

SHIRE OF EAST PILBARA

Local Planning Strategy



Endorsed by the
Western Australian Planning Commission

26TH JULY 2021

Disclaimer

This is a copy of the Local Planning Strategy at the date of endorsement produced from an electronic version of the Strategy held by the Department of Planning Lands & Heritage. Whilst all care has been taken to accurately portray the current Strategy provisions, no responsibility shall be taken for any omissions or errors in this documentation.

Consultation with the respective Local Government Authority should be made to view a current legal version of the Strategy.

Please advise the Department of Planning Lands & Heritage of any errors or omissions in this document.

Department of Planning
Gordon Stephenson
House
140 William Street
Perth WA 6000

Locked Bag 2506
Perth WA 6001

website: www.dplh.wa.gov.au
email: corporate@dplh.wa.gov.au
tel: 08 6551 9000
fax: 08 6551 9001
National Relay Service: 13 36 77
infoline: 1800 626 477



Shire of **EAST
Pilbara**
AUSTRALIA'S LARGEST SHIRE

THE SHIRE OF EAST PILBARA LOCAL PLANNING STRATEGY

PARTS 1 and 2



"A diverse community thriving in a vast landscape that offers a world of opportunity and rich heritage and culture."

DISCLAIMER

The information contained in this report has been prepared with care by the Shire and or our Consultants, or it has been supplied to us by apparently reliable sources. In either case, we have no reason to doubt its completeness or accuracy. However, neither the Shire nor its employees guarantee the information, nor does it or is it intended to form part of any contract. Accordingly, all interested parties should make their own inquiries to verify the information, as well as any additional or supporting information supplied, and it is the responsibility of interested parties to satisfy themselves in all respects.

This report is for the use only of the Shire and it disclaims responsibility to any third party acting upon or using the whole or part of its contents.

ADVERTISING

The Shire of East Pilbara Local Planning Strategy certified for advertising on 15 September 2020.



Signed for and on behalf of the Western Australian Planning Commission

Sean Collingwood

*An officer of the Commission duly authorised by the Commission
(pursuant to the Planning and Development Act 2005)*

Date: 15 September 2020

ADOPTED

The Shire of East Pilbara hereby adopts the Local Planning Strategy, at the Ordinary meeting of the Council held on the

29th day of January 2021

Anthony Middleton

SHIRE PRESIDENT

Steven Harding

CHIEF EXECUTIVE OFFICER

ENDORSEMENT

Endorsed by the Western Australian Planning Commission.



*an officer of the Commission duly authorised by the Commission
(pursuant to the Planning and Development Act 2005)*

Date: 26/07/21

Part 1

- 1. Introduction3
 - 1.1 Purpose of the Strategy4
 - 1.2 Application of the Strategy5
 - 1.3 Structure of the Strategy5
 - 1.4 Association of Process to the Local Planning Scheme5
- 2. Vision5
- 3. Strategic Plan6
 - 3.1 Population and Housing6
 - 3.1 1 Strategy – All Settlements7
 - 3.1 2 Action – All Settlements7
 - 3.1 3 Strategy - Newman7
 - 3.1 4 Actions - Newman7
 - 3.1 5 Strategy – Marble Bar8
 - 3.1 6 Actions – Marble Bar8
 - 3.1 7 Strategy - Nullagine8
 - 3.1 8 Actions - Nullagine8
 - 3.1 9 Strategy – New Townsite Development Areas9
 - 3.1 10 Actions – Development Areas9
 - 3.1 11 Strategy - Settlements9
 - 3.1 12 Action - Settlements9
 - 3.1.13 Action - Future Development Areas9
 - 3.2 Heritage, Urban Design and Character11
 - 3.2.1 Strategies11
 - 3.2.2 Actions11
 - 3.3 Retail and Commercial12
 - 3.3.1 Strategies12
 - 3.3.2 Actions12
 - 3.4 Industry13
 - 3.4.1 Strategies13
 - 3.4.2 Actions13
 - 3.5 Mining14
 - 3.5.1 Strategies14
 - 3.5.2 Actions14
 - 3.6 Tourism and Visitors15
 - 3.6.1 Strategies15
 - 3.6.2 Actions15
 - 3.7 Recreation and Open Space16
 - 3.7.1 Strategies16
 - 3.7.2 Actions16
 - 3.8 Community Facilities16

3.8.1 Strategies	16
3.8.2 Actions	17
3.9 Natural Resource Management and Environment	17
3.9.1 Strategies	17
3.9.2 Actions	17
3.10 Rural Land.....	18
3.10.1 Strategies	18
3.10.2 Actions	19
3.11 Traffic and Transport.....	19
3.11.1 Strategies	19
3.11.2 Actions	20
3.11.2.1 Roads	20
3.11.2.2 Freight and Logistics	20
3.11.2.3 Pedestrians and Cyclists	20
3.11.2.4 Airport	21
3.12 Infrastructure	21
3.12.1 Strategies	21
3.12.2 Actions	21
3.12.2.1 Water	21
3.12.2.2 Waste Disposal	22
3.12.2.3 Power	22
3.12.2.4 Telecommunications	23
3.12.2.5 Wastewater	23
3.13 Special Use	23
3.13.1 Strategy.....	23
3.13.2 Actions	23
4.Spatial Planning	23
4.1 Maps.....	23
Map 1 SOEP Overview	24
Map 2 Pastoral Leases	25
Map 3 Major Mine Sites	26
Map 4 Newman Local Planning Strategy.....	27
Map 5 Marble Bar Local Planning Strategy	28
Map 6 Nullagine Local Planning Strategy	29
Map 7 Newman Airport Development.....	30

1. INTRODUCTION

The development of this Local Planning Strategy (LPS) commenced in 2013 and has continued to contemplate the future land use planning needs for the Shire of East Pilbara (the Shire), as identified, during the extensive consultation period. The LPS has been adapted to consider the constantly evolving socio-economic landscape, latest climate data and global economic trends. The LPS represents a clear connection between future planning and the planning legislative framework. It is innovative and contemporary and will assist to deliver a greater level of flexibility for land use and development in the future across the land use zones.

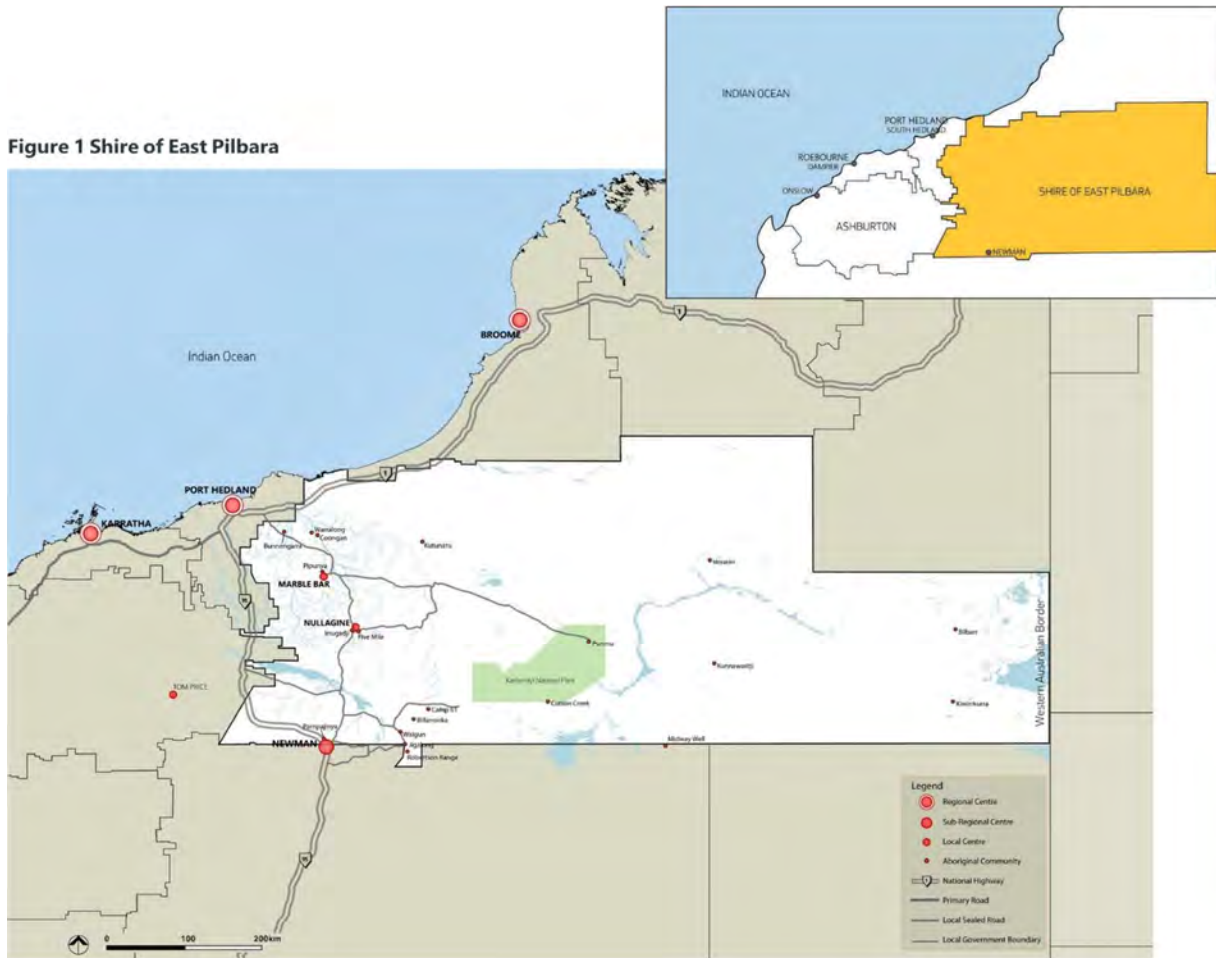
Once adopted, this LPS upon endorsement by the Western Australian Planning Commission (WAPC) will revoke the existing LPS endorsed by the WAPC on 1 June 2004.

Part One delivers the Strategy from the set of detailed Strategies and is specific in its actions. Part Two delivers an analysis of the Shire and supports Part One by providing the background and analysis to determine the way forward.

The LPS has clarified the planning opportunities and challenges for the Shire (the Shire). These land use planning opportunities and challenges highlight the priorities for strategic consideration and determine the focus for future growth and development over the coming ten year period. The identified challenges are highly interrelated and form the core elements for strategic planning, to achieve sustainable outcomes and progress for the community. Despite mining and resources activity representing a significant opportunity as an economic driver and growth stimulator, it is also the fundamental factor underpinning many of these strategic challenges. This LPS presents a strong case for the need to use the land use planning framework to create future opportunities for economic diversification across the Shire whilst seeking a balanced approach to achieve sustainable development and improve the general amenity in the Shire.

The LPS relates to the entire Shire and applies to all land and waters within the Shire boundary. The Study area is shown in Figure 1 below.

Figure 1 Shire of East Pilbara



1.1. Purpose of the Strategy

The LPS provides the Shire with a coordinated strategic land use and development planning framework that captures the long term vision of the Shire. The LPS development has involved a significant review of background information, policy settings and community consultation.

The LPS has been prepared in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015* (the Regulations) Part 3 cl. (11)(2) and aims to;

- establish a vision for the Shire;
- coordinate the existing plans and strategies that have been developed for the Region and the Shire;
- identify issues and constraints for the future development of the Shire and propose strategies to address them;
- set out a framework for the Shire's future planning and development;
- provide the rationale for the zoning and reservation of land and for the provisions of the Local Planning Scheme to inform all Stakeholders; and
- Identify future growth areas.

1.2. Application of the Strategy

The LPS will guide stakeholders including developers, community, government agencies, shire administration, Council and the Western Australian Planning Commission (WAPC) in land use planning decision making. Such land use planning includes proposed future scheme reviews and amendments, agency referrals, local planning policies, heritage protection, structure plans, local development plans, subdivision and development applications.

1.3. Structure of the Strategy

The LPS has been undertaken in accordance with the provisions of the Regulations and the Local Planning Manual (WAPC 2010). It is envisaged that the LPS will largely provide the strategic direction for the Shire over the next ten years. The LPS comprises two parts:

- i) Part 1- the land use and development strategies and actions required to achieve the deliverables. Further, each action has an assigned Priority Level being Short Term (1-5 years), Medium Term (5-10 years), Long Term (10 years plus) and Ongoing.
- ii) Part 2- Background Information and Analysis includes the strategic basis, detail and background information required to support the actions in Part 1.

1.4. Association of process to the Local Planning Scheme

The LPS will inform the review process for the preparation of the Shire's new Local Planning Scheme No.5, to be prepared upon endorsement of the LPS by the WAPC. Until such time the Local Planning Scheme No.4 will apply.

2. VISION

The Shire's Strategic Community Plan 2018-2028 captures the vision of its community and has been used as a primary strategic document to inform the LPS. The Shire's vision as outlined in the Strategic Community Plan 2018-2028 is:

"A diverse community thriving in a vast landscape that offers a world of opportunity and rich heritage and culture."

The Shire is characterized by a rich diversity of people, landscapes and heritage which offers a unique place to live and call home and a world of opportunities as a thriving economic region.

The Shire is a place for all people to live harmoniously – feeling included and connected with access to services that meet community needs. The Shire is committed to diverse and sustainable economic growth, balanced with the conservation and enhancement of its unique environmental assets and rich history and heritage.

The LPS is underpinned, developed and informed by a set of core planning principles which apply to all townsites across the East Pilbara region and remote settlements. The purpose of the principles is to aid in delivery of sustained prosperity and improved liveability within the Shire.

The Principles have been generated based on the identified challenges and opportunities within the Shire and provide the rationale behind the Shire's strategic planning objectives. The Principles have been identified to underline the LPS and underpin each of the strategic actions represented in Part 1. This ensures a suite of implementable contextual recommendations that align with Local, State and Regional planning frameworks.

3. STRATEGIC PLAN

3.1. Population and Housing

A recent study into the forecast residential population of the Shire for the next 20 years, using a medium growth scenario, indicates a total estimated population across the shire of 20,300 people.

Newman

Newman has experienced significant growth and change over the last decade. Recent population forecasting has identified that growth has slowed, reflecting economic conditions. The population is transient and attraction and retention of people within the town requires consideration.

Newman has a significantly higher ratio of men to women than the State and the concentration of residents from Aboriginal and Torres Strait Islander backgrounds has implications for community infrastructure and service planning.

Much of the housing stock within Newman is still owned by mining companies. BHP owns the majority of Newman's houses in addition to various government organisations and private owners. Whilst normalisation of the housing is gradually occurring, the ownership arrangement impacts housing capacity analysis and housing affordability.

Housing type within the Shire is generally comprised of low density, single dwelling housing. Within Newman, a high proportion of these are modular housing units is reflective of the high FIFO population within the town.

Challenges for housing supply in Newman, include changing or unknown requirements for accommodating resource company workforces, efficient land supply and mobilising a construction workforce to construct housing once approval has been granted.

Marble Bar and Nullagine

Population projections have identified that Marble Bar is likely to experience a contracting population, and Nullagine is unlikely to experience any growth in population. This low growth projections for both Nullagine and Marble Bar indicates that future additional dwelling capacity in the towns is considered unnecessary, at the time of this Report.

Housing in the Shire is diverse and differs greatly from the housing profile of the state. The average household size is larger within the Shire compared to Western Australia and the tenure is predominantly comprised of rental properties. The proportion of residents within the Shire that own their homes (outright or buying with a mortgage) is low in comparison to the State. This is representative of the type of housing stock available within Newman and the transience of the Newman residential workforce.

With recent economic shifts and changes to the resource market, current and relevant information regarding housing supply is limited. However, housing affordability and accessibility is thought to be a limiting factor in attracting and retaining people to the Shire, specifically within settlement areas.

The Pilbara Planning and Infrastructure Framework (2012) states that the Pilbara's settlement housing density and form is anticipated to change significantly. Residential apartments, townhouses and other forms of medium and higher density living is likely to become more prevalent. This provides scope to increase housing provisions in Newman, to better meet the projected future housing needs.

3.1.1. Strategy- All Settlements

- a) Create a sense of permanence and belonging by providing appropriate services equal to other areas within the State engendering long-term liveability.
- b) Ensure alignment between housing needs, choice and availability with the housing stock offered and release of developable land.
- c) Ensure that development considers natural physical constraints such as bushfire, coastal hazards and flooding.

3.1.2. Action – All Settlements

Monitor and review the Population Forecasting Report undertaken to support Part 2 of the LPS, at regular intervals of approximately five years (prior to LPS and Scheme reviews). This will capture changes in the conditions that have formed the basis for the Shire and towns projected population. (Medium Term)

3.1.3. Strategy – Newman

- a) Facilitate development of Newman as the primary regional centre in the Shire for an estimated population of 10,400 persons by 2035.
- b) Support outcomes that result in occupation of vacant mining housing or removal of derelict housing and support other compatible land uses other than residential on such land where appropriate.
- c) Acknowledge areas of future mining activity on the periphery of Newman townsite and support intensive post mining land uses in the transitional area post mining. Alternatively support a range of non-sensitive land uses that do not conflict with current and planned mining activities.

3.1.4. Actions - Newman

1. Develop a Housing Strategy underpinned by a Housing Needs Assessment and the Newman Accommodation Demand Analysis (Department of Housing, 2014), to implement a number of actions such as:
 - Establish actual housing availability;
 - Analyse housing needs (quantum and typology);
 - Review of land release and approval processes;
 - Determine pathways to facilitate the occupations of vacant company housing and removal/replacement/renovation of derelict housing;
 - Determine available and appropriate land for future housing;
 - Identify those lots within 1km of Newman that may suitable for an increase in residential density to support further subdivision and provide for infill opportunities.(Short Term)

2. Identify land for the future infill for the development of townhouses and multiple dwellings in areas of high amenity and shop top i.e. housing over retail low rise apartments in the Newman Town Centre subject to a structure plan having been prepared and approved. (Medium Term)
3. Liaise with mining companies to establish the level and capacity of mining owned housing stock and determine if the resource companies will need these dwellings for employees or if they would consider use by non-employees. (Short Term)
4. Require Precinct Planning in the East Newman residential area to improve amenity and liveability including formalizing pedestrian access and streetscape improvements. (Short Term)
5. In consultation with BHP, review and investigate the land identified as 'Townsite Transitional Area' in Newman to incorporate provisions within the Local Planning Scheme to ensure minimal land use conflict, support appropriate land use in the area, and protect residential amenity and industry from incompatible land uses. (Medium Term)
6. Consider amending areas presently zoned 'Residential' in the 'Townsite Transitional Area' (Figure 4) to a reserve consistent with the golf course and rural land use, where development has not commenced.

3.1.5. Strategy – Marble Bar

Facilitate development in Marble Bar to meet the requirements of a secondary centre level settlement in the Shire.

3.1.6. Actions - Marble Bar

1. Investigate Reserve 2906 in the management, care and control of the Shire for the purpose of "Commonage" and consider that land for alternate land uses. Seek confirmation of the Native Title impediments to conversion of crown reserve to freehold title, if any. (Medium Term)
2. Investigate and allocate land suitable for short stay accommodation for either workers or tourist purposes in the townsite. (Short Term)

3.1.7. Strategy – Nullagine

1. Facilitate development in Nullagine to meet the requirements of a secondary centre level settlement in the Shire.
2. Recognise the extent of the flood plain environment of the townsite.

3.1.8. Actions – Nullagine

1. Amend Local Planning Scheme maps to include Department of Water and Environmental Regulation (DWER) mapped Flood Prone Areas as provided by DWER in Nullagine River Flood Study- Nullagine Townsite. (Short Term)
2. Introduce a Special Control Area for the Nullagine Floodplain to the extent of the 100 year ARI level and associated provisions.
3. Investigate Reserve 2804 in the management, care and control of the Shire for the purpose of "Commonage" and consider that land for alternate land uses. Seek confirmation of the Native Title impediments to conversion of crown reserve to freehold title, if any. (Long Term)
4. Investigate land for townsite expansion for residential, tourist, and industrial land uses. (Medium Term)

3.1.9. Strategy – New Townsite Development /Workforce Settlements Investigation Areas

Facilitate development primarily for residential purposes subject to satisfactory justification and demonstration of the need/demand for such areas.

3.1.10. Actions – Development Areas

1. Include new Scheme provisions or introduce “Development Zone” by way of a Scheme Review and/or Amendment and include provisions as per the Regulations.
2. Require Development zones to be supported by the preparation of a Structure Plan and where it has been demonstrated that there is adequate connection to services including water, power, and wastewater/sewerage.

3.1.11. Strategy – Aboriginal Settlements

Require proper and orderly planning of Aboriginal Settlements in the Settlement zone to meet the requirements of the community including facilitating the provision of essential services to those places.

3.1.12. Action - Settlements

Require all development to be undertaken in accordance with an endorsed Layout Plan that is consistent with the requirements of the *State Planning Policy 3.2 - Aboriginal Settlements*. (Ongoing)

3.1.13. Action – Future Development Areas

Newman			
Land Use	Land Location	Approx. Area (ha)	Description
Residential	The large parcel of land south-east of the Town Centre containing the majority of Unallocated Crown Land Lots 369 and 370, reaching east of Welsh Drive, south to Cemetery Road and east to Great Northern Highway. (Map 4)	350	This area has been identified as the primary location for residential expansion due to future mining activities being protected to the north-west of the Town Centre. Prior to development commencing the area is subject to a scheme amendment and further planning which may include; Structure planning Traffic assessment Environmental assessment Bushfire assessment

			Geotechnical studies
Industrial	Further south of the existing Industrial estate south of the townsite. Contained within Crown Lot 556, spanning south of Welsh and McBride Drive west of the existing speed way club. (Map 4).	57	<p>A further extension of the existing industrial estate to the south of the Newman townsite. Made up of state controlled crown land the area has a sufficient buffer from future and current residential areas and capable of hosting heavy industry.</p> <p>Prior to development commencing the area is subject to a scheme amendment and further planning which may include;</p> <ul style="list-style-type: none"> Structure planning Traffic assessment Environmental assessment Bushfire assessment Geotechnical studies
Marble Bar			
Land Use	Location	Approx. Area (ha)	Description
Tourism	South of the Town Centre at the southern end of Contest St, Lot 264. (Map 5).	1.7	Currently zoned as Special Use the existing Marble Bar caravan park land use is to be formalised via a tourism zoning.

Industrial	Currently Unallocated Crown Land, north west of the Town Centre at the end of General St. (Map 5).	3.2	A further expansion of the existing industrial lots north west of the Town Centre to cater for the anticipated minor industrial growth.
------------	--	-----	---

3.2. Heritage, Urban Design and Character

There is strong Aboriginal and European culture within the Shire and there are significant heritage sites worth of protection. This provides an avenue to generate increased character, tourism opportunities, community identity and sense of place. Built design, sympathetic to the Pilbara climate, is also of necessity and will improve liveability in the Shire.

3.2.1. Strategies

- a) Enhance and preserve the built form character of the Shire to respect and retain significant existing heritage.
- b) Maintain and enhance the character and identity of the Shire by ensuring that new development is sympathetic with significant heritage buildings and/or places.
- c) Enhance local amenity and public safety.
- d) Encourage sustainable building design and climate responsive design standards appropriate to the Shire's location in accordance with the R-Codes.

3.2.2. Actions

1. To have regard for the Shire Municipal Inventory when making planning decisions including management recommendations. (Ongoing)
2. Develop a public art local planning policy to guide the location and standard of public art works to consider requiring developer contributions towards such artworks. (Medium Term)
3. Develop new strategies for community safety and crime prevention consistent with the WAPCs Designing Out Crime Planning Guidelines (WAPC 2006). (Ongoing)
4. Continue and monitor the implementation of the Newman Streetscape Plan to improve pedestrian amenity and provide facilities more suitable to Newman's climate. Evaluate and measure upon completion. (Ongoing)
5. Implement the following streetscape development projects, subject to annual budget, which involve landscaping of:
 - Newman drive;
 - Kalgan Drive;
 - Welsh Drive; and
 - Town Centre. (Long Term)

6. Continue the implementation of master plan for town landscaping, in particular the Beautification of Calcott/Newman Drive. (Ongoing)
7. Continue the implementation of public lighting upgrade program. (Ongoing)
8. Support activation of community facilities in Marble Bar that are currently closed or unused including the old general store building and adjacent Pipunya facility. (Short Term)
9. Introduce a Heritage List into the Scheme, consistent with the Deemed Provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015* to protect and preserve local government heritage sites of significance, subject to a review of its Municipal Heritage Inventory in accordance with the Regulations. . (Short Term)
10. Consider the inclusion of GeoHeritage sites in the Heritage list, if appropriate. (Medium Term)

3.3. Retail and Commercial

Retail and commercial development is essential for local residents as a means of supplying goods and services and providing local employment opportunities. The LPS will identify suitable sites for redevelopment, new retail and commercial development and recommend clauses for the Local Planning Scheme Review that will guide how such sites are developed.

3.3.1. Strategies

- a) Provide the community with an increased diversity of available land suitable for the breadth of goods and services commensurate to the available spending in the catchment.
- b) Support new retail opportunities within the Town Centre as the priority location, subject to land availability.
- c) Encourage innovation and new market development in the retail and commercial sector to facilitate local employment whilst concurrently reducing dependence on the mining industry.
- d) Ensure development is attractive and sympathetic to the Town Centre requirements that contributes to visitor experience and commercial requirements.

3.3.2. Actions

1. Consider replacing the Town Centre zone with Commercial zone and the Mixed Business zone with the Commercial zone in accordance with the Regulations, by way of Scheme review. (Short Term)
2. Introduce a new Mixed Use Zone in the Scheme, in accordance with the Regulations. (Short Term)
3. Undertake a Commercial and Retail Needs Assessment and Strategy. Key areas to be tested include the commercial land on Newman Drive for “big box”/ bulky goods commercial businesses. (Short Term)
4. Evaluate and measure the effectiveness of the Newman Town Centre Design Guidelines Plan to ensure that the Town Centre continues to provide an attractive commercial and social environment. (Ongoing)
5. On the basis the Town Centre is developed to capacity, investigate the rezoning of land adjacent to Newman Drive, near the town core to ‘Mixed Use’. (Medium Term)
6. Investigate the potential for logistics, transport and warehousing land uses within the vicinity of Newman Airport (see Industrial land section at 3.4) to accommodate new business development. (Short Term)

3.4. Industry

The delivery of an adequate supply of appropriately located service, light and general industry land will encourage diversification of industrial activity, strengthen employment opportunities and broaden the economic base of the Shire.

3.4.1. Strategies

- a) Acknowledge the importance of industrial land supply in the Shire and its contribution to the mining industry among other services.
- b) To ensure a supply of dedicated developable industrial land, serviced by appropriate transport, infrastructure and ancillary support activities in the short term, particularly general industry land availability.

3.4.2. Actions

1. Designate Light Industry, General Industry, and Industrial Development zones with associated objectives appropriate to the prevailing land use. (Short Term)
2. Appropriately manage land use conflict between sensitive land uses and noxious/hazardous land uses in the Scheme. (Short Term)
3. Undertake a feasibility assessment for all proposed industrial (or similar) sites to appropriately assess that areas role and strategic alignment. Consider the land assembly requirements and time lags that may be associated with impediments on those strategically identified sites, such as native title or mining tenure. (Short Term)
4. Investigate the following locations for industrial land development, subject to the criteria within Point 3:
 - i) Ptn Lot 370 and Lot 351, Great Northern Highway, Newman for Industry General, 200ha, near intersection of Marble Bar Road (Ref: Newman Revitalisation Plan - Townsite Growth Plan 2010).
 - ii) Lot 510 Welsh and McBride Drive, Newman
 - iii) Lots 2314 (R38609) and 1638 (R38610) of approx. 9ha, located to the south of the townsite (presently leased to the Newman Gun and Pistol Club).
 - iv) Ptn Airport Reserve 44775 to support Industrial and Freight/Logistics land uses, subject to further planning studies and an Airport Masterplan. Undertake a detailed assessment of the feasibility of the site including the prospective market and investment opportunities, infrastructure capacity and staging. Feasibility to consider the role of the hub and the desired land uses to define its function. (Short Term).
 - v) Portion of Lot 556 on P400578, UCL Lot 2354 on P218837, UCL Lot (with no lot or plan number) and a portion of Lot 2 on Plan 72027, noting that agreement is required with DWER to amend the Priority 1 Reserve boundary to include the proposed industrial land as Priority 3 category for the Newman Water Reserve. (Short Term)
5. Acknowledge that Industrial Investigations areas are, in some cases, located within P1 PDWSA's and that further discussion is required between DWER, the Shire and Development WA to consider any potential impacts on water quality and or amendment/reclassification of PDWSA boundaries.

6. Support and facilitate the expansion of the existing industrial area at General Street at Marble Bar. (Long Term)
7. Undertake background analysis to determine an appropriate location within Nullagine that is capable of supporting industrial land uses. (Medium Term)

3.5. Mining

Mining plays an important role in the Shire and the State, it is a major employer in the Pilbara region and has, historically been a primary driver for economic and population growth for the Shire, for which is expected to continue.

3.5.1. Strategies

- a) Acknowledge the opportunities and challenges associated with mining across the Shire and encourage a coordinated approach between levels of Government in respect of mining and its associated land uses in the Shire.
- b) Maintain sound communication with local mining representatives to ensure good planning outcomes.
- c) Provide strategic advice to mining companies and levels of government when developing Mining Closure Plans and consider alternate post mining land uses in areas strategically identified and suitable for such.
- d) Encourage and support a residential workforce model as opposed to fly in/fly out model, where possible.
- e) Recognise operational State Agreements with the Shire and consult with the Department of Jobs, Tourism, Sciences and Innovation on proposed land use and development proposal that may impact on State Agreements.

3.5.2. Actions

1. To acknowledge that there is no statutory planning provision under the *Planning and Development Act 2005* to require compliance with local government land use and planning where mining activities is prescribed under the *Mining Act 1978*. (Ongoing)
2. To provide a strategic position on mining proposals given the importance and influence of mining in the Shire pertinent to the economic, social and environmental aspects associated with the land use. (Ongoing)
3. Consider introducing 'Workforce Accommodation' as a new land use class within the Scheme with appropriate permissibility in the in the Town Centre, Nullagine Townsite, Residential and Rural zones. (Short Term)
4. Identify land for workers accommodation in or on the periphery of townsites to encourage social and economic outcomes for the whole community. (Short Term)
5. Advise the Department of Mines, Industry Regulations and Safety (DMIRS) that the Shire may support higher and better post mining land uses, in MineClosure Plans, subject to the relevant landowner undertaking a Scheme Amendment process, if required. (Ongoing)

3.6. Tourism and Visitors

The Shire is home to unique natural landscapes and has places of heritage value. The LPS will promote strategies that capitalize on these values to promote the region to international and domestic travellers.

3.6.1. Strategies

- a) Broaden and enable a greater range tourist land uses across the Shire particularly in the rural zone.
- b) Recognise established tourist sites and provide greater tourist land use flexibility particularly in the Special Use zone.
- c) Facilitate and encourage higher availability and standard of tourist accommodation.
- d) Support development that captures the natural assets of the land.
- e) Support sealing and advocate continued maintenance of primary access routes to increase visitor and tourist safety.
- f) Support Aboriginal Corporations and groups to develop Indigenous cultural tourism opportunities.

3.6.2. Actions

1. Consider introducing a new “Tourism zone” within the Scheme in accordance with the Regulations. (Short Term)
2. Consider including appropriate tourism land use classes with definitions in the Zoning Table of the Scheme and in accordance with the Regulations. (Short Term)
3. Identify key strategic tourist sites in the Shire and amend the Scheme Maps to include those sites in the Tourism zone. (Short Term)
4. Consider the following sites as potential Tourist zones in the Scheme review and subject to consent from landowners being:
 - Iron Clad Hotel
 - Marble Bar Holiday Park
 - Marble Bar Travellers Stop (Short Term)
 - Seasons Hotel Newman (83 rooms)
 - Newman Hotel Motel
 - Mia Hotel - House in the Desert (90 rooms) –currently under refurbishment
 - Kalgan’s Rest (620 ensuite units, camping sites and caravan bays)
 - Newman Visitors Centre (Short Term)
5. Consider the introduction of caravan parks and certain short stay land uses on Rural zone land as a discretionary land use. (Short Term)
6. Create a Local Planning Policy on the use of Short Stay Accommodation which considers ratios of site area for tourist accommodation only. (Medium Term)
7. Consider development of a “short term stay only” caravan and camping area in Newman, with the inclusion of short stay chalets/units, preferably located at the racecourse or Lot 302, Newman and Drive, Newman (Kurra Village-parking/laydown area). (Short Term)
8. Advocate the resealing of Marble Bar Road to allow improved connectivity and promote tourist access. (Ongoing)
9. Prepare mapping that identifies tourist routes and scenic drives, regional connectivity and also reviews the Newman Cultural Heritage Trail. (Medium Term)

3.7. Recreation and Open Space

There is a need for the appropriate provision, development and maintenance of high quality public open spaces and recreational areas for the enjoyment of locals and visitors alike. This section relates to land identified as “Reserve- Recreation” in the Scheme.

3.7.1. Strategies

- a) Protect, maintain and enhance the Shire’s open space for the recreational enjoyment of both residents and visitors.
- b) Promote local identity and character through the preservation and enhancement of key open space areas and national parks.
- c) Promote tourism through the preservation and enhancement of national parks and their natural environmental assets.
- d) Provide suitable access to major recreational areas to strengthen tourism and create increased recreation opportunities for residents.
- e) Ensure open space areas and recreational areas are functional, well maintained and to be fully utilised by residents and visitors.

3.7.2. Actions

1. Advocate improved access to major recreational areas such as National Parks within and adjacent to the Shire, by improving the promotion of natural features, way- finding signage, accessible roads and the provision of basic facilities in key locations as required. The focus will be on the following locations:
 - i. Karlamilyi National Park and access via: Walgun and Camp Tracey Road;
 - ii. Billinooka; Tallawanna Track; and Ripon Hills Road.
 - iii. Cape Keraudren Coastal Reserve; and
 - iv. Access to Karijini National Park. (Ongoing)
2. Plan and develop a Recreation Precinct consistent with this Strategy to accommodate the predicted growth of the Shire.
3. Ensure that future plans for Cape Keraudren align with existing management and ensure that the conservation and recreational values of this area are maintained and appropriately managed.

3.8. Community Facilities

Community Facilities are generally located on Reserve land within the Shire. They are identified as built infrastructure and provide social and physical provisions to the community, commensurate with population levels.

3.8.1. Strategies

- a) Ensure there is adequate land supply to provide community infrastructure for the future projected population levels.

- b) Encourage strong and enduring community connections through places and spaces that foster formal and informal interactions and support the social activities of the Shire's people.
- c) Provide suitable community facilities that attract people to the Shire and then retain them through adequate connectivity and availability of appropriate community services and facilities.
- d) Ensure strategic land identification to provide land supply for local primary, secondary and tertiary educational institutions (or facilitate remote access to them) that raise the educational quality and broaden the opportunities available to people within the Shire.

3.8.2. Actions

1. Implement, evaluate and review the Shire Strategic Community Plan and subsequent Capital Works budget to ensure provision for suitable levels and delivery of community infrastructure. (Ongoing)
2. Undertake design and planning to develop suites for health and allied health professionals on the former tennis court site near the Newman Hospital, to provide increased medical facilities and services to meet the needs of the community. (Medium Term)
3. In consultation with the Department of Education and other education providers:
 - a) Liaise with the Department of Education to allocate land for schools in alignment with projected population growth.
 - b) Plan for the development of a Newman Education Precinct that has the facilities which develop skills and training to support mining resource sector, as well as local businesses (i.e. school to work transition programs plus apprenticeships and traineeships).
 - c) Identify land and assist in the development for a high quality tertiary educational facility – a university campus or an alternative tertiary institution. (Medium Term)

3.9. Natural Resource Management and Environment

Protection and enhancement of local, regional, national and international level unique ecosystems and biodiversity are very important. The Pilbara's bio-sub-regions provide diverse landscapes creating habitats that support an array of flora and fauna.

3.9.1. Strategies

- a) Maintain, protect and enhance the Shire's natural resources.
- b) Develop and review strategies aimed at protecting and enhancing the natural environment.
- c) Ensure the Shire's unique geomorphology, flora and fauna is protected and preserved.
- d) Consider the likely effect of development on water resources and encourage water harvesting where appropriate.

3.9.2. Actions

1. Consider introducing a new 'Environmental Conservation' Reserve into the Scheme in accordance with the Regulations. (Short Term)
2. Include the Eighty Mile Beach Marine Park in the 'Environmental Conservation' Reserve including associated land uses or as a Reserve for conservation purposes. (Short Term)

3. Include the Fortescue Marsh as 'Environmental Conservation' Reserve once the proposed conservation reserve boundary has been defined. (Short Term)
4. Amend the Scheme Maps to include portions of former pastoral leases, currently Unallocated Crown Land (UCL) from Rural zone to Reserve for conservation in consultation with DBCA. (Short Term)
5. Investigate and implement a strategy and/or local planning policy to address the unreliability of surface water. Stricter requirements relating to water catchment mechanisms (e.g. rain water tanks, roof catchment requirements, restrictions on amount of hardstand areas, higher landscaping requirements and climate appropriate vegetation) within development applications are potential mechanisms for control. (Medium Term)
6. Prepare a Biodiversity Strategy across the Shire to protect and maintain the environment. (Long Term)

3.10. Rural Land

Pastoral activities have been identified as important for the region and the Shire. They assist in maintaining biodiversity and productivity of the land and contribute to the maintenance of inland communities through maintaining infrastructure (e.g. roads and airstrips) and assist in diversifying the economy.

All pastoral leases in Western Australia expired on 30 June 2015. The expiry of leases in 2015 was seen as an appropriate time to negotiate exclusions from pastoral leases of key areas of land identified for public purposes including biodiversity conservation. On 1 July 2015, all eligible Western Australian pastoral leases that met renewal conditions were renewed (435 (99.5%) eligible stations) which marks an historic event that will never happen again. This is an extremely high level of compliance among pastoral lessees and reflects the strong cooperation and collaboration between Government and the pastoral sector.

Lease renewal gives pastoral lessees security and certainty with new leases providing tenure for up to 50 years. Lease renewal allows pastoralists to continue to focus on their pastoral business and contribute to the economic and social fabric of Western Australia (DPLH website).

There are also a number of mining lease and tenements within the Shire.

3.10.1. Strategies

- a) Continue to increase agricultural productivity within the Shire, drawing on opportunities for cross-sector collaboration with mining activity.
- b) Promote rural land for agriculture, mining and other purposes in a manner that ensures the protection, enhancement and viability of the Shire.
- c) Facilitate the sustainable use and development of non-urban land for agriculture, renewable energy infrastructure, mining and other compatible purposes to ensure the protection, enhancement and viability of the Shire
- d) Protect land for primary production purposes and from inappropriate urban development.

3.10.2. Actions

1. Amend the Rural zone objectives in the Scheme to provide consistency with the objectives for the Rural zone within the Regulations. (Short Term)
2. In collaboration with Department of Primary Industries and Regional Development (DPIRD) identify and map areas currently zoned 'Rural' to be strategically recognised as land having high agricultural productivity for intensive agricultural land use. (Medium Term)
3. Support the investigation to use Ophalmia Dam as a water supply for agriculture production.(Ongoing)
4. Replace the Rural Living zone with new Rural Residential zone in accordance with the Regulations.(Short Term)
5. Consider the inclusion of certain tourist land uses in the Rural zone to accommodate appropriate tourist development land uses in order to diversify economic activity. (Short Term)
6. Insert new land use of 'Renewable Energy Facility' in the land use class table of the Scheme and definition in Schedule 1 – Dictionary of defined words and definitions to have the same definition as in the WAPC's draft Position Statement: Renewable energy facilities – *Means premises used to generate energy from a renewable energy source and includes any building or other structure used in, or in connection with the generation of energy by a renewable resource. It does not include anemometers, solar panels, wind turbines or other infrastructure used to generate energy located on a lot with a private rural use, single house or commercial premises where the energy produced principally supplies that use.* (Short Term)
7. Include the 'Renewable Energy Facilities' as a discretionary land use in the Rural zone. (Short Term)
8. Consider the preparation of a Scheme Amendment to amend Reserves including 541, 1542 and 38769 to Rural zone, to support intensive agriculture land use, where appropriate. This includes the closure of approximately 17km of Road 222 (Old Broome Road) to allow for the road reserve to be included as Rural zone and included in freehold title with the balance being amalgamated into abutting crown land.

3.11. Traffic and Transport

Given the remoteness of the Shire from other areas in the State and the distance between the Shire's settlement areas, provision and maintenance of reliable transport links is vital. These links will provide for road journeys for local residents and visitors and allow the transportation of goods to and from the Shire. Rail links are essential for the ongoing support of mining ventures and impediments to the provision of future freight rail links should be identified and mitigated.

3.11.1. Strategies

- a) Improve and maintain all forms of transport infrastructure within the Shire, to enhance connectivity within, and to areas external to the Shire
- b) Facilitate the development of new industry and sustain existing industry, through improved internal and external connectivity.
- c) Encourage walking and cycling as an alternate means of transport, within townsites.

3.11.2. Actions

3.11.2.1. Roads

Great Northern Highway

1. Continue to support planned projects currently underway to improve the Great Northern Highway, with a key focus addressing safety, increased demand and reliability and connectivity. (Ongoing)

Marble Bar Road

1. Support the sealing of Marble Bar Road is an important infrastructure upgrade required to improve road connectivity within, and to areas external to the Shire. This will allow for greater reliability for freight traffic and increase safety for vehicles. The upgrade of Marble Bar Road, in particular the portion of road between Newman and Marble Bar is increasingly important as new mining operations are occurring in the area and access to these operations is vital. (Ongoing)
2. Continue planned projects currently underway to improve Marble Bar Road, with a key focus addressing:
 - Upgrading and sealing;
 - Safety;
 - Increased demand; and
 - Reliability and connectivity (Ongoing)

Other Roads

1. Plan for the proposed bypass road from Welsh Drive / McBride Drive to the Great Northern Highway, located north of Marble Bar Road that will provide access around the Light Industrial Area in Newman. (Ongoing)
2. Plan for Road upgrades from Port Hedland to Woodie Woodie is essential for the success of agriculture in the region. (Ongoing)

3.11.2.2. Freight and logistics

1. Identify suitable locations for a regional level Freight and Logistics Hub situated adjacent to strategic freight transport corridors in Newman for the purpose of supporting transport, mining and resource activities. (Ongoing)
2. Undertake a detailed assessment of the feasibility of a transport and logistics hub. Prepare a Structure Plan on suitable land including servicing report, and consider any land release barriers such as native title or future mining tenure. (Medium Term)

3.11.2.3. Pedestrians and cyclists

Undertake and implement a Pathways Plan to prioritise pedestrian and cycle upgrades and connect the Shire's townsites, having consideration for the following:

- Limited permeability or safe routes for pedestrians and cyclists;
- Poor signage and directions to the Town Centre;
- lack of legible cycling and pedestrian routes; and

- Pedestrian and cyclist routes through the Newman Town Centre need to be clearly defined and missing links completed. (Ongoing)

3.11.2.4. Airport

1. Prepare a Newman Airport Masterplan to determine land required of Reserve 44775 for Airport purposes directly. (Short Term)
2. Prepare a Development Plan/Structure Plan that addresses planning for the balance of land that may be utilized for alternative land use and development at Reserve 44775. (Medium Term)
3. Liaise with the Department Planning, Lands and Heritage (DPLH) to consider the conversion of surplus Crown Lands at Reserve 44775 for freehold tenure/leasehold, subject to allocation of land defined by the Newman Airport Masterplan. (Short Term)
4. Create a Special Control Area over land at Reserve 44775 having regard for any planning controls or provisions as stated in the Newman Airport Masterplan, if required. (Short Term)
5. Prepare a Marble Bar Airport Masterplan. (Medium Term)

3.12. Infrastructure

Ongoing Infrastructure development and replacement is required in the Shire as it provides vital services to ensure that residences and industry can access the services they require to survive, flourish and grow.

3.12.1. Strategies

- a) Facilitate strategic development by ensuring provision of improved essential service infrastructure, with the capability to address current needs and future growth.
- b) Maintain and enhance current service infrastructure provision to facilitate growth in strategic locations.
- c) Promote the development and optimal use of key strategic infrastructure.

3.12.2. Actions

1. Service infrastructure across the Shire is ageing and the functional life expectancy of assets is unknown. It is recommended the Shire align infrastructure upgrades with forecast population growth, and ensure ageing infrastructure is replaced with more efficient infrastructure in a coordinated manner. (Ongoing)
2. Investigate and implement demand management programs, specifically relevant for behavioural patterns concerning water use, power use and waste, as Opportunities exist to implement demand management programs that seek to change usage behaviours and deliver greater efficiency benefits for existing infrastructure. (Medium Term)

3.12.2.1. Water

1. Water Corporation has scheduled a full review of the Newman water scheme based on the expected growth in services associated with the Pilbara Cities Vision. Ensure a review of the water scheme is undertaken and any constraints of the network are highlighted, particularly in the instance if expected growth occurs or is projected. (Short Term)

2. Population projections for Marble Bar are conservative, as it is considered that growth will be relatively low. Therefore, capacity is not considered a critical issue, unless significant growth and development are to occur. Undertake a detailed review of water infrastructure to identify any constraints of the existing network, particularly if significant growth and development occurs or if it is projected. (Ongoing)
3. Develop a Local Planning Policy for Stormwater harvesting in the form of rainwater collection tanks for domestic use, subsequently, reducing the need for potable water from the Water Corporation scheme. It is recommended the Shire incorporate water harvesting features into new buildings as part of development approval requirements. (Short Term)
4. Require applicable land use applications including subdivisions and scheme amendments to be supported by a Water Management Plan as determined in the DWER Publication: Guide to better urban water management including Local Water Management Strategies to support future planning. (Ongoing)
5. In consultation with DWER discuss Nullagine, Marble Bar and Newman water source protection areas to address the current water source protection plans and existing and proposed land use capabilities. (Short Term)

3.12.2.2. Waste Disposal

1. Investigate current lifespan of waste facilities across the Shire and plan to either expand existing facilities or identify new waste disposal sites based on projected population growth.

3.12.2.3. Power

1. Investigate the opportunity to install sustainable power infrastructure to reduce the demand on the power networks and allow for additional electrical supply. (Ongoing)
2. Ensure power upgrades are funded by prospective developers and appropriately coordinated with development and projected growth. The existing transmission, distribution and generation network is close to capacity. Any substantial development would likely require upgrades to the network and possibly power generation. (Ongoing)
3. Identify the responsibility of BHP to make arrangements to ensure adequate delivery and supply of power. (Short Term)
4. Identify a suitable partner to upgrade and supply power to the airport and surrounding areas. (Medium Term)
5. Support land use and development for renewable energies, where appropriate. (Ongoing)

3.12.2.4. Telecommunications

1. Seek service providers to provide a detailed audit of the existing telecommunication infrastructure, to identify existing infrastructure and allow for appropriate infrastructure to be built in accordance with forecast population growth and planned development. (Ongoing)

3.12.2.5. Basic Raw Materials

1. Undertake investigations to identify sites of basic raw material significance in the Shire for construction and maintenance materials required for future development and land use. (Medium Term)

3.12.2.6. Wastewater

1. Allocate appropriate funding to invest into wastewater infrastructure to support the ongoing growth of the Shire and address aging infrastructure constraints. In particular, investigate opportunities for wastewater pumping stations and gravity sewers in new subdivisions. (Ongoing)
2. Identify Reserve boundaries for Wastewater Reserve expansion in Newman and ensure land is reserved accordingly. (Short Term)

3.13. Special Use

3.13.1. Strategy

1. Amend the current Special Use zone objectives to provide in accordance with the Regulations.
2. Review the existing locations listed in the Scheme under Schedule 4 - Special Use zones and investigate sites that may be rezoned to a more appropriate zone. (Medium Term)

3.13.2 Actions

1. Amend the current Special Use zone objectives within the Scheme to provide consistency with the Regulations. (Short Term)
2. Consider existing listed in the Scheme under Schedule 4 - Special Use zones and investigate sites that may be rezoned to a more appropriate zone. (Medium Term)

4. SPATIAL PLANNING

4.1. Maps

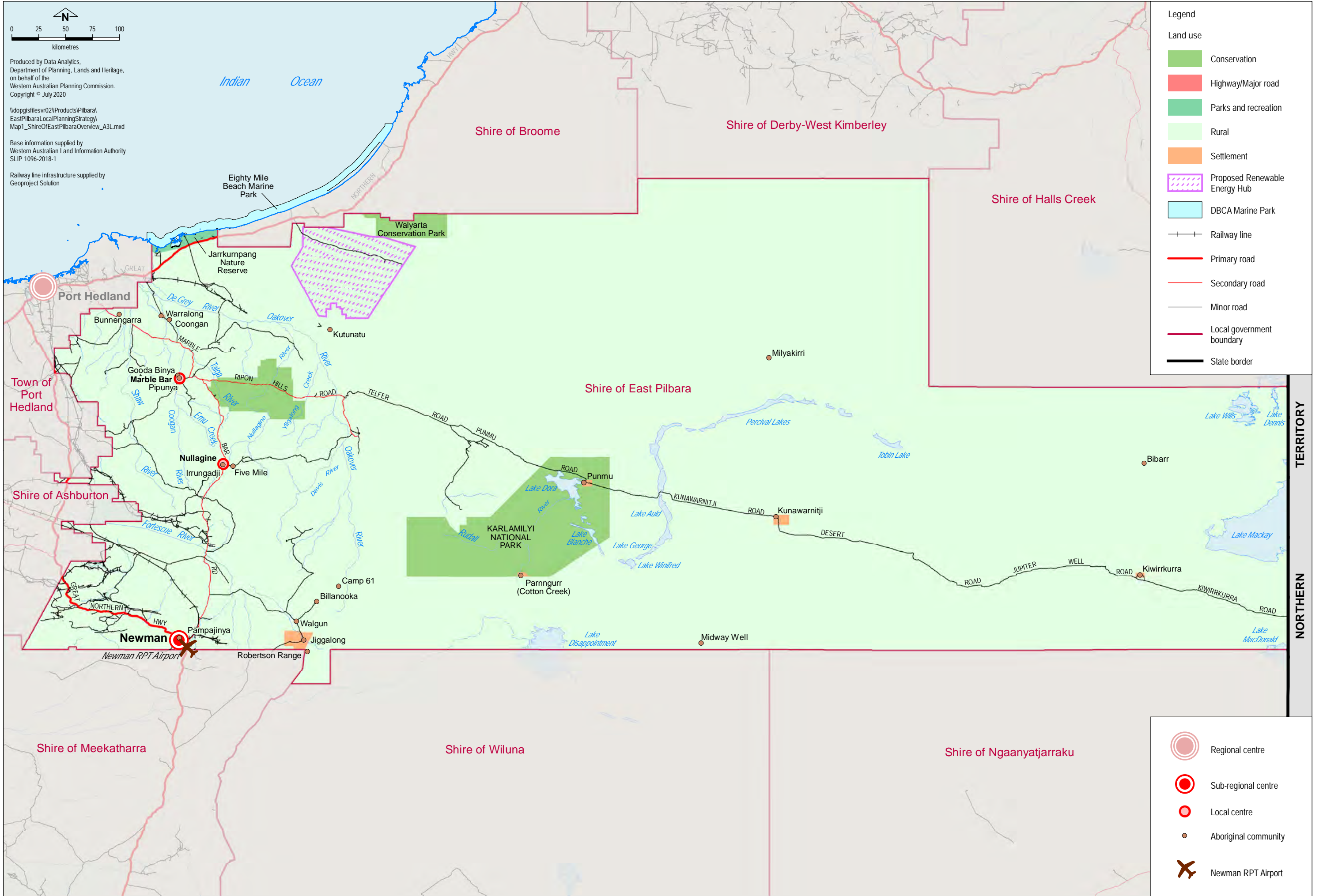
The Strategy maps reflect the current and future major land uses across the Shire whilst identifying townsites, primary national parks, transport linkages, pastoral leases, mining activity, airports against the expansive land mass contained within the Shire.

Land identified on the LPS Map for future development/investigation area will require a Scheme amendment to be prepared with supporting planning studies and reports to justify the Proposal.

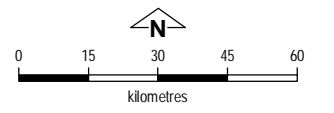
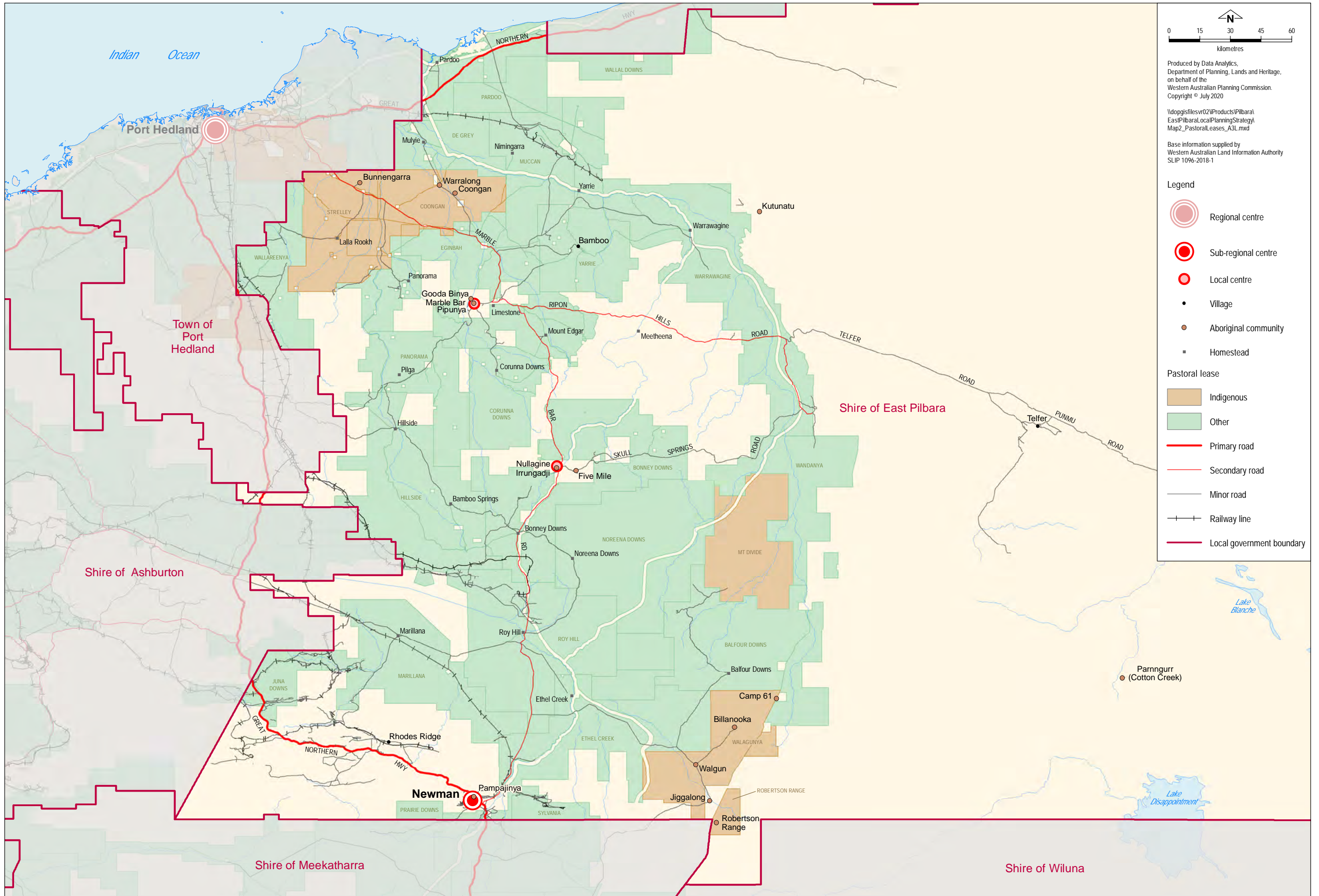
The latest Aboriginal Community Layout Plans can be accessed through the DPLH website at:

<https://www.dplh.wa.gov.au/information-and-services/state-planning/Aboriginal-communities/Aboriginal-community-maps/layout-plans>.

Shire of East Pilbara Local Planning Strategy



Shire of East Pilbara Overview



Produced by Data Analytics,
Department of Planning, Lands and Heritage,
on behalf of the
Western Australian Planning Commission.
Copyright © July 2020

\\dopgis\files\vr02\Products\Pilbara\EastPilbaraLocalPlanningStrategy\Map2_PastoralLeases_A3L.mxd

Base information supplied by
Western Australian Land Information Authority
SLIP 1096-2018-1

Legend

- Regional centre
- Sub-regional centre
- Local centre
- Village
- Aboriginal community
- Homestead

Pastoral lease

- Indigenous
- Other

Roads

- Primary road
- Secondary road
- Minor road

Other features

- Railway line
- Local government boundary

Shire of East Pilbara Local Planning Strategy



0 15 30 45 60
kilometres

Produced by Data Analytics,
Department of Planning, Lands and Heritage,
on behalf of the
Western Australian Planning Commission.
Copyright © July 2020

\\dopgis\files\vr02\Products\Pilbara\
EastPilbaraLocalPlanningStrategy\
Map3_MajorMineSites_A3L.mxd

Base information supplied by
Western Australian Land Information Authority
SLIP 1096-2018-1

Major Resource Projects data supplied by
Department of Mines, Industry Regulation and Safety

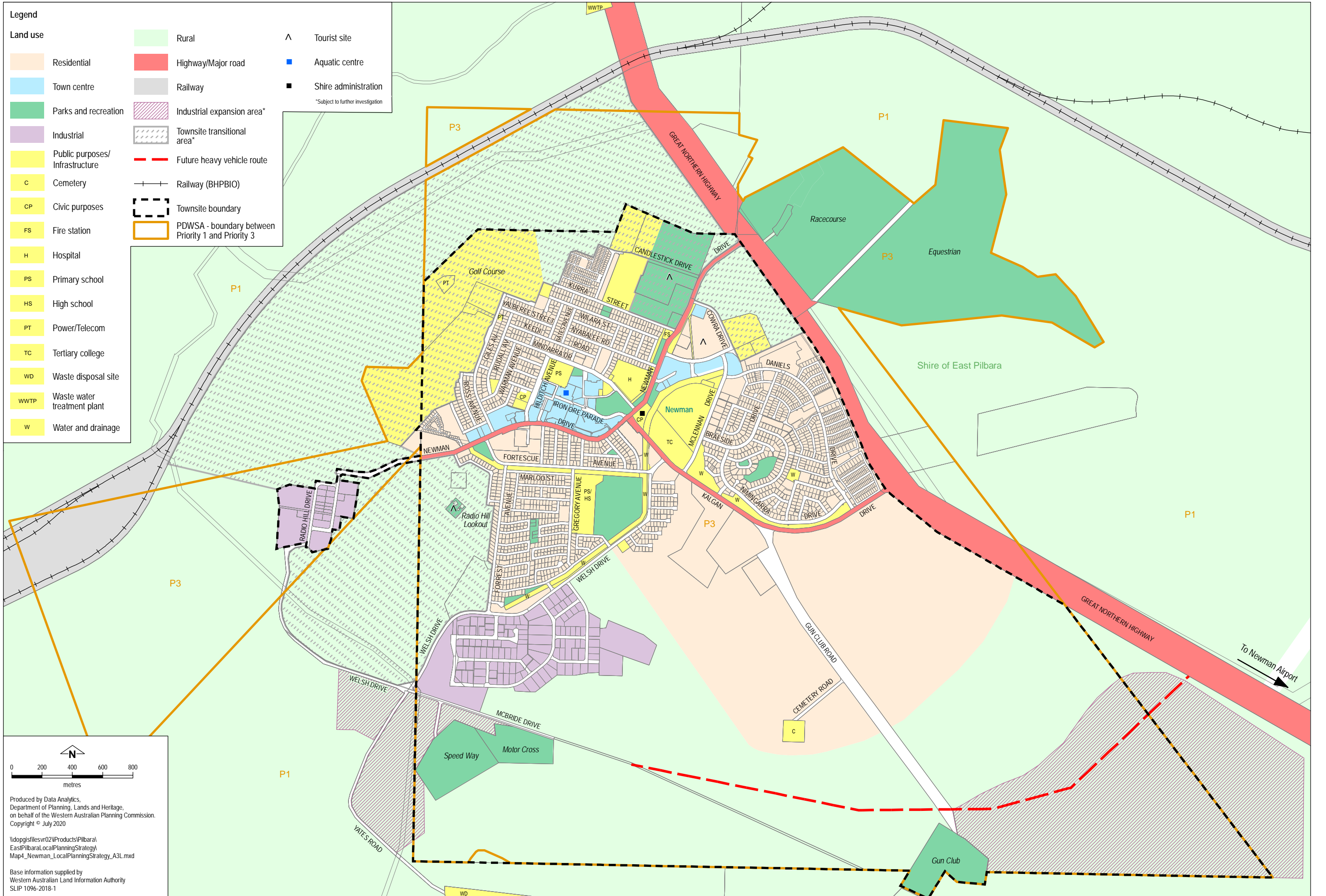
Railway line infrastructure supplied by
Geoproject Solution

NOTE:
Projects operating or under development with
an actual/anticipated production value of over
\$10 million or capital expenditure over \$20 million
are considered Major resource projects.

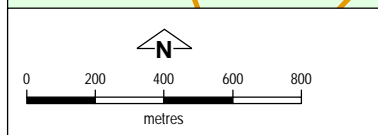
- Legend**
- Airport
 - Aerodrome
 - Airstrip
 - Regional centre
 - Sub-regional centre
 - Local centre
 - Aboriginal community
- Major Resources Projects**
- Gold
 - Iron ore
 - Manganese ore
 - Other
- Railway operator**
- BHPBIO
 - RIO
 - ROY HILL
 - TPI
 - Local government boundary

Major Minesites

Shire of East Pilbara Local Planning Strategy



- Legend**
- Land use**
- Rural
 - Residential
 - Town centre
 - Parks and recreation
 - Industrial
 - Public purposes/Infrastructure
 - c Cemetery
 - CP Civic purposes
 - FS Fire station
 - H Hospital
 - PS Primary school
 - HS High school
 - PT Power/Telecom
 - TC Tertiary college
 - WD Waste disposal site
 - WWTP Waste water treatment plant
 - W Water and drainage
- Highway/Major road
 - Railway
 - Future heavy vehicle route
 - Railway (BHPBIO)
 - Townsite boundary
 - PDWSA - boundary between Priority 1 and Priority 3
- Tourist site
 - Aquatic centre
 - Shire administration
- *Subject to further investigation

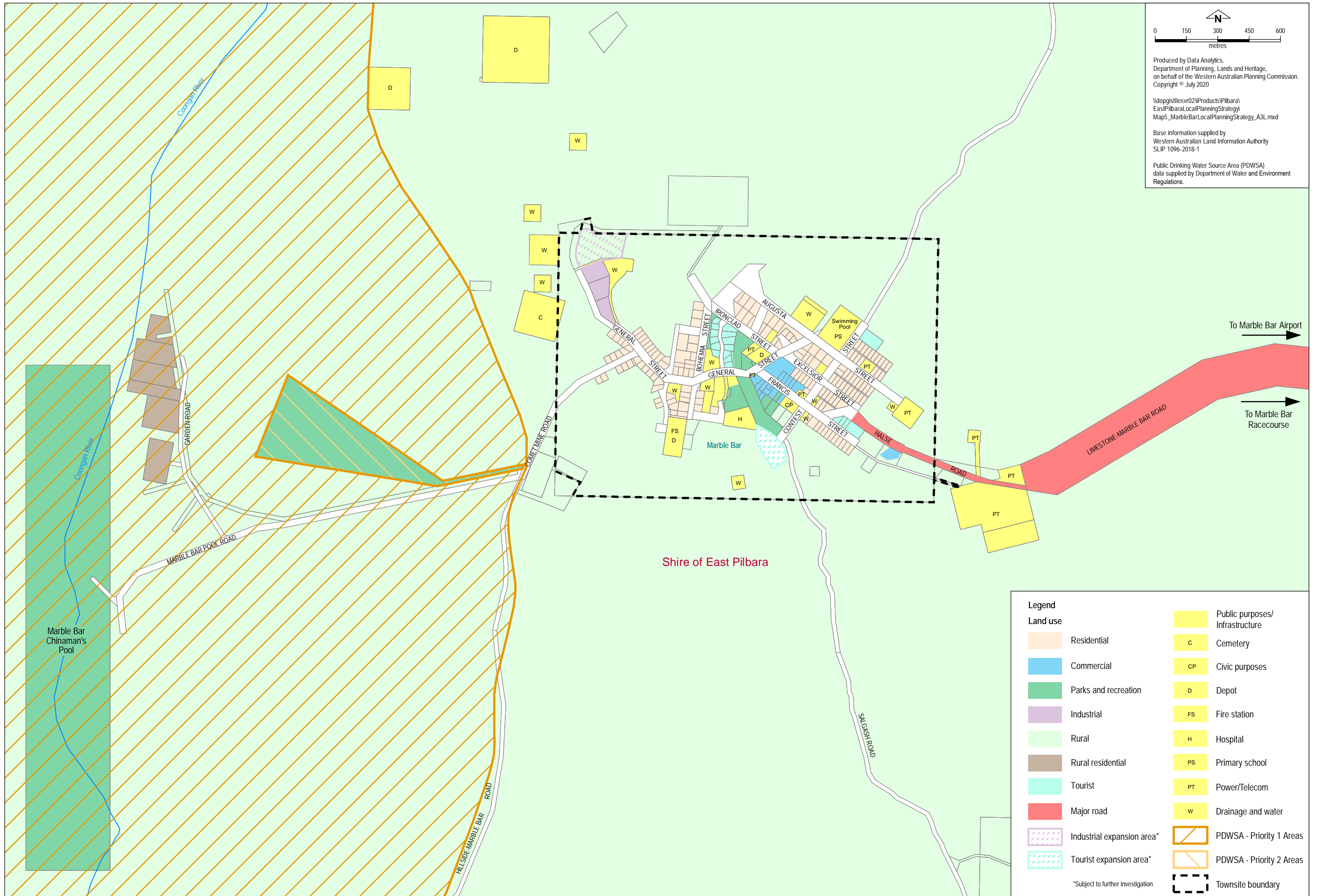


Produced by Data Analytics,
 Department of Planning, Lands and Heritage,
 on behalf of the Western Australian Planning Commission.
 Copyright © July 2020

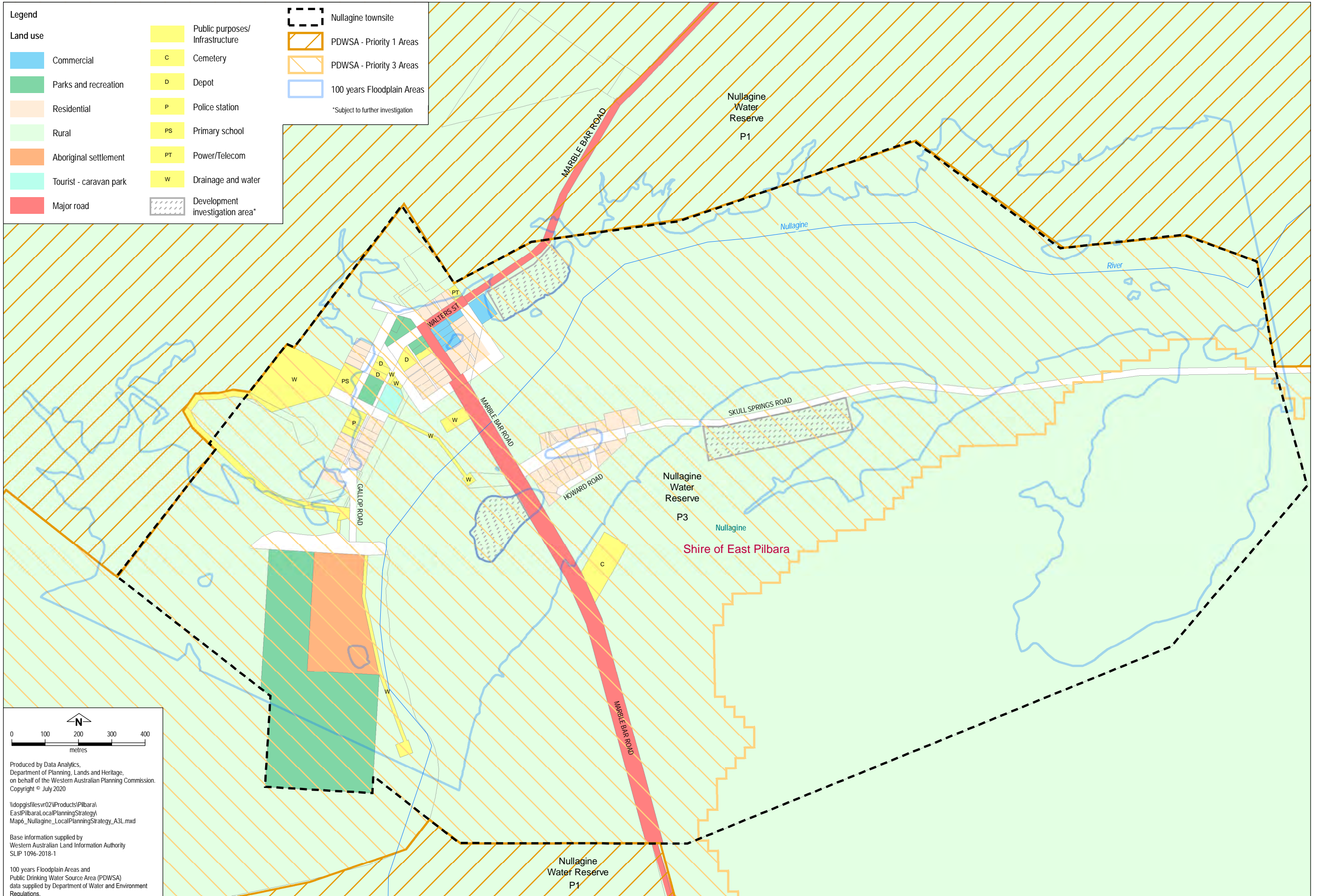
\\dopgisfiles\vr02\Products\Pilbara\EastPilbaraLocalPlanningStrategy\Map4_Newman_LocalPlanningStrategy_A3L.mxd

Base information supplied by
 Western Australian Land Information Authority
 SLIP 1096-2018-1

Newman Local Planning Strategy Spatial Plan



Marble Bar Local Planning Strategy Spatial Plan



Legend

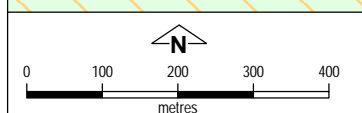
Land use

- Commercial
- Parks and recreation
- Residential
- Rural
- Aboriginal settlement
- Tourist - caravan park
- Major road
- Public purposes/Infrastructure
- C Cemetery
- D Depot
- P Police station
- PS Primary school
- PT Power/Telecom
- W Drainage and water
- Development investigation area*

Other symbols:

- Nullagine townsite
- PDWSA - Priority 1 Areas
- PDWSA - Priority 3 Areas
- 100 years Floodplain Areas

*Subject to further investigation



Produced by Data Analytics,
 Department of Planning, Lands and Heritage,
 on behalf of the Western Australian Planning Commission.
 Copyright © July 2020

\\dopgisfiles\vr02\Products\Pilbara\
 EastPilbaraLocalPlanningStrategy\
 Map6_Nullagine_LocalPlanningStrategy_A3L.mxd

Base information supplied by
 Western Australian Land Information Authority
 SLIP 1096-2018-1

100 years Floodplain Areas and
 Public Drinking Water Source Area (PDWSA)
 data supplied by Department of Water and Environment
 Regulations.

0 100 200 300 400 metres

Produced by Data Analytics,
Department of Planning, Lands and Heritage,
on behalf of the Western Australian Planning Commission.
Copyright © July 2020

\\dopgis\files\vr02\Products\Pilbara\EastPilbaraLocalPlanningStrategy\Map7_Newman_AirportDevelopment_A3L.mxd

Base information supplied by
Western Australian Land Information Authority
SLIP 1096-2018-1

Public Drinking Water Source Area (PDWSA)
data supplied by Department of Water and Environment
Regulations.

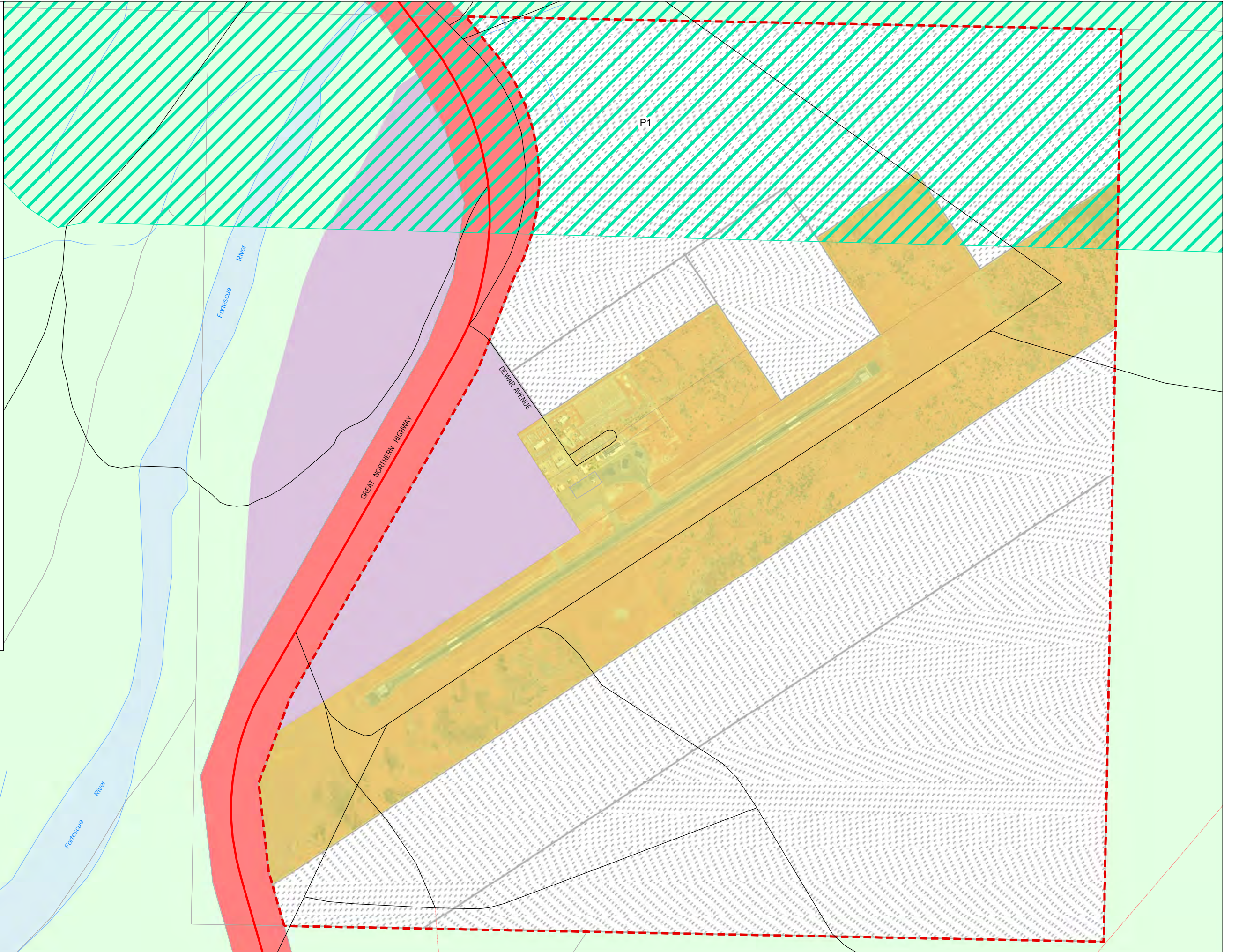
Service Layer Credits: Landgate / SLIP

Note:
Newman Airport Site and surrounds is
subject to further Master Planning

Legend

Land use

- Investigation area
- Highway/Major road
- Industrial
- Rural
- Waterways
- Public purposes/Infrastructure
- Newman Airport boundary
- PDWSA - Priority 1 Areas
- Cadastre
- Primary road
- Minor road
- Track
- River





THE SHIRE OF EAST PILBARA LOCAL PLANNING STRATEGY

PART 2 Background and Analysis



Contents

1. Introduction.....	4
1.1 Purpose of the Strategy.....	4
1.2 Strategy Structure	4
1.3 Relationship to the Local Planning Scheme.....	4
1.4 Preparation and Adoption.....	4
2. State and Regional Context	6
2.1 State Planning Strategy 2050	6
2.1.1 State Planning Framework Policy 1	10
2.1.2 State Planning Policy 2 – Environment and Natural Resource Policy	11
2.1.3 State Planning Policy 2.5 – Rural Planning Policy	11
2.1.4 State Planning Policy 2.6 – Coastal Planning	11
2.1.5 State Planning Policy 2.7 – Public Drinking Water Source Policy.....	12
2.1.6 State Planning Policy 2.9 – Water Resources	12
2.1.7 State Planning Policy 3 – Urban Growth and Settlement	12
2.1.8 State Planning Policy 3.1 – Residential Design Codes.....	13
2.1.9 State Planning Policy 3.2 – Aboriginal Settlements	13
2.1.10 State Planning Policy 3.4 – Natural Hazards and Disasters.....	13
2.1.11 State Planning Policy 3.5 – Historic Heritage Conservation.....	13
2.1.12 State Planning Policy 3.7 – Planning in Bushfire Prone Areas	14
2.1.13 State Planning Policy 4.1 – State Industrial Buffer Policy	14
2.1.14 State Planning Policy 5.2 - Telecommunications Infrastructure.....	14
2.1.15 State Planning Policy 5.4 - Road and Rail Noise.....	14
2.1.16 Planning Bulletin 83/2013 – Planning for Tourism	14
2.2 Pilbara Planning and Infrastructure Framework 2012	15
2.2.1 Population Growth	15
2.2.2 Housing.....	15
2.2.3 Economic Development.....	15
2.2.4 Utility Infrastructure	16
2.2.5 Community Infrastrucutre	16
2.2.6 Transport Infrastructure	16
2.2.7 Natural Environment	16
2.2.8 Cultural Heritage.....	16
2.3 Pilbara State of Environment Report 2013	17
2.4 Pilbara Regional Plan 2012 - 2017	17
2.5 Pilbara Cities.....	17
2.6 Pilbara Development Commission – Regional Investment Blueprint.....	17
2.7 The Shire Local Planning Strategy 2004	18
2.8 The Shire Pilbara Local Planning Scheme No. 4.....	19
2.9 Newman Revitalisation Plan Volume 1, 2 and 3.....	20
2.10 The Shire Strategic Community Plan 2018 - 2028	21
2.11 Local Profile	21
2.12 Physical Features.....	23

2.12.1 Climate.....	23
2.12.2 Geology.....	23
2.12.3 Soils and Topography.....	24
2.12.4 Waterways and Catchment Areas	24
2.12.5 Wetlands.....	24
2.12.6 Groundwater	25
2.12.7 Water Supply	26
2.12.8 Flora and Fauna	26
3.Population and Housing.....	28
3.1 Settlements and Growth	28
3.2 Townsites	28
3.3 Population	31
3.3.1 Population Growth	32
3.3.2 Future Population Growth and Economic Development.....	33
3.4 Housing.....	35
3.4.1 Housing Supply	35
3.4.2 Housing Type and Density	36
3.5 Aboriginal Communities.....	37
3.5.1 Jigalong Community Layout Plan 2	37
3.5.2 Kiwikurra Community Layout Plan.....	41
3.5.3 Kunawarritji Community Layout Plan	45
3.5.4 Parngurr (Cotton Creek) Community Layout Plan	49
3.5.5 Punmu (Lake Dora) Community Layout Plan	52
3.5.6 Warralong Layout Plan	55
4.Economy and Employment.....	57
4.1 Economy.....	57
4.2 Employment	58
4.3 Retail and Commercial	59
4.4 Industrial Land.....	61
4.5 Tourism and Visitors	63
5.Recreation and Open Space.....	66
6.1 National Parks	66
6.2 Recreation	68
7.Community Facilities	71
7.1 Health	72
7.2 Education.....	72
7.3 Early Childhood Services	72
7.4 Aged Care	73
7.5 Culture and Environment	73
8.Rural Land Use	74
8.1 Rural Areas	74
9.Heritage, Urban Design and Character	75
9.1 Heritage.....	76

9.2 Urban Design and Character	76
10. Traffic and Transport	86
10.1 Road Network.....	86
10.2 Rail.....	91
10.3 Airports.....	92
10.4 Ports	94
10.5 Public Transport	94
10.6 Pedestrians and Cyclists	95
11. Service Infrastructure	95
11.1 Water.....	95
11.2 Newman	95
11.3 Marble Bar	97
11.4 Nullagine	97
11.5 Power	98
11.6 Gas.....	100
11.7 Telecommunications	100
11.8 Drainage	101
11.9 Wastewater	105
11.10 Waste	105
12. Opportunities and Constraints	109
12.1 Population and Housing	110
12.2 Economy and Employment	112
12.3 Retail and Commercial Land.....	113
12.4 Industrial Land.....	114
12.5 Tourism and Visitors.....	115
12.5 Recreation and Open Space	117
12.6 Natural Resource Management Environment	117
12.7 Community Facilities	119
12.8 Rural Land Use.....	121
12.9 Heritage, Urban Design and Character.....	122
12.10 Transport.....	124
12.11 Infrastructure	126

1. INTRODUCTION

1.1. Purpose of the Strategy

The Shire Local Planning Strategy (LPS) has been developed in accordance and as required by *the Planning and Development (Local Planning Schemes) Regulations 2015* Part 3 – Local Planning Strategies, which requires all local governments to prepare a local planning strategy for each local planning scheme that is approved for land within its district. The LPS sets out the long term planning approach for the Shire over the next ten years, applies state and regional planning policy to it and provides the rationale for the zoning and classification of the land.

1.2. Strategy Structure

The LPS is presented in two parts. Part One sets out the actual Strategy required to achieve the visions, objectives and actions listed within it, based on land use planning statutory and strategic frameworks. This part, Part Two, includes the background information and analysis which provides the foundations for the planning rationale and to inform the LPS generally. Specifically, Part Two of the LPS outlines the:

- State and regional planning context which identifies the state and regional planning policies, strategies and plans relevant to the local area.
- Vision and mission statement of the Sop, based on the Sop strategic plans and policies relevant to the planning and development of the Shire.
- Demographic, economic and social context of the Shire.
- Environmental context of the Shire area, including significant areas of environmental and cultural significance such as geology, topography and landforms, flora and fauna;
- Infrastructure context including regional and shire transport and trunk servicing infrastructure.

In addition to comprehensive review of existing documents, studies and strategies, Part 2 has involved consultation with key stakeholders that have an influence on the way that the Shire will develop into the future.

1.3. Relationship to the Local Planning Scheme

Upon endorsement of the LPS, the Shire will review its Local Planning Scheme No.4 to reflect the proposed zoning and land use changes as depicted in the LPS. The objectives of the LPS will be reflected in the new Local Planning Scheme as part of the scheme review, where those objectives are readily able to be incorporated in the new scheme through either scheme maps or text. In some cases, further investigations may be required prior to those objectives being included into the scheme. Given that scheme reviews can be a lengthy process, the LPS may be called upon to justify an amendment to the current local planning scheme for significant projects/applications that require a change of land use for a particular site prior to the finalisation of a scheme review.

1.4. Preparation and Adoption

Planning and Development (Local Planning Schemes) Regulations 2015, Part 3, provides the statutory process for the preparation and adoption of a LPS, described generally as follows;

- a) Preparation of draft strategy once analysis of issues and opportunities has been undertaken for land use planning in the local government area
- b) Consideration of draft LPS by Council to forward to the WAPC for consent to advertise
- c) WAPC consider consent to advertise and may require amendment or grant authority to proceed to advertise
- d) Shire administration either amend/advertise, if advertise consistent with s 13 of the Regulations of not less than 21 days

- e) Consideration of Submissions and modifications if required to the draft LPS
- f) Local Government forwards draft LPS to WAPC for its consideration for approval, modification or refusal and
- g) Upon endorsement Public Notice is given and public inspection is available.



2. STATE AND REGIONAL CONTEXT

The following State, Regional and Local Planning Framework are referenced due to their relevance to land use and development in the Shire. Those policies include:

State Planning Framework

- WAPC Local Planning Manual (2010)
- State Planning Strategy (2014)
- State Planning Policies:
 - SPP 1- State Planning Policy Framework Policy (2010)
 - SPP 2- Environment and Natural Resources Policy (2003)
 - SPP 2.5- Rural Planning (2016)
 - SPP 2.6- State Coastal Planning (2013)
 - SPP 2.7- Public Drinking Water Source Policy (2003)
 - SPP 2.9-Water Resources
 - SPP 3- Urban Growth and Settlement (2011)
 - SPP 3.2- Aboriginal Settlements Policy (2011)
 - SPP 3.4- Natural Hazards and Disasters (2011)
 - SPP 3.5- Historic Heritage Conservation (2012)
 - SPP 3.7- Planning in Bushfire Prone Areas (2015)
 - SPP 4.1- State Industrial Buffer Policy
 - SPP 5.2-Telecommunications Infrastructure
 - SPP 5.4- Road and Rail Noise
 - SPP 7- Design of the Built Environment (2019)
 - SPP 7.3 – Residential Design Codes Volumes 1 and 2

Regional Planning Framework

- Pilbara Planning and Infrastructure Framework (2012)
- Pilbara – State of Environment Report (2013)
- Pilbara Regional Plan (2012 – 2017)
- Pilbara A Region In Profile (2011)
- Pilbara Regional Investment Blueprint

Local Planning Framework

- Local Planning Scheme No. 4 (2005)
- Local Planning Strategy (2004)
- The Shire – Strategic Community Plan 2018-2028

Other

- Newman and Tom Price Regional Hotspots Land Supply Update 2015
- Population Forecasting-The Shire, Hames Sharley,2014
- Transient Workers Accommodation in the Pilbara (2012)
- Pilbara Workforce Development Plan 2013-2016 (2013)
- Pilbara Vernacular Handbook (2010)
- Pilbara Regional Water Plan 2010-2030 (2010)
- Regional North Land Capacity Analysis - The Shire of East Pilbara (2020)

2.1. State Planning Strategy 2050

The State Planning Strategy, 2014 (SPS) is the preeminent strategic planning instrument for Western Australia, providing strategic direction for the State to 2050 and beyond. The SPS informs State, regional

and local planning strategies, policies and approvals, linking to and building upon other strategic planning positions put in place by the WAPC.

The SPS identifies parts of the Shire as economic activity areas, notably around Newman and Marble Bar. Newman is also associated with an infrastructure band and the Newman to Port Hedland road is deemed a major road. In the SPS Newman is classified as a sub-regional centre with Marble Bar considered as another centre.

The Strategy relies on a collaborative whole-of –government approach to land-use planning and land development issues. The strategic directions of key importance to Western Australia’s sustained growth have been identified within the SPS. These have been outlined in Table 1 to provide guidance to the development of the LPS.

Table 1: State Planning Strategy Strategic Direction

SPS STRATEGIC DIRECTION	CONSIDERATIONS FOR SOEP
<p>Economic development</p> <p><i>Objective: To facilitate coordinated and sustainable economic development.</i></p>	<p>Reinforces the role of the Pilbara as the engine room of the national economy. The Pilbara continues to emerge as a hotspot for global investment, emphasising the continued importance of the Region for the State’s economic development. Maximising these opportunities for global investment and strengthening the regions existing economic foundations needs to be a central focus of strategic planning for the Shire.</p> <p>Economic diversity for regional areas is critical for ongoing development. The Shire can capitalise on its strategic location to provide a significant node (Newman) on the inland freight corridor (Perth – Meekatharra – Newman).</p> <p>Provision of affordable and appropriate land to meet the needs of people, business and industry development (including buffers). There are opportunities to cluster industry to form locational relationships that produce optimal output and limited waste. This includes maximising existing infrastructure and providing new infrastructure that is connected and enhances business efficiency and liveability.</p>
<p>Education, training and knowledge transfer</p> <p><i>Objective: Western Australia becomes globally competitive as a creative, innovative and knowledge-based economy.</i></p>	<p>Regional knowledge based industries and education facilities that offer education and re- search associated with mining and energy sectors and agriculture is a key driver for the SPS and an opportunity for economic development within the Sop to stimulate economic diversity and growth.</p>
<p>Tourism</p> <p><i>Objective: To access and enhance a range of experiences unique to the State.</i></p>	<p>The Shire is within the North-West Tourism region and is considered important for tourism, drawing on its natural and cultural significance. Specifically, opportunities exist to concentrate on the region for wilderness, gorges, indigenous culture, landscapes, waterfalls and outbackad- ventures. There are opportunities to promote the unique identity, history and sense of place of the Shire, including celebrating Aboriginal culture and heritage. However,</p>

	<p>protection of highly valued sites is required - balancing tourism and conservation through effective planning and management.</p> <p>Accessibility to a range of diverse experiences is critical and this relies on strong infrastructure investment and delivery including provision of tourism workforce, tourism facilities and services.</p>
<p>Environment</p> <p><i>Objective: To conserve biodiversity and manage the state's natural resources in a sustainable manner</i></p>	<p>The Shire contains areas of State and National environmental significance (significant wet- lands, waterways and areas of natural heritage). The Shire also incorporates an area that is considered a national biodiversity hotspot. Conservation of these environmentally significant areas needs to be a consideration for the LPS, balanced with the need to diversify and grow the economic base through ventures such as mining, industry and tourism. Additionally, conservation of natural resources such as water, agricultural land and basic raw material deposits are preserved for future use and development. Strategic planning should consider cumulative impacts from development and activities occurring within the Shire.</p>
<p>Agriculture and food</p> <p><i>Objective: To enable the state's food supply chains to meet the projected demands of its domestic and global food and fisheries market</i></p>	<p>The Shire is predominantly located within a State agricultural region defined as pastoral – cattle grazing. Within the Shire, to the north of Newman, is an area that is considered opportunity for high irrigation agriculture. This provides a significant opportunity to capitalise on its strategic location and connectivity with the State for food production and agricultural pursuits. Well serviced by key infrastructure provides efficiency for food production.</p> <p>Furthermore, existing work being undertaken in the areas of biofuel production and mine dewatering provide added value to agricultural economies in the Shire.</p>
<p>Physical infrastructure</p> <p>Movement of people, re- sources and information</p> <p><i>Objective: To manage the movement of people, goods and services through an integrated network connected nationally and globally</i></p>	<p>Within the Shire, Newman is designated as a regional airport, there is a high density of rail links and the State movement network traverses the Shire. Newman forms a sub-regional node. Consideration should be given to delivering a coordinated and efficient freight logistics system incorporating road, rail, air and sea transport.</p> <p>Ensuring communities are connected with jobs and services is a key consideration for the Shire. With a high Fly-in/Fly-out (FIFO) population, locating people within the Shire's settlement areas is key to reducing travel distance and travel costs. However, existing movement networks must also have capacity to absorb increased travel demand. This is particularly important for air transport as this is the key movement network for employment-based trans- port to the Shire in the mining and resources sector.</p>

<p>Physical infrastructure</p> <p>Water</p> <p><i>Objective: To support Western Australia's growth and development by sustainably managing the availability and quality of water while maintaining a healthy, diverse and well managed water environment.</i></p>	<p>Strategic planning needs to consider water and water security through well integrated water planning with community, land use and economic planning. Evidence-based planning will ensure that water resources are not over-allocated and availability of water to support economic and population growth is achieved. Water efficiency and reduction in water use may be supported through demand management and water sensitive development mechanisms. Furthermore, consideration of water recycling should also be considered such as storm water harvesting and wastewater recycling.</p> <p>Public drinking water sources need to be protected and water use needs to be balanced with industry needs and catchment protection and restoration programs will be delivered to maintain and conserve areas of significance.</p>
<p>Waste</p> <p><i>Objective: To ensure WA's waste streams are managed as a resource.</i></p>	<p>Economic and population growth are driving increasing quantity of waste that must be processed, as such the strategic planning of the Shire needs to be based on accurate growth projections. It is noted that the type of waste generated and the way it is managed will change in line with changes in technology. It is recommended the Shire accurately gauges and responds to future waste requirements.</p>
<p>Telecommunications</p> <p><i>Objective: to ensure those responsible for telecommunications take into account WA's planning and development priorities and requirements.</i></p>	<p>The Shire's vast distances and sparse population generally presents challenges for ongoing improved tele-communications. The connectivity of the Shire will rely on the way in which telecommunications are integrated with other utilities and infra-structure development. Specifically, the strategic planning of rural and urban settlements will need to locate and design telecommunication infrastructure and services taking into account the needs of an ageing population, people with limited education or computer skills and people in remote settlements. Investment by third party stakeholders, such as local government, industry and communications providers, will need to consider evidence of a deficiency, investment viability and cost benefit. The main centres are currently serviced by NBN Co's Sky Muster.</p>
<p>Social infrastructure</p> <p><i>Objective: to enable liveable, inclusive and diverse communities</i></p>	<p>A major consideration for social infrastructure planning is the substantial variation of population and economic growth projections between and within regional areas of the State. A high standard of social infrastructure is often expected regardless of cost. Usually regional populations will not grow without the necessary social infrastructure to support that growth such as schools, health services, community facilities and programs. In addition, there is often a gap between revenue created from social infrastructure and expenditures on providing and maintaining that infrastructure. New methods will be needed for social infrastructure investment that can enhance the timeliness and equity in providing a social service. Funding for social infrastructure, in particular the 'soft' elements, will require innovative and creative approaches and partnerships.</p>

<p>Land availability</p> <p><i>Objective: to ensure the sustainable supply of land for future development</i></p>	<p>Infrastructure and service capacity limits development of existing land parcels to greater capacities, this increases pressures on future land supply. This concern is amplified is a continuation or increase in mining. Private and public investment to service land for further development is influenced by availability of local labour, freight and mobilisation costs and season weather conditions. The challenge will be to move ahead known trends and to plan and invest strategically for the Shire’s growth or appropriately plan for its population stagnations. If the area is anticipated to grow in alignment with the State forecasts, this will require the development of robust modelling and scenario building tools and their mobilisation across Government and the private sector.</p>
<p>Remote settlements</p> <p><i>Objective: to maintain economic and community development through improved connectivity and cultural support.</i></p>	<p>Remote settlements are reliant on a framework of supporting structure, including appropriate land tenure, native title resolution and adequate essential, social and municipal service provisions. The challenge is to ensure that the economic and social role that remote settlements play is not lost due to lack of adequate support.</p> <p>Increasing involvement in providing services and infrastructure in remote settlements is required, including integration with worker’s camps that affect the social and economic life of the settlement. All worker’s camps are based on the premise of a FIFO workforce. Balancing the needs of regional economic and social aspirations with the operational imperative of the resources sector is a challenge.</p>

2.1.1. State Planning Framework Policy 1

The State Planning Framework Policy No. 1 (SPP1) is the overarching Statement of Planning Policy. SPP1 which sets out the key principles relating to environment, community, economy, infrastructure and regional development which should guide the way in which future planning decisions are made.

SPP1 combines existing State and regional policies, strategies and guidelines within a central framework which provides a context for decision-making on land use and development in Western Australia. The Policy informs the Commission, local government and others involved in the planning process on those aspects of State level planning policy which are to be taken into account, and given effect, in order to ensure integrated decision- making across all spheres of planning.

SPP1 defines key principles with a significant impact on good decision making in land use planning and development. These principles have informed the development of the LPS and include:

- Environment – to protect and enhance key natural and cultural assets of the State and deliver to all West Australian’s a high quality of life which is based on environmentally sustainable principles.
- Community – To respond to social changes and facilitate the creation of vibrant, safe and self-reliant communities.
- Economy – to actively assist in the creation of regional wealth, support the development of new industries and encourage economic activity in accordance with sustainable development.
- Infrastructure – To facilitate strategic development by making provision for efficient and equitable transport and public utilities.

- Regional Development – To facilitate strategic development by making provision for efficient and equitable transport and public utilities.

2.1.2. State Planning Policy 2 - Environment and Natural Resource Policy

The *State Planning Policy 2 Environment and Natural Resource Policy* (SPP2) defines the principles and considerations that represent good and responsible planning in terms of environment and natural resource issues.

The underpinning objectives of the policy will inform the development of the LPS. These are:

- To protect, conserve and enhance the natural environment.
- To promote and assist in the wise and sustainable use and management of natural resources.

The LPS will consider those areas that have been previously identified as having high conservation value and include those areas in the Scheme either as a Conservation Reserve or a new Environmental Conservation zone.

2.1.3. State Planning Policy 2.5- Rural Planning Policy

State Planning Policy 2.5 – Rural Planning Policy (SPP2.5), applies to the planning of rural and agricultural land in Western Australia. The policy is applicable to all rural land in Western Australia. The Policy is very significant as most land in the Shire is zoned rural for which it would apply. A recent review of the Policy now includes objectives to;

- a) Support existing, expanded and future primary production through the protection of rural land, particularly priority agricultural land and land required for animal premises and/or the production of food;
 - b) Provide investment security for existing, expanded and future primary production and promote economic growth and regional development on rural land for rural land uses;
 - c) Outside of the Perth and Peel planning regions, secure significant basic raw material resources and provide for their extraction;
 - d) Provide a planning framework that comprehensively considers rural land and land uses, and facilitates consistent and timely decision-making;
 - e) Avoid and minimise land use conflicts;
 - f) Promote sustainable settlement in, and adjacent to, existing urban areas; and
 - g) Protect and sustainably manage environmental, landscape and water resource assets.
- The intent of this LPS is therefore to protect rural land and encourage a diversity of compatible rural land uses.

The LPS does not seek to generally amend its Scheme to provide for smaller agricultural lots and acknowledges also that most land operates under Pastoral Lease provisions. It is noted that the SPS supports amendments to those pastoral leases where the land uses are of rural intent or compatible with a rural setting i.e. small tourist ventures. There is future opportunity to undertake land studies to support the protection of priority agricultural land in the Shire and explore intensive irrigated agricultural and Aquaculture land uses also. As diversifying the Pilbara's economy is a high strategic priority the LPS will consider the provision of great land use flexibility in the rural zone.

2.1.4. State Planning Policy 2.6 – Coastal Planning

State Planning Policy 2.6 – Coastal Planning Policy (SPP2.6) assists decision making in the coastal zone, regarding the determination of foreshore reserves, protection of the coastline environs and risks associated with built form. It proposes a series of logical sequences to assist in the preparation of coastal management plans and management options of coastal areas. More recently coastal planning has become a more prevalent planning matter as climate variation indicates continual sea level rise and science suggesting coastlines will be the

subject of more frequent storm events leading to inundation. The Shire hosts coastline in the vicinity of Cape Keraudren which is a coastal reserve vested in the Shire. Whilst it is relatively undeveloped any future proposal for infrastructure would need to consider the impacts associated with the coastal environment.

2.1.5. State Policy Planning 2.7- Public Drinking Water Source Policy

State Planning Policy 2.7 – Public Drinking Water Source Policy (SPP2.7) has been developed to ensure that land use and development within Public Drinking Water Source Areas (PDWSA) is compatible with the protection and long-term management of water resources for public water supply. The purpose of PDWSAs is to identify water resources gazetted under the *Country Areas Water Supply Act* and to protect the Shire’s current and future PDWSA through land use planning mechanisms. Under the Policy, it is expected that the Shire’s Strategy, scheme and decision-making in general will identify and include (where appropriate) provisions to protect surface and ground water resources for public drinking water supply.

There are three PDWSA’s in the Shire being at Newman, Nullagine and Marble Bar where the Nullagine PDWSA is defined as Special Control Area. It is advised the Nullagine PDWSA Special Control Area be re-assessed in accordance with the priority classification specified SPP2.7 to ensure up to date compliance.

2.1.6. State Planning Policy 2.9 – Water Resources

“Water is a fundamental component in sustaining the wellbeing of the community, the environment and existing and future development”.

Water refers to water for consumption, recreational, industrial and commercial purposes including storm water, wastewater, irrigation and drinking water catchments, including reservoirs and bore fields. Primary development issues include:

- Sustainable use of water resources,
- Stream salinization,
- Nutrient enrichment of water resources,
- Loss of riparian vegetation; and,
- Erosion and sedimentation of waterways and contamination of water resources.

The objectives of this policy are to protect and conserve water resources, assist maintain availability of water and promote the management of water use. Local Government will consider this policy through its LPS, subsequent structure plans, scheme amendments, subdivision applications and land use planning applications. The Shire will refer to *Better Urban Water Management (2008-DWER)* guidelines to implement water management at various stages of the planning framework.

2.1.7. State Planning Policy 3.0 – Urban Growth and Settlement

State Planning Policy 3.0 – Urban Growth and Settlement (SPP3) ensures that settlement patterns provide sufficient and suitable land for a variety of housing, employment, recreation facilities and open space. The LPS responds to this policy by ensuring such land supply to enhance the quality of life in the communities. Newman is considered a regional centre and the LPS identifies future land supply to promote a more diverse economy.

2.1.8. State Planning Policy 7.3 – Residential Design Codes

State Planning Policy 7.3 – Residential Design Codes (R-Codes) guide development and subdivision in the Residential Zone. The density coding in the R-Codes will be later considered through a Housing Strategy to identify infill opportunities in the townsites. This requirement will be an action in the LPS.

2.1.9. State Planning Policy 3.2 Aboriginal Settlements

The objective of *State Planning Policy 3.2 Aboriginal Settlements* (SPP3.2) is to provide recognition of Aboriginal settlements through local planning schemes and strategies; and collaboratively plan for the orderly and coordinated development of Aboriginal settlements. The Policy measures aim to support the proper and orderly planning of Aboriginal settlements to facilitate better planning of remote settlements. Layout Plans are a mechanism to deliver this outcome. The Scheme currently has a Settlements zone that requires the preparation and endorsement of a Layout Plan.

2.1.10. State Planning Policy 3.4 – Natural Hazards and Disasters

State Planning Policy 3.4 – Natural Hazards and Disasters (SPP3.4) requires consideration of events such as floods, cyclones, storm surges, landslides, bushfires and earthquakes. Essentially land use planning should aim to mitigate and minimise adverse impacts of natural disasters on communities, the economy and the environment.

The LPS will include requirements for development on floodplain and in some instance not permit such development where it is considered obstructive to the water way. In most cases the 1 in 100 year level will be used to require all habitable, commercial and industrial buildings to have floor levels above the level of the defined flood event.

The Shire is exposed to Category 3 and above cyclones and the development requirements of built form are contained with the Building Code of Australia hence the LPS only references built form requirements for cyclones.

Since this policy the WAPC has separate policies for planning in bushfire prone areas which are referred to below.

2.1.11. State Planning Policy 3.5 – Historic Heritage Conservation

State Planning Policy 3.5 – Historic Heritage Conservation (SPP3.5) provides for the protection and conservation for places of heritage significance. It is generally limited to that of European heritage for buildings and sites. It is prudent to mention that Aboriginal sites of significance are protected under the auspices of the *Aboriginal Heritage Act 1972*.

There are currently five sites of significance listed on the State Heritage Register including;

1. Government Buildings in Marble Bar
2. Poinciana House Marble Bar
3. Corunna Downs Station and former wartime airbase
4. Ironclad Hotel Marble Bar
5. Halleys Comet Goldmine

The Shire has a Municipal Heritage Inventory prepared in 2008 of which the number of listed places in each area include Marble Bar (24), Nullagine (13) and Newman (14). It is a statutory requirement for Heritage reviews to occur every ten years and the SPP 3.5 also requires Schemes to include a Heritage List. Places on the Heritage list also include those places of heritage significance that may not be State Listed but are significant to communities, are identified in the Shires Municipal Heritage Inventory.

2.1.12. State Planning Policy 3.7 - Planning In Bushfire Prone Areas

The whole of the Shire is located in a mapped bushfire prone area as undertaken by the Department of Fire and Emergency Services (DFES, 2017). All development will be assessed having regard for its suitability in accordance with this Policy.

2.1.13. State Planning Policy 4.1 - State Industrial Buffer Policy

Whilst the State Industrial Buffer Policy was gazetted in 1997, local and state government have been referring predominantly to the draft amended State Policy – Industrial Interface (November 2017). The Policy seeks to prevent land use conflict between industry and/infrastructure facilities and sensitive land uses. This policy will apply specifically for planning decision making for new and existing industrial zones in Schemes, industrial land uses generally, infrastructure facilities and also includes land impacted by industrial or mining operations.

This Policy also refers to decision makers using the *EPA Environmental Protection Guidance Statement No.3 Sensitive Land Uses* which provides advice on which land uses require separation distances.

2.1.14. State Planning Policy 5.2 – Telecommunication Infrastructure

The objective of the policy is to facilitate the provision of telecommunications infrastructure in an efficient, cost-effective and environmentally responsible manner to meet community needs. The policy provides a framework for the preparation, assessment and determination of applications for planning approval for telecommunications infrastructure. The need for high-speed telecommunications in the Shire is vital to achieving a standard of living competitive with the rest of Australia. The LPS aims to address the need for telecommunications infrastructure and supports the provisions of SPP 5.2 for its efficient provision.

2.1.15. State Planning Policy 5.4 – Road and Rail Noise

The policy aims to promote an integrated system of sustainable land use and transport with efficient freight network design and best practice development. Protecting people from unreasonable levels of transport noise and protecting major transport corridors from incompatible urban encroachment are the mechanisms to achieve this aim. Road and rail transportation, for both everyday domestic usage and freight transport, are central to development in the Shire. New road and rail connections will be required to facilitate future growth of the population and economy. New residential areas will also be required to accommodate growth, and both must consider implications of transport noise. Noise criteria, management and mitigation provisions of SPP 5.4 are incorporated in the LPS to safeguard residential amenity and efficient transport operations.

2.1.16. Planning Bulletin 83/2013 - Planning For Tourism

There is opportunity for the Shire to enhance land use planning for tourist purposes by including either tourism precincts or sites in its LPS. Those areas should include the recognized 5A's of tourism destination development including attraction, accommodation, access, amenities and activities. Further identification of key sites is required and appropriate planning mechanisms are also required to be incorporated into the Shire's scheme.

There is a further opportunity to capture those sites currently offering tourist services throughout the Shire and include them as either special use sites for specific purpose or introduce a new Tourist zone.

2.2. Pilbara Planning and Infrastructure Framework 2012

The Pilbara Planning and Infrastructure Framework is a ‘whole of government’ initiative, endorsed by the WAPC and State Government, that sets the agenda for the physical development of the Pilbara (Pilbara Planning and Infrastructure Framework, 2012). The Framework sets out the strategic direction for the future development of the region over the next 25 years and was developed to inform the review of the SPS. The Framework outlines the opportunities and challenges facing the Pilbara and provides context to the Shire in relation to the broader strategic direction of the Pilbara region. It is also a critical guiding document for the development of the Shire’s LPS. The main focus areas are summarized below:

2.2.1. Population Growth

There is a forecast growth of the Pilbara region and it is anticipated some settlements will grow in scale and character, whilst others will decline. The Framework aims to consolidate urban form to the existing centres, making them inherently more liveable places.

It is intended that the concentration of population and supporting facilities in the regional nodes will have a positive, catalytic effect on the other settlements in their vicinity. In being in close proximity to higher level of services and amenity, regional nodes will become increasingly viable and attractive places to live. Newman is forecast to have a future population of 15000 by 2035 and is recognised as a sub-regional centre. Nullagine and Marble Bar are identified as Villages at a regional scale and are expected to remain as such.

The Framework based its population scenario on the Pilbara Cities aspiration targets. More accurate population forecasts (based on Census data and WA Tomorrow) indicate that Newman will have a population of approximately 10,400 by 2035. It is this figure that will guide the LPS.

2.2.2. Housing

Housing affordability has historically been a challenge within the region with a severe shortage of housing opportunities for lower paid occupations, particularly those that do not have housing provided as part of their employment package. Key constraints in the past to increasing the housing stock are identified as limited utility infrastructure capacity and the inability of the building industry to adequately respond to demand.

2.2.3. Economic Development

Currently the Pilbara’s economy is dependent on the mining of iron ore, minerals, oil and gas. Economic diversification is a key focal point of the Framework which aims to improve areas including the knowledge-based industries and increasing the region’s capacity to export goods and services. This shift is to be based on resource industry supply chain completion in the first phase, widening in the later phases to encompass knowledge-based industries with an increasing capacity to export goods and services.

The possible areas for economic diversification for the Pilbara and their potential application to the Shire are:

- **Primary Production** - There are a number of agricultural-based opportunities in the eastern tablelands (Newman area) utilising mine dewatering.

- **Tourism and hospitality** - The remoteness and rugged beauty of the region is considered to be some of its greatest strengths, improved amenities and a need to upgrade and seal access roads to provide opportunities for tourism-focused development is required.
- **Distribution and Retail** - Newman is to provide a general increase in the quantity of retail floor space resulting in a retail step change in the standard of provision.
- **Education and training** - The development of higher order education and training facilities, especially those that would serve the mining and oil and gas sectors, should be pursued.
- **Business, media, IT and consulting** - The development of a higher population threshold and a more developed network of enterprises would, in turn, support a higher level of business, media, information technology and consulting services.
- **Demand for industrial land** - The key areas of direct resource sector demand are associated with the two port authorities, together with Anketell, Newman and Onslow.
- **Community facilities** - A greater government commitment to provide a higher level of basic services and facilities such as health, education and other community services will have significant flow-on effects for the local community.

2.2.4. Utility Infrastructure

The framework focuses on the need to upgrade and replace much of the region's infrastructure and, in turn, looks at new approaches and technologies for utility infrastructure provision.

2.2.5. Community Infrastructure

In order to attract and retain workers and their families and meet the projected population growth, the Pilbara will require a both enhancement and a higher threshold of facilities and services. Areas for future investment include health, education, recreation, community support and culture and entertainment.

2.2.6. Transport Infrastructure

Projected expansions of economic activity and population requires a transport system that provides equitable access for residents and industry. Practical, safe, affordable opportunities for intra-regional, interstate and international travel is a necessity for the Pilbara and as a result a regional road network upgrade is required.

Additionally, other transport upgrades and expansions include:

- Expanded rail system increasing the three privately-
- Operated networks to five.
- Expanded trade tonnage at the region's seaports, including seaport facilities.
- Increased airport passenger by developing the regions four hub airport and providing greater connection between the region and selected international destinations.

2.2.7. Natural Environment

The recognition of the impact that economic growth will have on the environmental values of the region. An environmental response to bolster the natural environmental values make to the Pilbara's liveability, health, lifestyle and economy is a focus of the Framework.

2.2.8. Cultural Heritage

An expanded urban population requires a better understanding, recognition and respect for the region's past and present indigenous culture.

2.3. Pilbara State of Environment Report 2013

The Pilbara State of Environment Report 2013 was commissioned by Regional Development Australia (RDA) Pilbara in collaboration with the Shire of Ashburton, the Shire of Roebourne (now the City of Karratha) and the Town of Port Hedland. The report identifies population growth, consumption of resources and climate change as the top three environmental pressures facing the region.

2.4. Pilbara Regional Plan 2012 - 2017

The Pilbara Regional Plan 2012-2017, produced by Regional Development Australia, provides a regional profile of the Pilbara region. The Regional Plan provides important contextual information about the Region that will inform the development of the LPS, particularly information related to the Local government area and its townsites.

The vision of the Regional Plan is a Pilbara that is an economically vibrant and socially inclusive region that promotes opportunities. Key information contained within the document relevant to the LPS includes:

- Natural environment including geographical features, national parks and geo-heritage;
- Regional economic profile;
- Social profile and Community infrastructure including health, housing, culture, education and sport and recreation;
- Cultural heritage including indigenous heritage, pastoral legacy and heritage places; and
- Regional issues and challenges.

The Regional Plan also provides a suite of regional investment opportunities. Whilst all of the regional development initiatives have been considered with regard to their strategic regional role, the specific initiatives relevant to the Sop and the LPS include supporting special economic zones including airport upgrades, support for alternate agribusiness and ensuring service provision is appropriate to support a growing population.

2.5. Pilbara Cities

The Pilbara Development Commission (PDC) is a Statutory Authority of the State Government, established along with eight other regional development commissions under the *Regional Development Commissions Act* (1993). Under the PDC, Pilbara Cities (2010) was established to address the issues associated with significant growth in the region, in line with the growth of Karratha and Port Hedland into cities of 50,000 people and Newman to 15,000 people by 2035.

The region faces unique challenges to meet the demands of a burgeoning resources sector whilst supporting economic diversity and population growth to secure a sustainable future for its communities.

2.6. Pilbara Development Commission – Regional Investment Blueprint

The Pilbara Regional Investment Blueprint (the Blueprint) outlines an aspirational vision for the Pilbara in 2050. Fundamental to the Blueprint is the aspirational population forecast of 200,000 people living within the Pilbara region by 2050. As the Blueprint Vision states:

“In 2050, the Pilbara will have 200,000 people living in vibrant, modern and inclusive communities which offer quality services, career choice, affordable living and strong local communities.

The economy will feature diverse, innovative and resilient local and international firms underpinned by resources and energy industries”.

The Blueprint acknowledges that the population targets are aspirational but achievable. It outlines that the Pilbara will achieve 200,000 residents by providing over 40,000 new jobs by delivering on strategic priorities.

The Blueprint seeks to achieve identified strategies through a collaborative approach to the region's development. It establishes a common framework for all stakeholders to coordinate infrastructure development and service delivery, and improve the regulatory, social and physical environment where public and private investment can be attracted and delivered with confidence.

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 challenges stakeholders to collectively create a future in the Pilbara which fully capitalises on the region's strengths and comparative advantages, maximizing leverage of emerging global trends to deliver prosperity, diversity, sustainability and quality of life for local residents (Pilbara Investment Blueprint).

The Blueprint highlights that realising the vision for the Pilbara in 2050 will entail the development and growth of a regional economy founded on a range of competitive economic strengths or as referred to within the Blueprint as "Regional Pillars". The Regional Pillars represent areas of the Pilbara's economy and community where public and private investment should be prioritised in order to make the Blueprint vision a reality.



LOCAL CONTEXT

The local context has been shaped by reviewing the relevant existing local planning documents. These documents provide the foundation for existing planning and development in the Shire including the existing The Shire LPS.

2.7. The Shire Local Planning Strategy 2004

The current The Shire Local Planning Strategy (LPS 2004) was adopted in November 2005. The LPS 2004 provides a 10- 15 years guideline and framework for planning within the municipality.

The Local Planning Strategy is a planning tool that enables Council to set out its vision for the Shire, and stipulate the longer term direction for land use and development. The Shire has experienced significant economic, population, housing and employment growth, over the past decade. For the LPS to remain current and fulfil its purpose as a guiding strategic document it must account for such pivotal changes.

Subsequently, a review of the preceding LPS has been undertaken, accounting for the significant changes which have occurred within the region and concurrently setting a new vision, aspirations and strategic direction for the Shire.

The information within the LPS 2004 has been reviewed for relevancy and used to inform the development of this LPS. The strategies developed as parts of the LPS 2004 have also been reviewed as part of this LPS. This process has sought to identify those strategies that have been acted on since 2004, strategies that have not been acted on but are still relevant to the Shire and strategies that are considered outdated based on the change and progression of the Shire.

2.8. The Shire Local Planning Scheme No. 4

The Shire Town Planning Scheme No 4 (the Scheme) was originally gazetted on 13 December 2005 and most recently amended in 22 February 2019. The Scheme forms the primary statutory document controlling the nature of land use and development in the East Pilbara Local Government area.

The Scheme sets out the zones of the local government and includes both the objectives and land uses suitable for those zones. The zones in the Scheme are currently listed as Residential, Town Centre, Nullagine Townsite, Mixed Business, Industrial, Community and Cultural Purpose, Rural, Rural Living, Special Use, Residential Development and Settlement. Further, the Scheme states the use and development of Local Reserve provisions.

Upon adoption of the LPS by the WAPC, the Shire will review the Scheme to ensure that it is reflective of the actions stated in the LPS and is consistent with the Regulations. Existing and proposed development is heavily focused within the townsites of Newman, Nullagine and Marble Bar. A summary of the statutory planning framework for each of the major townsites within the Shire is summarised in this Section.

Newman

Residential zoning dominates Newman, the Town Centre zone located in the centre of the town is bound by residential parcels to the north, east and south. The Residential zones comprise predominately of a split density coding of Residential R15/40. Parks and Recreation reserves are sporadically located throughout residential zoned areas, as well as in the Town centre and near the public purpose zones. Located north-east of the Town Centre zone are five parcels of Special Use zoned lots. A Community and Cultural purpose zone binds the north-west edge of the Town, and pockets of Industrial zoned land are located towards the south-west.

Expansion opportunities have been previously identified however that land is the subject future mining activity and in this regard is referred to as a transitional area on the Strategy Map. Lot 300 bounded by Welsh Dr and Forrest Ave, Newman is zoned Residential and located in the proposed transitional area. The zoning of this parcel of land will be reviewed in the future due to its location and maybe rezoned to be included in a SCA under the scheme.

Marble Bar

Residential zoning dominates Marble Bar. The centre of the townsite comprises Recreation zoned land which is attached to the Town Centre zone to the north-east and Community and Cultural Purpose zone located to the north-west of the site. A pocket of industrial land is located on the outskirts of the town to the north-west. Various public purpose sites are sporadically located throughout the Town.

Nullagine

The Nullagine Townsite is the smallest of the major townsites in the Shire. The site is predominately zoned 'Nullagine Townsite', dissected into east and west by Nullagine Road.

The Townsite contains three land parcels of Recreation zoned land and has sporadically located parcels of public purpose zoned land.

Aboriginal Settlements

Aboriginal Settlements are largely mitigated by TPS4 and approved Layout Plans implemented by the WAPC, which seek to provide a framework for the planning and cohesive development of settlements. The Layout Plan includes the proposed layout of development and indicates the proposed land use and construction details of any buildings or works proposed. Unless otherwise specified in the adopted Layout Plan or related Policy, development and land use shall not occur within an Aboriginal Settlement.

The following Aboriginal settlements are within the Shire and have been given due regard in the development of the LPS:

- Jigalong;
- Punmu;
- Parngurr;
- Kiwirrkurra;
- Kunawarritji; and
- Warralong.

In addition to the above listed Settlements, the following Town Based Settlements also exist:

- Irrungadji (Nullagine);
- Goodabinya (Marble Bar); and
- Parnpajinya (Newman).

2.9. Newman Revitalisation Plan Volume 1, 2 and 3

The Newman Revitalisation Plan (NRP) was prepared by the Western Australian State Government and the Shire (Sop) through a consultative and multi-disciplinary approach, in response to their shared vision for Newman. The NRP has been designed as an adaptive management plan and project management tool, to help guide the action required to deliver the developed vision.

The NRP is made up of three volumes:

1. Implementation Plan - vision and the integrated strategy to evolve Newman into a sub-regional service centre.
2. Townsite Growth Plan - urban growth strategies and actions required to accommodate a permanent population of 15,000.
3. Town Centre Master Plan - sets out how the Town Centre will be modernised and transformed into a vibrant and attractive heart for Newman.

The key priorities defined within the Plan include:

- Driving economic diversification, which will require focus on regional and local economic development and infrastructure provision to establish Newman as a service hub.
- Increasing the availability of readily developed land and the provision of more affordable and diverse types of housing.
- Upgrading and expanding aging infrastructure to allow for growth.
- Promoting Newman's unique character and sense of place.
- Enhancing the level of amenity in the Town – focusing on the redevelopment and activation of the Town Centre.

- Lifting the quality and level of services and facilities which will encourage people to settle and remain in the Town; and
- A new approach to regional and local governance, which facilitates stronger partnerships and coordination.

The NRP was produced to provide a roadmap for the town's future transformation. The plan highlights the regions key strategic aspirations and provides synergies for the development of the LPS.

The Plan is considered a core document to inform the development of the LPS, however the aspirational population targets from the Plan will be revised, for the purpose of informing the LPS, to better reflect the most recent population forecasts.

2.10. The Shire Strategic Community Plan 2018 -2028

The Shire's Strategic Community Plan is a strategic document prepared for the Shire as a strategy and planning document to reflect community and local government aspirations and priorities over a 10+ year period.

With respect to land use planning the Strategic Community Plan is part of an integrated framework designed to guide local planning initiatives. Further the LPS is one of many Shire plans that forms the informing strategies of the Strategic Community Plan. The Vision of the SCP is: *"A diverse community thriving in a vast landscape that offers a world of opportunity and rich heritage and culture"*.

Key result areas in the SCP include economic, social, built environment, natural environment and governance. All Key result areas have specific Objectives, Strategies and Measures of Success. The LPS is relative to this SCP where land use planning can be used to achieve certain objectives.

It is incumbent on the LPS to recognize the land use strategies required to achieve the SCP success which include;

B1.2 Provide and maintain open spaces for the community to recreate and connect.

B2.2 Facilitate the release of land for diverse and inclusive housing options, industrial and commercial use.

B2.1 create liveable places through local area planning N2.1 Conserve natural vegetation, green spaces and bushland

G2.2 Preserve, enhance and celebrate the Shires' history and culture

Construction of Part 1 of the LPS includes provision to use the land use planning framework to enable the above identified strategies.

2.11. Local Profile

The Shire is the largest shire within the Pilbara region of Western Australia (WA), with an area of 379,571km² (including offshore islands or 371,696, excluding islands). The Pilbara region spans the breadth of central WA. The Pilbara incorporates the Shires of East Pilbara, Ashburton, Port Hedland and the City of Karratha, an area stretching east-west from the coast of Exmouth to the Northern Territory border and bounded by the Kimberley region to the north and the Mid West and Goldfields to the south (Figure 1).

The Pilbara region is rich in minerals, hydrocarbons, fisheries, agriculture and tourism assets. Aided by its proximity to emerging and existing high demand markets, the region has been called "the engine room of

the Australian economy” and is of significant economic and geostrategic importance to State and National interests.

In 2018 it was estimated that the Pilbara region had a population of 62,688, (Pilbara Development Commission) and the total number of usual residents on 2016 Census night was recorded as 59,554. (ABS, 2016), most of who live in the western third of the region. The majority of Pilbara residents reside in the region’s towns, which include Port Hedland, Karratha, Newman and Marble Bar. A substantial number of people also work in the region on a FIFO basis

The Shire was formed by an amalgamation of the Shires of Marble Bar and Nullagine in 1972. Upon amalgamation, the Shire became the largest Shire in the world comprising an area of over 379,571 km² (Pilbara Cities, 2012).



Figure 1: Regional Context

The total population of the Shire was recorded at 10,591 people in 2016 (ABS, 2016). The major settlement areas accommodate the largest population concentrations. These settlement areas are Newman, Marble Bar and Nullagine. The Shire’s administrative centre is located in Newman which is the largest of the centres. The ABS estimated residential population for 2019-2020 in the Shire was 10,921 people, as advised in statistics delivered in March 2021.

The Shire area also contains numerous Aboriginal settlements including Jigalong, Punmu and Parngurr. Aboriginal Town Based Settlements are also located in the towns of Nullagine (Irrungadi community) and Marble Bar (Goodabinya); these settlements are included in the data referred to as the 'rural balance'.

Figure 2 shows the location of the major townsites, Aboriginal settlements and major mine sites within the Shire.

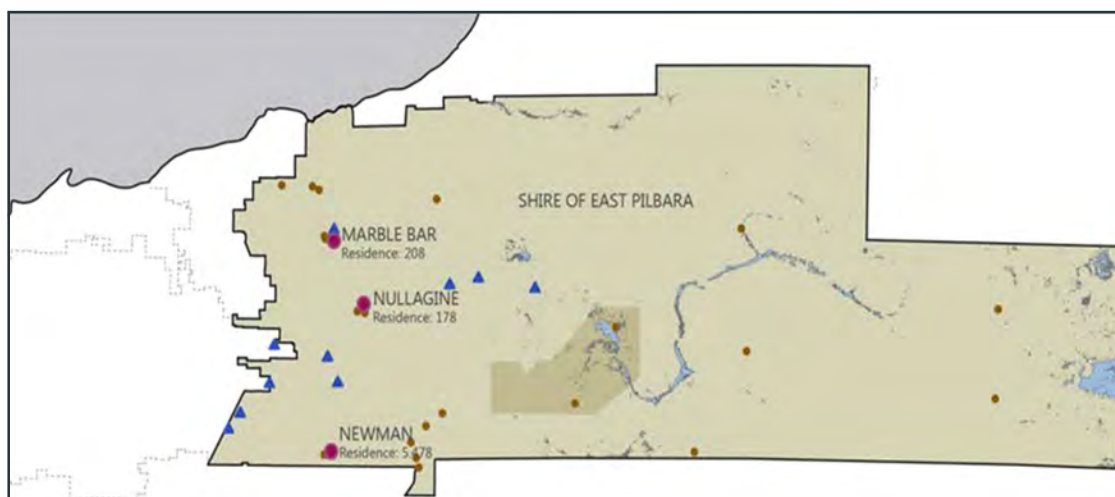


Figure 2: The Shire Context Map

2.12. Physical Features

The natural topography within the Shire has been historically and geographically accepted as an area of ancient geology, rugged topography and complex geomorphologic structure. The area consists of the desert tracts of the Canning Basin and areas of the region and are rich in various minerals, of which the present mining of extensively distributed iron ore deposits represent the latest, and probably most important resource.

The region can be separated into three distinct geographical formations; the coastal plain, inland and arid desert (which extends to Australia's dry centre).

2.12.1. Climate

Generally, the Shire experiences a large diurnal temperature variation year round, characteristic of typical desert-type climate. During the summer a maximum temperature in excess of 40° C is frequent and extreme conditions with temperatures above 45°C are not uncommon in inland areas. During the winter months the average day time temperature falls to 25°C.

Mean annual rainfall is mostly 150-250mm, dropping to 100mm in the south-east. There is greater chance of summer rain in the north while rain is mostly likely in either summer or winter in the south. In the north, the climate becomes a tropical semi-desert with 9-11 dry months and rainfall increases 600mm near the cape.

2.12.2. Geology

The East Pilbara has one of the Earth's best preserved remnants of ancient crust which is estimated to be more than 3.5 billion years old, comprising of ancient sedimentary rocks and some of the most ancient traces of life on earth, known as stromatolites.

The Shire contains all, or portion of seven main tectonic units, geologically distinct and together forming an area of generally rugged terrain – with some extensive coastal plains. Tectonic units include:

- Pilbara Block – Archaean granites and gneisses with some highly metamorphosed volcanic and sedimentary rocks.
- Hamersley Basin – Archaean to Proterozoic age, sandstones and volcanic of low metamorphic grade. Extensive areas of banded iron formation, includes canozoic valley fill alluviums and calcretes of the Fortescue valley. The basin age translates to times ranging from approx. 2,700 million years to about 2,400 million years old
- Gascoyne Province – Proterozoic granites, sedimentary and metamorphic sedimentary rocks.
- The eastern half of the Shire is underlain by the Canning Basin, a Phanerozoic (Aged from 540 million years to the present) basin that is prospective for hydrocarbons.
- Neoproterozoic Officer Basin sediments – aged between 900 million and 540 million years
- Rudall Complex of Palaeoproterozoic or early Proterozoic age, of metamorphic rocks.
- Yeneeno Basin rocks of Mesoproterozoic or middle Proterozoic age.

The ancient rock outcrops are a major natural heritage feature of the Shire. Additionally, a number of internationally important fossil sites are contained within protected reserves managed by the Geological Survey of Western Australia.

2.12.3. Soils and Topography

The East Pilbara sub-region features the Great Sandy Desert, a gently undulating plain which rises to 450m above sea level. The chief soils are red earthy sands and red siliceous sands with ironstone gravels locally. Occasional outcrops of sandstone and conglomerate rise above the plain shallow gravels with deep sandy gravels are found on lateritic plains and tablelands. The hills and ranges have Stony solid, red loamy earths, red shallow loams, red shallow sands and red earths. Red-brown hardpan shallow loams are found on wash pans, stony plains and the foot slopes of some hills. Calcareous loamy earths occur on calcrete plains while salt lake soils are also present.

2.12.4. Waterways and Catchment Areas

There are five major drainage basins for the region, being the Ashburton River, Onslow Coast, Fortescue River, Port Hedland Coast and De Grey River. The Shire area is traversed by several notable river systems, such as the Fortescue River; De Grey River and Ashburton River. The area is subject to flooding with the locations and severity of flooding varying depending on weather events, with the majority of the damage caused following natural disaster events such as tropical cyclones and tropical lows. As a result, most run-off occurs during the period December to March.

The majority of the Shire is covered by the Sandy Desert –Lake Dora catchment area. This majority of the eastern portion of the Shire rains into the Sandy Desert Basin, which contains extensive areas of salt lake chains. The De Grey River is most significant for the Shire, with several catchment areas located within the Shire that flow into tributaries of the De Grey River system. These include the Oakover River, Coongan River, Nullagine River and Shaw River. Flows are predominantly due to rainfall and as a result vary seasonally (January to March) and during periods of high rainfall e.g. cyclones.

2.12.5. Wetlands

The Pilbara contains a number of internationally (RAMSAR) and nationally significant wetlands. Within the Shire, the De Grey River wetland system, is listed in the Directory of Important Wetlands in Australia

(Environment Australia, 2001). This wetland system is of high ecological value and also provides cultural value to the local Indigenous people (Pilbara State of the Environment Report, 2013). The Fortescue Marsh is also listed as an area of environmental importance being the largest and most important wetland in the Pilbara region. This site is some 180,000ha of unallocated crown land which was excised from four pastoral leases in 2015. The contiguous occurrence of mulga, samphire and other communities surrounding a major wetland of this type and this wetland's functional significance represents a unique opportunity to conserve an essentially intact Pilbara wetland and fringing landscape with potentially interacting or co-dependent ecosystems, communities and species. The Fortescue Marsh Management Strategy 2018-24 aims to define an appropriate boundary for the conservation reserve, manage the area with traditional owners, nominate the area as a RAMSAR wetland, protect cultural and heritage values, manage natural values, community values, and visitor use and provide further research and ongoing monitoring.

A portion of the Eighty Mile Beach Marine Park and coastal strip are located within the Shire where it is proposed by DPAW to include additional areas into the conservation reserve system. The Eighty Mile Beach Marine Park is listed on the RAMSAR list of Wetlands of international importance. The site includes the intertidal mudflats from Cape Missiessy to Cape Keraudren (the beach) and Mandora Salt Marsh 40km to the east (located on ex- Anna Plains). The intertidal zone supports an abundance of macroinvertebrates, which provide food for very large numbers of shore birds.

2.12.6. Groundwater

The Pilbara State of the Environment Report, 2013 states that groundwater is most easily located and accessed near surface water drainage lines or alluvial channels.

For further, up to date, information on water availability, security and supply the Pilbara Regional Water Plan can be accessed, via the Department of Water and Environmental Regulation website at: <https://www.water.wa.gov.au/planning-for-the-future/allocation-plans/north-west-region-allocation-plan/pilbara-groundwater-allocation-plan>.

2.12.7. Water Supply

Groundwater is the major source of water for the Shire and the region as a whole, with groundwater attributing 97% of the water supply regionally. Rainfall reliability and the arid climate of the Shire means that surface water as a means of water supply cannot be depended on.

The Pilbara State of the Environment Report 2013, indicates that mining and mining related industry consumes over 80% of total water licensed for use in the Pilbara region. The remaining 9% is used for public drinking water supply and other industries (DWER Water Register, 2013).

Public Drinking Water Schemes

There are ten existing public drinking water source areas within the Pilbara region (Pilbara State of the Environment Report, 2013). Of these, four are located within, or partially within the Shire, including:

- Newman Water Reserve;
- Nullagine Water Reserve;
- Marble Bar Water Reserve; and
- De Grey River Water Reserve (partially located within the Town of Port Hedland).

As outlined in Section 2.1.4, it is the intent of the Shire Planning Scheme to reflect PDWSA's as Special Control Areas. The Scheme will include the four PDWSA's identified above as Special Control Areas.

Water recycling

Whilst water recycling does not occur extensively within the region or the Shire, a number of recent schemes are being implemented that are likely to provide a benchmark for how water is managed within the Region.

Initiatives that are currently being explored include Hamersley Agricultural Project. This project uses surplus water from below water table mining at Rio Tinto's Marandoo mine (Tom Price) for agricultural irrigation for fodder production at Hamersley Station. As part of this project, reinjection of water into the borefield will also be undertaken to replenish the aquifer that supplies water to the Tom Price township (DWER, 2011).

Additionally, the State Government has initiated the Pilbara Hinterland Agricultural Development Initiative (PHADI) through the Royalties for Regions program. The PHADI proposes to assist in establishing agricultural opportunities through using surplus mine dewater for irrigation in the Pilbara region.

As part of the initiative, two pilot projects have been defined (DPIRD, 2014):

- Woodie Woodie Pilot Project - 38 ha to be used to evaluate cropping options, including fodder production for cattle and biofuel crops utilising surplus mine dewater; and
- Yandicoogina Pilot Project - A 38 ha irrigated pilot site to evaluate a range of indicator crops utilising surplus mine dewater from multiple mining operations is being developed.

The Yandicoogina Pilot Project is located within the Shire. The intent of the PHADI is to facilitate improved water management, water conservation and assist in economic diversification and investment opportunities for a more sustainable Pilbara region.

2.12.8 Flora and Fauna

The region provides a unique composition of vegetation, which is reflective of the characteristic climate, land forms, geology and soils. Most of the East Pilbara sub-region is a shrub steppe grading to a tree steppe.

The ground cover is predominately *Triodia*, the shrubs *Hakea*, *Acacia* and *Grevillea*. The trees are *Acacia aneura*, *Owenia reticulata* and *Eucalyptus* spp.

Physiographic units and their corresponding vegetation are:

1. Abydos Plan, an area largely consisting of ancient granites and metamorphic rocks, generally covered with *Kanji* and *spinifex*, with coastal area of grass savannah and *spinifex*, with snappy gum steppe on higher landforms.
2. Chichester Plateau, part of the Hamersley Basin of old shales, sandstones and volcanic, shrub steppes and *spinifex* with areas of short grassland.
3. Fortescue Valley, part of the Hamersley Basin Tectonic unit, but geologically of valley fill alluviums and calcretes, with mulga short grassland grass plains with *spinifex* and tree steppes on upper valley sides.
4. Hamersley Plateau, lower proterozoic shales and volcanic, with extensive banded iron formations. Snappy gum and *spinifex* with areas of mulga and *spinifex*.
5. Gorge Ranges, part of the Pilbara Block geologically volcanic and metamorphic sedimentary rocks of Archaean age, vegetation of snappy gum and *spinifex*.
6. Oakover Valley, shales dolomites and volcanic with some phanerozoic limestones, *Kanji*, *spinifex*, some mulga.
7. Stuart hills, forming the north western end of the Ashburton Trough tectonic unit, geologically arkose conglomerates, shales, some granites. Vegetation is smokewood and *spinifex*, sparse shrubs and *spinifex*.
8. Onslow Coastal Plain, sands, limestones and alluvium, mixed shrub steppes, wattle scrub and shrub savannah.

Immediately to the south of the Pilbara Region, the Gascoyne Region is marked by a distinct change in geology and vegetation. The volcanic and iron formations of the Hamersley Plateau give way to conglomerates and shales of the Ashburton Trough and then to sandstones, shales and carbonates of the Gangemall Basin, with a distinct vegetation change to snakewood and mulga shrubland, and open shrubland, with mulga and *spinifex* low woodlands to the east.

The Pilbara's bio-subregions provide diverse landscapes creating habitats that support an array of mammal, reptile, bird and invertebrate species. The region is prolific in arid zone reptiles, particularly in the Great Sandy Desert (BHP, 2009).

The region provides a unique composition of vegetation, which is reflective of the characteristic climate, land forms, geology and soils. Most of the East Pilbara sub-region is a shrub steppe grading to a tree steppe. The ground cover is predominately *Triodia*, the shrubs *Hakea*, *Acacia* and *Grevillea*. The trees are *Acacia aneura*, *Owenia reticulata* and *Eucalyptus* spp.

BCE (2013) identify five broad Vegetation and Substrate Associations:

- VSA 1. *Acacia* shrubs over hummock grasslands on stony hills and plains.
- VSA 2. *Eucalypt* woodland over hummock grasslands on stony hills and plain.
- VSA 3. Bloodwood woodland over hummock grasslands on undulating stony hills.
- VSA 4. Well-developed cliff lines along mesa edges or gorges.
- VSA 5. Riparian zones (including *eucalypt* riparian woodland and adjacent loam plains supporting shrublands and *spinifex*).

3. POPULATION AND HOUSING

3.1. Settlements and Growth

Subdivision and development within the Shire is largely contained within the main townsites of Newman, Marble Bar and Nullagine. The broadscale settlement patterns are reflective of resource and mineral booms which have largely been responsible for population growth and settlement within the region.

The Pilbara Goldfield was proclaimed in 1888 and divided into two districts, Marble Bar and Nullagine. In the early 1890s the existence of alluvial gold in both mining districts produced a significant gold rush. Subsequently the town of Marble bar was gazetted in 1893 and Nullagine in 1895, lots sold rapidly following their release in 1894 (Strategic Community Plan, Creating Communities, 2012). Both Nullagine and Marble Bar were overshadowed after 1970 by the new iron ore mining town of Newman. Global demand for Iron ore propelled the East Pilbara into a period of rapid growth and development (Strategic Community Plan, Creating Communities, 2012).

3.2. Townsites

In light of the above, the following section provides an overview of development patterns which have occurred throughout the three major townsites.

Newman

Residential zoning dominates Newman, the Town Centre zone located in the centre of the town is bound by residential parcels to the north, east and south. The Residential zones comprise predominately of a split density coding of Residential R15/40. The areas are complemented by Parks and Recreation reserves which are located within the residential areas, as well as in the Town Centre and near the public purpose zones. Located north-east of the Town Centre zone are five parcels of Special Use zoned lots. A Community and Cultural purpose zone borders the north-west edge of the town, and pockets of Industrial zoned land are located towards the south-west.

The Newman Townsite Land Use Allocation Map illustrates the strategic growth areas for Newman Townsite. This Map highlights a "Townsite Transitional Area" to the west of the town for land is the subject of mining tenure. In this regard, it has been preserved for non-sensitive land uses in consultation with BHP in the future and with regard to subsequent planning approvals process. Some undeveloped residential land is situated in the transitional area and will be further investigated with the possibility of being rezoned.

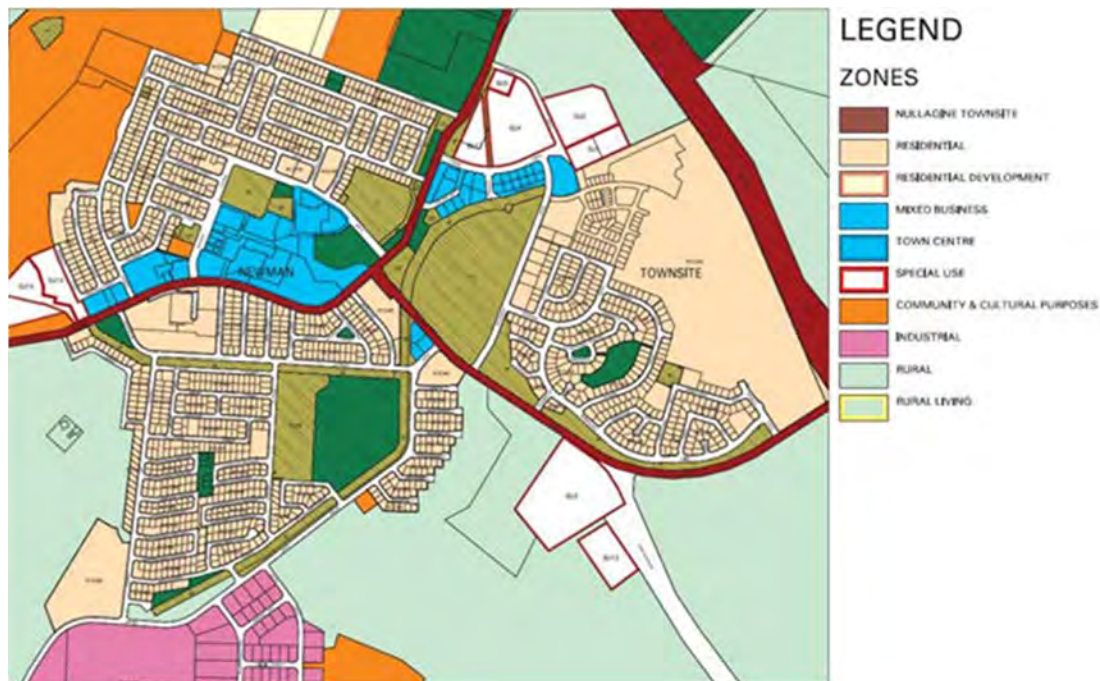


Figure 3: Newman Zoning Map (Extract)
 (Source: The Shire Local Planning Scheme)

Marble Bar

Similar to Newman, Residential zoning dominates Marble Bar, the centre of the townsite comprises of Recreation zoned land, which is attached to the Town Centre zone to the north-east and Community and Cultural Purpose zone located to the north-west of the site. A pocket of industrial land is located on the outskirts of the town to the north-west and various public purpose sites are sporadically located throughout the town as shown on Figure 34. A large Reserve for “Commonage” sits around the townsite of Marble Bar (R2906) and is listed with Schedule 4 of the Nyamal People (WCD2019/010) as an area where Native title does not exist. The LPS identifies potential new areas for industrial expansion and for inclusion in a new Tourist zone.

Nullagine

The Nullagine Townsite is the smallest of the major Townsites in the East Pilbara. The site is predominately zoned ‘Nullagine Townsite’, dissected into east and west by Nullagine Road and further into north and south by the Nullagine River. The Townsite contains three land parcels of Recreation zoned land and has sporadically located parcels of public purpose zoned land, shown in Figure 9.

Currently townsite development is constrained in some areas by floodplain and has limited townsite expansion areas due to adjacent UCL and Native title. A large Reserve for “Commonage” surrounds the Nullagine townsite (R2804) and is currently the subject of a claim area. Several areas have been identified in the LPS for future development given that the land is situated outside flood plain.



Figure 4: Marble Bar Zoning Map (Extract)
 (Source: The Shire Local Planning Scheme)

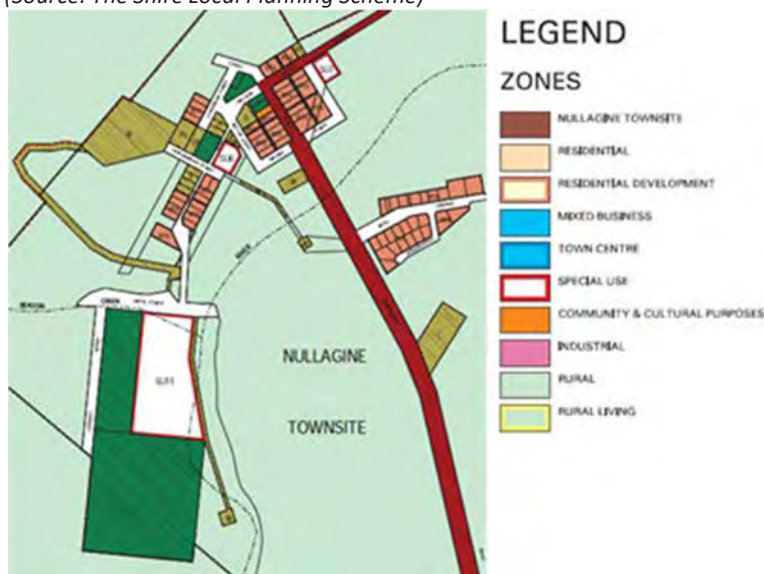


Figure 5: Nullagine Zoning Map (Extract)
 (Source: The Shire Local Planning Scheme)

Existing forecast growth projections have been identified based on historical growth rate data, which captures high growth rates due to historically intense resource activity and mining investment in the Region. As a result, further work was undertaken to determine the likely future population of the Shire and capture population responses to more recent downturns in mining activity. Changes largely related to the change in iron ore market prices and demand has shifted the level of growth occurring in the region. The forecasting involved extensive research and consultation with a range of stakeholders (including industry and Government) that will have an influence in the way that the Shire grows and develops into the future.

3.3. Population

As at March 2020, the Shire had an estimated resident population of 10,921. Figure 10 compares the demographic composition of the Shire with that of Western Australia, which indicates that the Shire has a greater proportion of males aged 25 to 59 years than the State. This is characteristic of the Pilbara region, due to the large resource economy. At the 2016 Census the Shire's population comprised of 66.64% males and 33.32% females with a median age of 34. Children aged 0-14 years made up 15.20% of the population and people over 65 years and over made up 2.10% of the population.

These low percentages resulted in a dependency ratio of 21.05% for the Shire, which was much lower than Western Australia's dependency ratio of 49.60%. Aboriginal and/or Torres Strait Islander people made up 19.60% of the Shire's population.

Figure 6: Age and Sex Pyramid for the Shire and Western Australia (source: ABS Census 2016)

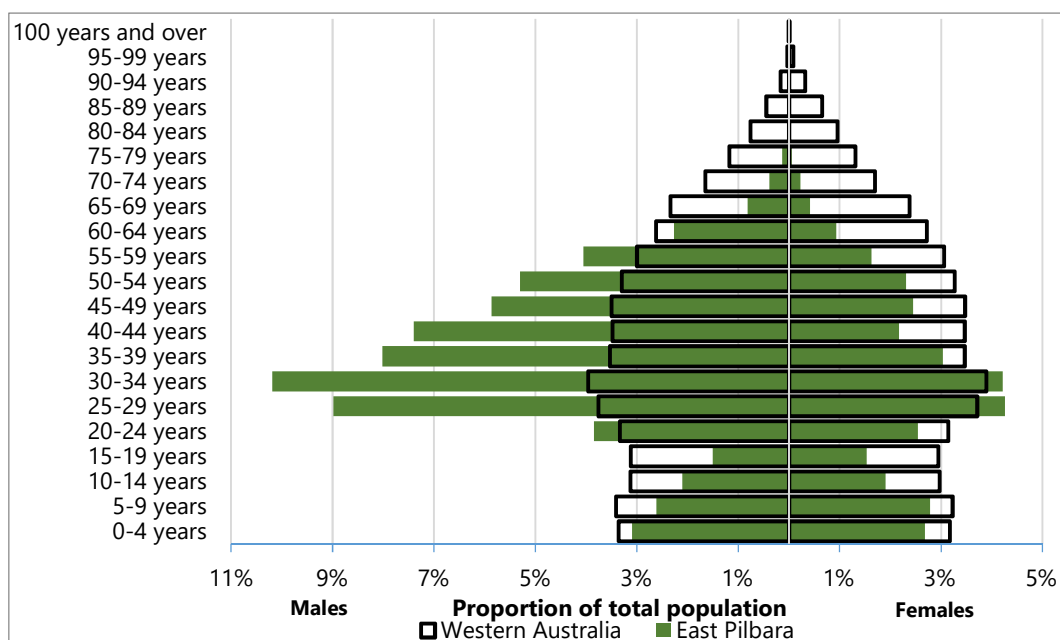


Table 2: 2016 Census Settlement Area Population (place of usual residence) (Source: abs Census 2016)

	Newman	Marble Bar	Nullagine	Jigalong	Kiwirrkurra
People	4,567	174	194	333	165
Average people per household	2.8	2.4	2.8	4.5	5
Families	950	37	28	73	41
Occupied Dwelling	1,230 (56.60%)	57 (55.3%)	36 (100%)	60 (70.90%)	30 (100%)
Unoccupied Dwelling	942 (43.40%)	46 (44.7%)	0	17 (22.10%)	0

It is important to note that there is typically a much larger population present in the Shire than is usually resident. On Census night in 2016, 17,933 people were counted in the Shire. This is much higher than the resident population (place of usual residence) of 10,597. As evident from Table 2, above, the majority of people with usual residence in the Shire are located within the town of Newman, representing 43% of the Shire’s population. The remainder of the Shire’s resident population is accommodated across the settlements of Jigalong (3%), Kiwirrkurra (1%), Nullagine (2%) and Marble Bar (2%). The Shire has a rural balance of 49%. The families with usual residence in the Shire comprised of 53.90% couple families with children, 31.80% couple families without children and 13% one parent families.

3.3.1. Population Growth

The population data discussed in this section refers to the Australian Bureau of Statistics (ABS) estimated resident population (ERP). The ERP is the official measure of the population of Australia, based on place of usual residence. Figure 11 shows the ERP annual growth rates for the Shire, the Pilbara region and Western Australia. It shows that from 2006 to 2013, the Shire and the Pilbara region recorded considerably high rates of population growth. After 2013, however, rates of population growth dropped significantly to negative levels, which can be attributed to the decline of the minerals and energy sector. Since 2017, there has been an improvement in the growth rate.

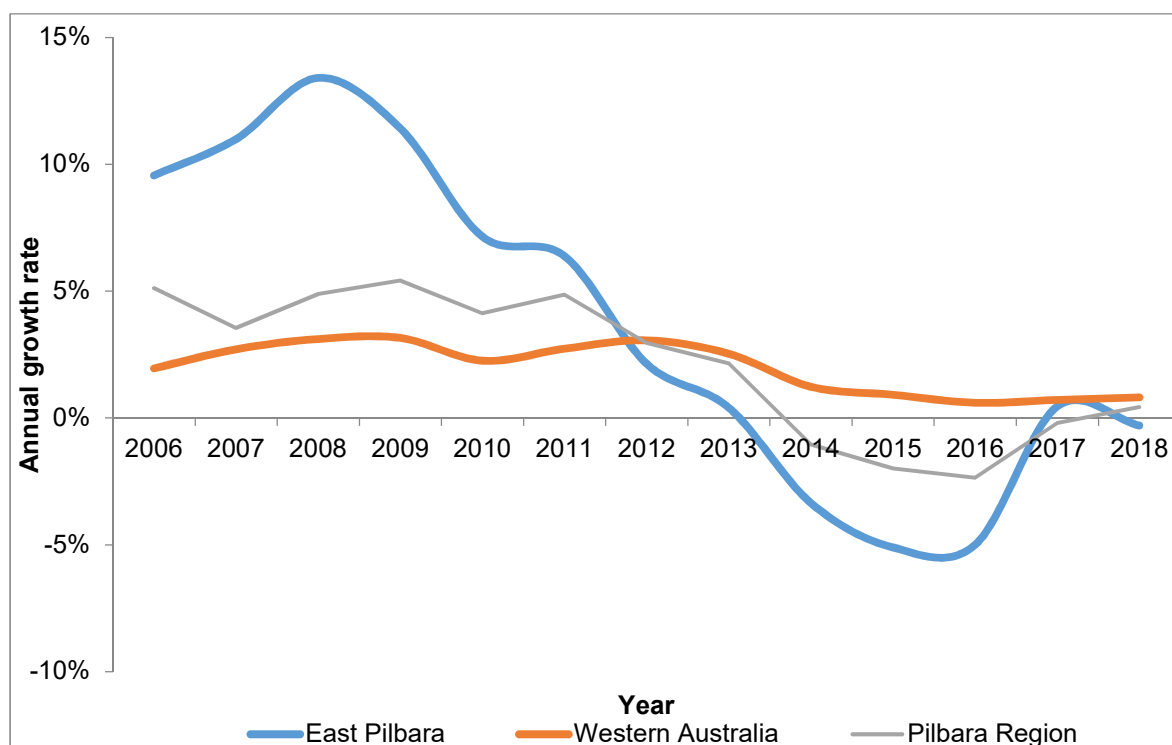


Figure 7: Estimated residential population growth (source: ABS (2018) Regional Population Growth, Australia, 2016-17. Catalogue No. 3218.0)

3.3.2. Future population growth and economic development

The Pilbara Industry's Community Council (PICC) employment and population projections anticipate the Newman residential population to increase to 8,290 by 2020. This target is shared by the Pilbara Planning and Infrastructure Framework and the Pilbara Cities Newman Revitalisation Plan, which has set the aspirational target of 15,000 by 2035 in order to shift Newman from a rural Town Centre to a sub-regional centre.

The ambitious growth target responds to the Pilbara Cities vision of State Government to modernise and grow Pilbara towns to support regional development. It also responds to the Shire's vision document Newman Tomorrow, which envisages a more significant town acting as a service hub for resource activity in East Pilbara.

Highlighted within PICC's Pilbara Population and Employment Projections to 2020 growth in the local population can be considered to have three components:

- New residential employees based in Newman;
- Families of new residential employees; and
- Indirect employment generated by economic growth -and growth in residential and FIFO employment in the local area.

Population forecasting undertaken for the Shire has indicated that the existing growth forecasts for the Shire, supported by the PICC and Pilbara Cities Newman Revitalisation Plan, were considered to be 'aspirational' and may not be reflective of the actual growth anticipated (Hames Sharley, 2014). As a result, applying a more conservative population growth scenario was developed to provide a spectrum of growth scenarios. This includes:

- A high scenario capturing the aspirational growth forecast previously developed for the Shire;
- A low forecast that reflects forecasts projected by WA Tomorrow; and
- A medium level forecast that applies a complex set of assumptions to allow a more considered output that is reflective of the actual economic and population fluctuations occurring in the Shire.

Figure 12 outlines the population as at 2016 and provides the population forecasts for 2035. It is the intent that the revised population forecasts will ultimately assist in planning for the provision of community facilities and services, housing demand, and infrastructure upgrades. Specifically, they will provide the ability to plan, program and budget infrastructure upgrades based on more appropriate population projections.

The strategic planning for the Shire is intended to be based on the medium scenario outlined in Figure 12. The reason being that it provides a balance between low trend based forecasts and high aspirational targets. The medium scenario is considered fit for purpose for the long term strategic planning of the Shire.

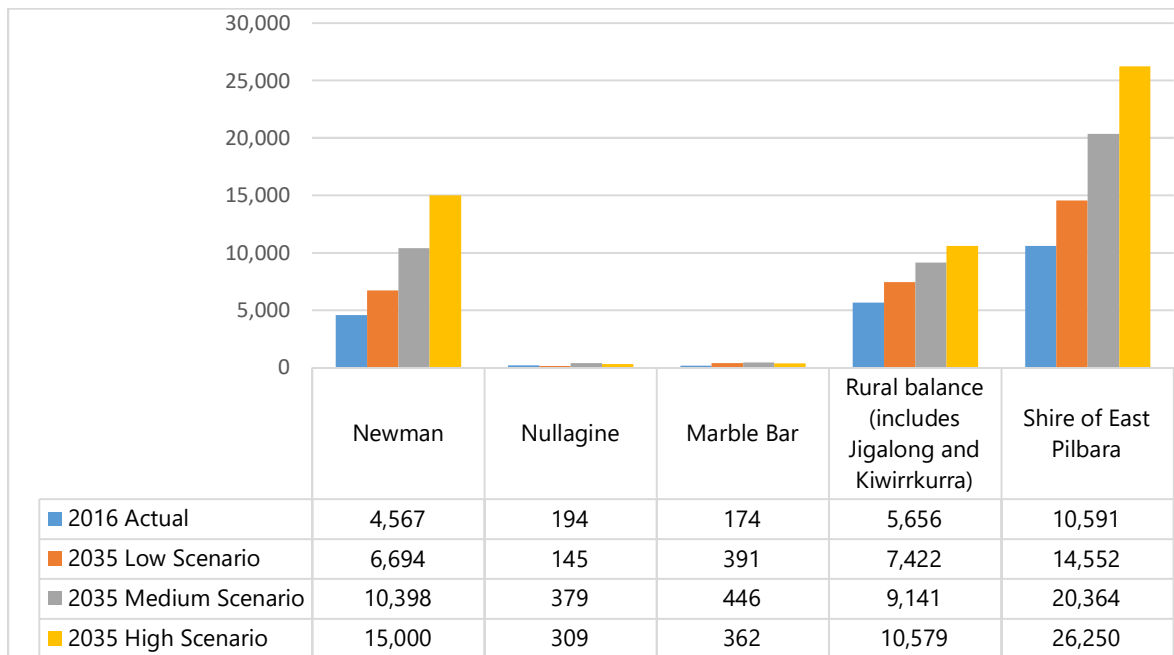


Figure 8: Settlement Area Population Forecasts

3.4. Housing

3.4.1. Housing Supply

Housing supply in the region caters for two prominent markets – FIFO workers and residential housing. These markets are guided by discrete drivers:

- FIFO housing supply is driven by mining and resources activity and may fluctuate with the level of activity occurring; and
- Residential housing supply is more stable, catering for longer term housing demands.

However, whilst these markets are different, housing supply in the area is interrelated as higher housing demands affect housing affordability and access. An increased supply of residential land in the region’s hotspots in recent years, including Newman, indicates that there has been an increase in housing demand. However, housing supply was determined to remain subpar during this period. Higher demands are due predominantly to increased FIFO activity and resultant population growth from a resource driven economy. As a result, Newman experienced rapid population growth between 2003-2007, due to the mining sector, where the town’s population grew roughly three times the rate of Western Australian as a whole (WAPC, Regional Hotspots Land Supply Update). During this time land availability was severely constrained which resulted in a housing and accommodation shortage. Since the end of the resources boom, demand for residential land has moderated. The current supply is considered adequate to meet projected demand for the short to medium term.

The Newman Regional Hotspots Land Supply Update (WAPC, 2015) reported on the stocks of land available for residential development in Newman. The study indicated that, at 2015, there was sufficient Crown land available to meet current demand housing demand for a projected population of 15,000 people. The same study indicates that many of the sites are constrained and ongoing work will be required to ensure a consistent flow of residential lots and dwellings to market during periods of high demand so as not to impede further growth. In addition to the lots created, as indicated in the below Table: Lots Created on Land Zoned for Residential and Industrial Purpose (DPLH) there are currently some additional 665 proposed residential lots with subdivision approval in Newman.

*Table 3: Lots Created on Land zoned for Residential and Industrial Purpose (For period Jan 2015-March 2019)
(Source: DPLH, Data Analytics 2019)*

Town	Zone LPS No.4	2015	2016	2017	2018	2019 (to March)	Total
Marble Bar	Residential					2	2
Newman	Residential	244	3	4			248
	Industrial	1	1		3		5
Nullagine	Nullagine Townsite	1				3	4

As Newman is a sub-regional centre, one of the Shire’s priorities is to ensure that there is an adequate supply of housing in the town. BHP owns the majority of Newman’s houses, with approximately 1,000 dwellings owned by BHP in 2012 (Development WA, 2012). However, normalisation within Newman is increasing the rate of private home ownership (Development WA 2012). Furthermore, approximately 200 dwellings are owned by various government organisations and 400 are privately owned (Development WA 2012).

As the mining sector appears to have settled into a post construction – operational phase demand for housing has reduced and supply appears stable. This can be demonstrated by the property market, which saw an eight-fold increase in the number of residential properties advertised for rent in 2014 (WAPC, Regional Hotspots Land Supply Update). Further, Landgate data suggests that in 2017-18 there were 76 established house sales compared to only two vacant lot sales for a similar period.

Additionally, there is a large percentage of unoccupied houses, particularly in Newman. This trend is likely to be due to the mining sector providing on site FIFO accommodation camp uses as an alternative to the workforce residing in the town. In 2016 there were a total of 2,618 dwellings with 60% occupied and 40% unoccupied compared to the State unoccupied dwellings of 13.6%. This data indicates that in 2016 there were approximately 1,040 vacant houses across the Shire.

3.4.2. Housing type and density

Housing type within the Shire (specifically settlement areas of Newman, Marble Bar and Nullagine), is generally comprised of low density, single dwelling housing. Within Newman, a high proportion of these are modular housing units, reflective of the high FIFO population within the town.

Housing type within Newman is reflective of the original development of the town as a mining town (by the Mt. Newman Mining Company), which predominantly housed single mine workers. This original housing type is not considered to be suitable for occupants such as families, shift workers or retirees (Development WA, 2012). Further development has since occurred in Newman and the housing mix includes a greater housing choice, including detached, single or double storey dwellings, a small amount of apartments, group home units and townhouses (Development WA, 2012).

Given the low populations within both Marble bar and Nullagine, the settlement pattern has allowed for a reasonably contained urban area. However, in Newman, where populations are more significant, the low density nature of housing has created a settlement pattern that is more expansive.

The continuation of the existing low density housing, and low intensity activity does not contribute to a level of vitality and vibrancy that often characterises other regional centres. Furthermore, the prevailing low densities are encouraging continued car dependence, inefficiencies in infrastructure provision and limits the diversity of housing choices.

The Pilbara Planning and Infrastructure Framework (2012) states that the Pilbara's settlement housing density and form is anticipated to change significantly. Residential apartments, townhouses and other forms of medium and higher density living is likely to become more prevalent. This provides scope to increase housing provisions in Newman, to better meet the projected future housing needs. Opportunities for infill or redevelopment within the existing urban areas should be identified. Occupied Private Dwelling type has been shown in Table 4.

Table 4: Dwelling type

DWELLING TYPE	EAST PILBARA (S)	NEWMAN
Separate house	90.3%	92 %
Semi-detached	4%	4.8%
Unit	1.4%	1.4%
Other dwelling	2.5%	0.4%
Unoccupied private dwelling	39.7%	42.2%

Source: ABS Census quickstats 2016

Challenges for housing supply in Newman, include changing or unknown requirements for accommodating resource comp any workforces, efficient land supply and mobilising a construction workforce to construct housing once approval has been granted. In depth research into the future provision of residential land to meet Newman’s projected population growth, together with analysis of the composition of households and types of housing they might occupy should occur following the completion of this LPS. It is suggested that a Housing Needs Assessment and Housing Strategy be undertaken to comprehensively address these information gaps.

However, low growth projections for both Nullagine and Marble Bar indicates that future additional dwelling capacity in the towns is considered unnecessary.

3.5. Aboriginal Communities

Planning for Aboriginal settlements is guided by *State Planning Policy 3.2 Aboriginal Settlements*. The policy defines Aboriginal settlement as being ‘a discrete place that is not contiguous with a gazetted town, is inhabited or intended to be inhabited wholly or principally by persons of Aboriginal descent, as defined under the Aboriginal Affairs Planning Authority Act 1972, and which has no less than 5 domestic dwellings and/or is supported by essential services that are provided by one or more state agency(s)’.

The following Aboriginal Settlements, are zoned “Settlement” in the Shire Local Planning Scheme No.4:

- Jigalong
- Kiwirrkurra
- Kunawaritji
- Parnngurr (Cotton Creek)
- Punmu (Lake Dora)
- Warralong

The Department of Planning manages the Planning for Aboriginal Communities Program on behalf of the WAPC in partnership with the Department of Housing. The program provides town planning services to Aboriginal Communities in Western Australia in accordance with *SPP 3.2 – Aboriginal Settlements*.

3.5.1. Jigalong Layout Plan 2

The CLP was prepared to address the Community’s objectives, special needs and requirements which included the following upgrading proposals:

- New single residences;
- Grass oval;
- Provision for camping facilities separate from residents;

- Requirement for new sewer lines to service proposed lots; and
- Fencing of new and existing residences.

The CLP is displayed at Figure 14, it was prepared in response to an assessment of the site’s physical and environmental characteristics, re-use of existing infrastructure (where possible), population demographics and site constraints (e.g. physical and servicing).

JIGALONG	
Location	Jigalong is located approximately 165km east of Newman, occupying Koondra Location 30 and Wanman Location 10 on Land Administration Plan 314. The community can be accessed via Marble Bar Road (approximately 100km of unsealed road) and the Talawanna Track east to the Canning Stock Route.
Demographics	Layout Plan 2 identifies a resident population of 299 persons. Population grows to approximately 450 people during the wet season.
Facilities and Services	<p>Due to Jigalong’s proximity to Newman there is a reliance on the higher order community facilities located in the major centre. Jigalong has the following community facilities:</p> <ul style="list-style-type: none"> • Medical Clinic • K-Y10 school • Childcare Centre • Shop • Sport and Recreation (swimming pool, basketball courts, oval) • Multi-function police facility • Visitor accommodation (community-run facility with 5 separate rooms, communal kitchen – sleeps a maximum of 13 people).
Education	The Jigalong Remote Community School is an important focal point for residents and caters for K-Y10. It has 105 enrolled students and a total of 17 staff (11 teaching and 6 non-teaching).
Economic/Tourism	Commercial offering in Jigalong is limited to the local store, maintenance workshop, arts and craft. Cattle grazing also occurs in the area and there is tourist accommodation available.

<p>Transport</p>	<p>External</p> <p>Jigalong is accessed from Newman via Marble Bar Road and the Talawana Track.</p> <p>Internal</p> <p>The internal road network comprises of a series of bitumen sealed and curbed roads providing access to the housing and services within the community. Most of these roads are in good condition.</p> <p>Air strip</p> <p>Jigalong has an unsealed air strip that is located 1.5kms from the main settlement.</p>
<p>Essential and Municipal Services</p>	<p>Water supply</p> <p>Community owns a potable water supply and reticulation system, maintained under the Remote Area Essential Services Program (RAESP) by the respective regional service provider.</p> <p>Effluent collection and disposal</p> <p>Community owns a comprehensive effluent disposal system maintained through RAESP by the appointed regional service provider.</p> <p>Telecommunications</p> <p>Telstra infrastructure is in place.</p>

Note: All data is extracted from Jigalong Layout Plan unless otherwise stated



Jigalong Layout Plan 2 - Living Area

Amendment 15



This Layout Plan does not constitute development approval. It is the responsibility of the developer to ensure that all relevant consents, approvals, licences and clearances are in place prior to commencing physical works on the site. Organisations responsible for such matters may include land owner, local government, incorporated community council, native title representative body, native title prescribed body corporate, Aboriginal Cultural Materials Committee, Environmental Protection Authority, state and federal government departments, and other relevant regulatory authorities. Go to the [PlanWA Interactive planning map](#) to view Layout Plans with other spatial layers.

Layout Plan 2 endorsement	
Community	5 October 2005
Local Government	16 December 2005
Traditional Owners	1 May 2019
WAPC	9 May 2006
Amendment 15 endorsement	
WAPC	25 September 2019

Jigalong Layout Plan 2 Background Report
 Base information and aerial imagery supplied by the Western Australian Land Information Authority SLIP 1096-2018-1. February 2020 aerial image. Extraction date of cadastre 2/04/2020. Waterway land use based on the 1 in 10 AEP flood level, Jigalong Flood Hazard Assessment Report April 2014. Construction and developer proponents to refer to report for site specific FFLs. Drinking Water Source Protection Plan November 2010 commissioned by the Department of Communities (Housing). Settlement layout lots are not derived from calculated dimensions. Map document: Jigalong LPZ Am15 - Living Area v2 E.mxd Produced by Land Use Planning, Department of Planning, Lands & Heritage, on behalf of the Western Australian Planning Commission. © Western Australian Planning Commission 2020

Land Use (see [Aboriginal Settlements Guidelines 1](#))

road reserve	road, essential servicedistributionnetwork
residential	house, residential quarters
visitor camping	camping ground, traditional law and culture
community	child care premises, civic use, corrective institution, educational establishment, health care centres, worshipbuilding
open space	agriculture - extensive, essential service distribution network, traditional law and culture
rural	rural pursuit, agriculture - intensive, animal husbandry - intensive, agriculture - intensive, essential service distribution network
recreation	recreation, essential servicedistribution network
pedestrian access way	essential service distribution network, pedestrian access way
drinking water source protection area	any use permitted under the Drinking Water Source Protection Plan
waterway	agriculture - extensive, agriculture - intensive, traditional law and culture
commercial	art centre, caravanpark, motel, office, service station, shop, tourismaccommodation
industrial	fuel depot, industry, motorvehicle repair, storage, vehicle wrecking
public utility	electricity supply, essential service distribution network, drinking water supply, wastewater disposal, telecommunications, rubbish disposal

Features

	watercourse
	cadastre
	lodged cadastre
	private lease
	recommended settlement zone
	settlement zone
	settlement layout (SL) lot & SL lot number
	fuel storage
	no-go area
	power station
	wastewater

3.5.2. Kiwirrkurra Layout Plan

KIWIRKURRA	
Location	Kiwirrkurra is located in the Western Desert Region approximately 820km east of Newman and approximately 600km north-west of Alice Springs and has been described as the most remote settlement in Australia. The settlement is part of the Ngaanyatjarra Lands.
Demographics	<p>The current residential population in Kiwirrkurra is estimated at approximately 150 people. A population of 210 permanent residents by 2025 has been calculated.</p> <p>The population fluctuates throughout the year and grows considerably during culture and lore and sporting events which are held at Kiwirrkurra</p> <p><i>(Source: anecdotal information obtained during Department of Planning community visit in 2014).</i></p>
Facilities and Services	<p>Kiwirrkurra has the following community facilities:</p> <ul style="list-style-type: none"> • Clinic (2 dialysis units and 2 resident nurses) • Visitor Centre (6 new rooms have been constructed, 2 self-contained sea containers) • Visitor camping grounds • Office • Community Store • Community Hall (also used as youth centre) • Workshop and Depot • Football Oval (no grass)
Education	Kiwirrkurra Community School caters for K-12 and is part of the Ngaanyatjarra Lands School which is comprised of schools throughout the Lands. Community residents advise that this school has the highest attendance rate of all schools in the Ngaanyatjarra Lands.
Economic/Tourism	Residents in the Kiwirrkurra community residents have developed ideas to capitalise on commercial and tourism opportunities. The Kiwirrkurra LP2 has been amended to ensure that land use planning is reflective of community aspirations. Opportunities for Kiwirrkurra identified include establishing a tourist camp (that can accommodate camper trailers) and cultural tours, which would be run by residents as part of the Remote Jobs in Communities Program (RJCP).

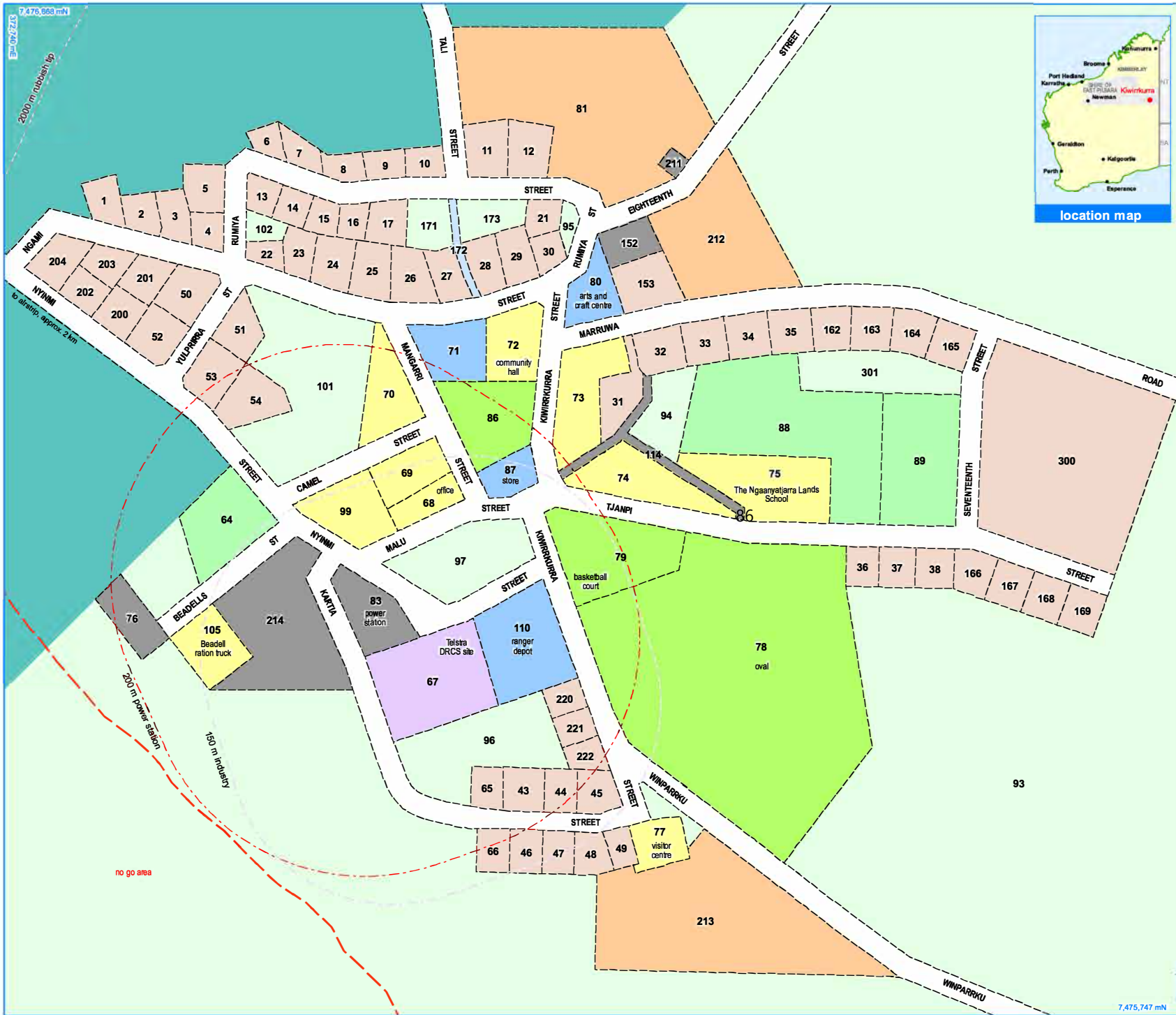
	The community also intends to develop a new community hall and undertake renovations to the existing shop.
Transport	<p>External</p> <p>Kiwirrkurra is accessed via the unsealed Gary Junction Road, which extends from Marble Bar to Alice Springs.</p> <p>Internal</p> <p>Internal roads in Kiwirrkurra are unsealed.</p> <p>Air strip</p> <p>Kiwirrkurra has an unsealed air strip that is located approximately 1.5kms north-west of the main settlement area.</p>
Essential and Municipal Services	<p>Water supply</p> <p>Water supply is not adequate to provide irrigation supplies. Kiwirrkurra has its own ground water basin. In the summer months the water supply has to be 'made'- treated using chlorine, etc. This is tested monthly and there has been no illness associated with the water supply.</p> <p>Power supply</p> <p>Power station was upgraded when the clinic was built in 2013.</p> <p>Wastewater disposal</p> <p>On-site treatment and disposal should be maintained as the wastewater system of choice. Septic tanks need upgrading.</p>

Note: All data is extracted from Kiwirrkurra Layout Plan unless otherwise stated

The Kiwirrkurra LP was prepared to address the Community's objectives, special needs and requirements which included:

- Establishment of a new clinic to replace the ageing existing facility;
- Establishment of a central landscaped sitting area in the heart of the Community to provide a sense of place and a focus for social gatherings;
- Provision of new housing lots both within and outside the flood prone area to ensure cohesive family groupings and the recognition that houses on stilts will be required in the flood prone area;
- Reticulation of the oval combined with a peripheral barrier to control vehicular access;
- Reestablishment of a dedicated camp site for Indigenous visitors;
- Expansion of the Arts and Crafts Centre with possible relocation near the Community Hall; and
- Establishment of a Community swimming pool near the School and the Oval.

The LP is displayed, it provides a land use planning framework, prepared in response to the site's opportunities and constraints and community expectations.



Kiwirrkurra Layout Plan 1 - Living Area Amendment 11

Land Administration

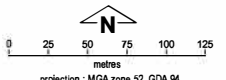
	cadastre
	lodged cadastre
	private lease
	recommended settlement zone
	settlement zone
	settlement layout (SL) lot & SL-number

Exclusion Boundary (see [Aboriginal Settlements Guideline 3](#))

	industry
	no-go area
	power station
	utility

Land Use (see [Aboriginal Settlements Guideline 1](#))

	road reserve	road, essential service distribution network
	residential	house, residential quarters
	visitor camping	camping ground, traditional law and culture
	community	child care premises, civic use, correctional institution, educational establishment, healthcare centre, worship building
	open space	agriculture - extensive, essential service distribution network, traditional law and culture
	rural	rural pursuit, agriculture - extensive, animal husbandry - intensive, agriculture - intensive, essential service distribution network
	recreation	recreation, essential service distribution network
	pedestrian access way	essential service distribution network, pedestrian access way
	drinking water source protection area	any use permitted under the Drinking Water Source Protection Plan
	waterway	agriculture - extensive, agriculture - intensive, traditional law and culture
	commercial	art centre, caravan park, motel, office, service station, shop, tourism accommodation
	industrial	fuel depot, industry, motor vehicle repair, storage, vehicle wrecking
	public utility	electricity supply, essential service distribution network, drinking water supply, wastewater disposal, telecommunications, rubbish disposal



This Layout Plan does not constitute development approval. It is the responsibility of the developer to ensure that all relevant consents, approvals, licences and clearances are in place prior to commencing physical works on site. Organisations responsible for such matters may include land owner, local government, incorporated community council, native title representative body, native title prescribed body corporate, Aboriginal Cultural Materials Committee, Environmental Protection Authority state and federal government departments, and other relevant regulatory authorities. Go to the [PlanWA Interactive planning map](#) to view Layout Plans with other spatial layers.

Base information and aerial imagery supplied by the Western Australian Land Information Authority SLIP 1096-2018-1. Cadastre date 2007/2020. May 2019 aerial image. Drinking water source protection area derived from the Kiwirrkurra Drinking Water Source Protection Plan November 2010, commissioned by the Dept. of Communities (Housing). Settlement layouts are not derived from calculated dimensions.

Map document: Kiwirrkurra L1 Amd11 - Living Area E.mxd
Produced by Land Use Planning, Department of Planning, Lands & Heritage on behalf of the Western Australian Planning Commission.
© Western Australian Planning Commission 2020



Kiwirrkurra Layout Plan 1 Background Report

Layout Plan 1 endorsement	
Community	20 February 2004
Local Government	14 April 2004
Traditional Owners	27 September 2016
WAPC	29 June 2004
Amendment 11 endorsement	
WAPC	20 July 2020

3.5.3. Kunawarritji Layout Plan

KUNAWARRITJI	
Location	Kunawarritji is located approximately 500kms north-east of Newman, at Well 33 on the Canning Stock Route.
Demographics	Kunawarritji has an estimated residential population of approximately 75 people. The population increases considerably during culture and lore events.
Facilities and Services	<p>The following community facilities are located in Kunawarritji:</p> <ul style="list-style-type: none"> • Health clinic (with resident nurse) • Visitor camp in • Football oval • Visitors centre • Community vegetable garden- ‘garden in a box’, workshop • Recreation centre • HACC facility • Office • Arts and craft centre • Community store
Education	Primary school capable of catering up to 60 students.
Economic/Tourism	<p>Approximately 900 tourist vehicles travel through the settlement per year and often purchase fuel and items from the community store, as Kunawarritji is located at Well 33 on the Canning Stock Route. Tourist accommodation is available at Kunawarritji.</p> <p>The ‘Outback Spirit’ tourism comp any commenced tours through Kunawarritji in 2014. The local community also has aspirations to start growing sandalwood to make a profitable business venture.</p>

<p>Transport</p>	<p>External</p> <p>Kunawarritji is accessed via Kiwirkurra Road (unsealed) which provides a link to the Canning Stock Route, it is located at Well 33.</p> <p>Internal roads</p> <p>Roads within Kunawarritji are unsealed.</p> <p>Airstrip</p> <p>An unsealed airstrip is located 12km east of Kunawarritji.</p>	
	<p>Essential and Municipal Services</p>	<p>Wastewater</p> <p>No septic ponds (have to take via sewerage container to Hedland).</p> <p>Water supply</p> <p>Two operating bores provide water to the community. A disinfection system treats the water prior to entering the reticulation system. Underground reticulation supplies water to the community.</p> <p>Waste disposal</p> <p>In 2014, community was considered getting a hydraulic dump trailer for collecting individual houses rubbish. Rubbish tip is located to the south-west of the settlement and has been fenced. The tip has been located so that when the rubbish tip is full there is space immediately surrounding the tip to create another 4-5 tips of similar size.</p> <p>Power supply</p> <p>Power station has 250w diesel generators (rated second in the state).</p>

Note: All data is extracted from Kunawarritji Layout Plan unless otherwise stated

The LP was prepared to address the Community's objectives, special needs and requirements which included:

- Establishment of a new development area mainly for residential purposes east of the existing settlement;
- No development west of the power station now or in the future in order to protect the integrity of existing Lore area;
- Consolidation of a central landscaped area in the heart of the Community east of the office and north of the new clinic;
- Development of a reticulated open space in close proximity to the school;
- Provision of new housing lots in the same format as the existing layout;
- Establishment of a horticulture area near the settlement's southern and main entry;
- Establishment of a dedicated camp site for Indigenous visitors near the oval with ablution facilities in close proximity to the school;
- Expansion of the Arts and Crafts Centre with relocation in the old store building;
- Establishment of a Community swimming pool near the recreation centre;
- Creation of a protected bushland area with small dedicated but unserviced camp sites for visiting tourists;

The LP is displayed at Figure 16, it was prepared in response to the site's opportunities and constraints including environmental considerations, infrastructure and servicing requirements and community expectations.

7,530,254 mN

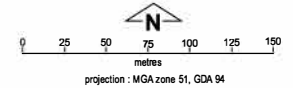


location map



Kunawarritji Layout Plan 1 - Living Area Amendment 9

- Features**
- production bore
- Land Administration**
- cadastre
 - lodged cadastre
 - private lease
 - recommended settlement zone
 - settlement zone
 - settlement layout (SL) lot & SL lot number
- Exclusion Boundary** (see SPP 3.2 Aboriginal Settlements Guideline)
- drinking water source wellhead protection zone
 - industry
 - no-go area
 - power station
- Land Use** (see SPP 3.2 Aboriginal Settlements Guideline)
- | | |
|---------------------------------------|--|
| road reserve | road, essential service distribution network |
| residential | house, residential quarters |
| visitor camping | camping ground, traditional law and culture |
| community | child care premises, civic use, corrective institution, educational establishment, health care centre, workshop |
| open space | agriculture - extensive, essential service distribution network, traditional law and culture |
| rural | rural pursuit, agriculture - extensive, animal husbandry - intensive, agriculture - intensive, essential service distribution network |
| recreation | recreation, essential service distribution network |
| pedestrian access way | essential service distribution network, pedestrian access way |
| drinking water source protection area | any use permitted under the Drinking Water Source Protection Plan |
| waterway | agriculture - extensive, agriculture - intensive, traditional law and culture |
| commercial | art centre, caravan park, motel, office, service station, shop, tourism accommodation |
| industrial | fuel depot, industry, motor vehicle repair, storage, vehicle wrecking |
| public utility | electricity supply, essential service distribution network, drinking water supply, wastewater disposal, telecommunications, rubbish disposal |



This Layout Plan does not constitute development approval. It is the responsibility of the developer to ensure that all relevant consents, approvals, licences and clearances are in place prior to commencing physical works on the site. Organisations responsible for such matters may include land owner, local government, incorporated community council, native title representative body, native title prescribed body corporate, Aboriginal Cultural Materials Committee, Environmental Protection Authority state and federal government departments, and other relevant regulatory authorities. Go to the [PlanWA interactive planning map](#) to view Layout Plans with other spatial layers.

Base information and aerial imagery supplied by the Western Australian Land Information Authority SLIP 1180-2020-1. Cadastre date 11/12/2020. March 2018 aerial image. Drinking water source protection areas derived from the Kunawarritji Drinking Water Source Protection Plan May 2019, commissioned by the Dept of Planning, Lands & Heritage. Settlement layouts are not derived from calculated dimensions. Positional accuracy of aerial imagery is ± 2 metres. Map document : Kunawarritji LPI Amd9 - Living Area Emd Produced by Land Use Planning, Department of Planning, Lands & Heritage on behalf of the Western Australian Planning Commission. © Western Australian Planning Commission 2020



Kunawarritji Layout Plan 1 Background Report

Layout Plan 1 endorsement	
Community	19 March 2004
Local Government	18 May 2004
Traditional Owners	-
Amendment 9 endorsement	
WAPC	4 May 2004
WAPC	9 December 2020

7,529,387 mN

3.5.4. Parnngurr (Cotton Creek) Layout Plan

PARNNGURR	
Location	Parnngurr (Cotton Creek) is located approximately 300kms north-east of Newman in the Karlamilyi (Rudall River) National Park and 280kms west of Jigalong.
Demographics	<i>Parnngurr LP identifies a resident population of 140 people. Population can increase to 500 people during lore time and sporting carnivals.</i>
Facilities and Services	<p>Parnngurr has the following community facilities:</p> <ul style="list-style-type: none"> • Office / community hall • Community store • Health clinic (with resident nurse) • Primary school • Football oval and softball pitch (both no grass) and basketball court • Workshop / fuel depot • Visitor shelters and a camping area
Education	Small primary school capable of catering up to 20 students.
Economic/Tourism	Traditional hunting, foraging and medicine practices, art and craftwork (primarily through Martumili Artworks), tourism associated with the Rudall River (Karlamilyi) National Park and the Canning Stock Route, mining (with a number of mines located further east in the Pilbara). The community store, health clinic and school provide limited employment opportunities.
Transport	<p>External</p> <p>Parnngurr is accessed from Jigalong (via the Talawana Track) and Newman (via unsealed roads). The main access road to Jigalong from Newman is regularly maintained, however, the access road from Jigalong to the settlement is not. Access to Parnngurr is constrained, as major roads are not all weather. Talawana Track is regularly closed during the wet season, supplies are often transported to the settlement via plane.</p> <p>Internal</p> <p>Roads within Parnngurr are not sealed. No constructed storm drains exist. Although some water pooling occurs after heavy rains, due to the sandy terrain there is little runoff and high infiltration rates.</p> <p>Airstrip</p>

	<p>All weather air strip located 500m west of the settlement. Runway is 1.2kms long and has a gravel surface with good grade and drainage. The strip has portable battery operated lighting. The Royal Flying Doctor Service regularly uses the airstrip.</p>
<p>Essential and Municipal Services</p>	<p>Regional service provider is Pilbara Meta Maya. Capital works are undertaken through the RAESP Program.</p>
	<p>Wastewater</p> <p>Settlement is serviced by a deep sewerage system that is gravity fed to a sewer transfer pump station. The plant consists of a system of oxidisation and evaporation ponds.</p>
	<p>Water supply</p> <p>Water supply system consists of two bores equipped with electric submersible pumps which pumped into an elevated tank. Most of the water supply network has been designed and installed by the Water Corporation and is in accordance with their standards.</p>
	<p>Power supply</p> <p>Power station is located approx. 250m north-west of the northern boundary of the settlement. Power is supplied by 2 diesel generators.</p>
	<p>Waste disposal</p> <p>Rubbish tip is located within an unfenced area approx. 1.4kms north-west of the settlement.</p> <p>The rubbish is dumped in 2m deep pits that are periodically backfilled.</p>

Note: All data is extracted from Parrngurr Layout Plan unless otherwise stated.

The LP was prepared to provide guidance on future planning and growth. The plan includes the following land use types:

- Residential (existing and future);
- Community purposes;
- Cultural purposes;
- Industrial / Public Utility; and
- Open Space (recreation and bush).

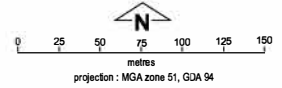
The plan was prepared with the objective of ensuring that there is sufficient land for these uses and separation of non-compatible uses. It also provides land use objectives and guidelines to assist in the consideration of future development of the land.

The LP is displayed at Figure 17, it was prepared based on an assessment of the site's physical environmental characteristics, re-use of existing infrastructure, population demographics and constraints (physical and servicing



Parnngurr Layout Plan 2 - Living Area Amendment 6

- Features**
- production bore
- Land Administration**
- settlement layout (SL) lot & SL-totnumber
- Exclusion Boundary (see Aboriginal Settlements Guideline 3)**
- chlorine gas storage
 - drinking water source wellhead protection zone
 - fuel storage
 - industry
 - no-go area
 - power station
 - utility
 - wastewater
- Land Use (see Aboriginal Settlements Guideline 1)**
- | | |
|---------------------------------------|--|
| road reserve | road, essential servicedistributionnetwork |
| residential | house, residential quarters |
| visitorcamping | campingground, traditional lawandculture |
| community | child care premises, civic use, corrective institution, educational establishment, health carecentre, workshop building |
| openspace | agriculture - extensive, essentialservice distribution network, traditional lawandculture |
| rural | rural pursuit, agriculture - extensive, animal husbandry - intensive, agriculture - intensive, essential servicedistributionnetwork |
| recreation | recreation, essential servicedistributionnetwork |
| pedestrian access way | essential service distributionnetwork, pedestrianaccess way |
| drinking water source protection zone | any use permitted under the Drinking Water Source Protection Plan |
| waterway | agriculture - extensive, agriculture - intensive, traditional lawand culture |
| commercial | artcentre, caravanpark, motel, office, servicestation, shop, tourismaccommodation |
| industrial | fuel depot, industry, motorvehiclerepair, storage, vehicle wrecking |
| public utility | electricity supply, essential service distribution network, drinking water supply, wastewater disposal, telecommunications, rubbish disposal |



This Layout Plan does not constitute development approval. It is the responsibility of the developer to ensure that all relevant consents, approvals, licences and clearances are in place prior to commencing physical works on the site. Organisations responsible for such matters may include landowner, local government, incorporated community council, native title representative body, native title prescribed body corporate, Aboriginal Cultural Materials Committee, Environmental Protection Authority, state and federal government departments, and other relevant regulatory authorities. Go to the [Parnngurr Interactive Planning Map](#) to view Layout Plans with other spatial layers.

Base information and aerial imagery supplied by the Western Australian Land Information Authority SLIP 1096-2018-1. Cadastre date 4/ 10/2019, March 2018 aerial image. Drinking water source protection area derived from the Parnngurr Drinking Water Source Protection Plan May 2019, commissioned by the Dept. of Planning, Lands and Heritage. Settlement layout lots are not derived from cadastral dimensions.

Map document : Parnngurr LP2 Amd6 - Living Area.mxd
Produced by Land Use Planning, Department of Planning, Lands & Heritage on behalf of the Western Australian Planning Commission.
© Western Australian Planning Commission 2019



Parnngurr Layout Plan 2 Background Report

Layout Plan 2 endorsement	
Community	18 April 2007
Local Government	30 March 2007
Traditional Owners	-
WAPC	4 December 2007
Amendment 6 endorsement	
WAPC	17 September 2019

3.5.5. Punmu (Lake Dora) Layout Plan

Punmu I	
Location	Punmu is located approximately 380kms north-east of Newman and approximately 360kms south-east of Marble Bar in the Karlamilyi (Rudall River) National Park.
Demographics	Punmu LP identifies a resident population of 83 people. Population can increase to 300-500 people during lore time and sporting carnivals.
Facilities and Services	<p>Punmu has the following community facilities:</p> <ul style="list-style-type: none"> • Community store • Health clinic (with resident nurse) • Arts and crafts centres • Sport and Recreation (Football oval, softball oval, basketball courts) • School • Workshop • Fuel depot
Education	Rawa Community School is located in Punmu and is part of the Aboriginal Independent Community Schools group.
Economic/Tourism	Community store, health clinic and school provide limited employment opportunities for residents. CDEP employment and training is provided in truck driving, earth moving equipment, welding and building works in association with the mining companies in the region. A number of community residents get employment at mines in the Pilbara. The community has established a relationship with the nearby Telfer mine which employs community residents and has assisted with development works at the settlement.
Transport	<p>External</p> <p>Punmu is accessed via the Telfer Mine Road and the Ripon Hills Road. Direct road access is available to Newman on an unsealed road 300kms to the south. Access to Punmu is constrained as major roads are not suitable in all weather conditions.</p> <p>Internal roads</p> <p>The roads within the settlement are not sealed. Some water pooling occurs after heavy rains.</p> <p>Airstrip</p> <p>An all-weather airstrip is located 4.5kms east of the settlement. The runway is 1.2kms long and has a gravel surface with good grade and drainage. Portable</p>

	lights are used if required. The Royal Flying Doctor Service regularly uses the airstrip.
Essential and Municipal Services	Wastewater Served by a deep sewerage system which is gravity fed to a sewer transfer pump station, located on the northern edge of the community. WWTP consists of a system of oxidisation and evaporation ponds.
	Water supply Water supply system consists of two bores equipped with electric submersible pumps which pumps directly into a 25KL elevated tank. Water supply has been designed and installed by the Water Corporation and is in accordance with current Water Corporation standards.
	Power supply Power is supplied by 3 diesel generator sets. Maintenance is undertaken by Pilbara Meta Maya.
	Waste disposal Rubbish tip is located within an unfenced area approx. 500m north-west of settlement.

Note: All data is extracted from Punmu Layout Plan unless otherwise stated.

The LP was prepared to provide guidance on future planning and growth. The plan includes the following proposed improvements:

- Existing office expansion.
- Discussions with the Shire regarding funding for an arts centre building. It is proposed that the centre would be incorporated as part of the extensions to the office.
- It is proposed that the store would be replaced, when funds become available, with a new building opposite the office. When the store is relocated the existing building is to be used as a utility centre for community activities.
- Establish and reticulate grass at the oval.
- Workshop repairs after fire damage.
- Resurface basketball courts and provide lighting.
- Landscaping works.
- A site for future housing at the southeast edge of the Community has been identified.
- Improvements to the airstrip including the widening of the airstrip, permanent lighting, a storage shed for fuel and other equipment and drainage improvements.
- Department of Housing to construct 3 new houses in the 2008/08 financial year.
- Improvements required to the Community store. The building requires upgrading and enlarging.

The LP was prepared with the objective of ensuring that there is sufficient land for the proposed land uses and separation of non-compatible uses. It provides land use objectives and guidelines to assist in the consideration of future development of the land, with regard to the following land uses:

- Residential (existing and future);

- Community purposes;
- Cultural purposes;
- Industrial / Public Utility; and
- Open Space (recreation and bush).

The CLP was prepared based on an assessment of the site's physical environmental characteristics, re-use of existing infrastructure, population demographics and constraints (physical and servicing).

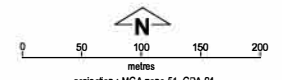


Punmu Layout Plan 2 - Living Area Amendment 4

- Features**
- bore
- Land Administration**
- cadastre
 - lodgedcadastre
 - privateland
 - recommended settlement zone
 - settlement zone
 - settlement layout (SL) lot & SL-lot number
- Exclusion Boundary** (see [Aboriginal Settlements Guideline 3](#))
- drinking water source wellhead protection zone
 - industry
 - no-go area
 - power station
 - wastewater

Land Use (see [Aboriginal Settlements Guideline 1](#))

road reserve	road, essential service distribution network
residential	house, residential quarters
visitor camping	camping ground, traditional law and culture
community	child care premises, civic use, correctional institution, educational establishment, health care centre, worship building
open space	agriculture - extensive, essential service distribution network, traditional law and culture
rural	rural pursuit, agriculture - extensive, animal husbandry - intensive, agriculture - intensive, essential service distribution network
recreation	recreation, essential service distribution network
pedestrian access way	essential service distribution network, pedestrian access way
drinking water source protection area	any use permitted under the Drinking Water Source Protection Plan
waterway	agriculture - extensive, agriculture - intensive, traditional law and culture
commercial	art centre, caravan park, motel, office, service station, shop, tourism accommodation
industrial	fuel depot, industry, motor vehicle repair, storage, vehicle wrecking
public utility	electricity supply, essential service distribution network, drinking water supply, wastewater disposal, telecommunications, rubbish disposal



This Layout Plan does not constitute development approval. It is the responsibility of the developer to ensure that all relevant consents, approvals, licences and clearances are in place prior to commencing physical works on the site.

Organisations responsible for such matters may include landowner, local government, incorporated community council, native title representative body, native title prescribed body corporate, Aboriginal Cultural Materials Committee, Environmental Protection Authority, state and federal government departments, and other relevant regulatory authorities. Go to the [PlanWA Interactive planning map](#) to view Layout Plans with other spatial layers.

Base information and aerial imagery supplied by the Western Australian Land Information Authority SLIP 1 056-2018-1. Cadastre date 11/10/2019. March 2018 aerial image. Drinking water source protection area derived from the Punmu Drinking Water Source Protection Plan May 2019, commissioned by the Dept. of Planning, Lands and Heritage. Settlement layouts are not derived from calculated dimensions.

Map document: Punmu LP2 Amd4 - Living Area.mxd
Produced by Land Use Planning, Department of Planning, Lands & Heritage on behalf of the Western Australian Planning Commission.
© Western Australian Planning Commission 2019

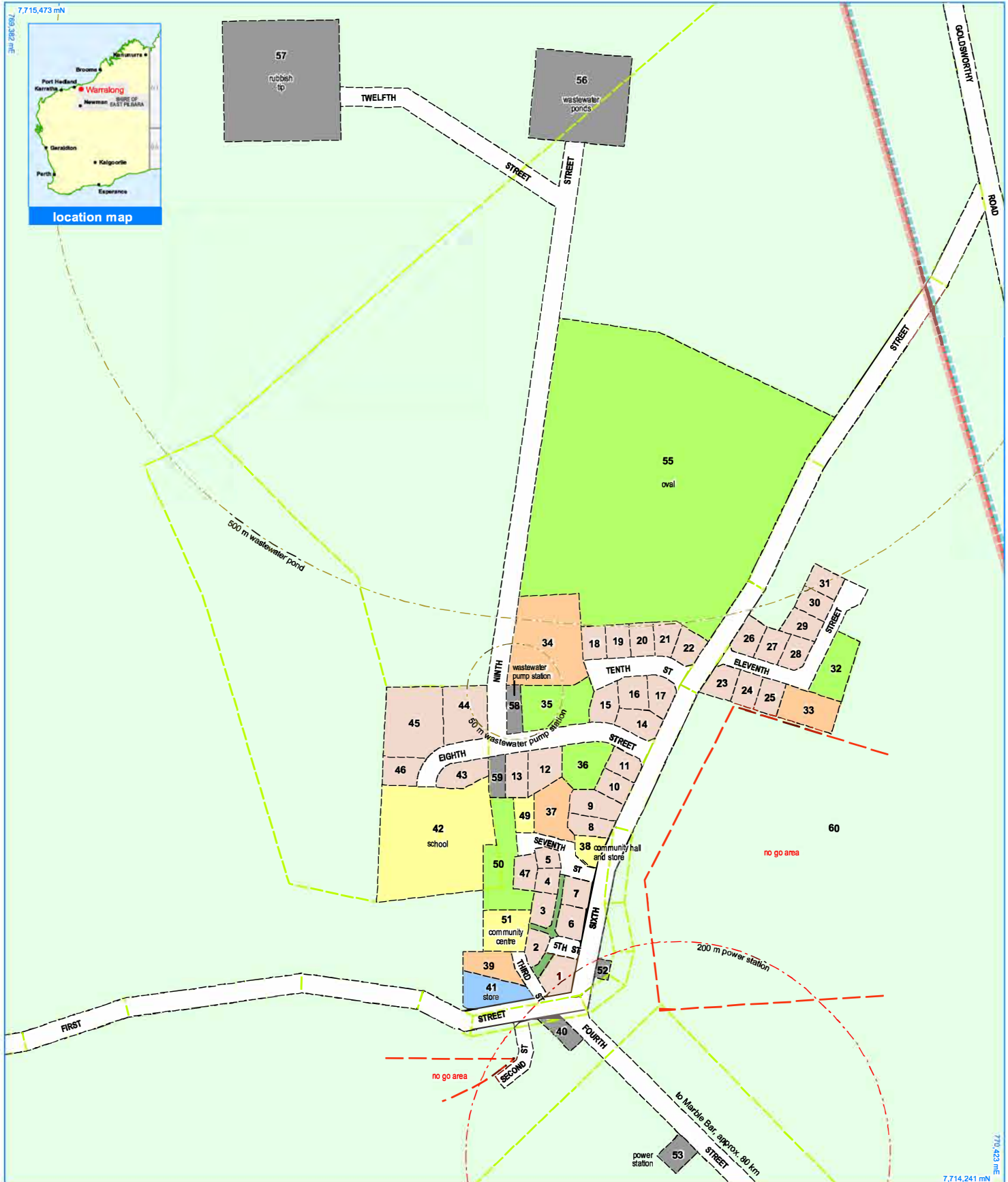
Punmu Layout Plan 2 Background Report

Layout Plan 2 endorsement	
Community	20 June 2007
Local Government	30 March 2007
Traditional Owners	-
WAPC	4 December 2007
Amendment 4 endorsement	
WAPC	17 September 2019

3.5.6. Warralong Layout Plan

Warralong	
Location	Warralong is located approximately 110 kms South east of Port Hedland and 60km north of Marble Bar.
Demographics	Warralong LP identifies a resident population of 50 people (estimated).
Facilities and Services	<p>Warralong has the following community facilities:</p> <ul style="list-style-type: none"> • Health clinic • Homestead use for activities such as Arts and crafts • Sport and Recreation (Football oval)
Education	Strelley Community School is located across three general areas with approximately 70 students.
Transport	<p><u>External</u></p> <p>Warralong is connected by road to both Marble Bar and Port Hedland.</p> <p><u>Internal roads</u></p> <p>The roads within the settlement are generally not sealed and not designed with drainage capacity. The main road is however sealed.</p>
Essential and Municipal Services	<p>Wastewater</p> <p>Serviced by an underground reticulated gravity sewerage system which is gravity fed to a sewer transfer pump station and discharged into sedimentation ponds some 500m north of the community.</p> <p>Water supply</p> <p>Water supply system consists of two bores equipped which feed into a 200kL overhead water tank to supply each dwelling with service. The supply is community owned and maintained through the Remote Area Essential Services Program (RAESP).</p> <p>Power supply</p> <p>Power is supplied 140kw power station and owned by Community (RAESP).</p> <p>Waste disposal</p> <p>Rubbish tip is located within an unfenced area approx. 500m north-west of settlement.</p>

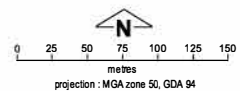
Note: All data is extracted from Warralong Layout Plan unless otherwise stated



Warralong Layout Plan 1 - Living Area Amendment 3



This Layout Plan does not constitute development approval. It is the responsibility of the developer to ensure that all relevant consents, approvals, licences and clearances are in place prior to commencing physical works on the site. Organisations responsible for such matters may include land owner, local government, incorporated community council, native title representative body, native title prescribed body corporate, Aboriginal Cultural Materials Committee, Environmental Protection Authority, state and federal government departments, and other relevant regulatory authorities. Go to the [PlanWA interactive planning map](#) to view Layout Plans with other spatial layers.



Warralong Layout Plan 1 Background Report

Base information and aerial imagery supplied by the Western Australian Land Information Authority SLIP 1098-2018-1. June 2020 aerial image. Extraction date of cadastre 11/08/2020. Settlement layout lots are not derived from calculated dimensions. Map document: Warralong LP1 Amd3 - Living Area E.mxd Produced by Land Use Planning, Department of Planning, Lands & Heritage, on behalf of the Western Australian Planning Commission. © Western Australian Planning Commission 2020

Land Use	(see Aboriginal Settlements Guideline 1)
road reserve	road, essential service distribution network
residential	house, residential quarters
visitor camping	camping ground, traditional law and culture
community	child care premises, civic use, community institution, educational establishment, health care centre, worship building
open space	agriculture - extensive, agriculture - intensive, traditional law and culture
rural	rural pursuit, agriculture - extensive, animal husbandry - intensive, agriculture - intensive, essential service distribution network
recreation	recreation, essential service distribution network
pedestrian access way	essential service distribution network, pedestrian access way
drinking water source protection area	any use permitted under the Drinking Water Source Protection Plan
waterway	agriculture - extensive, agriculture - intensive, traditional law and culture
commercial	at or near caravan park, motel, office, service station, shop, tourism accommodation
industrial	fuel depot, industry, motor vehicle repair, storage, vehicle wrecking
public utility	electricity supply, essential service distribution network, drinking water supply, wastewater disposal, telecommunications, rubbish disposal

Land Administration
cadastre
lodged cadastre
private lease
recommended settlement zone
settlement zone
settlement layout (SL) lot & SL-Jot number
63
Exclusion Boundary (see Aboriginal Settlements Guideline 3)
no-go area
power station
wastewater

Layout Plan 1 endorsement	
Community	1 March 2008
Local Government	5 May 2006
Traditional Owners	-
WAPC	31 October 2006
Amendment 3 endorsement	
WAPC	24 July 2020

4. ECONOMY AND EMPLOYMENT

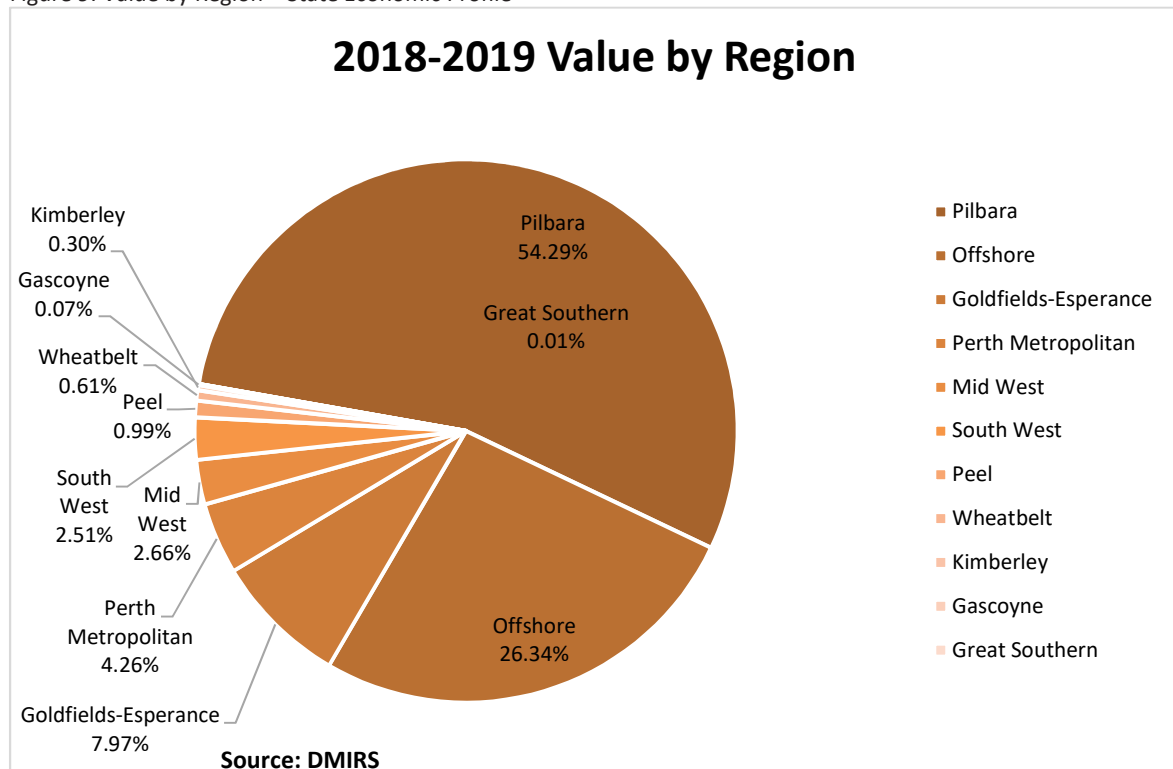
4.1. Economy

Demand for labour in the State is strongly associated with the mining resources sector. The State’s mining industry currently ranks as Western Australia’s fourth largest employer. The industry also has important flow on effects to other industries, most notably the construction and manufacturing industries, creating additional jobs throughout the economy.

WA private sector capital in mining grew by 334% between 2005 and 2009, plateauing in 2009/2010 before climbing again from 2010 to 2013. Much of the growth is attributable to the expansions in Pilbara resource project development. This is consistent with economic activity in the Shire, with more than 83% of the Shire’s \$25.8 billion economic output attributable to mining, with a further 6.5% derived from construction activity. The significant expansion of the resources sector in the latter part of the last decade saw the Shire also record strong employment growth.

The State economic profile is also reflective of the economic profile of the Shire. In 2018-19 the Pilbara Region contributed \$79 billion to the State’s \$145 billion resources sector.

Figure 9: Value by Region – State Economic Profile



Source: DMIRS 2018-19

In 2019 Mineral commodities dominated the State’s resources sector, accounting for 74 per cent, or \$107 billion, of total sales value. Iron ore was by far the most valuable commodity, accounting for 73 per cent of mineral sales and 54 per cent of overall sales. Iron ore recorded sales valued at \$78.2 billion in 2018–19, up 26 per cent on the previous year and a new record for iron ore sales values. This was largely achieved on the back of improved iron ore prices as the volume of iron ore sold actually declined from 839 million tonnes (Mt) to just less than 794 Mt. In 2019, the Shire, had an estimated gross regional

product of \$10,498 billion which reflects approximately 4.05 % of Western Australia's Gross State Product (GSP) of \$259.426 billion.

Table 5: Value of Onshore Minerals and Petroleum.

Source; Department Mines, Industry Regulation and Safety

Value of Minerals and Petroleum 2018- (Excludes offshore)	
Pilbara Total	64,888,110,766
Goldfields-Esperance Total	11,586,392,210
Peel Total	1,478,396,066
Mid West Total	3,647,667,515
Great Southern Total	8,165,113
Wheatbelt Total	1,075,443,811
Kimberley Total	380,331,253
South West Total	3,112,280,363
Gascoyne Total	85,464,067
Perth Metropolitan Total	5,916,215,039
Total WA	92,178,466,203

4.2. Employment

The primary employer in the Shire is the Iron Ore industry followed by Gold Ore, Support Services, Catering Services, Labour Supply Services and the rural sector. The nature of the FIFO industry however makes it difficult to capture, through Census data, the full employment figures from the mining industry.

The diversity of the economy is inherently important to reduce the reliance on one economic stream to sustain the Shire's economy. The key issue is the capacity for the Shire to generate alternatives to the current and historical expression of resources-based activity that will underpin sustainability into the future.

In 2016, the Census data estimated the number of people that worked in the Shire at 15,353 persons, of which 30% of them resided in the Shire and 75% of them were employed in the mining industry.

Table: 6 Industry Employment Trends 2011-2016

Industry	Jobs 2016	Jobs 2011	%change
Mining	11516	8733	31.9%
Construction	707	1185	-40.3%
Administration and Support Services	585	403	45.2%
Accommodation and Food Services	536	690	-22.3%
Other Services	326	355	-8.2%
Education and Training	257	254	1.2%
Public Administration and Safety	194	182	6.6%
Retail Trade	187	121	54.5%

Transport, Postal and Warehousing	175	190	-7.9%
Health Care and Social Assistance	157	186	15.6%
Wholesale Trade	133	127	4.7%
Manufacturing	131	235	-44.3%
Agriculture, Forestry and Fishing	128	73	75.3%
Professional, Scientific and Technical Services	101	202	-50.0%
Electricity, Gas, Water and Waste Services	99	44	125.0%
Rental, Hiring and Real Estate Services	88	97	-9.3%
Financial and Insurance Services	23	18	27.8%
Art and Recreation Services	6	48	-87.5%
Information Media and Telecommunications	4	21	-81.0%
Total	15,353	13,164	

(Source REMP LAN: www.economyprofile.com.au/eastpilbara/trends)

The above table indicates that between the last two Census's there was a substantial increase in the number of jobs in mining, administration, retail trade, infrastructure services and agriculture, forestry and fishing. This indicates that not only the mining sector is driving the economy in terms of jobs growth.

Significant declines were seen in manufacturing, construction, accommodation services, professional and technical services, art and recreation services and information and telecommunications. Anecdotally, it is thought that this trend may be attributed to the mining industry moving from construction to operational phase and the increase in mining companies providing FIFO workforce services at site as opposed to residential living arrangements.

The Shire's employment profile is dominated by mining, which in 2016, accounted for 75% of the workforce. These figures establish the dominant role that the mining industry plays within the Shire and its contribution to the Shire's economy. As a result, any volatility or fluctuation in the mining industry would result in an effect on other industries and employment in the Shire. Additionally, employment has decline in sectors such as essential services that are important for the Shires development and ongoing productivity and community-building. A focus on maintaining and reinvigorating these areas should be considered.

An aspirational population target of 15,000 for the Shire (or indeed for Newman) suggests an active resident workforce of 6,000 to 7,000. Given the current concentrated nature of the Shires economic base, this growth in jobs cannot be achieved within the current market conditions.

4.3. Retail and Commercial

Retailing activity is contained within the settlement areas of Marble Bar, Newman and to a lesser extent, Nullagine. Newman is the preeminent retail and commercial centre for the Shire. Commercial activity is predominantly centralised within Newman, as the regional centre for the Shire.

Newman has an array of retail, financial, hospitality and food and beverage facilities, including banks, post-office, caravan parks, hotel/motels, restaurants, vehicle service repair centres, medical and hospital facilities, and numerous sporting clubs. The main shopping precinct within Newman comprises the Boulevard Shopping Centre which contains a Woolworth's supermarket and space for up to 18 other retail tenancies. More recently BHP through its social investment program developed a 1930 square metre commercial retail centre including IGA and Dome café and other smaller retailers.

Due to the costs of living within Newman, it has been stated that this has an impact on the type and mix of retail within Newman. There has been a deficiency in smaller retailing enterprises that commonly provides a level of character e.g. butchers, bakeries and coffee shops. Development of a more balanced economy with diversity and choice in employment is needed.

An increase in retail and commercial floor space will be required, based on population growth trajectory. There is commitment from the Shire to develop and support commercial enterprise within the Shire, specifically within the central business area. Small business is of particular importance and consideration of supporting small business development will be undertaken by:

- Supporting retail/office space development;
- Encouragement of home-based businesses,
- Development of a small business incubator;
- Development of public/community facilities; and
- Improving information technology.

Significant development sites have also been identified for development of commercial enterprise in Newman, including land on Newman Drive (to include the redevelopment of the BHP former mess); and land adjacent to the Shire offices. Additionally, it is also proposed that investigation and development of the airport enterprise precinct be undertaken which may include appropriate commercial development.

The Town Centre Revitalisation Plan (Pilbara Cities, 2010), recommends that a particular focus of the Town Centre precinct continues to address the following:

- Primary shopping centre in Newman – the current centre is internalised and surrounded by car parking. The configuration of the development effectively turns its back on the street, drawing activity away from the public realm. As a result, the shopping centre de-activates the Town Centre, negatively affecting the areas aesthetics and eliminating opportunities for passive surveillance of adjoining public areas.
- Most buildings in the Town Centre are over 25 years old and are often stand-alone purpose built structures which fail to respond to both the climate and context of Newman and lack connections and synergies with surrounding uses.
- Commercial development within Newman is fragmented and surrounded by large expanses of carparks. This results in commercial development that lacks integration with surrounding shops and uses.
- Streetscape enhancement - the existing buildings within Newman's Town Centre have little consideration for the streetscape, and provide little opportunity for synergies between complementary activities.

In 2020 Pracys Consultants conducted an analysis on commercial floor space in Newman and determined the below gap requirements for retail floor spaces categorized by use to year 2030.

Pracys 2020-Newman Forecasted Population Floor space Gap (m2) (Recommended for Planning)

Year	Shops	Rother retail	Offices	Entertainment	Health/welfare	Other retail
2021	279	221	147	55	394	55
2026	486	386	256	95	688	95
2031	631	501	332	124	893	124

Marble Bar provides lower order retail for convenience purposes including a convenience store, traveller stop, service station and public bar (Iron Clad Hotel). Due to Marble Bar's proximity to Port Hedland, this serves as the main retail centre for Marble Bar. Retail in Nullagine is basic, offering basic convenience only.

For both Nullagine and Marble Bar, the quantum of population does not necessitate additional retailing at this stage. Should significant growth occur in either centre, this may need to be considered. However, it is also believed that this would occur organically with population growth.

Whilst high level information exists relating to the retailing and commercial industry for the Shire, there are a number of challenges for these industries that need to be explored to fully understand the potential for retailing, commercial, bulky goods office and industrial. It is suggested that a retail and commercial needs assessment be undertaken to explore the challenges and opportunities for the sector, followed by the development of a comprehensive Retail and Commercial Strategy.

4.4. Industrial Land

Newman, particularly, is a key service centre for some of the world's largest iron-ore projects. In this regard, the continual development of industrial zoned land is very important to ensure that business opportunities are continually available, assisting in economic growth and employment in the area's resource industry.

The Newman Light Industrial Area developed by Development WA in 2007 created fifty five lots for light industrial land use of which is located 1.5km from the Town Centre and in 2019 only one lot remained for sale. The site is used for a variety of businesses including building, construction, automotive and mining equipment all strongly connected to the mining industry. The Shire continues to receive enquiries for industrial land access and also is aware that there is currently a demand and shortage of land supply.

In 2014 and on behalf of Development WA (now Development WA), Urbis Planning Consultants considered three key potential industrial sites within Newman area and included:

1. Site 1 – Great Northern Highway, Ptn Lot 370 and Lot 351 near intersection of Marble Bar Road. Located 4km from the Newman Town Centre. This land, of approximately 200ha, was identified for general industry (not light industry) in the Newman Revitalisation Plan - Townsite Growth Plan (2010).
2. Site 2 – Airport, Ptn Airport Reserve located immediately north of the runway with boundaries currently not designed. This site provides good access immediately to Great Northern Highway and the Airport being some 10kms from Newman Townsite.
3. Site 3 – Light Industrial Expansion Area, Ptn Part Lot 17 Newman Drive Newman located adjacent to the Newman Townsite and existing Light Industrial Area which is at capacity. This site was later found to be constrained by future mining land use.
4. Site 4 – Portion of Lot 556 on P400578, UCL Lot 2354 on P218837, UCL Lot (with no lot or plan number) and a portion of Lot 2 on Plan 72027. Further consultation is required with DWER to investigate the Priority 1 Reserve boundary to determine whether it is appropriate to include the

proposed industrial land as Priority 3 category for Newman Water Reserve and further stakeholder engagement is required in order to progress.

Investigations revealed that there is a need to provide for general industry sites to the south and the construction of the By-pass road is critical to service the area, particularly the southern stages of the project as Newman Drive is not desirable for heavy vehicle access.

Currently, Development WA is progressing the release of Unallocated Crown Land at Lot 510 bounded by Welsh and McBride Drive. The Newman Revitalisation Plan identified light industrial land, to the south west of town to the proposed Bypass road and the Newman Expansion Project identified area to the south of the existing light industrial precinct for expansion. Whilst this land is strategically located some land to the south is restricted by gas pipeline and is currently the subject of native title matters.

Additionally, Lots 2314 (R38609) and 1638 (R38610) of approx. 9ha, located to the south of the townsite and at the eastern periphery of the Newman Industrial Area have been identified as a logical extension of the current industrial land. The Shire currently leases the land to the Newman Gun and Pistol Club.

Shire Reserve 44774 at, Koondra Location 36 (previously known as parklands next to the Airport), which comprises of approximately 156ha has previously been identified as Transport and Freight Hub for which reserve purpose was amended to such in 2013. The Shire has power to lease this land for a period not exceeding twenty one years at present. The land is directly adjacent to the Fortescue River and floodplain investigations has revealed most of the site is situated in the 1/100 year flood plain. This site is therefore not optimal for development.

The Shire considers that there may be suitable land for industrial development at the Newman Airport reserve, being Airport Reserve 44775 at Koondra Location 37. The Airport Reserve is currently some 802ha and provides ample area for both airport and other complimentary land uses. It is situated adjacent the Great Northern Highway and is strategically located for freight and logistics business. An Airport Masterplan is being prepared which will seek to identify land surplus from airport operations.

Whilst it may appear there is an abundance of potential industrial land sites, this is not the case and further site assessments and business cases are required to ensure that the supply meets the demand. It may be that land under current Reserve tenure can be developed more efficiently to meet short term market demands albeit leasehold agreements would prevail and amendments to Reserve Management Orders required. Other limiting factors include high servicing costs to remote sites and dependence on a Bypass road, in Newman, to alleviate heavy industrial traffic traversing through residential/ town areas. Further native title clearance poses time lags to deliver industrial land to market where objection or claim is identified.

In June 2016 Development WA presented town planning Scheme Amendment No.23 (SA23) to the Shire which proposed to rezone 33ha of Crown Land to an 'Industrial Development' zone to the south west of the township. Scheme Amendment 23 proposed to rezone a portion of Lot 556 on P400578, UCL lot 2354 on P218837, UCL (with no lot or plan number) from 'Rural' to 'Industrial Development' zone and rezone a portion of Lot 2 on Plan 72027 from 'Recreation' to 'Industrial Development' zone.

The subject land within Scheme Amendment 23 is developable, albeit constrained, and formal initiation of amendment 23 would facilitate development of 100 lots for general industry and transport logistics purposes. Scheme Amendment 23 is on hold subject to resolution of a number of issues including Native Title, the Department of Water and Environment Regulation's Priority 1 site classification, and obtaining support from BHP, Department of Jobs, Tourism, Science and Innovation as well as the Department of Mines, Industry Regulations and Safety.

4.5. TOURISM AND VISITORS

Beyond mining, tourism is identified, in many regional strategic documents, as a major opportunity to build and diversify the Shire’s economy. With access to numerous natural features and cultural attractors, enhancing tourism within the shire through promotion of the region’s unique character, lifestyle, culture and natural environment should be considered.

Located on the Great Northern Highway Newman, is known as the Eastern gateway to Karajini National Park and provides access to Karlamilyi National Parks and the Canning Stock Route. Cape Keraudren continues to attract visitors and provides camping and caravan park facilities on the coast. In 2017-2018, the park recorded some 5478 visitors to the site.

A breakdown of tourist expenditure for the Region is provided in Table 6.

Table 7: Tourism Visitor Expenditure, Pilbara Region 2018-Tourism WA

	DOMESTIC DAY	DOMESTIC OVERNIGHT	INTERNATIONAL
Average Stay (Nights)	-	8 Nights	30 Nights
Average Spend per Trip	\$227	\$1222	\$1510
Average Spend per Night	-	\$155	\$50

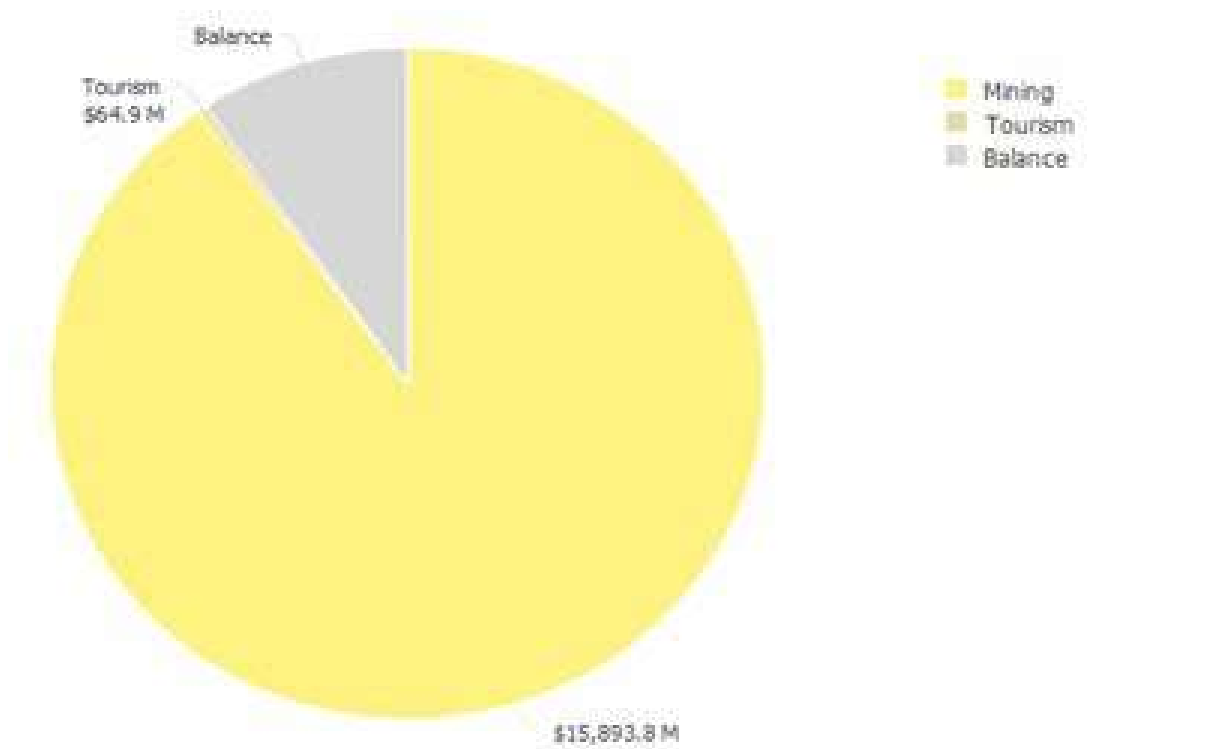


Figure 10: Tourism, The Shire, Source: REMP LAN, 2014

Tourism is considered immature in the Pilbara region and a concerted effort is required to cultivate a stronger tourist market. Currently, tourism within the Shire predominantly appeals to 4-wheel driving enthusiasts and 'grey nomad' tourists. Due to climatic reasons, the tourism season is generally throughout the winter months.

The rationale provided is that the 'mining monopoly has stifled growth' and presents an uncompetitive tourism destination. This is partly due to availability and affordability of short stay accommodation with "accommodation price pressures resulting from traditional tourist accommodation being used by FIFO workers have drastically reduced the financial viability of the tourism industry in the Pilbara." (Pilbara Regional Council, 2012)

Furthermore, some of the remote natural features of the Shire are difficult to access due to their distance, poor signage and isolation from urban areas, conditions of the park and difficulty accessing basic facilities such as fresh water, park ranger services, camping facilities or picnic areas, and neither the mine companies nor Aboriginal settlements have store of food, water or fuel for travellers.

However, as a tourism centre, there is an opportunity to diversify the tourism offering, but also the visitor demographic. In terms of attraction the Shire has identified the following opportunities including:

- Luxury end investors;
- Industrial tourism;
- Geological and geomorphological;
- Education;
- Wildlife and Flowers;
- Self-drive market and trail experiences;
- Event/sport tourism.

Kantar Public conducted Survey commissioned by Tourism WA and State Government in 2017 which identified that there was opportunities to strengthen tourism in the Pilbara by addressing gaps on offer and functional issues which could improve desirability and visitor experience. It further inferred that there is;

- Widespread desire for a greater range of accommodation choice beyond caravanning and camping and;
- There is a desire for more luxurious resort style accommodation.

Table 8: The Pilbara Overnight Visitor Summary

	YE Dec 2106/17/18 Annual Average Visitors	YE Dec 2016/17/18 %
Est. Visitors		
Intrastate	783,100	84%
Interstate	110,400	12%
International	43,400	5%
Total	936,800	100%
Est Visitor Nights		
Intrastate	5,640,800	71%
Interstate	1,502,900	19%
International	834,700	10%
Total	7,978,400	100%
Av Length of Stay (nights)		

Intrastate	7.2
Interstate	13.6
International	19.2
Total	8.5

(Source; *The Pilbara 2018 Fact Visitor Factsheet-Tourism WA – Strategy and Research May 2019*)

Of the Visitors, surveyed, and represented in the above table 82% of the domestic visitors were visiting for business with the balance generally holidaying. Of the International Visitors 20% were on business with the balance generally holidaying.

Presently, development is constrained for tourist land uses including accommodation throughout the Shire partly due to the lack of a specific tourist zone in the Scheme.

Newman

Pilbara Cities pointed to a future Newman configured as a sub-regional service hub and tourism centre. Newman provides access to a number of natural features including Weeli Wolli, Kalgans Pool and Eagle Rock Falls. The Canning Stock Route is also within close proximity to Newman, which is renowned for both its cultural and historic value.

Visitors can access Newman by air with regular domestic flights to/from Newman from Perth. Bus travel provides an alternative to air travel, with buses accessing Newman once a week from Perth (Perth to Port Hedland route).

Newman has a variety of accommodation available including caravan parks, motels and hotels. There are seven existing accommodation providers in Newman, including:

- Seasons Hotel Newman (83 rooms)
- Newman Hotel Motel
- Mia Hotel - House in the Desert (90 rooms) –currently under refurbishment
- Kalgan’s Rest (620 ensuite units, camping sites and caravan bays)
- Whaleback Village (176 ensuite units, powered sites, camp grounds and backpacker facilities. Of the 176 sites, the majority are used for semi-permanent residents associated with the mining industry)
- Dearlove’s Caravan Park Newman
- Newman Visitors Centre

To manage some of the constraints identified for tourism in Newman, the Shire indicates a desire to develop a short term caravan park on Lot 302 previously used as the laydown area/parking for BHP’s “Kurra Village”.

Strategically, the visibility of Newman as a tourist destination and its attractiveness needs to be reviewed. Without a level of desirability to a tourism market, it is unlikely that the growth in the market will occur.

Marble Bar

There is opportunity for Marble Bar to develop into a tourist and local service centre. Marble Bar is in close proximity to a number of significant landscape features (for example, Chinaman’s Pool, Coppin’s

Gap, Doolena Gorge or Carawine Gorge) as well as a number of cultural and historic landmarks (such as Comet Gold Mine and Museum and the Corunna Downs RAAF Base).

The town itself boasts of The Iron Clad Hotel, a unique and iconic outback pub, historic buildings and the Marble Bar races (annually held in July) and is an ideal location for 'grey nomads' and special interest prospecting/fossicking visitor markets (Strategic community plan).

Existing within the town currently are the following accommodation options:

- Iron Clad Hotel
- Marble Bar Holiday Park
- Marble Bar Travellers Stop

Currently, access to Marble Bar is via road transport only using Marble Bar Road. As Marble Bar Road is predominantly unsealed, this restricts visitors to those that have a sturdy vehicle and cross country caravan (if caravanning).

There are good strategic land use planning opportunities to strengthen tourist land uses in Marble Bar by amending certain zones to include that land in a tourist zone.

Nullagine

Nullagine has a rich history as a gold rush town and as the site of the first diamond discovery in Australia. Visitors are attracted to Nullagine for fossicking and its unique natural inland setting.

Due to its size, the town has very limited tourist facilities other than the Caravan Park (Shire managed); Conglomerate Hotel and the Roadhouse and General Store. Similar to Marble Bar, access is via road transport only using Marble Bar Road. As Marble Bar Road is predominantly unsealed, this restricts visitors to those that have a sturdy vehicle and cross country caravan (if caravanning). The caravan park is located within the 1 in 10 year floodplain and future consideration of infrastructure renewal or alternative site could be considered appropriate.

5. RECREATION AND OPEN SPACE

There are substantial areas of open space within the Shire. Most notably the Shire contains the Karlamilyi National Park (formally the Rudall River National Park) which is an area of National conservation significance. Smaller areas of open space and parks are located within the urban settlement areas of Newman, Marble Bar and Nullagine.

5.1. National Parks

The Shire contains the largest national park area within WA. Karlamilyi National Park is 12,837km² and the second largest national park in Australia. Additionally, Karajini National Park at 6,200km² in size is 190km's north of Newman and although not within the Shire is often accessed via the town.

Karlamilyi National Park (also known as Rundall River National Park) is located in a remote area north east of Newman on the boundary between the Great Sandy Desert and the Little Sandy Desert. The Park is mostly arid or semi-arid desert and includes the watershed of the Rudall River. The Park is accessible from Newman (via 'Walgun' and 'Billinnooka' and along the Tallawanna Track) and Marble Bar along the Ripon Hills Road and is popular for remote area tourism. There are two Aboriginal settlements within the park;

Punmu and Parnngurr. The Park is zoned 'Conservation' under the Shire's current Town Planning Scheme No. 4.

Access to Karlamilyi is difficult and the public are not encouraged to visit the park as conditions are tough, and there are no facilities by way of fresh water supplied, signage, park ranger services, camping facilities or picnic areas, and neither the mine companies nor Aboriginal settlements have store of food, water or fuel for travellers.

Also within the Shire is Cape Keraudren Coastal Reserve. The reserve comprises an area of approximately 4,800 hectares and was vested in the Shire in 1985 and is located 179kms north of Port Hedland on the Great Northern Highway. The Reserve contains camping facilities and provides various opportunities for fishing, boating and other active or passive recreational activities.

Whilst not within the Shire, Karijini national park is a significant tourist destination that can be accessed from Newman. Access to Karijini is much more accessible than Karlamilyi, with the park providing 2WD and 4WD options. From Newman the park may be reached via Karijini Drive from Great Northern Highway or Tom Price, via Marandoo Road.

In 2015 portions of pastoral lease were excluded and returned to UCL based on their environmental values and strategic locations. Those pastoral lease exclusions included portions of Anna Plains, Pardoo, Hillside, Mulga Downs, Marillana, Roy Hill and Juna DWERns. In 1999 Ex- Meentheena was purchased by the State with intentions of this land and those previously listed above as being areas added to the conservation reserve system.

5.2. Recreation

Sport and recreation opportunities are the basis of social capital building in regional Australia. Access to high quality sport and recreation facilities, particularly in a landscape with an unfavourable climate, is essential to quality of life, and therefore, to labour retention.

Recreational Facilities

Other recreational facilities and open space areas located within each of the settlement areas have been outlined in Table 8.

Table 8: Recreational Facilities

AREA	RECREATION FACILITIES	MAJOR OPEN SPACE AREAS
Newman	<ul style="list-style-type: none"> Newman Recreation Centre including fitness Centre; Indoor Sports Centre and Crèche Service Newman Aquatic Centre (50m swimming pool) Fortescue Golf Club Newman Race Course 	<ul style="list-style-type: none"> Boomerang Park North Newman reserve Boomerang oval Capricorn oval
Marble Bar	<ul style="list-style-type: none"> Marble Bar Aquatic Centre (25m Swimming pool) Marble Bar Gym 	<ul style="list-style-type: none"> Memorial Park
Nullagine	<ul style="list-style-type: none"> Irrungadji Oval Reserve; Lynas Hill Lookout 	

Smaller neighbourhood open space areas and unformalised parks are also located throughout residential areas within Newman. Additional community facilities, of which some contain recreational facilities, are detailed within Section 7- Community Facilities.

A strategic goal for Newman (Newman Tomorrow) is 'People of vitality' which seeks to diversify and provide access to recreational, leisure and creative activities. Newman Sport, Recreation and Open Space Assessment (2012) was commissioned to provide guidance as to recreational improvements within Newman into the future.

Amongst residents, one of the key focuses for Newman in the future is for improved entertainment / recreation facilities such as pool and sauna, indoor cricket; and parks such as Water Park, theme park, skate park, Dog Park (Strategic Community plan). A key focus for the Shire is to continue to maintain recreation facilities and public open spaces.

As part of current planning, the strategic planning for the Shire identifies the development of a recreational precinct to meet the predicted future growth (Strategic community plan). This was based on the 15,000 aspirational population forecast. Further to this, there are no significant new open space areas or recreational area planned within Newman. However, facility upgrades and new facilities have been identified. This is discussed in Section 7 - Community Facilities.

There is a recreational area and recreation club (including swimming pool) within Marble Bar and one formal park, Memorial Park. Within Marble Bar there are several other open space areas such as the area along Sandy Creek. These recreational and open space facilities are considered to be adequate for the role and population of the town.

There are no formal open space or recreational areas located within Nullagine, other than an oval reserve adjoining the Irrungadji Community. However, given the setting and population of Nullagine, this is not considered to be a significant issue or constraint.

A number of recreation projects have been completed within the Shire, including upgrades to playgrounds and parkland and the improvement of sporting fields including the provision of sports field lighting. Other unfunded short to medium term works include the development of Newman Lions Park as an overflow active sporting reserve and community events venue (Pilbara Cities, 2009). Newman Sport, Recreation and open Space Assessment (2012) provides an overview of planning requirements and recommendations for recreational facilities. Implementation of this report and its recommendations will ensure that access and opportunity in a diverse range of recreational pursuits become a permanent part of Newman life.

Newman



Figure 11: Newman recreation location

(Source: Pilbara vernacular Handbook, Development WA 2012)

Marble Bar



Figure 12 : Marble Bar recreation location

Nullagine



Figure 13 Nullagine recreation location

6. COMMUNITY FACILITIES

The Shire Strategic Community Plan 2018-2028 states that “the Shire recognizes the importance of social connectedness and exclusivity in developing a thriving, healthy and active community. “

A cohesive, attractive and recognisable community is fundamental to addressing broader objectives in the Shire such as economic diversity, attraction and retention of skilled labour (including government and community service workers), retaining younger generations and improving their future opportunities through education and up-skilling, supporting Aboriginal settlements and addressing social and economic issues connected with Fly-in/Fly-out employment.

Community and emergency services are clustered within the townships of Newman, Marble Bar and Nullagine.

Mine camps generally operate their own basic community services in isolation from the Shires infrastructure and services. This may include basic emergency response services and health services.

Table 9: Community Facilities

Area	Emergency Service	Civil	Health	Education	Early Learning	Religious	Community
Newman	Newman Police Service State Emergency Service Newman Volunteer Fire and Rescue Ambulance sub-station (1x FT Paramedic)	Newman Visitor Centre Newman Community Library Post Office Newman Cemetery	Newman Hospital (District hospital) Newman Medical Centre Child Health Clinic Dentist Chiropractor Physiotherapy	South Newman Primary School (State school) Newman Primary School (State school) Newman Senior High School (State School) TAFE camp us	YMCA Newman Early Starters Learning Centre Newman Day Care Centre Crèche at Recreation Centre	Baptist Church Martu Christian Fellowship Muslim Congregation Mosque Newman Congregation of Jehovah Witness St Stephens Anglican	Newman RSL Newman YMCA Newman Lions Club Newman Youth Centre
Marble Bar	Police Station State Emergency Service	Public Library Post Office service Community Resource Centre Cemetery Closed Pioneer Cemetery	Nursing Post	Primary School (State)			
Nullagine	Police Station	Public Library Nullagine Post Office	Nursing Post	Nullagine Remote Community School			

		Nullagine Cemetery					
--	--	--------------------	--	--	--	--	--

6.1. Health

Within the Pilbara Region, health is one of the preeminent focus areas relating to community development. Regionally, it has been noted that there is a need for significant expansion and upgrade to health services, including the provision of additional services. Newman Hospital provides district level hospital services for the Shire. The support of health infrastructure and services in Newman has been adopted as a strategic direction in the Shire’s Economic Development and Tourism Strategy. Two areas have been identified for action:

- Development of suites for health and allied health professionals on the former tennis court site near the Newman Hospital; and
- Strong advocacy of the renewal of Newman Hospital.

Both of these actions are supported by the Western Australian Country Health Service.

Renewal of the Newman Hospital should include purpose- built facilities that cater to population characteristics and allow for population growth.

Outside of Newman there are smaller nursing posts and medical facilities. These provide basic medical services to regional areas.

6.2. Education

One of the top five focus areas identified by residents of the Shire was education. As of the Census 2016, 33.4% of people were attending an educational institution within the Shire. Of these, 17.9 % were in primary school, 10.2% in secondary school and 8.8% in a tertiary or technical institution. Education opportunities in the Pilbara range from early learning to post-secondary. Newman has two primary schools and a secondary school. Tertiary education is via TAFE, also with a physical location within the town. Schools are also located within other settlement areas and Aboriginal settlements, these have been outlined in Table 8.

In addition, Pilbara Institute delivers vocational education and training (VET), which are nationally accredited across camp uses in the Pilbara including Newman. Pilbara Institute also serves a number of remote Aboriginal settlements in Marble Bar and Nullagine. The Pilbara Institute is also recognised as a centre of excellence for its work in preserving Indigenous languages from all over Australia (Pilbara Planning and Infrastructure, 2012).

Additionally, in response to growth and further development of the Shire, specifically settlement areas, it is important that the Shire work with the Western Australian Government to plan for and set aside locations of new primary, secondary schools and possibly tertiary facilities in order to meet future needs. This is proposed to occur in coordination with the development of a Newman Land Use Masterplan.

6.3. Early Childhood Services

Early Childhood Services across the Pilbara can be divided into Long Day Care, Out of School and Vacation Care, Occasional Care, Family Day Care and Playgroups. Long Day Care services provide quality all day or part- time care for children of working families and the general community. Out of school hours care services provide care mainly for primary aged children before and after school and during vacation time.

Occasional care is a unique child care service that supports families by providing flexible care for children from birth to school age. It can be accessed regularly or irregularly.

Other Early Years Services operate in towns across the Pilbara region including Toy Libraries, Early years Groups, Mothers and Babies groups. Information on these groups is usually made available from the Child health clinic, local library or Women's Centre.

Recent shortages in childcare facilities have been addressed through Government and Industry support for new centres in Newman.

6.4. Aged Care

Aged care facilities and services including retirement living options will increase in importance as the Pilbara population grows and the community aims to become more vertically integrated developing family histories across four generations. These requirements are anticipated to be addressed as the part of the longer- term affordable housing strategy for the region (RDAP).

There are no planned projects specifically addressing aged care identified. However, the Shire seeks to support community services that include aged care.

6.5. Culture and Entertainment

The Shire has a rich Aboriginal and historical culture. The strength of its culture is a key consideration in driving a positive future for the Shire and providing the community with a strong sense of identity. Currently, cultural and entertainment facilities are limited in the region. However, there are plans to enhance the vitality and vibrancy of many of the regional centres such as Newman (Pilbara Planning and Infrastructure Framework, 2012).

All of the facilities and services discussed within this section will assist in cultivating a stronger community and community identity. Beyond this, emphasis on art, culture and youth programs to be run in the Shire will also help to further achieve cohesiveness and vibrancy.

In terms of specific cultural and entertainment facilities, there are currently minimal facilities in the Shire. Within Newman many of the facilities are multi-use and accommodate community groups and events (i.e. YMCA, Recreation Centre). This is also consistent for the other settlement areas. There is a state of the art Indigenous Art and Cultural Centre for Martumilli located next to the Shire's administration building in Newman which continues to attract many visitors and local artists.

7. RURAL LAND USE

7.1. Rural Areas

The rural zone in the Shire comprises one of the largest rural zones in the southern hemisphere given the Shire contains some 379,000 square kilometres in area. Rural land has, since European settlement, been used for pastoralism and mining - of which the economic importance cannot be understated.

Pastoral Leases

In 2019 there were 29 pastoral leases in the Shire, including eleven that overlap into other adjoining Shire's. According to the Department of Land Planning and Heritage data base, those pastoral leases cover a land area in the Shire of approximately 77,371,110 ha.

Prior to the resources boom of the 1960s, the pastoral industry was the mainstay of the economy in the Pilbara. With increased attention and investment in Australia as one of the global food bowls, the focus on the region for its pastoral productivity will become more dominant.

Pastoral activities have been identified as important for the region and the shire as they;

- Contribute to the economy and assist in providing much needed economic diversity in the region
- Maintain biodiversity and productivity of the land,
- Contribute to the maintenance of inland communities through maintaining infrastructure (e.g. roads and airstrips)

Pastoral Leases have historically limited land uses to that of grazing and in this regard, there will be ongoing land tenure arrangements required to facilitate alternate land uses on such pastoral leases. The LPS should demonstrate that the rural zone can accommodate other land uses that complement the zone. Examples of this would be intensive agriculture and to some degree eco-tourism.

Intensive Agriculture

The Department of Primary Industry and Research is planning for the future of irrigated agriculture in the Pilbara Region. The project namely "Pilbara Hinterland Agricultural Development Initiative" (PHADI) was funded by Royalties for Regions to the amount of \$12.5 million over a four year period.

PHADI will investigate and share key information on agronomics, land tenure, supply chain and markets, economic viability, cultural and environmental areas of significance and stakeholder aspirations.

Water sources under investigation include dams and managed aquifer recharge, surface water, mine dewater surplus and groundwater. It is thought that up to 10,000 ha of land may be able to be irrigated for fodder, food and fuel productions to increase productivity on rural land. The Pardoo locality is the subject of intensive fodder irrigation project and proposes to convert Crown Land currently identified as "Reserve" in the Scheme to freehold title. Council has previously supported the excision of portions Reserves 541, 1542, and 38769 for conversion to freehold as part of Pardoo Beef Corporation's intensive agriculture project. This is subject to Telstra having no objection to the excision of portion Reserve 38769.

Additionally, there has been opportunities identified for algae-based aquaculture production in the region, both onshore and inshore which could see producers exporting nutraceuticals and pharmaceuticals to local, national and international markets.

Mining Leases

There are a large number of mining leases and tenements within the Shire which generally operate on rural zone land. Whilst the local government planning framework does not control mining land use it is important to consider the opportunities and constraints the land use and mining industry has in the Shire.

It is therefore incumbent on the Shire to have consideration of the mining land use and consider how the LPS may capture and develop the Shire to optimize opportunities.

In some cases, land the subject of post mining closure, may be strategically identified for other land uses rather than be rehabilitated to its original status. The Shire will endeavour to engage with mining companies and state government in relation to post closure mining plans and consider opportunities for post mining land uses subject to satisfactory rehabilitation and closure objectives.

Those post mining land uses will generally accord with the Australian Land Use and Management Classification for post mining land use and include;

- i. Conservation and environment,
- ii. Productions from relatively natural environments,
- iii. Production from dryland agriculture and plantations,
- iv. Productions from irrigated agriculture and plantations,
- v. Intensive uses; and,
- vi. Water.

Renewable Energy

Increasingly, rural land is being used for renewable energy development including wind and solar farms. The Pilbara is strategically located to provide optimal conditions for renewable energy farming. The region has the capacity to provide some of the largest land areas in the world for renewable energy farming which can provide for local, national and international energy supplies.

Rural Residential Land

Currently there is no land zoned for rural living in the Shire. The Rural Residential zoning generally provides lot sizes of 1-4ha. Rural Residential lots can provide an alternate small rural lifestyle where those lots are on the periphery of townsites and are connected to services. Further, studies are required to determine the demand for such land use in the Shire together with consideration of land tenure complexities, if applicable. Planning studies should demonstrate that the land is capable of connection to a reticulated services particularly water.

Larger format lots, such as those provided by a rural residential zoning often have the effect of sterilizing land for future subdivision by fragmenting the land between multiple landowners, which makes a coordinated approach to development difficult. To counter this, care should be taken to only site rural residential land in locations that are either, unsuitable for future residential use or in areas that will not be required for residential expansion going forward.

8. HERITAGE, URBAN DESIGN AND CHARACTER

The Shire is culturally and historically rich, the land has been occupied for thousands of years with Indigenous Australians demonstrating autonomy, mobility and innovation in adapting to a harsh natural environment (Creating Communities, 2010).

The original Aboriginal settlement formed the innate character of the area. This has further been shaped by European settlement. The following section reinforces the need for heritage protection and character enhancement within the Shire. It explores areas of heritage and cultural significance and identifies key elements for preservation whilst also recognising, preserving and enhancing existing character by way of producing bespoke development standards and requirements. The Shire will prepare a Heritage List by

review of its Municipal Heritage Inventory to provide a higher level of statutory protection to heritage sites.

The following section investigates appropriate climatic building design responses aimed to preserve and enhance the regions character whilst boosting public spaces and amenities.

8.1. Heritage

Pastoral Legacy

Early European settlement in the Pilbara Region occurred at Roebourne and the port of Cossack. Early industry was largely pastoral, gold mining and pearling. The pre-mining era towns provide many examples of colonial architecture of the early 1900s, with the best examples being at Cossack, Roebourne, and Marble Bar. The conservation of colonial heritage in old townsites such as Marble Bar is very important.

Aboriginal Heritage

Aboriginal people have lived in the Pilbara for more than 40,000 years. Today there are more than 31 Aboriginal cultural or language groups across the region. Pilbara Indigenous culture still follows traditional Law patterns, processes and custodian duties. The beliefs that Dreamtime beings, who created the land features and continues to control water and food supplies, are still strongly felt throughout the Pilbara. Conservation of indigenous culture and the land, to which they have traditional custodianship, is central to the respect and recognition of the part such culture plays in the identity of the Pilbara. The LPS recognizes the importance of Aboriginal heritage and acknowledges that Aboriginal heritage must be preserved (so far as is reasonably practical) in accordance with the *Aboriginal Heritage Act 1972*.

Pilbara Heritage Places

There are no sites listed on the National Heritage List. However, there are 5 sites that are considered of State heritage significance and are listed on the State Heritage List administered by the Office of Heritage. These include:

1. Government Buildings in Marble Bar
2. Poinciana House Marble Bar
3. Corunna Downs Station and former wartime airbase
4. Ironclad Hotel Marble Bar and
5. Halley's Comet Gold Mine

The Shire has a Municipal Inventory which was prepared by O'Brien Planning Consultants in 1999 and it provides a list of historic sites consider worthy of preservation at that time. In accordance with the *Heritage Act 2018* a review is required to be undertaken of the Shires Municipal Heritage Inventory. In accordance with the MST provisions a Heritage List will be prepared in conjunction with the review of the Shire's Municipal Inventory.

8.2. Urban Design and Character

Due to the Shire's vast landscape the following section focuses on the built form and urban morphology of the key townsites of Newman, Marble Bar and Nullagine. This section, in particular, focuses on the identification and enhancement of local character and identity, the enhancement of local amenities and public safety as well as reinforcing the need for sustainable building design and climatically appropriate buildings through the implementation of design standards and guidelines.

NEWMAN

Town Centre



Figure 14: Newman townsite land use

(Pilbara Vernacular Handbook, Development WA 2012)

Existing Development

The primary shopping centre in Newman was constructed some 30 years ago. This shopping centre is internalized, effectively turning its back on the street and drawing activity away from the street. It is surrounded by large areas of both sheltered and unsheltered car parking. A new shopping centre has been recently built by BHP, and provides an improved street facade including street shop frontages and an improved streetscape. However, most buildings in the Town Centre are over 30 years old and are stand-alone purpose-built structures which fail to respond to both the climate and context of Newman (Pilbara Vernacular Handbook, 2012). Much of Newman's commercial development is fragmented also surrounded by large expanses of carparks. As a result, commercial developments tend to lack integration with other shops and their surrounds. There is a need for co-location of retail, commercial and community services.

The primary shopping precinct is the Boulevard Shopping Centre which has a Woolworth's supermarket and room for up to 18 other retail tenancies. The new BHP premise includes an IGA and several other commercial business outlets.



Public Space in Newman Town Centre



Extensive car parking in Newman Town Centre



Newman General Street

Challenges

Highlighted within the Newman Town Centre Style Guide and Design Guideline, Newman's Town Centre is anticipated to develop into a more fully integrated service, shopping and social area. The centre will accommodate a greater density and diversity of activities in a more efficient and more attractive setting. The centre should develop the public amenity, safety and enhancement of local character to accommodate the existing residents, whilst providing adaptable design solutions and provisions for potential population demands.

Public realm and existing uses

There is a strategic need to implement a program to deliver much needed public realm and amenity at both the townsite and Town Centre level, including:

- Enhanced movement networks for pedestrians and cyclists;
- Responsive design reactive to the energy, water and environmental limitations;
- Enhancement of public amenities (Emphasis on climatic responsive design) and improvement of public safety; and
- New entry statement to the Town Centre, provision of a new main street and town square and landscaping which enhances sense of arrival.

The existing uses are not complimentary to each other and the following issues have been identified:

- Buildings are disconnected from the street edge and surrounded by large expanses of car parks.
- Poor pedestrian amenity, where lack of pedestrian infrastructure is compounded by large areas of hot unshaded asphalt.
- Movement throughout the Town Centre is unintuitive and relies on knowledge rather than an intuitive understanding.
- Limited landscaping and shade trees to reduce the heat island effect.

Character

- Existing development with the Newman Town Centre does not contribute to the local image or identity of Newman.
- The existing buildings do not enhance the streetscape appearance or facilitate the development of any local character.
- Buildings lack design quality and a sense of permanence.
- Few buildings in the Town Centre exhibit a Newman style or local identity.
- Large expanses of facades, limited relationship with the public realm, contributing to a dull, arduous and harsh Town Centre experience.
- Limited diversity and inappropriate residential provisions for a Town Centre environment.

Relevance to LPS

- The future planning provisions for the Newman Town Centre are being addressed by Pilbara Cities Town Centre Revitalisation Plan and will be complemented by the Newman Town Centre Development Strategy.

Residential/Townsites



Figure 15: Newman townsite residential land use (Pilbara Vernacular Handbook, Development WA 2012)

Existing Development

Newman's residential subdivisions were constructed in response to immediate demand for housing for mining employees. These early developments have a dormitory aesthetic and a proliferation of a repetitive housing type throughout a single residential area. House designs generally do not consider the unique environmental and social requirements of living in Newman (Pilbara Vernacular Handbook, 2012). Housing in Newman is predominately single storey detached, with few double storey houses. Larger lots have been developed into apartments and semi-detached houses, usually near the Newman Town Centre (Pilbara Vernacular Handbook, 2012). The stages of early residential development in Newman are clearly delineated. Housing stock within these areas characteristically are representative of their era of development, and are identified in Figure 38.



1960s house in Newman

(Source: Pilbara Vernacular Handbook, 2012)



1970s house in Newman

(Source: Pilbara Vernacular Handbook, 2012)



1980s house in Newman

(Source: Pilbara Vernacular Handbook, 2012)



Contemporary house in Newman.

(Source: Pilbara Vernacular Handbook, 2012)



Figure 16: Newman's residential areas depicted by era (Pilbara Vernacular Handbook, Development WA 2012)

Challenges

The issues surrounding Newman's residential suburbs are summarised below.

Housing design

- a) Most houses were designed without consideration of climate responsive strategies; responsive climatic design standards and requirements are needed to facilitate more sustainable building design.
- b) The temporary cycle of life in Newman is reflected by 'do-it-yourself' sheds and pergolas, which detract from the broader character and amenity of the area.
- c) Lot layouts and size accommodate for single detached houses, which currently dominate the town. Greater lot diversity is needed to facilitate a broader variety of housing choices.
- d) Repetitive, housing built en-masse to accommodate mining workers reinforces perceptions of transience rather than permanence.
- e) Some areas lack passive surveillance due to low density provisions, and impermeable fencing.

Residential character

- a) Existing development within Newman's residential areas does not contribute to the local image or identity of Newman
- b) The existing housing stock does not enhance the streetscape appearance or facilitate the development of any local character.
- c) Buildings lack design quality and a sense of durability.
- d) Few houses exhibit a Newman style or local identity.
- e) Generally areas lack passive surveillance undermining the amenity of the area.

Relevance to LPS

The LPS will seek to address the below opportunities relevant to housing and the residential areas in Newman:

- Develop a more permanent and diverse housing aesthetic.
- Develop short stay accommodation that is integrated with the town and sympathetic to its character.
- Existing large lots offer a great deal of flexibility; creating redevelopment options and the opportunity to utilise environmentally responsive strategies.
- Availability of lots for Greenfield and infill development.
- Provide cardinal lots in new (Greenfield) development areas.
- Normalisation process can provide opportunities for new development and enhanced ownership with alterations, extensions and refurbishment.

Marble Bar

Existing Development

Low density residential zoning dominates Marble Bar, the centre of the town comprises of Recreation zoned land, adjacent to the Town Centre zone which lies to the north-east. The Town Centre comprises of minimal commercial uses providing basic goods to the local community. Residential development is characterised by single semi-detached housing stock, a homogenous supply not too dissimilar to Newman housing provisions.

Marble Bar holds historical and cultural significance to the East Pilbara Region, it is a unique example of a pioneering outback town established in the gold rush days of the late 1800s. Marble Bar also contains natural beauty as well as historic charm, these elements are innate to the area character and should be enhanced and preserved where appropriate.

Residential/Town Centre



Figure 17: Marble Bar zoning map

Challenges

There are a number of existing areas which are not as well utilized as they should be, a number of community facilities in Marble Bar are currently closed or unused. The demise of these community facilities pose negative impacts on the broader aesthetic and character of the town. The following areas have been highlighted as key concerns:

- a) On the main street, the old general store building and adjacent Pipunya facility have been closed, boarded up and left in a poor condition (Prospectus Future directions for Marble Bar, Creating Communities 2010).
- b) The telecentre communication and training facility for residents and visitors is in inadequate in size and requires upgrading.
- c) The old school hostel and employment training workshop, another Pipunya facility, stands unused and derelict.
- d) There is a disengagement of youth from organized sports and recreation which has subsequently led to the disuse of related amenities. Although the Shire is seeking to increase its capacity to staff and fund
- e) The planned activation of recreation facilities. As they currently stand they pose negative impacts and safety concerns to the area.

The disuse and sometimes dilapidation of commercial and public amenities within Marble Bar significantly diminishes the aesthetics of the town, can potentially leave an unfavourable impression with tourists and also potentially impacts on the collective psyche of the community (Prospectus Future directions for Marble Bar, Creating Communities 2010).



Ironclad Hotel



Marble Bar War Memorial



Marble Bar Church

Residential character and housing design

- a) Most houses were designed without consideration of climate responsive strategies; responsive climatic design standards and requirements are needed to facilitate more sustainable building design.
- b) Some areas lack passive surveillance due to low density provisions.
- c) Existing development within Marble Bar's residential areas does not contribute to the local image or local identity.

Relevance to LPS

The LPS will seek to address the above stated challenges currently facing Marble Bar:

- Provide landscaping and local amenity design strategies to boost aesthetics of the Town Centre;
- Provide landscaping and local amenity design strategies to boost aesthetics of recreational facilities;
- Identify and preserve exiting areas of cultural and historical significance.

Nullagine

Nullagine is the smallest of the major Townsites in the East Pilbara, and is predominately zoned 'Nullagine Townsite'. The Townsite contains three land parcels of Recreation zoned land, and has sporadically located parcels of public purpose zoned land. Given the small nature of Nullagine and the dominance of residential development, which faces similar challenges to Marble Bar and Newman emphasis for the town is to focus on climate responsive housing design.



Figure 18: Nullagine zoning Map

9. TRAFFIC AND TRANSPORT

9.1. Road Network

The Pilbara road network consists of some 9,402 kilometres of classified roads comprising 881 kilometres of National Highway, 1,521 kilometres of State Roads and 7,000 kilometres of Local Government Roads (ROADS 2030 - Pilbara). Approximately 80% of the Pilbara's imports are transported by road. However, only 3% of the region's exports are transported by road with the balance being transported by rail.

Within the Shire key routes are:

- + Great Northern Highway (Route 95) – Auslink strategic corridor;
- + Marble Bar Road (M30); and
- + M63 between Marble Bar and Telfer.

The Great Northern Highway is a sealed road providing connections between Newman and Port Hedland, whilst both Marble Bar Road and the M63 are secondary roads and are unsealed in some locations. The Pilbara Framework: Regional Profile (WAPC, 2009) shows the existing road network in the Shire. A map detailing the road network from this document is illustrated in Figure 29.

Great Northern Highway

Great Northern Highway is currently the primary freight and transport road link between Perth and Newman; and from Newman to Port Hedland. The Pilbara Planning and Infrastructure Framework considers the traffic volumes on the road network (see Figure 29). Vehicle trips generated along this road link is projected to continue to increase along the Great Northern Highway, which is based on growth and economic activity of all regional towns within the Pilbara including Newman, Port Hedland and Karratha.



Figure 19: Transport Map

Marble Bar Road

Marble Bar Road is a key road link in the Shire, used for transport and logistics businesses transporting goods and services to mining areas, between the settlement areas of Newman, Nullagine and Marble Bar as well as Port Hedland and to other major infrastructure such as the Port. Marble Bar Road is predominantly unsealed.

The Pilbara Planning and Infrastructure Framework considers the traffic volumes on the road network in three locations across the Pilbara (see Figure 29). With regards to the road network in the Shire, Marble Bar Road is the most relevant as it is evident that although not as significant an increase as on the Great Northern Highway, there has been a continual increase in traffic volumes on Marble Bar Road.

Whilst the road network through the townsites themselves is considered to be of a reasonable standard, the road network between the townsites must be considered when planning further development in the region. The numerous floodway's along the Marble Bar Road are often impassable and damaged by the flowing water, resulting in the road being closed for an average of 33 days per year. This is cause for concern among all local communities and road users as extended periods of isolation can occur and cause supplies to run out. The road has historically had re-sheeting works undertaken on sections of the road as part of ongoing maintenance and grading has occurred approximately every month. The increased mining activities and heavy vehicle use has made the road difficult to maintain to an acceptable condition. Between 2008-2012 there were 67 crashes on the Marble Bar Road from Newman and Ripon Hill Road of which five were fatal and six requiring hospitalization (MRWA Pilbara Regional Profile 2013). The sealing of Marble Bar Road is considered a priority as it is an important transport route that provides road connectivity within, and to areas external to the Shire.

Upgrading the road to sealed standard will allow for greater reliability for freight traffic and increase safety for vehicles travelling on these routes. Upgrading of the road to sealed standard is also important to maintain transport route security and increase connectivity and reliability during the wet season, as the frequency and duration of closure currently has an impact on surrounding communities. This is an issue that could continue to prevent further growth and community development within the region, particularly townsites of Marble Bar and Nullagine.

Local Roads

The Shire operates and maintains a significant road and path asset portfolio. The majority of these roads (92%) are unsealed (see Table 10).

Table 10: Description of Length of Road and Pathway Assets (SOEP)

ASSET DESCRIPTION	LENGTH (KM)
Asphalt/concrete roads	163
Spray Sealed Roads	200
Unsealed Gravel Roads	1597
Unsealed Formed Roads	1456
Total All Roads	3310
Paths	81

There is limited data available regarding the frequency of use of the road network outside of Newman. However, significant traffic is derived from quad road trains and heavy light to medium vehicles (MRWA Pilbara Traffic Digest 2012/2013).

Whilst sufficient infrastructure is available to service the existing demands, the condition of the road network requires continual maintenance and improvement.

Table 11: Road Network Condition

CONDITION	1	2	3	4	5
Pavement Rutting (Sealed Roads)	48%	31%	20%	1%	0%
Cracking Extent (Sealed Roads)	81%	17%	2%	0%	0%
Unsealed Gravel Roads	2%	4%	32%	40%	22%
Paths	5.8%	41.6%	47.6%	5%	0%

Despite over 50% of the surfaced network approaching or already exceeding the end of its typical design life, the sealed road network is considered to be currently in good condition with both the surfacing and the pavement structure mostly, (79%), in excellent to good condition. The unsealed network is considered to be in fair to poor, (72%), condition given its vast extent and the dynamic nature of an unsealed network. Currently funds for road sealing are allocated in the budget and prioritised locations decided in that particular year.

Higher ongoing maintenance costs are likely to result from the unsealed roads as they are more susceptible to environmental factors such as rainfall events and flooding. In addition to this are imp acts caused by the ongoing deterioration from heavy traffic loading, making it difficult to maintain these roads in a consistent condition.

Based on projections regarding population and future economic activity, any increase will result in an increase in vehicles using the road network. Existing poor unsealed road conditions may be prohibitive to future economic growth and are likely to require continuous maintenance to ensure standards are upheld.

The Shire is currently in the process of developing a forward plan to nominate specific roads to be sealed as part of a road sealing program. Additionally, the Shire have agreements for road sealing and road

maintenance activities where mining activity results in high usage and/or certain road standard requirements (see Table 12).

Table 12: Maintenance and upgrade agreements

ROAD	RESPONSIBILITY
Woodie Road	Consolidated Minerals allocate funding of \$200,000 per annum for the maintenance and renewal of the Road. The maintenance activities are managed by the Shire.
Skull Springs Road	Millennium Minerals will be responsible for ongoing road maintenance for the duration of their mining operations.
Munjina Roy Hill Road	Rio Tinto Koodaideri Project is still in the developing stages. Traffic at is only expected for mine and railway construction activities and restricted to general freight. An ongoing maintenance and renewal agreement will be developed. There is a written agreement in place between Process Minerals International and the Shire. Process Minerals International is responsible for the construction of a 60km sealed road and ongoing maintenance for the life of the mine.
Telfer Road	Maintained by Newcrest Mining to provide access to their Telfer Mining Operations.
Hillside Marble Bar Road	This project is still in developing stages by Atlas Iron Limited. Atlas Iron Limited will construct a section of road required for a heavy haulage to RAV 10 network standard. An ongoing maintenance and renewal agreement will be developed.

A number of other projects are currently being planned or have been planned for construction, these include:

Light Industrial Area Bypass Road - A bypass road from the Welsh Drive / McBride Drive junction is being progressed linking to the Great Northern Highway, approximately 500m north of the intersection with Marble Bar Road. Work is still underway with regards to this road. Figure 32 shows a plan of the possible alignments that provide a bypass around the Light Industrial Area in Newman.

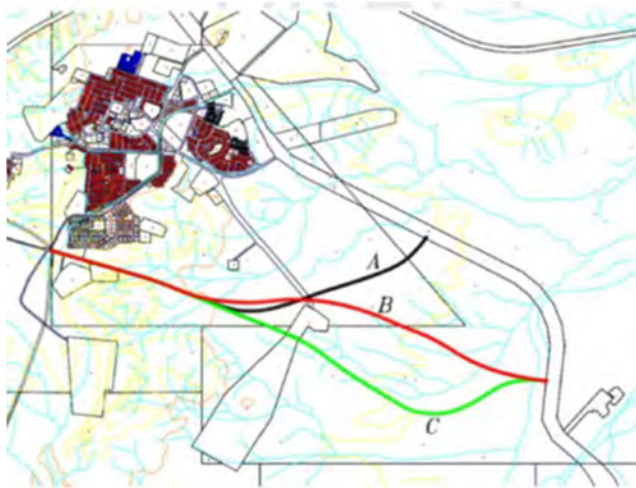


Figure 20: Light Industrial Area Bypass Alignments

There are a number of more localized issues identified for consideration, these include:

- Poor traffic management due to road layout within Newman
- Lack of integration between the road networks of the residential areas in Newman and the Town Centre
- Welsh Drive is considered to be a potential hotspot location. The vehicle mix in this location is a problem.
- The majority of the road network is subject to flooding, particularly roads within the catchment areas of the Oakover, Fortescue and DeGrey Rivers. Locations and severity varies year by year depending on weather events, with the majority of the damage caused following natural disaster events such as tropical cyclones and tropical lows. The roads affected generally are within the aforementioned catchment areas.

Improvements are made to formation and drainage in known locations. However, depending on the severity of the event damage still occurs due to the high rainfall and velocity of the runoff.

Transport and Logistics Hub

The need and opportunity for a potential future transport and logistics hub has been identified for Newman. It is suggested that a transport and logistics master plan be developed to further this opportunity and consider major links (including the vital Newman to Marble Bar upgrade envisaged by the Pilbara Planning and Infrastructure Framework); transport infrastructure interfaces; strengthen freight corridors; and maximise opportunities for integrated growth.

9.2. Rail

There are three mineral export rail systems in the region; operated by BHP, Rio Tinto and Fortescue Metals Group (FMG). The railway operated by BHP serves the north western and south western

regions of the Shire, connecting to Port Hedland, whilst the FMG railway provides a link between the Shire (north of the Fortescue River) and the Port at Port Hedland. The Rio Tinto railway reaches into the south western corner of the Shire and links to the Port of Dampier. These have been specifically constructed as heavy duty standard gauge railways to transport iron ore from mine sites to port facilities. The Pilbara Framework: Regional Profile published by the WAPC shows the rail network in the Shire.

The three existing railways are due to be augmented by two new railways (operated by Hancock and API / MCC). This new infrastructure will extend the region's mainline rail system from 1,525km to approximately 2,245km. Anticipated increased frequency of ore trains will have implications for road traffic at at-grade road crossings. Third party access to the railway system is currently under negotiation, having been given the 'green light' by recent high court and ministerial decisions (Pilbara Framework: Regional Profile, 2009). Rail coverage to Marble Bar and Nullagine is poor. Any further development in these locations and any development in other locations would require additional railway infrastructure to be constructed.

The Pilbara Planning and Infrastructure Framework illustrate a significant increase in iron ore tonnage carried to the region's ports. As illustrated in Figure 34, the East Pilbara rail network was predicted to carry more tonnes per annum than the West Pilbara rail network between 2014 and 2017.

In addition, as part of the Roy Hill Project a 344km single line heavy haul railway is being constructed to transport the processed iron ore from the mine to a dedicated port stockyard facility located to the south of Port Hedland.

9.3. Airports

The region has experienced a boom in airport activity through the significant increase in the number of fly-in-fly-out (FIFO) workers and the multitude of support services staff delivered to mining sites. There are currently four Code 4 airports in the Pilbara region (with code 4 CASA airstrips), operated by Local Government and a mining companies, providing scheduled services to Perth and a limited number of other destinations outside the region:

- Port Hedland
- Karratha
- Newman
- Paraburdoo

Newman

Newman Airport is located within the Shire. It is owned and operated by the Shire and provides a vital link between the community of Newman and surrounding communities to Perth. Newman airport is also the only inland public airport in the northern half of WA and the only public airport located within the Shire (11 kilometres south of Newman town). More than 340,000 passengers pass through Newman airport per annum, with 54 Regular Public Transport (RPT) flights per week between Newman and Perth (The Shire website). Qantas, QantasLink, Virgin Australia and Virgin Australia Regional Airlines (VARVA) all operate services from Newman to Perth. The airport predominantly services FIFO workers from the nearby BHP Iron Ore Mines, in addition to regional domestic connectivity.

Newman Airport is already deemed too small to cope efficiently with incoming and outgoing passenger numbers with a current inflow / outflow of three times the projected amount of passengers, with passenger numbers continue to increase at approximately 30% per annum.

There is a lack of patron facilities usually associated with normal airport services including café's, tourist shops etc. and visitor experience needs to be improved significantly.

Newman Airport requires a level of investment from government and industry that is commensurate with its importance as an intrastate and potential interstate hub, feeding workforce, contractors, consultants and ancillary services into an economically critical industry for Western Australia and the nation.

Recent upgrades were undertaken for both the landside and airside components of the airport in 2012/13. Airside upgrades include an extension to the General Aviation Apron to accommodate additional fixed wing and helicopter aircraft. Internal upgrades to the terminal included an extension to check in counters and baggage handling capacity, extension to departure lounge and upgrades to the terminal building to install solar power on the roof of the building.

The airport has a code 3C runway (2,072m long by 30m wide with 3m wide sealed shoulders) originally designed for a BA146 and F28 operations. The runway is not surveyed for a code 4C operation which allows larger B737 and A320 aircraft to use the runway. There are three existing Regular Public Transport (RPT) bays that enable the aircraft to be parked. There is a fourth bay on the General Aviation apron that is suitable for code 4C aircraft.

The Air services Australia Aviation Rescue and Fire Fighting (ARFF) station was opened in September 2014 and provided category 6 coverage for all aircraft operating into and out of Newman during promulgated hours of operation. Hours of operation are primarily for scheduled flights.

The Shire has engaged (2018), Aviation Consultants to undertake an Airport Masterplan to indicate land use for aviation and associated services including business enclave. The Masterplan/Structure Plan will then be used to guide future development and reserve land use Management Orders. A Scheme Amendment may be undertaken to have the surplus Airport area available for development if freehold tenure is expected alternatively leasehold will see a proposal to amend the Management Order and land use which will expedite land for development. Should the Airport Masterplan not be completed in time the Recommendations from that Report will be included in a Scheme Review.

Marble Bar and Nullagine

The townsites of Marble Bar and Nullagine both contain airstrips that are owned and operated by the Shire. Marble Bar has a sealed runway and Nullagine has a gravel runway. These facilities provide vital air links to the respective towns, with the RFDS, Police and local charter operators all relying on these airstrips for the provision of vital services to the towns.

The Shire Annual Report 2011/12 indicates the following breakdown of aircraft movements (covering Newman Airport and the airstrips at Marble Bar and Nullagine):

- RPT movements 31.7% (confined to using only three parking bays on the RPT apron by nature of its screened services categorisation)
- Closed charters 14.1%
- Helicopters 23.3% (supports the need for a dedicated helibase)
- RFDS flights 7.2%
- General GA (General Aviation) aircraft 22.7%
- Business jets 1%

From this, it is clear that the airport currently serves various needs and requirements and this is likely to continue in the future.

Other Airports

In addition to these airports there are also air services direct to mine sites. Most large and small communities also have aerodrome facilities as the development of the Pilbara has relied heavily on the aviation industry to transport people and freight, due to the distances between settlements and the poor, often unreliable road conditions. Access to airports and aerodrome facilities will continue to be important in the future and must be considered when planning development in the region. Even with upgrades to the road network, distances remain vast and travel is much faster by air.

9.3. Ports

There are three major ports located within the Pilbara region. These are located at Dampier, Port Hedland and Port Walcott (Cape Lambert). None of the Ports are located in the Shire. Port Hedland is the closest port to the Shire, accessed via Marble Bar Road or the Great Northern Highway using the road network.

Port Hedland is 203km from Marble Bar, 298km from Nullagine and 456km from Newman. Port Hedland serves the mineral rich Eastern Pilbara region and its main export commodity is iron ore. Railways operated by BHP and FMG provide a connection between the Shire and the port at Port Hedland, whilst Rio Tinto operate a railway that connects the Shire at one end to the Port of Dampier at the other. These railways have been specifically constructed to transport iron ore from the mine sites to the port facilities. Both the Ports of Dampier and Port Hedland are operated and managed by port authorities.

9.4. Public Transport

A bus service runs between Newman and Port Hedland. There are two trips a week between Nullagine and Port Hedland via Marble Bar and one trip a week between Nullagine and Newman. The bus is predominantly used to transport passengers to health appointments.

The route and frequency of the existing service may need to be altered depending on the location of the development and the change in travel demand due to the size of the development. Alternatively, additional services may be necessary to accommodate any proposed development.

Funding for this service is through the Department of Transport (DoT) (approximately \$100,000 per annum). However, funding is inadequate (due to the high accommodation costs for the driver to stay in Port Hedland). As a result, Municipal funds are used to fund the remainder of the service, as the expenses are more than double of the DoT allocated funding (\$218,000).

9.5. Pedestrians and Cyclists

Most of the streets in Newman include a pedestrian footpath on at least one side of the road and residents can easily walk to commercial and recreational amenities. There is also a running / walking path around the perimeter of the town that is regularly used by both locals and tourists. There are pedestrian footpaths on some of the roads in Marble Bar, such as General Street, and Francis Street. Minor residential streets do not however have footpaths. There are limited footpaths through Nullagine such as along Marble Bar Road through the centre of Nullagine. There are however no footpaths on minor residential roads.

Development of footpaths / cycle paths is required along key desire lines / between movement generators within the proposed development (for example between a residential area and a school or shops). Pedestrians and cyclists should be separated from heavy vehicles as much as possible. Freight routes should be directed around settlements wherever practical.

The Shire has a Pathways Plan of which a review should be undertaken every five years to ensure that the delivery of pedestrian and cycling pathways are delivered in the most needed and appropriate locations.

10. SERVICE INFRASTRUCTURE

10.1. Water

Information has been obtained from Water Corporation, BHP and Pilbara Planning and Infrastructure Framework (2012).

Water supply across Shire consists of independent water supply for each of the towns (Newman, Marble Bar and Nullagine). The water supply is treated to relevant standards and then reticulated to developments through the Water Corporation Network. Any areas of development outside of the Town Centre generally have their own water source (i.e. rainwater tank).

10.2. Newman

Newman is located within the Pilbara Groundwater Area, which is proclaimed under the *Rights in Water and Irrigation Act 1914 (WA)*. Ophthalmia Dam catchment covers approximately 4200km² and intercepts stream flow from the Fortescue River and local creeks (Warrawanda Creek, Whaleback Creek and Shovelanna Creek). Ophthalmia Dam was constructed in 1981 as a means to artificially recharge Ophthalmia bore field. It has a total storage capacity at full storage level (513.5mRL) of approximately 31GL.

The Ophthalmia bore field is located approximately 15km east of Newman and provides raw water to the town of Newman, Mt Whaleback mining operations and OreBody 25. BHP owns and operates the bores on the water source/s, treatment and other bulk water transfer infrastructure for Newman and also for their mining operations. BHP has a Department of Water and Environmental Regulation (DWER) licence to draw 10 GL/year from the bore field for ore processing and public water supply.

The BHP Newman service tanks are located about 500m west of the town at an altitude of around 586m AHD. Raw water from the various BHP sources is transferred to raw water storage tanks. Stored raw water is passed into the Water Treatment Plant on demand. The treatment and disinfection system is located upstream of the treated water storage tanks. Treated water is stored in three treated water tanks that have a combined capacity of 9.1ML.

The current water treatment plant will support approximately 10,000 people. There are plans for a new water treatment plant that will be able to supply 15,000 people in Newman and nearby mine sites.

The Newman water network is gravity fed. There are no water pump stations downstream of the storage tanks. The transfer point (where BHP transfers the responsibility for supply to the Water Corporation) is shown in Figure 35. Treated water gravitates from the treated water storage tanks via three parallel outlet mains (DN300, DN250, and DN200) to supply the town reticulation network.

Opportunities to relinquish water treatment and potable water storage assets to Water Corporation has previously been suggested. However, it is noted that water source licensing and asset separation would be difficult due to the intrinsic relationship between the dewatering and recharge process and mining operations (Newman Revitalisation Plan, 2010).

Water network capacity modelling was undertaken by Water Corporation in 2011. This capacity review highlighted that some components of the existing system are at or close to their full capacity. Further development in the town and resultant additional water service connections is likely to require substantial capital expenditure on upgrades to the water distribution and reticulation system. Some localised reticulation upgrades by land developers will also be required in order to support subdivision and development proposals.

The Water Corporation capacity review (2011) also highlighted a maximum supply (height) limit of approximately 560m AHD from the existing storage tanks.

A number of short term works to improve the Newman reticulation network have been identified and include:

- Installation of a short sections of distribution mains;
- Additional cross-connections between mains and isolation valves in parts of the system to improve performance; and
- Installation of flow monitoring equipment at certain critical points in the system to inform future upgrade decisions.

Water Corporation has scheduled a full review of the Newman water scheme based on the expected growth in services associated with the Pilbara Cities vision. The timing and scope of the review will be dependent on the outcome of ongoing business discussions between the Water Corporation and BHP. It is expected that upon upgrading of the current facilities the Water Reserve boundaries will need to be amended to provide for expansion.

10.3. Marble Bar

Marble Bar water is sourced from the Coongan River bore field situated approximately 2km to the west of the town. The town is using approximately 20% of the available water supply.

Water Corporation currently has a series of operating production bores in the bore field that pump into a 2500KL service tank (tank Top Water Level 214.5m) located on the hill immediately south of the town. Raw water is chlorinated prior to entering the tank, which then gravitates into the town reticulation system via a DN250 water distribution main to the intersection of General St and Francis St. Smaller DN150 and DN100 water reticulation mains radiate out from this point.

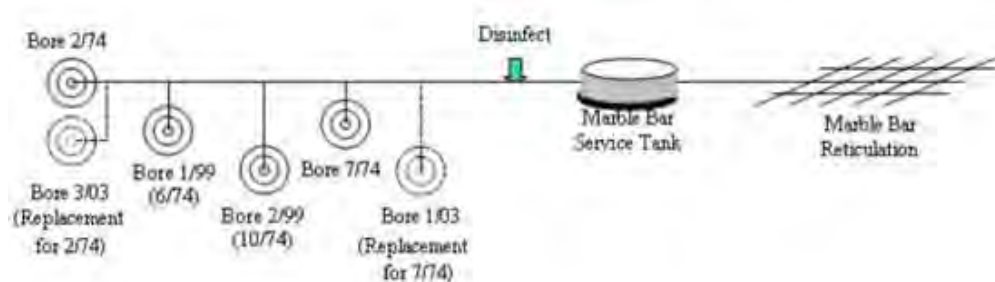


Figure 21: Schematic of Marble Bar water supply system

In 2003-4, the total number of townsite connections to was approximately 149 lots. Water Corporation's long- term planning assumes a low growth rate for Marble Bar. The total number of services could increase to around 165 services over the next 30 years. Given the low population projections for Marble Bar, this is assumed to be sufficient unless significant unpredicted development occurs.

The licensed allocation for the Coongan River bore field is 200,000kL/yr. When planning was last conducted in 2007, the actual abstraction was around 122,000 KL, which represents approximately 61% of the available license is utilised. There are a number of issues that include elevated salinity levels and water hardness in the source of the water supply.

It's not known if there are any constraints in the existing water reticulation network as no significant growth has occurred and there is no planning information available. However, based on population projections for Marble Bar, it is considered that growth will be relatively low and therefore capacity issues are not considered to be a critical issue unless significant development and growth are to occur. As a result, it is recommended that a review be carried out to identify any constraints of the existing network if significant growth is proposed.

10.4. Nullagine

Nullagine water is sourced from two bores and two town wells. The two bores are located approximately 7.5km to the north-east of the town and the wells are located on the southern banks of the river close to the townsite. The bores and wells all draw water from the Nullagine River alluvium, which relies on recharge from annual river flows. The estimated available water of 0.05GLpa is very close to the current usage level of 0.04GLpa

Water from the distant bores to the north-east is transferred via a long DN150 bore collector main and fed into the town reticulation system. Source water is chlorinated before entering the reticulation system. Two service tanks are located on the hill (approximately 405m AHD) immediately to the north-west of the town and each have a capacity of 225KL.

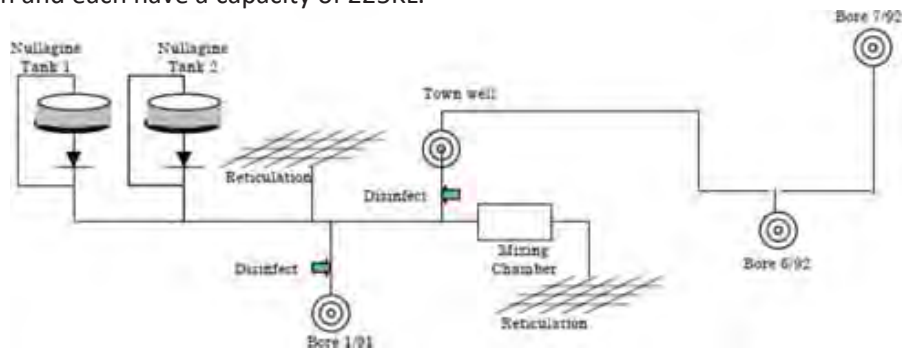


Figure 22: Schematic of Nullagine water supply scheme

It's not known if there are any constraints in the existing water reticulation network as no significant growth has occurred and there is no planning information available. However, based on population projections for Nullagine, it is considered that growth will be negligible and therefore capacity issues are not considered to be a critical issue unless significant development and growth are to occur. As a result, it is recommended that a review be carried out to identify any constraints of the existing network if significant growth is proposed.

Storm water harvesting in the form of rainwater collected off roofs into tanks which can provide water for toilets and gardens and reduce the need for potable water from Water Corporation scheme. These can be incorporated into new buildings as part of development requirements. Department of Water and Environmental Regulation has reviewed the Nullagine Water Reserve Boundaries for which will need to be amended in the Shires Scheme.

10.5. Power

Power is supplied from a number of different sources across the Shire that includes gas fired power station, diesel generators and solar panels depending on which town you live in. Power is then distributed through the electrical network as required by developments within the townsites and any areas that have access to the network.

Opportunities exist to install sustainable power infrastructure to reduce the demand on the power networks and allow for additional electrical supply. These can be incorporated into new and existing buildings. There are preliminary plans for a large renewable energy site in the Shire which may assist in providing for additional power supplies.

Newman

BHP is the supply authority for Newman and adjacent mine sites. They own and operate the transmission and distribution lines for Newman and adjacent mine sites.

Newman is currently supplied electricity from a 178MW gas fire power station that is owned by Alinta. BHP are in the process of constructing their own 190MW gas fired power station, 'Yammina', to replace the Alinta power station. The new Yammina gas fired power station will include gas turbines equipped with

heat recovery steam generators to capture waste heat for the generation of additional power. This is projected to minimise gas usage while increasing thermal efficiency and reducing carbon emissions. In the event of a gas service interruption, the plant has also been configured to allow normal operations to continue using diesel fuel. Of the 190MW approximately 18MW is allocated to Newman, the remaining is to be allocated to mining operations and ancillary mining activities.

The existing transmission, distribution and generation network is close to capacity. Any substantial developments would likely require upgrades to the network and possibly power generation. Upgrades would need to be funded by prospective developers.

Additional supply may be found in the existing network as existing infrastructure is replaced over time with more efficient infrastructure. Furthermore, sustainable power generation may also assist in balancing out demands on the power network and prolonging the need for major infrastructure upgrades.

Any new developments within Newman are required to be completed in accordance with BHP SPEC-059-E-12000/2 Newman Power Electricity Network Conditions of Supply and Design and Installation Policy and Standards. This provides guidance to consumers and developers and details the service and installation rules, general conditions of supply and policies and standards that are applicable to all existing consumers and contractors and developers associated with future connections to the network.

Marble Bar

Horizon Power is the supply authority for Marble Bar. The power generation in Marble Bar was upgraded in 2009/2010. The Pippunyah power station supplies power to the town through a combination of 1350 solar panels (capable of producing 300 KW), four 320 KW diesel generators and 500KW temporary energy storage system. The solar panels have tracking technology to follow the sun and maximise electricity production during the day which can supply approximately 65% of the town's electricity during the day and 30% of the average annual demand.

The temporary energy storage system is used to provide additional power to the distribution network during periods of cloud cover.

Whilst it is unknown what the current capacity levels are for power, it's assumed that due to recent upgrades and low forecast growth within Marble Bar, the existing infrastructure provision is adequate to meet future growth levels. Detailed capacity planning would need to be undertaken if significant growth or development is proposed within Marble Bar.

Nullagine

Horizon Power is the supply authority for Nullagine. The power generation in Nullagine was upgraded in 2009/2010. The power station supplies power to the town through a combination of 900 solar panels (capable of producing 200 KW), three 320 KW diesel generators and 500KW temporary energy storage system. The solar panels have tracking technology to follow the sun and maximise electricity production during the day which can supply approximately 65% of the town's electricity during the day and 30% of the average annual demand.

The temporary energy storage system is used to provide additional power to the distribution network during periods of cloud cover.

Whilst it is unknown what the current capacity levels are for power, it's assumed that due to recent upgrades and low forecast growth within Nullagine, the existing infrastructure provision is adequate to meet future growth levels. Detailed capacity planning would need to be undertaken if significant growth or development is proposed within Nullagine.

10.6. Gas

Information has been obtained from BHP, Pilbara planning and Infrastructure framework (2012) and APA Group. The Telfer Gas Pipeline is a 443km transmission pipeline traversing the Shire that delivers gas to the Telfer gold-copper mine in the east Pilbara region and the Nifty Copper mine some 350kms east of Port Hedland.

Newman Power Station is a 178MW gas fired power station supplying power via 220kv transmission line to the Roy Hill mines, 120kms north of Newman townsite. Natural gas is transported via the Goldfields Gas Transmission Pipeline. There is no residential gas supply in Newman, Marble Bar and Nullagine.

10.7. Telecommunications

Telstra is the dominant provider of mobile and broadband services in the Shire. The National Broadband Network (NBN) is available at selected locations in Newman. Telecommunication coverage is provided by a network of underground/overhead cables and mobile phone towers.

A 2008 telecommunication assessment indicated that the townsites have adequate mobile coverage (Telstra, n.d). However, there was limited coverage for long distances of main highways between the towns.

Newman

Newman has access to ADSL2+ and the NBN in selected locations. Any new developments larger than 100 lots would be serviced by the NBN to provide broadband in Newman where it is located in an NBN service area. Mobile network is available to Newman by a number of providers which include Telstra and Optus. The mobile network data speeds vary depending on where you are in the town (Figure 38). It has been found on nearby mine sites that the mobile coverage is adequate to service the daytime demand requirements. However due to fluctuations in peak demand which is found to occur at the end of shifts then coverage issues occur.

Marble Bar

Telstra provides coverage to the town and surrounding areas by the 3G network. The data speed is up to 3Mbps. There is no NBN available. There is very limited information in regards to the existing infrastructure in place for the existing telecommunication network to determine the capacity of the existing network and any constraints. A detailed audit of the existing telecommunication infrastructure needs to be completed to identify existing infrastructure and allow for appropriate NBN infrastructure to be planned and built.

Nullagine

Telstra provides coverage to the town and surrounding areas by the 3G network. There is no NBN available.

There is very limited information in regards to the existing infrastructure in place for the existing telecommunication network to determine the capacity of the existing network and any constraints. A detailed audit of the existing telecommunication infrastructure needs to be completed to identify existing infrastructure and allow for appropriate NBN infrastructure to be planned and built.

10.8. Drainage

Information has been obtained from Flood study of Newman Townsite (Golder and Associates, 2013) Nullagine River Flood Study – Nullagine Townsite (Department of Water and Environmental Regulation, 2007) and consultation with the Shire.

The Shire is located on Pindan soils which have very limited infiltration when wet. As a result, there is a reliance on existing carriageways, open swales and culverts to transfer storm water away from settlement areas to water courses. There is very limited underground pit and pipe drainage infrastructure.

Newman

Surface water is conveyed towards an easterly direction along three flow paths. These flow paths cross the Great Northern Highway via existing culverts (Golder and Associates, 2013). The Flood Study of Newman Townsite (Golder and Associates, 2013) provided a prediction of various water heights around the existing townsite. This enabled determination flooding based on natural surface levels for different rainfall events (ranging from 2 to 100 years).

As can be seen in Figure 39 some areas of the existing townsite are prone to localised flooding of water in a 5 year rainfall event, specifically the area in the vicinity of Wilara Street and O'Flaherty Street.

In a 100 year rainfall event, the extent and depth of flooding increases. At proposed development locations, there is a considerable upstream catchment and also restriction created by the existing culvert capacity under the Great Northern Highway. Any development that occurs in these locations will need to take into account the potential flood levels and the impact that fill will have on reducing storage in these areas.

Marble Bar

No available drainage information exists for Marble Bar. As a result, flooding information is limited and therefore constraints related to flooding and drainage within Marble Bar are unknown. A flooding study is recommended to be undertaken to assess the imp acts from flooding and determine developable land to support any future proposed development.

Nullagine

The Department of Water and Environmental Regulation undertook a flood assessment of the Nullagine townsite in 2007. Flooding is a significant constraint to access and development within Nullagine and has previously caused impacts to property and access. The flood study was undertaken to assess the impacts of flooding and provide mitigation measures to reduce future impact from flooding for new and existing development. The Study undertook hydraulic modelling to determine flood levels (10, 25 and 100 year) and land use planning guidance to allow a 0.5m buffer to all new development and minimise potential flood damage of existing properties through mechanisms such as raising or relocating houses. Figure 40 shows the flood levels of different rainfall events and extent of flooding for Nullagine.



Figure 23: Flood Map Model, Newman Source: Golder and Associates, 2013

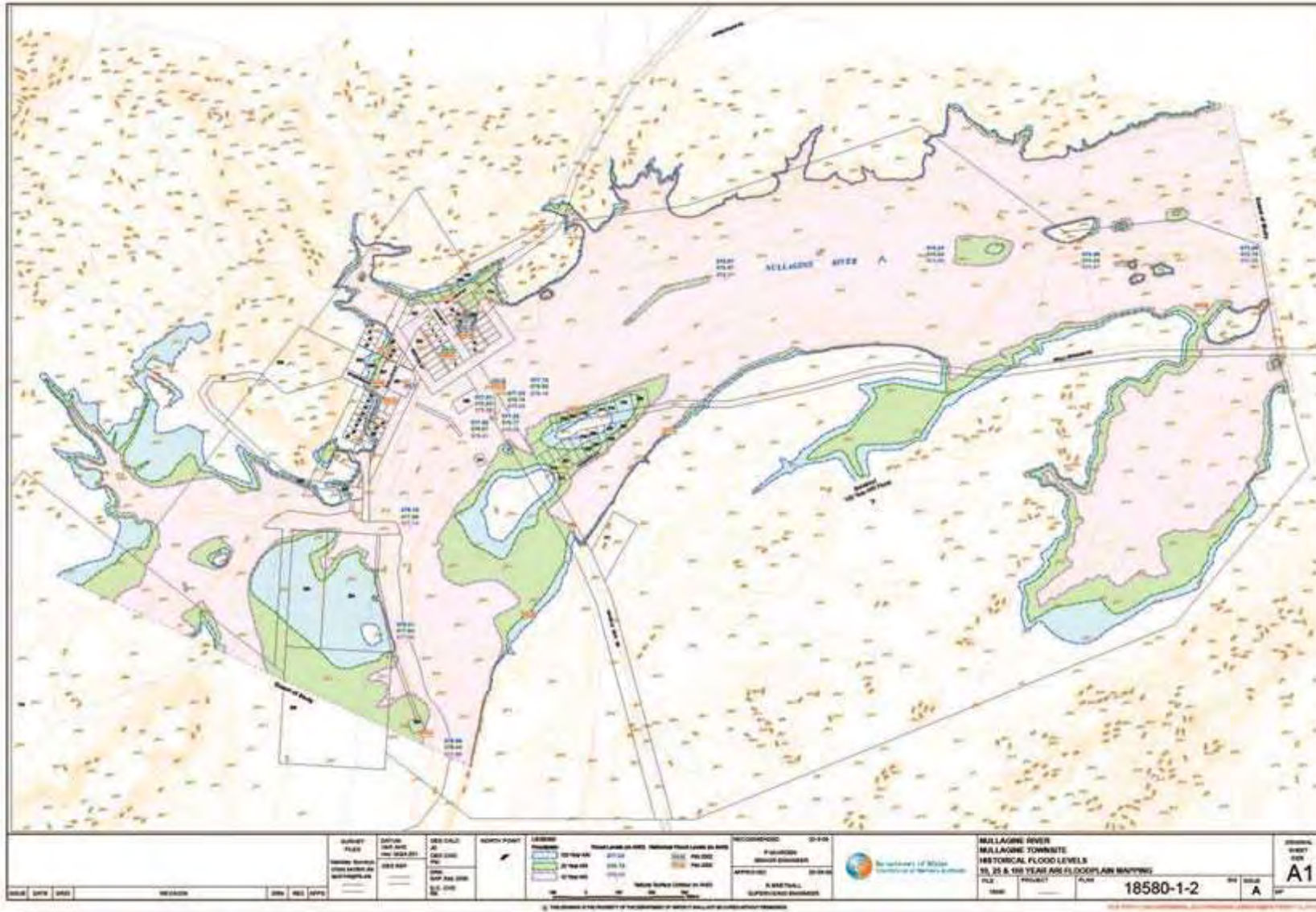


Figure 24: Flood Map Model, Nullagine Source: Golder and Associates, 2016

10.9. Wastewater

Information has been obtained from Water Corporation, Pilbara Planning and Infrastructure Framework (DATE) and the Newman Sewerage Treatment Plant: Expansion strategy for town population growth up to 18,000 (Sop, 2012).

Wastewater treatment is only relevant for Newman townsite. Wastewater in Marble Bar, Nullagine and areas surrounding Newman do not currently have access to the wastewater network. Wastewater for these areas is generally via onsite treatment by a septic tank and discharged on site by a leach drain.

Newman

Wastewater in Newman is transferred by a gravity network and pump stations that are operated by Water Corporation and then transferred to a Waste Water Treatment Plant (WWTP) to the north of Newman townsite which is owned and operated by the Shire. The treated effluent is used to irrigate recreational areas.

A planning review was conducted in 2013 by Rowcon Pty Ltd which found that the existing WWTP has a capacity to treat a population of approximately 9,500 people. Due to recent population fluctuations within Newman, the Shire has endorsed the expansion of the WWTP to 18,000 people. The expansion would involve upgrading the wastewater treatment system in parallel so that the existing WWTP could operate whilst the new plant is constructed.

In addition, Water Corporation has recently reviewed and updated its wastewater network planning for the town to take account of proposed new growth areas (including Development WA developments to the east and north-east of the town). These new subdivisions will require the construction of a new waste water pumping station and gravity sewers. Other known smaller development areas (e.g. Lot 1640 on the western edge of the town (as per Amendment No.20 of the Shire Planning Scheme) can be provided with wastewater services by the developer undertaking extensions from the existing sewer reticulation.

Marble Bar and Nullagine

Marble Bar and Nullagine manage wastewater private septic tanks and leach drains on each of the lots to treat and discharge of wastewater. There are no existing Water Corporation mains within the Towns. If any significant development was to occur within either Marble Bar or Nullagine, waste water could be treated in a similar method or by the use of an Anaerobic Treatment Unit (ATU) and sub-surface drippers.

10.10. Waste

A Waste Data Study for the Pilbara Region and Shire of Broome (Waste Authority, 2013) indicates that in 2011/12 a total of 659,816 tonnes of waste was generated across an area including the sub-catchments of:

- Onslow Sub-catchment Area;
- Tom Price Sub-catchment Area;
- Newman Sub-catchment Area; and
- Remote East Pilbara Sub-catchment Area.

The relevant sub-catchments for the Shire are the Newman Sub-catchment Area, located in the southwest of the Shire and including Newman and Nullagine; and the Remote East Pilbara sub-catchment area that

includes camp locations for employee camps associated with several significant hard rock mining operations. Across the Newman and Remote East Pilbara sub-catchments, a total of 117,302 tonnes of waste was generated (17.5% of total study area).

A summary of the treatment of waste generated within the Newman sub-catchment is summarised in Figure 56.

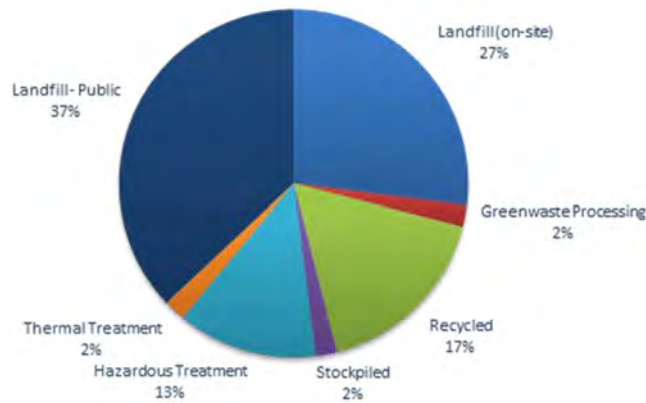


Figure 25: Treatment of Waste

The Waste Data Study for the Pilbara Region and Shire of Broome (Waste Authority, 2013) outlines the key waste management infrastructure located within the Newman Sub-catchment Area. Waste facilities in the sub-catchment are outlined in Table 13 and illustrated on Figure 56.

Table 13: Key Waste Management Facilities within the Newman Sub-catchment Area

Source: Waste Data Study for the Pilbara Region and Shire of Broome (Waste Authority, 2013)

NAME	OPERATOR
Nullagine Refuse Site	The Shire
Windell Refuse Site	The Shire
Nimingarra Iron Ore Mine	BHP
Mt Whaleback/ Orebody 29	BHP
Mining Area C	BHP
Yandi Iron Ore Mine	BHP
Orebody 18 Iron Ore Mine	BHP
Wheellarra Hill (Jimblebar) Iron Ore Mine	BHP
Orebody 23/25 Iron Ore Mine	BHP
Yarrie Project	BHP
Yandicoogina Operation	Rio Tinto
Mt Whaleback Mine Site	Nationwide Oil
Roy Hill Infrastructure Construction - Camp 2	Hancock Mining JV
Roy Hill Infrastructure Construction - Camp 4	Hancock Mining JV
Christmas Creek Iron Ore Mine	Fortescue Metals Group
Cloudbreak Iron Ore Mine	Fortescue Metals Group
Hope Downs Iron Ore Mine	Rio Tinto
Bamboo Creek Goldmine	Kitchener Mining

Within the Remote East Pilbara sub-catchment, a summary of the treatment of waste generated within the Remote East Pilbara sub-catchment is summarised on Figure 43.

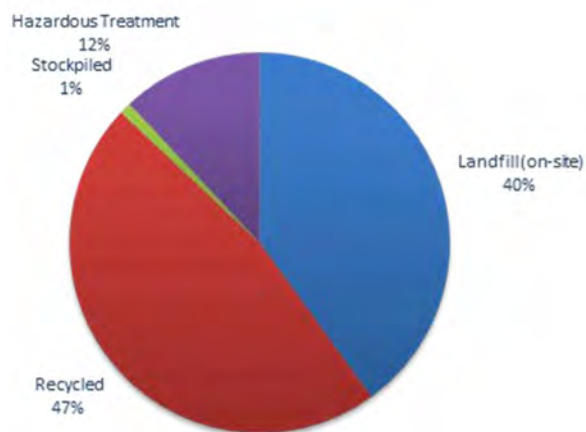


Figure 26: Treatment of Waste Generated in the Remote East Pilbara Sub- Catchment

The key waste management infrastructure located within the Remote East Pilbara Sub-Catchment is outlined in Table 14.

Table 14: Key Waste Management Facilities within the Remote East Pilbara Sub-catchment Area

NAME	OPERATOR
Woodie Manganese Project	Pilbara Manganese
Nifty Copper Operation	Aditya Birla Group

Anticipated growth in the region will result in waste generation reaching between 112,653 tonnes (low growth scenario) and 108,339 tonnes (high growth scenario) by 2020.

11. OPPORTUNITIES AND CONSTRAINTS

The analysis contained within this report has clarified a number of strategic opportunities and challenges for the Shire. These challenges are highly interrelated and need to be reflected as the underpinning elements for strategic planning, to achieve sustainable outcomes and progress. Whilst also a significant opportunity as an economic driver and growth stimulator, mining and resources activity is the fundamental factor underpinning these strategic challenges. This has been illustrated below.

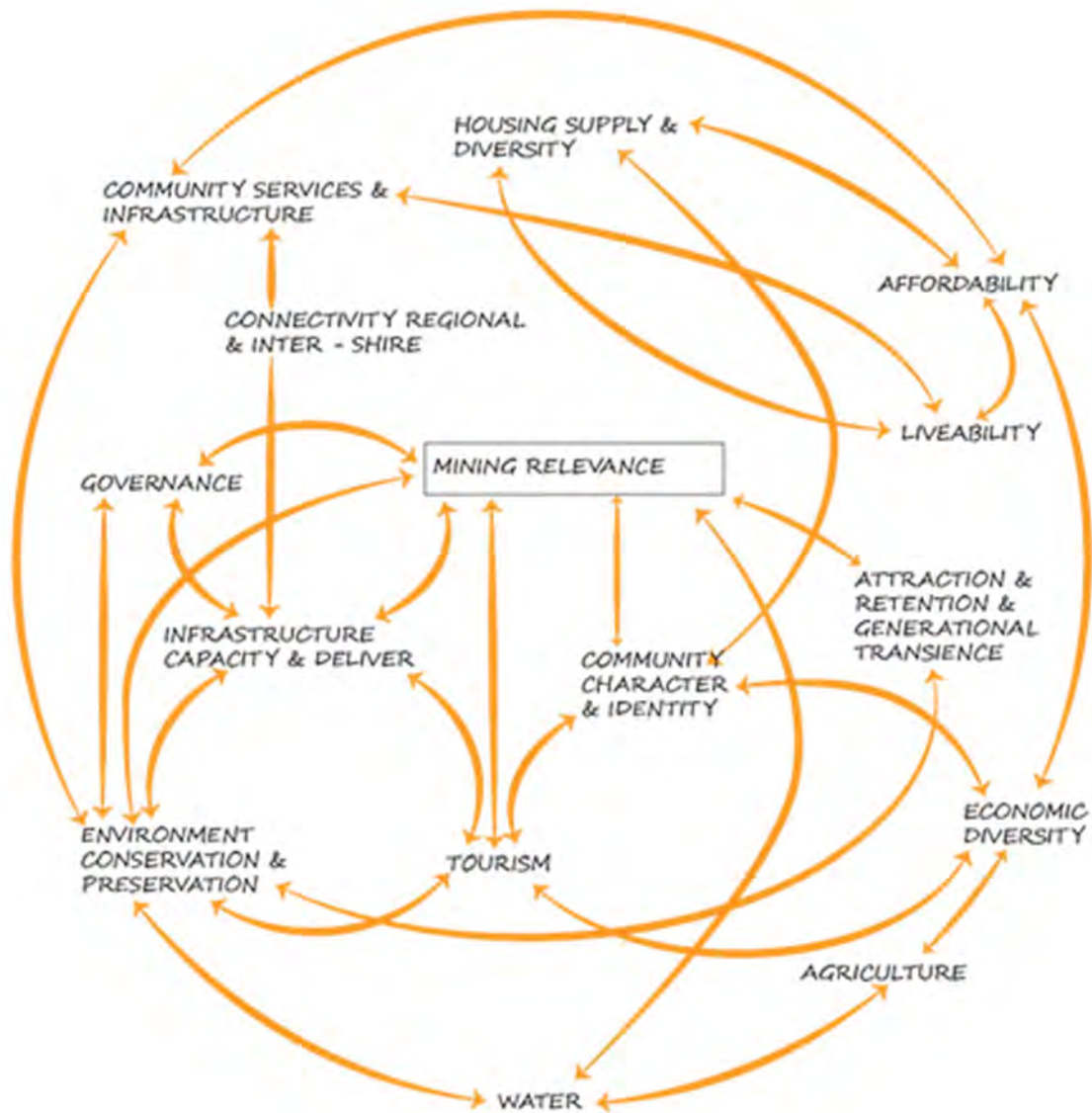


Figure 27: Opportunity and Constraints matrix

12.1. Population and Housing

Analysis of the demographic profile, future growth projections and housing environments have identified the opportunities and constraints detailed in Table 15.

Table 15: Population and Housing Opportunities and Constraints

Topic	
Housing availability and Affordability	There is a lack of information available to wholly understand the issues associated with housing availability and housing affordability, particularly in a highly changeable environment. Housing within Newman is considered unaffordable. There is a low level of home ownership and whilst rental figures are similar to other Pilbara towns, they are significantly higher than the Western Australian average. This has impacts for attraction and retention of people to Newman, community-building, community and economic diversity income and liveability polarisation and the ability to offer choice – across employment, services, retailing.
Newman Population growth	Newman experienced significant growth and change over the last decade. Recent population forecasting has identified that growth has slowed, reflecting economic conditions.
Transient population	The population in Newman is transient. Attraction to Newman and retention of people within Newman requires consideration.
Demographic gender composition	Newman has a male to female ratio of 3:1. This is a significantly higher ratio of men to women than the State and has implications for community infrastructure and service planning
Aboriginal and Torres Strait Islander composition	Newman has a concentration of residents from Aboriginal and Torres Strait Islander backgrounds. This has implications for community infrastructure and service planning.
Normalisation of Newman	Much of the housing stock within Newman is still owned by mining companies (predominantly BHP). Whilst normalisation of the housing is gradually occurring, the ownership arrangement impacts housing capacity analysis and housing affordability.
Housing supply	There is sufficient Crown land available to meet current and future demand, with identified sites. Housing supply needs to be commensurate with housing need. This includes ensuring that the delivery and mix of housing is reflective of the composition of the community. Disconnection between current supply and need will impact negatively on affordability and ultimately constrain the attraction and retention of people within Newman.

Government Housing incentives	Many Government agencies incentivise regional positions by providing housing as part of salary packaging. This has implications for housing affordability.
Marble Bar Contracting Populations	Population projections have identified that Marble Bar is likely to experience a contracting population.
Nullagine Stagnant Population	Population projections have identified that Nullagine is unlikely to experience any growth in population.

Planning Rationale

Newman will continue to develop as the primary regional centre, hosting approximately 10,400 persons by 2035, in the Shire with both Marble Bar and Nullagine considered as secondary centres.

Further research is required to identify the opportunities, constraints and requirements for the Shire; and any mechanisms to manage housing affordability issues. This may be in the form of a Housing Needs Assessment and Housing Strategy with appropriate in depth of research into the future provision of residential land to meet the revised projected population growth.

Strategies are required to improve the liveability and streetscape, particularly in East Newman, with a focus on encouraging land owners to re-invest in the area, increase surveillance and create a “sense of place” to assist foster pride in the community.

12.2. Economy and Employment

Analysis of the economic and employment profile have identified the opportunities and constraints detailed in Table 16.

Table 16: Economy and Employment Opportunities and Constraints

Topic	
Agriculture	<p>There are many opportunities for the increased investment into bolstering the Shires agricultural production. Agricultural land is at a premium and future impacts on food availability and food security will secure the agricultural regions importance into the future. The ability for the Shire to produce food and agricultural products to support the region as well as transport nationally and internationally is significant.</p> <p>Water and labour is a critical component of generating a strong agricultural industry. There is a significant opportunity to capitalise on the discharged water from mining activity to support agriculture. Agricultural land should be preserved in specific locations than enable efficient transfer and use of this reusable resource.</p>
Aboriginal Prospects	<p>Aboriginal Corporations in the Shire are currently developing opportunities for enterprise. This assists in increasing local employment, investment and Aboriginal engagement in the local job market.</p>
Newman	
<p>Economic Risk - Lack of Diversification</p> <p>Construction and Trade Workforce</p> <p>Logistics Hub</p>	<p>High reliance on mining results in a higher risk profile for the Shire with regard to economic security. If there are shifts in resourcing activity, this will have imp acts on the town. Increased diversity safeguards the town from being as highly susceptible to shifts and changes in the mining and resources economy.</p> <p>High reliance on mining utilises the construction and trade workforce from Newman and offers greater financial remuneration. As a result, availability of a construction and trade workforce for development in Newman is imp acted by worker availability and/or cost.</p> <p>Capitalise on the strategic location on key transport freight corridors through collocation of transport and logistics enterprise in Newman (including road freight and air freight) as a central hub that services the sub-region and mining and resource activities.</p>

Locate specific services in Newman	Opportunity to identify and locate key support services that are needed for mining and resource operations within Newman e.g. laundry facilities.
Marble Bar Economic Risk- Lack of key economic driver Tourism	Marble Bar lacks key economic generators required to sustain the town and stimulate growth. Marble Bar as a tourist base provides opportunity to add another economic generator for the town.
Nullagine Economic Risk- Lack of key economic driver	Nullagine lacks key economic generators required to sustain the town and stimulate growth.

Planning Rationale

Whilst Part One of this LPS does not specifically refer to stand alone strategies for Economy and Employment these can be located throughout Part One under various Headings. The LPS aims to increase land use zones across the Scheme which will result in greater land supply for various business activities thus increasing local employment. The land use zones include Agriculture, Tourist and Industrial zones.

Other land use and development barriers are prevalent in the Shire and can include extensive mining tenements and native title matters.

12.3. Retail and Commercial Land

Analysis of the retail and commercial environment have identified the opportunities and constraints detailed in Table 17.

Table 17: Retail and Commercial Opportunities and Constraints

Topic	
Newman Retail and commercial mix and diversity Small to medium sized enterprises	Retailing and commercial mix and diversity is stifled by affordability, proximity and connectivity for transport of goods and services, land allocation and a lack of retailing focus to support a vibrant retailing market. Opportunity to encourage / incentivise local retailing and commercial to expand product / services base where a market demand is identified. Opportunity is incentivise mobile service for retailing / services from Newman or surrounding major retailing and commercial hubs. Affordability imp acts the capacity for SME and small start-up enterprises or commercial activities.

Affordability	Retailing is impacted by the cost of goods and services due to transport time and costs.
Change in retailing Environment	Online shopping is having an impact on local retail and trade, as goods and services may be purchased online and often at a cheaper rate.
Fragmentation of activity	Fragmentation of commercial and retail areas also mean that a strong core or central heart is missing from Newman.

Planning Rationale

Further research is required to identify the opportunities, constraints and requirements for the Shire; and any mechanisms to improve the retail and commercial environment, particularly focusing on Newman as the primary Regional Centre.

This may be in the form of a Retail and Commercial Needs Assessment and Strategy with appropriate in depth of research into the future provision of commercial land to meet the projected population growth, diversity of economy and community requirement. There is a lack of information available to wholly understand the issues associated with retail and commercial needs and requirements for the Shire. The retailing and commercial environment is complex, particularly in a highly changeable environment.

Precinct Planning is also required to improve the aesthetics of all town centres and, at a minimum, should focus on climate sensitive built design, streetscape and improving visitor experience.

Amendment to the zones in accordance with the Regulations is required which will provide far greater land use and development flexibility, this is reflected in Part 1.

12.4. Industrial Land

Table 18: Industrial Land Opportunities and Constraints

Topic	
Newman Critical shortage of available industrial land supply	Industrial land servicing Liaise and advocate immediately for the release of additional industrial land supply. Negotiate Native Title claims to expedite such industrial land. There is no zoned general industrial land in the Shire. Industrial land supply needs to be integrated with infrastructure provision. Infrastructure delivery needs to be commensurate with development and growth of industrial precincts and not prohibitive to establishment of industrial enterprise.
Mining impinging on townsite	Manage to balance mining activity with other land uses, including impacts from mining operations.

Timely release of land	Infrastructure management Infrastructure is owned and managed by BHP. This is an issue for integrated planning of development and infrastructure including upgrades and transparency relating to infrastructure capacity and assurance around development capability.
Logistics hub	Development capability is restricted by slow land release processes. Capitalise on the strategic location on key transport freight corridors through collocation of transport and logistics enterprise in Newman (including road freight and air freight) as a central hub that services the sub-region and mining and resource activities. Consider surplus land at Airport Reserve subject to Airport Masterplan to ensure Airport in perpetuity.
Marble Bar	Extend Industrial land at existing Industrial Zone on the periphery of townsite/consider Airport Reserve surplus land.
Nullagine	Seek strategic industrial land site in close proximity to the townsite.

Planning Rationale

The identification and supply of industrial zoned land to the market is critical to meet the needs of the transport and mining service sector particularly. Whilst Development WA has traditionally responded to the market currently land strategically identified is the subject of native title implications.

Concern is raised that if the industrial land supply is not available in the short term, business will continue to locate outside of the Shire.

New Industrial zones will be identified in the review of the Local Planning Scheme in accordance with the actions identified in Part One of the LSP and will be consistent with the Regulations.

Further all townsites will benefit from the identification of strategically located sites for additional light industrial land use and in some cases the extension of existing light industrial areas is warranted making use of existing infrastructure.

It is desirable to locate land for general industry and freight/transport depot development along major freight routes or provide direct access to such, if possible.

12.5. Tourism and Visitors

Analysis of the tourism and visitor context have identified the opportunities and constraints detailed in Table 19.

Table 19: Tourism and Visitor Opportunities and Constraints

Topic	
Access	Many tourism sites are difficult to access due to challenging terrain. This is also an opportunity to market for more adventure travel tourism. Further visitors indicate that they would like higher end accommodation provision in the Pilbara generally. Land use planning framework is required to strengthen and facilitate development for tourism.
Infrastructure	Infrastructure, particularly transport and communications, does not support growth in the tourism market. Tourism drivers need to be supported with adequate infrastructure to encourage development in the market. Four wheel drive and mining tourism can generally be accommodated for immediately.
Newman Facilities	Many of the tourism accommodation facilities are at capacity due to mining related use (long term stays by non-tourists). This impacts the accessibility, affordability and attractiveness of Newman as a tourism destination. The Newman airport offers good access to the region.
Location and proximity to tourism features	There are many natural features within close proximity to Newman that are considered opportunistic for tourism. Newman is considered the “Eastern Gateway “to Karajini National Park.
Marble Bar Location and proximity to tourism features	Marble Bar offers many natural and historical features within close proximity to that are considered opportunistic for tourism. The town also offers good tourism accommodation and facilities.
Nullagine Location and proximity to tourism features	Nullagine offers many natural and historical features within close proximity to that are considered opportunistic for tourism. Existing facilities exist but need to be strengthened to support increased tourism draw.
Destination	However, Nullagine is currently not a well-known tourism destination. It offers a historical setting and caravan park facilities, but little other infrastructure.

Planning Rationale

Tourism is defined as being relatively undeveloped in the Pilbara. The Shire’s Scheme is also undeveloped in terms of including Tourism as a specific zone with associated provisions. In this regard, new Scheme provisions will provide for tourist zone and allow a greater variety of tourist land uses including short stay accommodation, chalets etc. .

12.5. Recreation and Open Space

Analysis of recreation and open space areas, including their location and accessibility, have identified the opportunities and constraints detailed in Table 20.

Table 20: Recreation and Open Space Opportunities and Constraints

Topic	
Preservation of National Parks	There is a need to preserve national parks and key open space areas. These uses are significant for tourists and the community, providing identity and character to the region.
Quality	The quality and practicality of open space and recreational areas is important rather than the volume of area assigned for recreational and open space purpose.
Accessibility	Accessibility to major recreational areas such as national parks is required to strengthen tourism and create increased recreation opportunities for residents. Improved infrastructure including, accessible roads and basic facilities at key locations is required.

Planning Rationale

There is a need to further develop a Recreation and Open Space hierarchy for all Recreation Reserves across the Shire.

12.6. Natural Resource Management-Environment

Analysis of environmental issues and opportunities have been outlined in Table 21.

Table 21: Environmental Opportunities and Constraints

Topic	
Water	<p>Water is a critical resource for the ongoing productivity of the region. Access to water and water availability should be a consideration for all development within the Shire to ensure that groundwater and surface water systems are not depleted and are preserved and conserved where possible. In most cases water allocations are determined by the Department of Water and Environmental Regulation and Environmental Regulation not the local government.</p> <ul style="list-style-type: none"> - Surface water sources are becoming increasingly unreliable due to changes in rainfall patterns. The majority of water is sourced from groundwater sources. Groundwater source protection from depletion is a major issue.

Flora and Fauna	<ul style="list-style-type: none"> - Mining activity is a significant user of water. Recycling and reuse strategies need to be considered to maximise water access and ongoing availability for the Shire. - There is a significant opportunity to capitalise on the discharged water from mining activity to support agriculture.
Mining Impact	<p>There are a number of significant fauna and flora species located within the Shire. Impacts to threatened and endangered species from mining and development may have a negative impact on the Shire's biodiversity and the ongoing sustainability of these species.</p> <p>Create dialogue to facilitate good environmental outcomes to ensure that the environmental and community values of the Shire are preserved and enhanced.</p>
Geomorphology	<p>The Shire contains a unique geomorphological environment. This provides significant value for indigenous communities and also presents an opportunity for tourism.</p> <p>Balancing the impacts of mining on the land and environment to minimise degradation of the unique landform is required.</p>
Coastal environs	<p>Department of Parks and Wildlife consider that the future management of Cape Keraudren is considered and plans are prepared that complement their management of the Eighty Mile Beach Marine Park and the coastal UCL proposed to be added to the conservation reserve system.</p> <p>The Fortescue Marshland and the Eighty Mile Beach Marine Park are areas of high conservation to be recognized in the LPS as Reserves for Conservation given they are areas of high conservation value.</p>
Floodplain - Nullagine	<p>Nullagine River Flood Study was undertaken in 2007 and confirms most of the townsite is situated within the 1 in 100 year floodplain. Recommendations from that Report (DWER) suggested that:</p> <ul style="list-style-type: none"> a) Any proposed development is located outside of the 100 year ARI floodplain, a minimum building floor level of 0.50 metre above the adjacent 100 year ARI level is recommended. b) For any proposed development within the 100 year ARI floodplain the DWER, (now DWER) will provide advice on each proposal based on its merits. Factors to be considered are depth of flow, velocity of flow, potential flood damage etc. If

	considered acceptable a minimum building floor level above the adjacent 100 year ARI flood level would be recommended.
--	--

Planning Rationale

Land use and development has the potential to negatively impact on biodiversity and ecological systems. At each planning stage consideration of potential impacts to natural resources will be given and where in house advice cannot be provided the Shire will refer those matters to the relevant State agency responsible for that portfolio.

The LPS however, will provide for a new “Environmental Conservation Zone” in its Scheme and include those areas identified as environmentally significant for inclusion such as the Fortescue Marsh and a portion of the Eighty Mile Beach (UCL) as identified by DPAW.

Alternatively, natural hazards can pose threats and include fire, floods, cyclones etc. and land use planning can assist minimize risk to people and property. The use of a Special Control Area that provides planning guidance for flooding in Nullagine townsite is considered a priority.

12.7. Community Facilities

Analysis of the community facilities provided across the Shire have identified the opportunities and constraints detailed in Table 22.

Table 22: Community Facilities Opportunities and Constraints

Topic	
Demonstrate need to attract and retain Ageing in the Pilbara	Opportunity to attract and retain people to the Shire through adequate connectivity and availability of required services and facilities. The resident population profile of the Pilbara is underrepresented in terms of residents aged 65 and over. This reflects the challenges of 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 resident population. Senior residents also provide important volunteer services within communities. There is opportunity relating to innovative service delivery options. Which can range from teleconferencing-based consultations with specialist and mental health experts, to virtual procedures and in-home outreach post- acute care should be explored for the Shire; and

Innovative Service Delivery	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.
Newman Schooling and Education	Whilst Newman has multiple schools, these schools lack a competitive advantage over those located in other areas. Raising the educational quality and broadening the opportunities available to students would provide an incentive for families to stay in Newman.
Tertiary education training	Newman lacks diversity and access to tertiary education and training. As a result, people seeking tertiary education opportunities leave Newman for other locations offering better tertiary education and training options.
Community Services	Lack of services and facilities as well of difficulties of attracting a workforce to be employed in the service industry / community sector is critical for a sub-regional centre. Specifically, these include health, education and recreational services, aged services and Aboriginal services.
Marble Bar and Nullagine	
Accessibility to community services	Increased accessibility and connectivity of the town to principal community services is important for the ongoing viability of the town and its community.
Community services	Attraction of a workforce to be employed in this sector in the town is critical. Specifically, these include health, education and recreational services, aged services and Aboriginal services.

Planning Rationale

Community infrastructure needs to be commensurate with the existing and projected community need. Planning for community facilities and services needs to be pre-emptive to attract and retain people to the area.

A comprehensive community infrastructure analysis is required and a review of associated land supply requirements. Duplication of facilities in townsites is not desirable. Identification of priorities for provision of community facilities provided by the Shire is generally represented in its Strategic Community Plan and Capital Works Budget (reviewed annually).

12.8. Rural Land Use

Analysis of the context surrounding rural land use, subdivision and future development have identified the opportunities and constraints detailed in Table 23.

Table 23: Rural Land Use, Subdivision and development Opportunities and Constraints

Topic	
Intensive Agriculture	There are many opportunities for bolstering agricultural production. The future of food availability and food security will become increasingly important for securing agriculture in the Shire. The ability to produce food and agricultural product to support the region as well as transport nationally and internationally is significant. Water and labour is a critical component of generating a strong agricultural industry. Government, subject to certain conditions, has supported possible conversion of pastoral lease to freehold tenure on the basis the land will be developed into a large scale irrigation project.
Rural Small Holdings	There are no small rural lots in the Shire to provide rural lifestyle opportunities.
Rural Residential	There is anecdotal evidence to suggest that rural residential lots may be a desired product.
Varied Agricultural/complimentary rural land pursuits	Limited opportunity for diversification of land uses on rural zone land under pastoral lease provisions, however alternated complimentary land uses should be supported, for example tourism where there is a destination of value to visit or a tourism experience to be had.
Renewable Energy	Currently renewable energies can be considered as a “Use Not Listed” in the Scheme. It is considered that Shire will continue to receive enquiry in relation to renewable energy projects based on its favourable climatic conditions and large land areas. Like isolated mining projects such developments may also consider a workforce village to support the renewable energy project- dependent on scale.

Planning Rationale

The Agriculture zone can provide adequate land mass for many land uses that are not necessarily agricultural pursuits. The LPS encourages the use of the agricultural zone for rural land uses and in some cases small scale complimentary tourist land uses. The pastoral industry is a historical use of rural land and there is increasing interest in intensive agriculture also.

Progressively the Shire is experiencing the location of infrastructure services and corridors on rural land. At this time the Environmental Protection Authority is assessing a proposal for a large a development

envelope of 662,400ha for renewable energy in the northeast of the Shire and an associated workforce village.

The provision of Rural Residential land will also be considered subject to appropriate land identification, demand and private investment where that land can be connected to, appropriate services primarily reticulated water. Rural Residential product will provide an alternate lifestyle option for those who want to live “out of town” and require larger lots for recreational lifestyle.

12.9. Heritage, Urban Design and Character

Analysis of the heritage, urban design and character of the three townsites have identified the opportunities and constraints detailed in Table 24.

Table 24: Heritage, Urban Design and Character Opportunities and Constraints

Topic	
<p>Newman Urban Form</p>	<p>The urban structure and form is reflective of its historical use as a mining town. Incremental growth has meant that the settlement is expansive and relatively unwalkable which together with extreme heat in summer conditions limits vibrancy and street life / activity.</p>
<p>Town Centre</p>	<p>It is anticipated that the Newman Town Centre will develop into a more integrated shopping and social area, accommodating a greater density and diversity of activities in a more efficient and attractive setting.</p>
<p>Public Amenities</p>	<p>There is a strategic need to implement a program to deliver much needed public realm enhancements and amenities at a townsite and Town Centre level, including: Enhanced movement networks for pedestrians and cyclists; Improvements to poor pedestrian amenity, where lack of pedestrian infrastructure is compounded by large areas of hot unshaded asphalt. Enhancement of public amenities (emphasis on climate responsive design) and improvement of public safety; and New entry statement to the Town Centre, provision of a new main street and continual enhancement of the Town Centre including superior landscaping which enhances sense of arrival.</p> <p>All public realm enhancements should be responsive to and designed relative to the energy, water and environmental limitations.</p>
<p>Commercial Development</p>	<p>Existing uses are not complementary to each other. Buildings are disconnected from the street edge and surrounded by large expanses of car parking. Existing development with the Newman Town Centre does not contribute to the local image or identity of Newman. The existing buildings do not enhance the streetscape appearance or facilitate the development of any local character.</p>

<p>Character and identity</p>	<p>Buildings lack design quality and a sense of permanence. Few buildings in the Town Centre exhibit a Newman style or local identity. Large expanses of black facades with limited relationship with the public realm contribute to a dull, arduous and harsh Town Centre experience. Limited diversity and inappropriate residential provisions for a Town Centre environment.</p> <p>Most houses were designed without consideration of climate responsive strategies. Responsive climatic design standards and requirements are needed to facilitate more sustainable building design.</p>
<p>Marble Bar</p> <p>Character and identity</p> <p>Aboriginal and cultural heritage</p> <p>Public Amenity</p> <p>Disused commercial and community facilities</p>	<p>Marble Bar has strong historic and cultural identity. This is a strength of the town and a drawcard for tourism.</p> <p>There is strong Aboriginal heritage within the Shire and there are several Aboriginal and cultural heritage sites. This heritage and culture provides opportunity to generate increased community identity and character and tourism interest.</p> <p>Poor pedestrian amenity and the lack of pedestrian infrastructure is compounded by large areas of hot unshaded asphalt.</p> <p>There are a number of existing areas which are not as well utilised as they could be, a number of community facilities in Marble Bar are currently closed or unused. The demise of these community facilities pose negative impacts on the broader aesthetic and character of the town. The following areas have been highlighted as key concerns:</p> <ul style="list-style-type: none"> • Old general store building and adjacent Pipunya facility have been closed, boarded up and left in a poor condition (ProspectUs Future directions for Marble Bar, Creating Communities 2010). • The telecentre communication and training facility for residents and visitors is inadequate in size. • The old school hostel and employment training workshop, another Pipunya facility, stands unused. <p>There is a disengagement of youth from organised sports and recreation this subsequently leads to the disuse of related amenities. Although the Shire is seeking to increase its capacity to staff and fund the planned activation of recreation facilities, they currently pose negative impacts and safety concerns to the area.</p>
<p>Nullagine</p> <p>Character and identity</p>	<p>Nullagine has strong historic and cultural history, this should be identified and enhanced within its urban form.</p>

Public Amenities	To be enhanced and provide climate appropriate design solutions for the urban realm.
------------------	--

Planning Rationale

The LPS raises the requirement for climate sensitive design to respond to the Pilbara climate, particularly the summer heat. There are many proposed strategies in Part 1 that will be continual and ongoing subject to budgetary constraints, to provide guidance on improving and preserving urban design.

The heritage of the Shire cannot be understated and is home to some of the oldest landforms and cultures in the world, which define the unique character of the area. The LPS will aim to include a Heritage List in accordance with the Regulations to protect the highly regarded heritage in the Shire.

12.10. Transport

Analysis of transport within the Shire has identified the opportunities and constraints detailed in Table 25.

Table 25: Transport Opportunities and Constraints

Topic	
General	Transport is heavily dominated by vehicle transport, including heavy vehicles. Regional roads are under the statutory control of MRWA inclusive of management and maintenance. I.e. Great Northern Highway.
Demand Management	Opportunities to implement demand management programs that seek to change usage behaviours and deliver greater efficiency benefits for existing infrastructure. This is relevant to active transport up-take, car parking and driver behaviour.
Roads and Traffic including Freight	<p>Safety - Road Sealing is considered safe and efficient. Unsealed roads may have higher ongoing maintenance costs.</p> <p>Increased demand - Increased demand on major transport routes will impact safety, efficiency and reliability of the regional road network. Increased traffic generation on Marble Bar Road. Resealing of key corridors is important for safety, connectivity and economic growth. Increases in conflict between regional resource / freight traffic and local traffic associated with townsites, particularly at peak periods.</p> <p>Reliability and connectivity - Flooding of the road network effects reliability and connectivity, this is particularly important for ensuring connectivity to and between townsites and Aboriginal settlements.</p> <p>Funding - Lack of funding for road maintenance and improvements</p> <p>Connectivity – Productivity of the shire is reliant on connectivity and access between Pilbara towns and access to remote Aboriginal settlements.</p>

Rail	<p>Privatisation - Rail transport within the Shire is predominantly privatised for mining operations. As a result, achieving access for other users is constrained.</p> <p>Capacity - due to privatisation of railways, shifts in mining activity and economic prospects; as well as a lack of transparent information, the long term rail capacity needs are unclear.</p> <p>Safety - At grade crossings pose safety risk.</p> <p>Barriers - Rail corridors create barriers and have potential for land-use separation and land alienation.</p>
Air transport	<p>Newman Airport is at capacity. This restricts transport of goods, services and people into and out of Newman.</p> <p>Marble Bar Airport usage may increase with servicing, subject to Airport Masterplan and demand study.</p>
Active Transport	<p>There is not currently a high use of active transport modes (e.g. walking, cycling, running). This is in part is linked to the long distances involved between home and workplace for many as well as the climatic harshness in the summer months.</p>
Public Transport	<p>Public transport is currently minimal across the Shire. Funding of existing public transport is inadequate to meet actual costs and therefore additional subsidy is required from the Shire.</p>
Logistics Hub	<p>Capitalise on the strategic location on key transport freight corridors through collocation of transport and logistics enterprise in Newman (including road freight and air freight) as a central hub that services the sub-region and mining and resource activities.</p>

Planning Rationale

Airport

The development of a business/freight logistic hub near the Newman airport has been a long standing proposal in order to meet the needs of business in the area. An Airport Masterplan is being prepared which will indicate the land suitable for such purpose subject to all future airport land uses being considered.

Development at the Marble Bar Airport is considered desirable for a potential terminal service in the future and may provide an opportunity for greater mining/commercial use.

Road

The sealing of Marble Bar road is considered a priority as it will provide markedly improved year round access for all users including tourists, freight transporters and the local community. It has been identified as being unsafe and impassable throughout flooding episodes.

Pedestrians/Cyclists

The existing network does not encourage active transport alternatives through designated routes and end of trip facilities, however the topography of the network provides opportunity for active travel alternatives if the distance and climate factors can be overcome.

12.11. Infrastructure

Analysis of transport within the Shire has identified the opportunities and constraints detailed in Table 26.

Table 26: Infrastructure Opportunities and Constraints

Topic	
Aging Infrastructure	Services infrastructure across the Shire is aging and the functional life expectancy of assets is unknown.
Sustainable Infrastructure	Opportunities to deliver sustainable alternatives to servicing infrastructure to provide greater efficiency, minimize whole of life infrastructure costs and provide positive environmental, social and economic outcomes. For example (but not limited to): Stormwater harvesting and grey water reuse. Renewable Energy infrastructure. Precinct-based infrastructure such as cogeneration for major redevelopment areas and industrial developments.
Demand Management	Opportunities exist to implement demand management programs that seek to change usage behaviours and deliver greater efficiency benefits for existing infrastructure. This is specifically relevant for water use, power use and waste.
Gas	No residential gas supply.
Telecommunications	Limited connectivity along long distances of main highways between towns. No mobile coverage for other telecommunications providers other than Telstra outside of Newman.
Waste Disposal	Opportunities exist for recycling and reuse of waste generated. Need to survey remaining landfill areas and identify expansion areas/new sites if required.
Newman Water	Ownership - BHP owns and operates the bores, treatment and other bulk water transfer for Newman.

<p>Power</p> <p>Telecommunications</p> <p>Drainage</p> <p>Wastewater</p>	<p>Opportunity to relinquish water treatment to Water Corporation, pending ability to manage licencing and asset separation. Adequate capacity for growth - New water treatment facility (2016) has capacity to support a population of 15,000 people. Additional connections for significant development will require upgrades and capital expenditure for water distribution and reticulation system.</p> <p>Ownership - BHP is the supply authority for Newman and adjacent mines. New Yammina gas fired power station will provide additional power capacity Transmission, distribution and generation network is close to capacity. Significant new development will require upgrades to the network. Opportunity to find additional supply in the network through incremental replacement of aging infrastructure.</p> <p>Newman is well connected with ADSL2+, 4G and NBN (in some locations). There are fluctuations in accessibility due to peak demand. Peak demand periods are linked to mining shift end periods.</p> <p>Areas of Newman are prone to localised flooding within a 5 year rainfall event. Upstream catchment and culvert capacity issues imp acts proposed development areas. Culvert capacity is inadequate under the Great Northern Highway.</p> <p>The current WWTP inlet can screen flows at up to 60L/s, which is not sufficient for the current inflows received at 68L/s. WC have recently completed upgrades to their pump station to allow for their planned maximum capacity of 187L/s. The proposed works will upgrade the screen to account for flows up to 100L/s and will have the ability to be expanded to 200L/s in the future, accounting for the WCs planned maximum capacity.</p> <p>The project proposal has been spilt into Stage One and Two. Stage One consists of a \$6.26 Million Dollar upgrade for the 2019/2020 financial year to maximise future benefits and mitigate ongoing risks.</p>
<p>Marble Bar</p> <p>Water</p> <p>Telecommunications</p> <p>Wastewater</p>	<p>Additional capacity on the water licence. Lack of reliable data on water infrastructure capacity and condition. Service is only provided by Telstra and NBN Satellite available. Wastewater is managed through private septic facilities and leach drains.</p>
<p>Nullagine</p> <p>Water</p> <p>Telecommunications</p>	<p>Water usage is close to available water supply. New development would require investigations into upgrades. Lack of reliable data on water infrastructure capacity and condition. Service is only provided by Telstra and NBN satellite available.</p>

Drainage	Drainage is a significant issue, with flooding imp acting access to the town and isolating properties.
Wastewater	Wastewater is managed through private septic facilities and leach drains.

Planning Rationale

In most cases service infrastructure is provided for by servicing authorities, as defined by the Economic Regulation Authority. In some situations it is the Shire or BHP providing core service. However evident is the need to ensure that the level of infrastructure in the Shire is commensurate with the needs of the community and in this regard, it will be reflected in the Shires Asset Management Plans. Other Infrastructure provided be developers and ultimately inherited by the Shire will consider whole of life cycle costs and be designed generally in accordance with Australian Standards, to the satisfaction of the Shire.