth in demand. The growth of the demand for beef cattle presents a significant the opportunity for livestock production in the Pilbara to expand and grow.</p> <p>At the same time, opportunities to diversify regional food production into cropping must also be pursued. The proximity of the Pilbara to Asia and strong accessibility to export infrastructure, means Pilbara has the potential to export fresh food to growing South East Asian markets and/or feedstock to local and regional markets. However, the Pilbara's higher cost of production and strong competition from other food producing regions in Western Australia and the world means the Pilbara is not currently placed well to pursue bulk food crop production and export (i.e. coarse grains). Instead, niche and high value cropping opportunities should be targeted. This will require innovative approaches to water management to support intensive horticulture and agricultural activities, as well as major branding and marketing activities to sell Pilbara and North West food to the world. Land tenure also needs to be resolved to facilitate the major international investment in the region, akin to the Ord River Scheme in the Kimberley, and for the Pilbara to reach its true food producing potential.</p>	

TRANSFORMATIONAL OPPORTUNITY 13: High Value Agriculture and Cropping

BENEFITS:

- Industry diversification and local business support.
- Local low cost food production for Pilbara residents and households.
- Agriculture and food export opportunities.
- Food processing and value adding opportunities.
- Regional research and development.
- Domestic and international investment attraction.

CONSTRAINTS AND CHALLENGES:

- Land tenure.
- Consistent water availability.
- Suitable export infrastructure capacity.
- Lack of meat processing facility to service local needs.
- Bio-security measures.

OUTCOMES

<p>2020</p>	<ul style="list-style-type: none"> • Agriculture and horticulture opportunities from mine dewater and ground water sources have been successfully trialled and tested. • Pastoralists are diversifying and expanding their businesses with the support of Seizing the Opportunities and Northern Beef Futures outcomes. • Northern food brand established with Gascoyne and Kimberley regions. • Land tenure frameworks support agricultural development. • Double Gross Value Agricultural Production (GVAP)
<p>2036</p>	<ul style="list-style-type: none"> • Pilbara and North Western Australia recognised globally as a high quality food producing region. • Highly productive land-based food producers are exporting to local, national and international markets. • Food production features value-adding products. • 2.5 times GVAP.
<p>2050</p>	<ul style="list-style-type: none"> • Pilbara and Australia’s North West contribute significantly to regional and global food security. • Triple GVAP.

TRANSFORMATIONAL OPPORTUNITY 13: High Value Agriculture and Cropping

KEY STAKEHOLDERS

- Pilbara Development Commission
- Pilbara pastoral industry
- Agriculture businesses
- Department of Agriculture and Food
- Department of Lands
- Department of Transport
- Department of Water
- Aboriginal groups with Native Title claims or land holdings
- Resource and energy companies
- Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 14 : Aquaculture, Algae Biofuels and Co-products	
DEVELOPMENT APPROACH	Diversification
REGIONAL PILLAR	Agriculture and Aquaculture
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> ● Rising Middle Class; ● Global Food Consumption ● Climate Change and Water Security ● Low Carbon Future
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> ● Political Stability ● Export Infrastructure ● Geographical Proximity to Asia ● Natural Environment and Resources
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> ● Local Employment Growth ● Population Growth and Retention ● Aboriginal Development ● Import Replacement ● Export Potential ● Environmental Sustainability
OPPORTUNITY DESCRIPTION:	
<p>The growth of global population, coupled with rising incomes and purchasing power, is driving growth of demand for protein. Seafood, which has long been a primary source of protein in many countries around the world, has been experiencing strong growth. In 2012, the Food and Agricultural Organisation estimated that humans consume an average 15.4 kilograms of seafood per person, a historical record, with Asia accounting for two thirds of this demand. However, in response to this growth, and concerns regarding the sustainable management of the ocean’s food resources, seafood production has been undergoing a structural change, with greater focus on aquaculture.</p> <p>In 2010, aquaculture accounts for 47% of global fish production. Aquaculture is expected to continue to grow rapidly in coming years and overtake wild capture as the primary source of the world’s seafood. However, this growth rate is expected to slow in response to water constraints, limited availability of optimal production locations and rising input costs.</p> <p>Western Australia has long been home to major commercial aquaculture activities, starting with the production of South Sea pearls along the North West Coast. Other species that have been grown and farmed include abalone, marron, silver perch, rainbow trout and microalgae, while other opportunities such as octopus, prawns, sea cucumber, brine shrimp, tuna (yellowfin and southern bluefin), yellowtail kingfish and other marine fish have been identified.</p> <p>The Pilbara’s extensive and relatively population free coastline and inland areas makes it ideally suitable for aquaculture. One offshore marine aquaculture zone has been declared by the Western Australian Government with one other currently being progressed. These zones, located in the Kimberley and Mid-West regions respectively are current being established with the aim of providing “investment ready” locations for offshore aquaculture activities. The Pilbara has a number of</p>	

TRANSFORMATIONAL OPPORTUNITY 14 : Aquaculture, Algae Biofuels and Co-products

offshore locations suitable for aquaculture, as demonstrated by the pearl industry. Onshore marine aquaculture also has significant potential with a number of coastal areas suitable for pond aquaculture of crustaceans and finfish. In addition the vast quantities of fresh water associated with mining activities from dewatering and mine pit lakes in addition to artesian sources also presents future opportunities for inland aquaculture. The lack of suitable locations in other parts of the world means long-term demand for pristine environments off the WA central and north west coasts may see focus invariably shift to the Pilbara.

The Pilbara's plentiful amounts of sunlight and coastal land make it an ideal location for algae and seaweed culture. While there is the potential for biodiesel production, there is growing recognition of the pharmaceutical and nutraceutical properties of algae and seaweeds for use in human and animal medicines and foods.

BENEFITS:

- Industry diversification and local business support.
- Availability of regionally-produced fuel for Pilbara industry and residents.
- Food export opportunities.
- Food processing and value adding opportunities.
- Regional research and development.
- Domestic and international investment attraction.
- Opportunities to leverage synergies between livestock and onshore aquaculture production.

CONSTRAINTS AND CHALLENGES:

- Land tenure.
- Consistent water availability.
- Export infrastructure capacity.
- Lack of critical mass of investment and production impacts viability of production.
- Lack of declared maritime aquaculture zone in the Pilbara.
- Small domestic market – focus primarily on international markets.
- Bio-security measures.

OUTCOMES

2020	<ul style="list-style-type: none"> • Land tenure frameworks support aquaculture (onshore and offshore) development • Aquaculture species suited to the Pilbara are being introduced and developed.
2036	<ul style="list-style-type: none"> • Highly productive land-based and ocean-based aquaculture producers are exporting to local, national and international markets. • Algae-based aquaculture producers are exporting nutraceuticals and pharmaceuticals to local, national and international markets.

TRANSFORMATIONAL OPPORTUNITY 14 : Aquaculture, Algae Biofuels and Co-products	
2050	<ul style="list-style-type: none"> ● Pilbara and Australia’s North West contribute significantly to regional and global food security.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> ● Pilbara Development Commission ● Department of Fisheries ● Aboriginal groups with Native Title claims or land holdings ● Aquaculture businesses ● Department of Lands ● Department of Transport ● Department of Water ● Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 15: Energy Production	
DEVELOPMENT APPROACH	Diversification
REGIONAL PILLAR	Energy
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Urbanisation • Low Carbon Future
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> • Natural Environment and Resources • Location of Major Industrial Activity
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Local Employment Growth • Population Growth and Retention
OPPORTUNITY DESCRIPTION:	
<p>Energy has long been recognised as a primary driver of economic development. Coal and oil have, and are expected to continue to be important sources of energy in the medium term though greater attention and investment is being directed towards renewable energy production (such as solar, wind, hydro, tidal and geothermal) as the world seeks a more diversified energy base as well as low carbon energy sources. Additionally, natural gas has continued to grow in prominence as an important base load energy source.</p> <p>The Pilbara is blessed with one of the most intensive and extensive mixes of energy assets in the world. The Pilbara possesses offshore and onshore gas reserves, coal deposits, geothermal, biofuel production potential and consistent and intensive solar radiation. Realising and exploiting these energy assets will be critical to the development and growth of the Pilbara.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Consistent and reliable energy supply for business and residential sectors. • Reduced business and household costs through lower energy costs. • Diversified energy mix for local industry, providing improved energy supply and cost certainty. • Decreased reliance on global energy supplies for regional economic activity. 	
CONSTRAINTS AND CHALLENGES:	
<ul style="list-style-type: none"> • Lack of interconnected infrastructure to distribute energy supplies around the region. • Land tenure. 	
OUTCOMES	
2020	<ul style="list-style-type: none"> • Land tenure frameworks support energy precinct development. • Pilbara businesses are integrating into energy supply chains of offshore and onshore oil and gas, exploration, extraction and export activities. • Renewable and alternative energy sources are being utilised, supported by a suitable market framework.

TRANSFORMATIONAL OPPORTUNITY 15: Energy Production	
2036	<ul style="list-style-type: none"> ● Renewable and alternative energy developments are operating, incentivised by appropriate regulatory frameworks. ● Feasible onshore gas developments are operating and predominately serviced by businesses in the Pilbara.
2050	<ul style="list-style-type: none"> ● The Pilbara has a diversified source of sustainable energy including renewable and alternative energy sources.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> ● Pilbara Development Commission ● Resource and energy companies ● Department of Mines and Petroleum ● Department of Lands ● Department of Transport ● Department of Water ● Aboriginal groups with Native Title claims or land holdings ● Western Power ● Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 16: Energy Export	
DEVELOPMENT APPROACH	Diversification
REGIONAL PILLAR	Energy
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Urbanisation • Rising Middle Class • Shift in Economic and Military Power • Low Carbon Future
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> • Political Stability • Export Infrastructure • Geographical Proximity to Asia • Natural Environment and Resources
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Local Employment Growth • Population Growth and Retention • Export Potential
OPPORTUNITY DESCRIPTION:	
<p>While improving energy security and self-sufficiency in the Pilbara region is an important goal, the size and quality of the region's energy assets means they also represent a significant export opportunity. The established energy export profile is a valuable asset that provides the Pilbara the opportunity to tap into growing global demand and build upon its established export capacities.</p> <p>In addition to offshore oil and gas exports, Western Australia is blessed with significant onshore gas resources, either in tight gas or shale gas deposits. Major deposits include the Perth, Carnarvon and Canning Basins. The Canning Basin, the largest of all three basins extends along the coast north of Port Hedland to north of Derby and extends south east inland towards the Western Australian border.</p> <p>Expectations are that initial development of the Canning Basin will likely focus on supplying regional and state markets. This may include providing energy for heavy industry, mining and residential sectors in the Pilbara, as well as transportation by pipeline to Perth and South West markets. However, the potential size of the resource base means gas exports are a possibility. This would require significant investment in extraction, transportation and export infrastructure, though there may be synergies with both mining and offshore gas operations in the Pilbara and North West.</p> <p>In terms of alternate fuels, the establishment and expansion of industrial algae-based biofuel production may provide a potential niche export market for the Pilbara to other parts of Western Australia, Australia and the world. This would require not only the establishment of extensive transport and export infrastructure but also increased acceptance of non-fossil liquid fuels in the global energy mix. While unlikely in the short-to-medium term, it represents a significant potential opportunity in the long-term.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Increased exports to international markets. • Diversified energy exports, as global energy demand mix changes. • Increased government taxation and royalties revenue. 	

CONSTRAINTS AND CHALLENGES:	
<ul style="list-style-type: none"> • Export infrastructure capacity. • Small domestic market – focus primarily on international markets. • Need for greater global acceptance of non-traditional energy sources. • Strong global competition for energy and exports. 	
OUTCOMES	
2020	<ul style="list-style-type: none"> • Energy export options and technological and market innovations are capitalising on the location advantages of the Pilbara.
2036	<ul style="list-style-type: none"> • Energy export facilities are operating, incentivised by appropriate regulatory frameworks.
2050	<ul style="list-style-type: none"> • The Pilbara exports diverse energy sources to regional, national and international markets.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • Resource and Energy Companies • Department of Mines and Petroleum • Department of State Development • Department of Lands • Department of Transport • Department of Water • Aboriginal groups with Native Title claims or land holdings • Department of Regional Development

TRANSFORMATIONAL OPPORTUNITY 17: Nature Based Tourism	
DEVELOPMENT APPROACH	Diversification
REGIONAL PILLAR	Tourism
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Rising Middle Class
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> • Geographical Proximity to Asia • Natural Environment and Resources
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Local Employment Growth • Population Growth and Retention • Environmental Sustainability
OPPORTUNITY DESCRIPTION:	
<p>The tourism sector, arguably more than any other sector in the region, has suffered from ‘crowding out’ caused by competition for short stay accommodation, transportation vehicles and labour. Despite the attraction of the Pilbara’s rugged landscape for adventure tourism, the sector remains largely underdeveloped in terms of the adequacy of tourism-related infrastructure, marketing and promotion, and short stay accommodation choices.</p> <p>Tourism has the potential to be a significant direct employer in the region and indirect employer through hospitality, food and beverage, and entertainment and recreation services. There are numerous opportunities to grow the tourism sector into the future and build on the natural strengths and competitive advantages of the Pilbara as a tourism destination (e.g. airport access).</p> <p>The uniqueness of the Pilbara landscape and environment assets can underpin a vibrant, niche and experiential nature-based tourism sector. This could include opportunities new eco-accommodation provision and resorts, fishing tours and increasing access to the regions National Parks and conservation estates.</p> <p>Expanding tourism generally, and nature-based tourism specifically, will require investments in tourism infrastructure and amenities to improve accessibility and visitor experiences.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Increased leisure and holiday visitation to the Pilbara, with associated expenditure. • Significant flow-on impacts for local retailers and businesses. • Maintenance of natural environmental assets. • Employment, training and business opportunities for Aboriginal groups. • Visitation supports additional investment in infrastructure and services, above that which can be supported by local residents alone. • Investment attraction in eco-tourism accommodation. • Diversifies tourism attractions and offering for visitors, including backpackers and grey nomad segments. 	
CONSTRAINTS AND CHALLENGES:	

TRANSFORMATIONAL OPPORTUNITY 17: Nature Based Tourism

- High seasonality
- Unknown brand recognition amongst international travellers.
- Requires active asset management to prevent degradation from over use.
- Spatially dispersed assets – long travel distances.
- Lack of critical mass of activity and attractions will require whole of North West approach.
- Cost of travel to the Pilbara is often prohibitive.
- Strong eco-tourism market competition.

OUTCOMES

2020	<ul style="list-style-type: none"> • The Pilbara's natural and man-made environment is invested in and leveraged off to offer a larger and more diverse range of tourism products, including national parks, trails, adventure, museums, industrial tourism, ocean-based tourism, cultural and old town sites. • A larger and more diverse range of accommodation options, such as eco-tourism, are available. • The Pilbara is fully incorporated into Western Australia and National tourism branding and promotions and is achieving national and international market recognition. • There is an increase in regional, national and international leisure visitor numbers.
2036	<ul style="list-style-type: none"> • The Pilbara is recognised as offering quality and diverse tourism products, including national parks, trails, adventure, museums, industrial tourism, ocean-based tourism, cultural and old town sites. • Accommodation options, including eco-tourism, hotel and resort products, and costs are equivalent to comparable regional areas.
2050	<ul style="list-style-type: none"> • The Pilbara is recognised internationally as a unique eco and nature-based tourism destination that is highly accessible and has a diverse range of attractions, amenities and accommodation options.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Pilbara Development Commission • Tourism WA • Tourism industry • Australia's Northwest Tourism • Department of Parks and Wildlife • Pilbara Regional Council • Regional Development Australia – Pilbara • Aboriginal Groups with Native Title claims or land holdings

TRANSFORMATIONAL OPPORTUNITY 18: Heritage and Aboriginal Tourism Development	
DEVELOPMENT APPROACH	Diversification
REGIONAL PILLAR	Tourism
REGIONAL AND GLOBAL INFLUENCES	<ul style="list-style-type: none"> • Rising Middle Class
COMPARATIVE ADVANTAGES	<ul style="list-style-type: none"> • Geographical Proximity to Asia • Natural Environment and Resources • Aboriginal Culture and Heritage
STRATEGIC PRIORITIES	<ul style="list-style-type: none"> • Local Employment Growth • Population Growth and Retention • Aboriginal Development • Environmental Sustainability
OPPORTUNITY DESCRIPTION:	
<p>Aboriginal and colonial Australia history is long and storied and adds measurable value to our community and our economy. This is increasingly the case in the tourism sector, with Australia's heritage regularly identified as a major attractor/area of interest for international tourists. Attracting and retaining such tourists, with their higher expenditure and longer lengths of stay is a state objective of Tourism Australia and the Australian Government. At the same time, Aboriginal heritage-based tourism is recognised as a potentially effective economic and business development strategy for Aboriginal communities. Where the heritage offering is objectively attractive to key market segments and incorporates strong dynamic and interactive elements, heritage based tourism can provide Aboriginal communities and groups significant employment, income and economic and social participation benefits.</p> <p>The Pilbara has an established visitation sector, with strong growth over the past decade in aircraft and passenger movements through all major airports. This visitation has been primarily associated with employment and business related travel, which has effectively crowded out leisure and holiday-based tourism. With the transitioning of the current mining cycle to the production phase and additional capacity in the travel and accommodation sectors, there is a transformational opportunity in the short-to-medium term to incentivise greater numbers of leisure-based tourists. Aboriginal heritage should figure strongly in the development of new assets and attractions.</p> <p>Realising this potential, through targeted investment in sustainable commercial operations is critical to enhancing the quality of life, socio-economic status and participation of Aboriginal people in the Pilbara economy and society. There is also great synergy for the Pilbara to partner with the Kimberley to become Australia's cultural tourism hub.</p>	
BENEFITS:	
<ul style="list-style-type: none"> • Increased leisure and holiday visitation to the Pilbara, with associated expenditure. • Significant flow-on impacts for local retailers and businesses. • Maintenance of Aboriginal and cultural assets. • Visitation supports additional investment in infrastructure and services, above that which can be supported by local residents alone. • Employment, business and training opportunities for Aboriginal groups. 	

TRANSFORMATIONAL OPPORTUNITY 17: Nature Based Tourism

- Diversifies tourism attractions and offering for visitors, including backpackers and grey nomad segments.

CONSTRAINTS AND CHALLENGES:

- High seasonality
- Unknown brand recognition amongst international travellers.
- Requires active asset management to prevent degradation from over use.
- Spatially dispersed assets – need to long travel distances.
- Lack of critical mass of activity and attractions will require whole of North West approach.
- Cost of travel to the Pilbara is often prohibitive for leisure tourists.

OUTCOMES

2020	<ul style="list-style-type: none"> • Aboriginal cultural attractions are explored, formalised, protected and invested in to ensure sustainable visitation • World class iconic cultural facilities such as museums and art galleries are developed. • Aboriginal tourism businesses are sustainable and profitable, providing significant employment, training and commercial opportunities for Aboriginal peoples.
2036	<ul style="list-style-type: none"> • Aboriginal tourism is regarded as an integral part of the region's broader tourism offering. • A network of cultural and tourism centres is established across the region. • The Pilbara has international direct flights from a diverse range of destinations
2050	<ul style="list-style-type: none"> • Heritage and Aboriginal tourist attractions are recognised by the international market as unique offerings that attract visitors from around the world in their own right.
KEY STAKEHOLDERS	<ul style="list-style-type: none"> • Aboriginal Groups with Native Title Claims or land holdings • Tourism Industry • Department of Parks and Wildlife • Pilbara Development Commission • Tourism WA • Australia's Northwest Tourism • Pilbara Regional Council • Regional Development Australia - Pilbara

9.0 Implementation Overview

Development of an Implementation Plan

The Pilbara Development Commission recognises the 35 year timeframe to 2050 will necessitate a long term commitment by stakeholders to the Vision of the Blueprint. In light of this, the Commission considers stakeholder input into shaping the Blueprint's implementation strategy as critical to its success.

To this extent, the Commission seeks during public consultation from Pilbara stakeholders, comments and feedback on the Blueprint's implementation. Following the public consultation period on the Blueprint itself, the Commission will develop an implementation strategy and a monitoring and evaluation framework that is informed by that feedback.

The implementation strategy will be guided by the answers to the following questions:

- What role do you or your organisation want to play in the implementation of the Blueprint?
- How would you or your organisation potentially resource that role?
- What should the objectives of the implementation strategy be?
- How should the implementation Strategy be lead?
- Given the Commission's legislative goal to "encourage, promote, facilitate and monitor the economic development in the region", what role should the Commission play?
- What should the framework look like for prioritising initiatives and projects given existing public and private resources?

Why Does the Blueprint Need an Implementation Plan?

The Blueprint provides an overarching framework with nine pillars guided by the region's comparative advantages, needs and opportunities.

Successful transformation of the Pilbara will require a sequenced set of actions, initiatives and projects that will need to be delivered by a range of public, private and community stakeholders collaboratively.

The ongoing sequencing, costing and management of outcomes in line with economic and social aspirations, and the periodical renewal of the Blueprint will be part of the Implementation Plan.

What Will the Implementation Plan Include?

The Blueprint will be implemented through a partnership approach, building coalitions and leveraging expertise, knowledge and investment funding to ensure the optimum outcomes are achieved for the region through targeted, well-planned and effective investment.

The approach to implementation of the Blueprint will be comprised of a number of interrelated, coordinated, supportive actions.

These actions are broadly outlined below.

- **Investment Promotion** – including promoting and marketing of the Blueprint to stakeholders, engagement with financiers and investment, mobilisation of new investment, business case preparation, industry coordination and sector specific investment coordination.
- **Advocacy and Leadership** – including policy and process change advocacy, government policy input, Pilbara Cities vision-keeping, planning and strategy implementation coordination, reform promotion and advocacy.
- **Facilitation and Enablement** – including delivery coalition and partnership formation, public-private partnership fostering, public funding leveraging public to attract and leverage private and community funding and promote knowledge and information about the Pilbara to inform decision making.
- **Governance and Regulation** – including monitoring, reviewing and assessing Blueprint implementation, stakeholder engagement, community engagement, regional governance and regulatory reform promotion and promoting coordination between all levels of Government.

Who is Responsible?

The Pilbara has the highest level of governance representation of any region in the state, and arguably the nation. The current population of around 60,000 is represented by four LGAs, the LGA peak body the Pilbara Regional Council (PRC), Federal and State Government parliamentary representatives as well as Federal and State statutory bodies.

The Pilbara is also home to a dynamic private business sector, with major international corporations, national and state significant companies and a range of small and medium-sized local businesses. These businesses are a major source of investment in the region. The region is also a major destination for national and international investment, which provides critical funds to realise the potential of the Pilbara economy.

Finally, modern economic activity and investment is increasingly driven by national and international investors. From sovereign wealth funds and government owned corporations, to high net worth individuals, international investors are continually seeking short and long-term investment opportunities. Strategically directed, such investors can be an invaluable partners for transformative projects, infrastructure and industries in a region.

Alignment of objectives of these stakeholders and close coordination between the tiers of government and public and private sectors is critical to the effective implementation of the Blueprint. Specific stakeholders in the growth and development of the Pilbara region that will play a role in the implementation of this Blueprint include:

- **Federal Government:** The Federal Government has a stated policy commitment to the development of Northern Australia regions. The substance of this policy commitment will be fleshed out in the course of the current parliamentary Joint Select Committee on Northern Australia which will examine the potential for the development of mineral, energy, agricultural, tourism, defence and other industries in Northern Australia. A number of Federal departments and agencies have important roles in the development of the Pilbara including Communications, Defence, Immigration and Border Protection, Infrastructure and Regional Development, CSIRO, Bureau of Infrastructure, Transport and Regional Economics, Bureau of Resources and Energy Economics, NBN Co Ltd and Tourism Australia.
- **Regional Development Australia:** RDA was established in 2008 to bring together all levels of government to support the growth and development of regional Australia. It is supported by the Commonwealth Department of Infrastructure and Regional Development and is made up of a network of 55 non-profit, community-based locally managed committees serving rural, regional, remote and urban communities

across Australia. RDA Committees are locally managed, community-based organisations jointly funded by the Federal and State Governments. RDA Pilbara is mandated to play an engagement, coordination and advocacy role and support growth and development within the region.

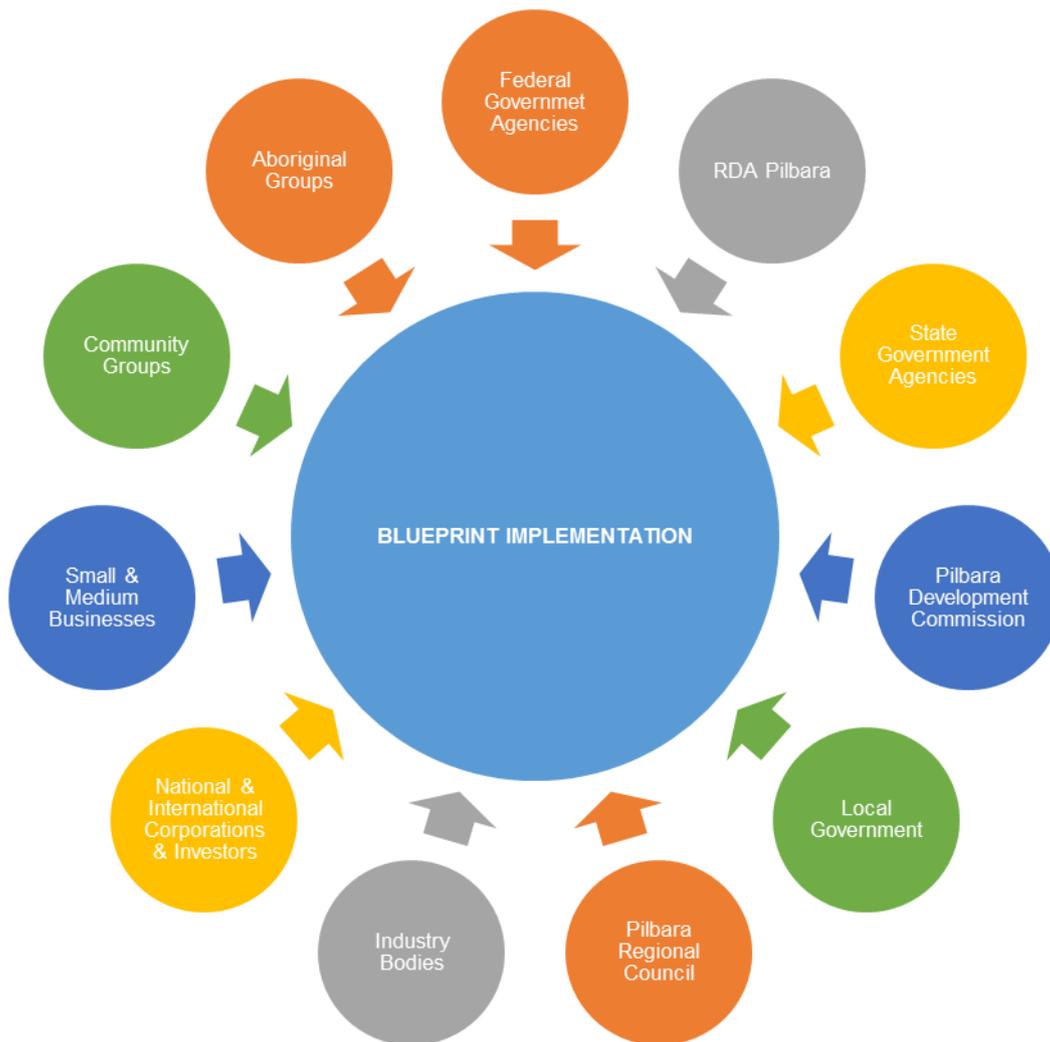
- **State Government Agencies:** All key state government departments and agencies have representation in the region including departments responsible for utilities, transport, training and workforce development, health, education and Aboriginal affairs, amongst others. The key policy instruments of the State Government to support development in the Pilbara are in planning and financing regional development and creating the business and regulatory environment to support development. Planning under the Planning Act is the responsibility of the Western Australian Planning Commission (WAPC) supported by the Department of Planning. In the Pilbara, the WAPC has delegated some planning decisions to the Pilbara Regional Planning Committee. Headed by the Chairman of the WAPC, this committee comprises representatives from LGAs, State Government including departments of state, regional development, utilities and minerals, business and industry and community and Aboriginal peoples.
- **Pilbara Development Commission:** The PDC is a State statutory authority with an independent board mandated to focus on strategic planning and engagement for the economic and social development of the region. The PDC's role is as a leader, advocate, broker and innovator of solutions to the growth and development of the region, promoting objectives of diversity of economic, community and social development and the development of land supply and accommodation and infrastructure solutions to support the region's needs.
- **Local Government:** Each LGA in the Pilbara has responsibility for the preparation of local planning strategies and schemes, amendments to local planning schemes and structure plans with assistance, where necessary, from the State Department of Planning. Each local Council in the Pilbara has produced sub-regional township plans that align with the objectives of key regional planning instruments such as the PPIF and expand in detail on strategic and statutory planning for each of the major townships. Local governments also play an important role in the enabling and facilitation of growth enhancing initiatives, they own and maintain key infrastructure and have considerable assets and resources to foster new opportunities.
- **Pilbara Regional Council:** The PRC was established in 2000 under the WA Local Government Act 1995 and is a collaborative partnership between the four Pilbara LGAs. The PRC sees its mandate to support regional service delivery, provide a voice for the Pilbara, add economic value and provide governance support. The PRC also promotes cost efficiencies through shared management of services and projects across the four LGAs.
- **Industry Bodies:** Informing policy development in the region, chambers of commerce and other industry bodies provide a forum for industry to work in collaboration with Commonwealth, State and local governments and Pilbara communities.
- **Major National and International Corporations and Investors:** The Pilbara is home to a wide range of national and internationally significant corporations, particularly in the mining and resources sector. The most prominent are BHP Iron Ore and Rio Tinto, which contribute significantly to the Pilbara economy and community through exports, employment generation, local supply chains and investment in community facilities and infrastructure.
- **Local Small and Medium Businesses:** The Pilbara is home to a diverse group of small and medium businesses that generate significant employment opportunities for existing and new residents. Value adding and diversifying the Pilbara economy will depend greatly on the investment and growth of local small and medium businesses in the region.
- **Community Groups:** The Pilbara is blessed by an active, dynamic community sector, supported by a wide range of community groups. Covering all parts of the community – including health, education, social welfare, support for disadvantaged groups, sport and recreation and religious and spiritual endeavours –

community groups play a critical role in building the social capital of the Pilbara. They invest in facilities and services and enhance the liveability of the region, improving the attraction and retention of residents.

- **Aboriginal Groups:** As the traditional owners of the Pilbara, Aboriginal communities and people are fundamental to the growth and development of the region. Fostering and promoting Aboriginal heritage and culture and enhancing Aboriginal quality of life and participation in the wider economy requires strong buy in from Aboriginal groups and people.

Only by working together, in a coordinated and concerted approach, can the Blueprint be successfully implemented and the vision, pillars and strategic objectives of the Blueprint be realised.

Figure 40 Pilbara Regional Investment Blueprint Stakeholders



Financing & Funding Development

The Pilbara's forecast population growth trajectory towards 2020 of around 75,000 persons will demand ongoing investment in economic, social and community infrastructure to overcome current deficits and cater for an additional demand for housing, utilities and liveable communities. Financing the next phase of Pilbara investment in economic, social and community infrastructure will be a challenge. New sources of investment finance will need to be identified and unlocked to fund development needs in the region.

Better investment coordination between the public and private sectors could also help overcome the current fragmented and duplicated approach to infrastructure funding. New models for financing regional development are needed that can:

- Utilise public funding to leverage other capital sources to attract new complementary and supplementary funding;
- Mobilise and coordinate the considerable sums of domestic latent capital that exists in the region;
- Overcome the fragmented approach to sector funding through employing pooled funding and sector-wide approaches and scaling up successful models of coordinated industry, community and government funding for the health and education sectors;
- Investigate new capital raising mechanisms such as public-private partnerships, municipal bonds and value capture; and
- Examine the viability of public asset sales that can both release new capital for priority infrastructure investment and support expansion and more efficient management of existing assets.

There are numerous funding pools available which will have to be accessed in order to achieve the aspirational vision for the Pilbara. The main funding avenues are summarised below.

- **Private Sector** – Private sector investment, by households and businesses, is integral to the future development of the Pilbara. The private sector has largely funded the development of the Pilbara since the start of mineral exploration in the 1960s. Private sector investment has been particularly significant over the past 15 years as part of major resource sector investment in new mines and expansion of existing mine capacity and associated transport and distribution infrastructure. Over \$300 billion of investment is estimated to have occurred over this period. Appropriate frameworks need to be developed which can facilitate private investment and leverage off public investment.
- **Royalties for Regions** – The Royalties for Regions (RfR) scheme has been the Western Australia State Government's policy and funding mechanism for regional development investment since its inception in 2008. A total of \$3.67 billion from RfR was invested over the five years to June 2014¹¹⁰. RfR has been a major contributor to the Pilbara's development over the past five years under the Pilbara Revitalisation Plan and Pilbara Cities initiative, with over \$1.8 billion committed to the region since 2009 supporting major upgrades and expansion of economic, social and community infrastructure to accommodate a growing population. Although the Pilbara enters a new production phase, RfR will be an important source of required funding to continue to support the region's development and exploit and facilitate new opportunities.
- **Commonwealth** – Commonwealth expenditure is essential to the development of regional capacity. The Commonwealth is the main source of revenue in the country, with significant investment already flowing through to roads and social programs in the Pilbara. The bipartisan commitment to realising the potential

of northern Australia is an important policy announcement with the potential to unlock and facilitate opportunities in the region.

- **Superannuation Funds** – Significant amounts of investment capital have accrued in superannuation funds under management in Australia. Such funds are estimated to total around \$1.4 trillion with an additional \$60 billion added to funds annually through the compulsory superannuation levy.
- **Public Private Partnerships** – Public-private partnerships (PPPs) are not new to the Pilbara. The historical pattern of settlement and investment in the region has largely been modelled on the PPP concept. Resource companies have built, serviced and populated the towns and government has provided essential services and managed land development as part of the partnership. State Agreements between the West Australian State Government and mining companies have formed the basis of defining the respective roles and responsibilities of these partnerships. These agreements could provide the basis for a renewed approach to PPPs for major infrastructure investment.
- **Native Title Trusts** – The native title dividend to Aboriginal communities from mining companies is estimated to be worth as much as \$3 billion a year. This represents a pool of investment capital that has the potential to provide mutual benefit for Aboriginal communities and the wider community and region through productive, growth generating investment.

Monitoring and Reviewing Outcomes and Actions

The Implementation Plan will determine responsibility for the monitoring and evaluation of outcomes from the Blueprint. The PDC and stakeholders will jointly develop a framework for monitoring and evaluation, including performance measures.

The monitoring and evaluation framework shall serve several purposes including to:

- Measure investment across the region disaggregated by sector;
- Assess business case development including the number and focus of business cases prepared;
- Capture policy and procedural initiatives and reforms that improve the investment and development in the region;
- Monitor demographic and population changes, wellbeing and social cohesion; and
- Report on outcomes, achievements and any shortcomings in implementation of the Regional Investment Blueprint.

The Blueprint Implementation Plan will also determine a review, evaluation and reporting process. Community consultation and feedback on investment and development outcomes and issues will be sourced during this process of review. The Blueprint's contemporary relevance will also be assessed and updates or amendments made to ensure the document remains useful and relevant as guide for investment and development of the region.

Appendix 1

Acronyms

ANSIA	Ashburton North Strategic Industrial Area
BHPB	BHP Billiton
COAG	Council of Australian Governments
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DoP	Department of Planning
FIFO	Fly In, Fly Out
FMG	Fortescue Metals Group
GDP	Gross Domestic Product
GRP	Gross Regional Product
IFSP	Industry Facilitation Support Program
LGA	Local Government Area
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MENA	Middle East and North Africa
Mt	Million Tonnes
Mtpa	Million Tonnes Per Annum
NAPLAN	The National Assessment Program – Literacy and Numeracy
NBN	National Broadband Network
NGO	Non Government Organisation
PDC	Pilbara Development Commission
PFSCUF	Pilbara Fabrication and Services Common User Facility
PHADI	Pilbara Hinterland Agricultural Development Initiative
PPIF	Pilbara Planning and Infrastructure Framework
PPP	Public Private Partnership
PRC	Pilbara Regional Council
RAI	Regional Australia Institute
RDA	Regional Development Australia
RfR	Royalties for Regions
RTIO	Rio Tinto Iron Ore
SoA	Shire of Ashburton
SoEP	Shire of East Pilbara
WAPC	Western Australian Planning Commission

Key Plans and Strategies

State Planning Strategy 2050

The *State Planning Strategy* is the lead strategic planning document for the Western Australian State Government. It highlights principles, strategic goals and strategic directions that are important to the land-use planning and development of Western Australia. A Vision of sustained growth and prosperity underpins the Strategy and is framed around diversity, liveability, connectedness and collaboration, with the following high levels aims.

- A diverse state; offering a diversity of ecosystems, landscapes, enterprises, people and cultures
- A liveable state; the place of choice for the brightest and best
- A connected state; as connected to the rest of the world as any other place;
- A collaborative state; enabling alignments that progress the State's sustained growth and prosperity

Five interrelated strategic goals have been identified with the view to realising a Vision of sustained prosperity for Western Australia.

- Global competitiveness will be enhanced through continued economic diversification
- Strong and resilient regions will be built through economic expansion and inter-regional collaboration;
- Sustainable communities will be enhanced by investment in infrastructure and social capital;
- Infrastructure planning and coordination will achieve efficiencies and synergy in pursuit of economic growth.
- Conservation of the environment will be enhanced by sustainable development and efficient resource use.

Western Australian Regional Freight Transport Network Plan

The Western Australian State Government *Regional Freight Network Plan* identifies the strategic long-term planning, policy and project priorities required to facilitate growth and ensure optimal network performance for the Western Australian regional freight network to 2031. The plan forecasts significant growth in regional freight movement to 2031:

- Regional road freight load will double from what it was in 2010;
- Freight movements through the State's port authorities will be 2.5 times what it is today growing to 1 billion tonnes per annum by 2030; and
- Rail freight serviced by the State's rail freight network will be 2.25 times what is was in 2010.

The plan also anticipates a significant increase in freight movement in the Pilbara along North West Coastal Highway, Marble Bar Road, the Karratha-Tom Price Road and the Nanutarra-Munjina Road, as cargo is moved from port to new processing plants and industrial estates along the coast, or to the expanding network of mines located inland.

The plan identifies as number of Pilbara priorities and commitments including:

- Establishment of integrated deep-water port and industrial estates at Anketell and Ashburton;
- Expansion at existing port authority ports to accommodate growth in the region's resources; and

- Development of the Pilbara road network to support coastal and inland industrial expansion of the Pilbara Cities Initiative.

Western Australian State Aviation Strategy

The *State Aviation Strategy* aims to support the economic and social development of regional WA through the provision of safe, affordable, efficient and effective aviation services and infrastructure. The draft strategy proposals include the State Government taking steps to:

- Directly engage with major regional airports in relation to forecasts of aviation activity, particularly in relation to master planning;
- Improve infrastructure planning and development at local government owned regional airports;
- Encourage private sector investment in, and management of, regional airports to improve their effectiveness and efficiency;
- Foster the development of tourism through improved aviation services; and
- Encourage competition on intrastate air routes and seek to reduce the high cost of intrastate airfares.

COAG Themes of Economic Importance

The Council of Australian Government (COAG) five themes of strategic importance lie at the intersection of jurisdictional responsibilities:

- A long-term strategy for economic and social participation;
- A national economy driven by our competitive advantages;
- A more sustainable and liveable Australia;
- Better health services and a more sustainable health system for all Australians; and
- Closing the gap on Aboriginal disadvantage.

These themes represent fundamental issues for the Australian economy and are acutely relevant to the growth and development of the Pilbara. This Blueprint seeks to contribute to achieving lasting solutions to these themes in the region and establishes a dynamic framework for national priorities to be identified, considered and addressed on an ongoing basis.

Developing Northern Australia Priorities

The Australian Government has identified developing the potential of northern Australia as a key priority to the nation's prosperity. The Commonwealth Green Paper on Developing Northern Australia has identified six high level policy priorities to develop Northern Australia.

- Delivering economic infrastructure: including through planning and prioritising projects and identifying effective ways to fund and finance them, particularly through leveraging private sector investment.
- Improving land use and access: including through more flexible and longer term tenure, greater consistency across jurisdictions, new ways for Aboriginal Australians to use their land for development, efficient native title processes and more accurate information.
- Improving water access and management: including through better understanding of systems, planning and investing in new infrastructure (such as dams) and reforming water management and planning, including functional water markets.

- Promoting trade and investment and strengthening the business environment: including through boosting population, improving labour availability, cutting red tape and increasing trade, especially with Asia.
- Fostering education, research and innovation: including through developing research networks, improving local workforce and industry skills and engaging with international education and training markets.
- Enhancing governance: including through better coordinating government and non-government activities, greater engagement with the north and building local capacity.

Pilbara Planning and Infrastructure Framework

The Pilbara Planning and Infrastructure Framework sets out a range of strategic planning goals, objectives and actions to address opportunities and challenges, such as the provision of adequate physical and community infrastructure to accommodate population growth over the next 25 years. The Framework supports the State Government's commitment to planning for the expansion of urban centres such as Karratha and Port Hedland via the Pilbara Cities Vision.

The Framework additionally identifies an economic development Vision whereby the Pilbara will have a robust, diverse and sustainable regional economy to service the needs of its industry and commerce effectively. Key to this Vision is the development of a Pilbara economy which is 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.

Pilbara Cities Vision

The Blueprint is fundamentally linked to the Pilbara Cities program and Vision which aims to address the issues associated with significant population and mineral and resource economic growth in the region.

The Pilbara Cities' Vision is to create places in the Pilbara with access to high standards of education, health and diverse employment and career opportunities, which people choose to settle on a permanent basis. Notably, Karratha and Port Hedland are envisioned as cities of 50,000 people each and Newman with a population of 15,000 people. Other Pilbara towns, including Tom Price and Onslow, are also set to grow to become more attractive and sustainable local communities to benefit the entire region.

Pilbara Cities identifies its key focus areas as including:

- Infrastructure coordination – energy, water, waste water, roads, ports and marinas;
- Land availability and development – land preparation, planning, developer attraction and retention, and housing;
- Community projects and engagement – education, health, community facilities, and Aboriginal participation; and
- Economic diversification – industry development, supply chain development, business attraction and development, and transformational projects.

Regional Development Australia Pilbara

Regional Development Australia (RDA) is a partnership between the Australian, state and territory and local governments to support the growth and development of Australia's regions. RDA Pilbara has developed four key priority areas:

- Attracting and facilitating infrastructure investment in the Pilbara
- Promoting economic diversification and capitalising on the Pilbara's competitive advantage
- Supporting priority sector investment projects that meet the aspirations of longevity and sustainability
- Supporting the community sector to promote liveability through place based solutions for local communities.

Pilbara Regional Water Supply Strategy

The *Pilbara Regional Water Supply Strategy* provides early assessment and supports further planning for new water supplies in the medium and long-term. This strategy provides a short-list of feasible options for meeting demand at the coastal towns and ports, scenarios of future demand for water and triggers to inform when new investigations and additional planning will be required.

To assist proponents, Department of Water have developed guidelines and policy, including the Pilbara Groundwater Allocation Plan, Western Australian Water in Mining Guideline and Strategic Policy 2.09: Use of Mine Dewatering Surplus.

Pilbara Workforce Development Plan 2013-2016

The *Pilbara Workforce Development Plan 2013–2016* aims to build, attract and retain a skilled workforce to meet the economic needs of the Pilbara. It contains a range of priority actions which were identified by local stakeholders to address local workforce development challenges. The Workforce Development Plan is complemented and guided by a suite of other plans and resources, including:

- The Western Australian workforce planning and development model;
- Skilling WA - A workforce development plan for Western Australia;
- The State Training Plan;
- Training together - Working together: Aboriginal workforce development strategy;
- Industry workforce development plans;
- The Workplace essentials for better business website; and
- The Western Australian migration portal.

Pilbara Tourism Product Development Plan

The *Pilbara Tourism Product Development Plan* provides a framework for the long term development of the tourism industry in the region which is based on product development, marketing and promotions, and training and support. The Plan has identified a number of tourism product development priorities for the region over the short term (i.e. 1-5 years) and the long term (i.e. 5-15 years), as follows:

- Older couples: Travelling for leisure purposes and often participating in caravanning.
- Backpacker market: Backpackers are important to the Pilbara as they provide a source of key service workers – the estimated number of backpackers has grown by an average annual rate of 13.6% from 2008.
- International couples: These visitors are a relatively small group, representing roughly 8,000 visitors per annum and they are likely adventure seekers attracted by the natural environment of the Pilbara.

- Arts/heritage/culture: These visitors include those that visited museums, art galleries, heritage sites, Aboriginal experiences, etc.
- Nature-based: These visitors include those that visited beaches, national parks, went fishing, scuba diving, snorkelling or went bushwalking.
- Cruise ship passengers: While currently very small, cruise shipping which utilises the port infrastructure of the region is one of the fastest growing areas of tourism and the Pilbara is uniquely located to service cruise ships, in particular boutique adventure cruising.

Local Strategies and Plans

Myriad of local plans, strategies and priorities informed the Blueprint, including but not limited to:

- Pilbara's Port City Growth Plan and Implementation Plan (Town of Port Hedland);
- Strategic Community Plan 2012-2022 (Town of Port Hedland);
- Karratha City of the North (City of Karratha);
- Draft Karratha Local Planning Strategy (City of Karratha);
- Strategic Community Plan 2012-2022 (City of Karratha);
- Newman Revitalisation Plan (Shire of East Pilbara);
- Newman Tomorrow – 2030 Vision (Shire of East Pilbara);
- Economic Development and Tourism Strategy, 2012 – 2015 (Shire of East Pilbara);
- Onslow Expansion Plan, Star of the North (Shire of Ashburton); and
- Living Life – Community Strategic Plan 2012 – 2022 (Shire of Ashburton).

Appendix 2

Key Regional Indicators

Area of Focus	Indicator	Pilbara	Nation	Source
Workforce Participation	Adult Participation Rate	86.50%	65.60%	Percentage of population (15+) in the workforce (ABS Census)
	Adult Female Participation Rate	75.40%	59.20%	Percentage of female population (15+) in the workforce (ABS Census)
	Aboriginal Adult Participation Rate	57.30%	53.30%	Percentage of Aboriginal population (15+) in the workforce (ABS Census)
	Year 12 Qualified	42.50%	46.10%	Percentage of adult population that did not complete year 12 (ABS Census)
Skills	University Qualified	10.80%	22.80%	Percentage of working age population with university qualifications (ABS Census)
	Technical Qualified	33.10%	31.60%	Percentage of working age population with certificate or diploma qualifications (ABS Census)
	English Proficiency	79.70%	92.00%	Percentage of population with English as a first language, or if second language, speaks English well (ABS Census)
Education and Training Outcomes	Year 12 Completions	56.20%	75.30%	Proportion of young adults (20-24) with year 12 certificate (ABS Census)
	Learning or Earning	61.10%	80.10%	Proportions of 15-19 year olds engaged in school, work or further education/training
	Primary School Performance	44.20%	62.80%	Percentage of high bands achieved by NAPLAN participants (My Schools, Australian Government)
	Secondary School Performance	21.90%	37.40%	Percentage of high bands achieved by NAPLAN participants (My Schools, Australian Government)

Area of Focus	Indicator	Pilbara	Nation	Source
Economic Sustainability	Businesses	35.9	89.9	Businesses per 1000 residents (ABS 8165.0)
	Unemployment	3.10%	5.20%	Proportion of labour force unemployed
	Economic Diversification	0.13%	0.56%	Hachman Index of Diversification - higher score indicates more diversity (Regional Australia Institute)
	Occupation Diversification	75.00%	100.00%	Proportion of occupations representing more than 5% of jobs (ABS Census)
	Welfare Dependent Families	9.74%	9.80%	Proportion of welfare dependent families with children (PHIDU Social Health Atlas)
	Industry Diversification	21.10%	42.10%	Proportion of industries representing more than 5% of jobs (ABS Census)
	Regional Price Index	118.6	100.0*	Regional Price Index (Department of Regional Development, Government of Western Australia, 2013)
Community Vibrancy and Diversity	Leadership Capacity	20.00%	34.90%	Percentage of the potential community leaders, measuring both the quality of human capital and the availability of resources suitable for leadership roles (Regional Australia Institute)
	Volunteer Activity	14.40%	17.70%	Percentage of residents (15+) who participate in volunteer activity (ABS Census)
	Aged Residents (65+)	2.10%	14.20%	Proportion of residents aged 65+
	Family Households	76.0%	71.5%	
Health and Educational Access	Access to Hospital Services (per capita)	0.04	0.11	Number of people employed in hospitals per resident (ABS Census)
	Access to GP Services (per capita)	0.023	0.054	Number of GP services per capita

Area of Focus	Indicator	Pilbara	Nation	Source
	Adult Health	53.50%	55.50%	Adults with at least one of four of the health risk factors of smoking, harmful use of alcohol, physical inactivity and obesity (PHIDU Social Health Atlas)
	Access to Allied Health Services	4.10%	11.00%	Percentage of workforce employed in health services excluding hospitals
	Child Development Vulnerability	48.30%	24.30%	Percentage of developmentally vulnerable children (PHIDU Social Health Atlas)
	Distance to Medical Facility	33.9km	38.9km	Average distance for residents to medical facilities (Regional Australia Institute)
	Distance to Primary Education Services	37.5km	24km	Average distance for residents to a primary school (My Schools, Australian Government)
	Distance to Secondary Education Services	92.2km	23.3km	Average distance for residents to a high school (My Schools, Australian Government)
Digital Connectivity	Broadband Connections	74.7%	62.5%	Percentage of households and businesses with broadband internet (Regional Australia Institute)
	Mobile Coverage	38.0%	80.0%	Percentage area with 3G coverage (Telstra)
	Mobile Internet	260.0%	310.0%	Quality of access score - 1 poor and 6 excellent (Regional Australia Institute)
	Internet Connectivity	82.9%	79.0%	Percentage of households with internet connection (ABS Census)
Movement of People	Airport RPT Usage (per capita)	27.6	6.3	RPT passenger numbers per resident (Department of Infrastructure and Regional Development)
	Overseas Born Residents	38.5%	30.2%	Percentage of residents born overseas (ABS Census)

Area of Focus	Indicator	Pilbara	Nation	Source
Freight Infrastructure	Population Turnover	159.9%	46.2%	People that moved to or from the region 2006-11 as a percentage of the total population in 2006 (ABS Census)
	Airport Access	41km	79.7km	Average distance for residents and businesses to a commercial airport (Regional Australia Institute)
	International Merchandise Exports (per capita)	\$1.48m	\$0.012m	Merchandise exports as a function of the resident population (BREE)
	Port Access	108.1km	141.6km	Average distance for business to a port (Regional Australia Institute)
	Road Infrastructure	17.9km	19.4km	Distance to major (class 1 or 2) road (Regional Australia Institute)
	Rail Infrastructure	29.0km	35.6km	Distance for residents and businesses to nearest rail station (Regional Australia Institute)
Innovation	Research and Development Professionals	0.0%	0.1%	Percentage employed as research and development managers (ABS Census)
	Technology-Related Businesses	3.0%	8.5%	Proportion of workforce employed in technology and related businesses (ABS Census)
	Research Organisations	0.00%	0.01%	Percentage of registered research organisations out of all businesses (Innovation Australia)
Entrepreneurship	New business start-ups	22.9%	13.5%	New businesses since 2009 as a proportion of all businesses (ABS 8165.0)
	Non-employed micro businesses	20.8	38.9	Non-employed businesses per 1000 residents (ABS 8165.0)
	Income Source Own Business	\$24,082	\$23,453	Average own unincorporated business income (ABS 6524.055, 2011-12)
	Small businesses	9.0	24.4	Small businesses (less than 5 employees) per 1000 residents (ABS 8165.0)

Area of Focus	Indicator	Pilbara	Nation	Source
Cost of Doing Business	Net Primary Productivity	0.28	53.77	Measure of potential agricultural productivity (Regional Australia Institute)
	Labour Costs	\$74,334	\$42,544	Average wage and salary income (Regional Australia Institute)
	Access to Local Finance	2.0%	4.7%	Percentage of people employed in financial roles (ABS Census)
	Agriculture	0.4%	2.3%	Percentage of people employed in agriculture (ABS Census)
	Hours of Sunlight	11		
Natural Resources	Mineral and Energy Resources	41.2%	1.7%	Percentage of people employed in minerals and energy industries (ABS Census)
	Commercial Fishing and Aquaculture	0.0%	0.1%	Percentage of people employed in fishing and aquaculture industries (ABS Census)
	Coastal Access	94.3km	109.0km	Average distance of residents to the coast (Regional Australia Institute)
	National parks	72.8km	46.2km	Average distance of residents to the National Parks or nature reserves (Regional Australia Institute)

Appendix 3

Acknowledgements

This Plan was prepared by the Pilbara Development Commission with the assistance of RPS Group. As part of the development of the Blueprint, the following stakeholders generously contributed their time and expertise:

- City of Karratha;
- Shire of Ashburton;
- Shire of East Pilbara;
- Town of Port Hedland;
- Department of Aboriginal Affairs;
- Department of Agriculture and Food;
- Department of Commerce;
- Department of Education;
- Department of Fisheries;
- Department of Health;
- Department of Housing;
- Department of Lands;
- Department of Mines and Petroleum;
- Department of Planning;
- Department of Regional Development;
- Department of State Development;
- Department of Training and Workforce Development;
- Department of Transport;
- Department of Water;
- Disability Services Commission;
- LandCorp;
- Pilbara Ports Authority;
- Tourism WA;
- Water Corporation;
- Karratha Chamber of Commerce and Industry;
- Onslow Chamber of Commerce and Industry;
- Port Hedland Chamber of Commerce and Industry;
- Tom Price/Paraburdoo Chamber of Commerce and Industry;
- Pilbara Regional Council; and
- Regional Development Australia Pilbara.

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