

# ON OUR HORIZON

Profiling nine of the major projects planned in the Shire of Carnarvon and their impact on population and services



# Project pipeline

**On our horizon** profiles the pipeline of nine major projects planned in the **Shire of Carnarvon** over the next ten years to understand their enduring impact on Carnarvon's social services including housing, education, childcare, health, justice, and air services.

The nine major projects **on our horizon** will:

- create new jobs
- attract new population to Carnarvon
- benefit local businesses and encourage new businesses to establish to service the construction and operation phases of the projects and to cater for the new population attracted by the projects.

2022

## **NINGALOO REEF RESORT STAFF ACCOMMODATION VILLAGE**

### **RAC**

The \$8.6 million accommodation village will house key service workers employed in Coral Bay's tourism sector. The village will take 6 months to construct and will create 100 construction jobs.

2022

## **GASCOYNE FOOD BOWL**

The creation of 278ha of horticultural land will boost the Carnarvon horticulture district by almost one quarter. Table grape producer Fruitco; local melon producer Durmo Quality Produce; and vegetable grower 4 Ways Fresh will develop the land with the first production expected in late 2022. The project will represent around 37 local jobs as well as 240 seasonal jobs.

2022

## **YANGIBANA RARE EARTHS PROJECT**

### **Hastings Technology**

The \$658 million Yangibana rare earths project is located 250km north east of Carnarvon. Construction is expected to begin late 2022 requiring 500 construction jobs over two years. Production is scheduled for 2024 and will require more than \$200 million per annum of expenditure and ongoing employment of 250 staff.

MID  
2023

## **NINGALOO REEF RESORT**

### **RAC**

The upgrade of the Ningaloo Reef Resort will require \$40 million of construction spending over two years and will provide jobs for 250 workers. At peak times, there will be 55 staff required to run the resort who will be housed in the accommodation village.

ESTIMATE  
2023

## OLD JUSTICE PRECINCT REVITALISATION

### DGCorp

In a prime location, overlooking the Fascine, the Old Justice Precinct site is set to be redeveloped into a mixed use residential, retail, and commercial area known as The Pier. It will employ around 100 construction workers and 40 workers in operation.

ESTIMATE  
2024

## CARNARVON BARGE LOADING FACILITY

### Stratland investments

The planned \$10 million barge loading facility will cater for projects in the Gascoyne region and parts of the Pilbara and Mid West regions. Construction will create 20 local jobs and a further 20 local workers will be required to maintain the facility.

MID  
2025

## GREEN HYDROGEN PROJECT

### Province Resources

The HyEnergy renewable energy project plans to take advantage of Carnarvon's optimum climate. The project will be located on development sites adjacent to town and will supply renewable hydrogen to the export and domestic markets. It will be a major employer requiring a peak of 4,000 construction workers and around 1,500 operations staff.

ESTIMATE  
2026

## BABBAGE ISLAND RESORT

### Halsall & Associates

The planned phased development of accommodation units, caravan park and camping ground at Babbage Island in Carnarvon will create 332 accommodation sites as well as resort style facilities creating around 100 construction jobs and 40 ongoing operations jobs.

ESTIMATE  
2028

## GNARALOO GREEN ENERGY

### Fortescue Future Industries

Fortescue Future Industries is currently investigating a green hydrogen project including a renewable energy generation hub comprising wind turbines and infill solar arrays, and nearby port facilities. It represents as many as 4,000 construction workers and around 1,500 jobs in its operation phase.



The Shire of Carnarvon acknowledges and respects the Yinggarda (Carnarvon) and Baiyungu (Coral Bay) as the traditional custodians of the lands where we live and work. We pay our respects to Elders, past, present and emerging. The Shire of Carnarvon is committed to honouring the traditional custodians' unique cultural and spiritual relationships to the land, waters and seas and their rich contribution to society.



# What does this mean for the Shire of Carnarvon?



- From 2022 to 2032, the nine major projects **on our horizon** will deliver:
  - capital spending of over \$30 billion, and
  - 9,000 construction jobs with peak construction in 2029.
- Operations staff will be required from 2022 and by 2032 over 3,500 enduring operations jobs will be created.
- The project proponents indicate a preference for locally based employees. This means that at the peak workforce demand in 2029, there will be an additional 600 construction and nearly 200 operations workers and their families living in the Shire.
- By 2032, with all nine major projects in operation, as many as 400 operations workers and their families will be new residents to Carnarvon increasing the population of the Shire by 750 people.

Based on this snapshot of the nine major projects on our horizon, conservative future population estimates will place additional demand on social services and infrastructure in the Shire of Carnarvon.

## ● CHILDCARE

Requirement for a further **55 childcare places** to meet the State average for childcare provision.

## ● EDUCATION

A further 80 kindergarten to year 12 children attending schools in the Shire requiring around **four new primary and two new secondary teachers**.

## ● HOUSING

Demand for updated housing stock and an **additional 350 dwellings** in Carnarvon over and above those planned for the Shire over the next ten years and including those needed for government employees.

## ● AIR SERVICES

Creating demand for an **additional 26 commercial flights between Perth and Carnarvon** each year to maintain the current inbound passenger to population ratio in the Shire.

Other developments planned in the Shire will place further pressure on social services and infrastructure

## ● HEALTH

A need for around **four to five new hospital beds, one new GP, and one new GP nurse** to maintain current health to population ratios in the Shire.

## ● POLICE

The need for **another four to five police officers** to maintain the current population to police ratio in the Shire.

15 August 2022

Report to Shire of Carnarvon

# On Our Horizons

The impact of nine major projects on the Shire of Carnarvon



## About ACIL Allen

ACIL Allen is a leading independent economics, policy and strategy advisory firm, dedicated to helping clients solve complex issues.

Our purpose is to help clients make informed decisions about complex economic and public policy issues.

Our vision is to be Australia's most trusted economics, policy and strategy advisory firm. We are committed and passionate about providing rigorous independent advice that contributes to a better world.

### Suggested citation for this report

Hodby, Antonia and Roberts, Marshall (2022), On Our Horizons: the impact of major projects on the Shire of Carnarvon, ACIL Allen

**Reliance and disclaimer** The professional analysis and advice in this report has been prepared by ACIL Allen for the exclusive use of the party or parties to whom it is addressed (the addressee) and for the purposes specified in it. This report is supplied in good faith and reflects the knowledge, expertise and experience of the consultants involved. The report must not be published, quoted or disseminated to any other party without ACIL Allen's prior written consent. ACIL Allen accepts no responsibility whatsoever for any loss occasioned by any person acting or refraining from action as a result of reliance on the report, other than the addressee.

In conducting the analysis in this report ACIL Allen has endeavoured to use what it considers is the best information available at the date of publication, including information supplied by the addressee. ACIL Allen has relied upon the information provided by the addressee and has not sought to verify the accuracy of the information supplied. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Unless stated otherwise, ACIL Allen does not warrant the accuracy of any forecast or projection in the report. Although ACIL Allen exercises reasonable care when making forecasts or projections, factors in the process, such as future market behaviour, are inherently uncertain and cannot be forecast or projected reliably.

This report does not constitute a personal recommendation of ACIL Allen or take into account the particular investment objectives, financial situations, or needs of the addressee in relation to any transaction that the addressee is contemplating. Investors should consider whether the content of this report is suitable for their particular circumstances and, if appropriate, seek their own professional advice and carry out any further necessary investigations before deciding whether or not to proceed with a transaction. ACIL Allen shall not be liable in respect of any claim arising out of the failure of a client investment to perform to the advantage of the client or to the advantage of the client to the degree suggested or assumed in any advice or forecast given by ACIL Allen.

# Contents

1	Introduction	5
1.1	Methodology	5
1.2	Acronyms and definitions	6
1.3	Report structure	6
2	Major projects on our horizon	7
2.1	Carnarvon Fruit Bowl	7
2.2	Yangibana Rare Earths Project	8
2.3	Ningaloo Reef Resort and accommodation village	9
2.4	Carnarvon Barge Loading Facility	9
2.5	Babbage Island Resort	10
2.6	Old Justice Precinct: The Pier	11
2.7	Gnaraloo Green Hydrogen Project	11
2.8	HyEnergy™	12
2.9	Aggregated demand for employment	12
2.10	Impact on the workforce in the Shire of Carnarvon	13
2.11	Impact on demographics	14
2.12	Impact on population	15
3	Social services and infrastructure	17
3.1	Assumptions	17
3.2	Infrastructure limitations	18
3.3	Housing	18
3.4	Health	19
3.5	Education	20
3.6	Child care	20
3.7	Policing	21
3.8	Air services	21
A	Image sources	A-1
B	Methodology: Population multipliers	B-1
B.2	Source data	B-4
Figures		
<b>Figure 2.1</b>	Major projects: demand for employment: construction, operation, and seasonal workforces: full time equivalent jobs (FTE)	13
<b>Figure 2.2</b>	Employment and Unemployment: Shire of Carnarvon: number of persons	13
<b>Figure 2.3</b>	Demand for locally based workforce: major projects: construction, operation, and seasonal workforces: full time equivalent jobs (FTE)	14
<b>Figure 2.4</b>	Current and future demographic profile: Shire of Carnarvon: number of persons	15
<b>Figure 2.5</b>	Population and population growth: Shire of Carnarvon	16

# Contents

Tables		
<b>Table 1.1</b>	Acronyms	6
<b>Table 2.5</b>	Key characteristics: Carnarvon Fruit Bowl	7
<b>Table 2.1</b>	Key characteristics: Yangibana rare earths project	8
<b>Table 2.3</b>	Key characteristics: Ningaloo Reef Resort and accommodation village project	9
<b>Table 2.4</b>	Key characteristics: Carnarvon Barge Loading Facility	10
<b>Table 2.6</b>	Key characteristics: Babbage Island Resort	10
<b>Table 2.7</b>	Key characteristics: The Pier	11
<b>Table 2.2</b>	Key characteristics: Gnarlou Green Hydrogen project	11
<b>Table 2.8</b>	Key characteristics: HyEnergy project	12
<b>Table 2.9</b>	Assumed age profile of new employees	14
<b>Table 2.10</b>	Population multipliers, by age group	15
<b>Table B.1</b>	List of data sources	B-1
<b>Table B.2</b>	Distribution of employed individuals, per 100 new employees, no rounding applied	B-2
<b>Table B.3</b>	Distribution of partners, by age, per 100 new employees, no rounding applied	B-2
<b>Table B.4</b>	Distribution of dependent children, by age, per 100 new employees, no rounding applied	B-3
<b>Table B.5</b>	Distribution of children by education stage, children of partnered families, by age, per 100 new employees, no rounding applied	B-3
<b>Table B.6</b>	Distribution of children by education stage, children of unpartnered families, by age, per 100 new employees, no rounding applied	B-3
<b>Table B.7</b>	Summary of population inflows, per 100 new employees, by age category	B-4
<b>Table B.8</b>	Summary of population multipliers, by age category	B-4
<b>Table B.9</b>	Age by MDCP Social Marital Status, Western Australia (1.00 = 100%)	B-4
<b>Table B.10</b>	Age by FMCF - 1 Digit Level, Western Australia (1.00 = 100%)	B-5
<b>Table B.11</b>	Age by CDCF Count of Dependent Children in Family, Couple family, Western Australia (1.00 = 100%)	B-5
<b>Table B.12</b>	Age by CDCF Count of Dependent Children in Family, One parent family, Western Australia (1.00 = 100%)	B-6
<b>Table B.13</b>	Distribution of children by educational institution attendance, assumed for Western Australia (1.00 = 100%)	B-6
Boxes		
<b>Box 1.1</b>	Data and information disclaimer	5



# Introduction

# 1

There is a pipeline of major projects planned for the Shire of Carnarvon in the tourism, mining, agriculture, aquaculture, housing, retail, food and beverage, and infrastructure sectors over the decade from 2022 to 2032. The construction of these projects is expected to get underway mid-2022 and extend through to 2031 providing transformational benefits to the Shire in terms of jobs, business opportunities and the attraction of new permanent population. The On Our Horizon report profiles a selection of nine of the major projects in the pipeline to examine their impact on social services and infrastructure in the Shire of Carnarvon noting that there are other projects which will also provide new employment opportunities in the Shire and place even more pressure on social infrastructure.

## 1.1 Methodology

Consultation was undertaken with the proponents of the nine major projects to understand their key characteristics in terms of their construction and operation phases including:

- Timing
- Employment
- Spending
- Local content targets for spending and employment.

Where proponent information was not available, it was supplemented by publicly available information or informed estimates.

### Box 1.1 Data and information disclaimer

The information contained in this report are best estimates as of July 2022 based on information supplied by proponents, published in the public domain, and assumptions made by stakeholders with some knowledge of the projects. The information may change due to changes in investment decisions by proponents. The information contained in this report should therefore be used as a guide only and should not be relied on.

*Source: ACIL Allen*

This information describing the major projects was aggregated to form a timeline of projected employment including an estimate of the staff that could be located in Carnarvon during the construction and operation phases of the projects. A standard household profile for Western Australia was applied to understand the likely impact on the population of Carnarvon and its demographic profile.

A review of the key social services and infrastructure in Carnarvon was undertaken to their capacity to cater for additional population demand. This analysis was compared with the projections of population and demographics to identify what additional social services and infrastructure would be required in the town to cater for the additional population.

## 1.2 Acronyms and definitions

---

The key acronyms and definitions used in this report are presented in **Table 1.1**.

**Table 1.1** Acronyms

Acronym	Meaning
FTE	Full time equivalent employee
ha	hectare
mtpa	Million tonnes per annum
t	tonnes

*Source: ACIL Allen*

## 1.3 Report structure

---

Chapter Two of this report profiles the nine major projects on our horizon and they key characteristics along with a summary of their aggregated impact. Chapter Three profiles the key social services and infrastructure including its current capacity and its ability to absorb additional population.

# Major projects on our horizon

# 2

This chapter describes the pipeline of major projects on the Shire of Carnarvon's horizon including a brief description of the project and its key spending and employment characteristics. Note that all employment in this chapter is presented in full time equivalent jobs unless otherwise stated. A full time equivalent job is the aggregation of all part time and full time jobs expressed as the equivalent of a full time job.

## 2.1 Carnarvon Fruit Bowl



The Gascoyne Food Bowl Initiative is a State Government initiative designed to increase horticultural production in Carnarvon by providing new land and water resources for irrigation expansion. An outcome of the project is the development of 278 hectares (ha) of horticultural land known as the Carnarvon Fruit Bowl that will boost the Carnarvon horticulture district by almost one quarter. Three producers have been awarded the rights to develop the land including:

- Fruitico, a large table grape producer based in the Peel region who has plans to spend \$25 million to develop 219 ha of land for the production of table grapes. The project is likely to require the hire of up to 25 permanent employees including a Farm Manager, Administrative Assistant, Agronomist and twenty farm labourers. Up to 200 seasonal workers will be required to prune vines and harvest grapes with these workers only required for parts of the year.
- Durmo Quality Produce, a local melon producer based in Carnarvon has plans to expand their production of watermelons and rockmelons by approximately 20 ha. It is assumed that the additional production will result in the employment of six additional full time equivalent staff once the project has reached full operation, as well as seasonal workers required to plant and harvest the melons with two growing seasons assumed.
- 4 Ways Fresh, a South Australian company with horticulture operations in Geraldton has plans to develop 40 ha of land for the production of vegetables including capsicum, eggplant, tomatoes, and zucchini. The company will employ a Farm Manager, six full time employees and around 30 seasonal employees to assist with planting and harvesting once full operation has been reached.

The Carnarvon Fruit Bowl project will represent significant local job creation particularly during the peak times associated with planting, pruning, and harvesting. Once all three projects are operating at full production, it is estimated that around 37 permanent jobs will be created along with 240 jobs that are likely to last for several months during peak planting, pruning, and harvest periods. It is likely that all new employees will represent new population in Carnarvon with project proponents making use of government schemes to address labour shortages in the agriculture industry such as the Pacific Australia Labour Mobility (PALM) scheme, and the Australian Agriculture Visa Program. The estimated labour requirements of the project are presented in **Table 2.1**.

**Table 2.1** Key characteristics: Carnarvon Fruit Bowl

	Total	Carnarvon local content	Local content share
Construction workforce	Peak of 35	Peak of 35	100%

	Total	Carnarvon local content	Local content share
Permanent operations workforce	37 per annum	37 per annum	100%
Seasonal workforce	240 per annum during peak periods only	240 per annum during peak periods only	100%

Source: 4 Ways Fresh, DPIRD, WA Business News, ACIL Allen

## 2.2 Yangibana Rare Earths Project



The Yangibana Project is a significant rare earths project located 250 kilometres north east of Carnarvon which will produce a mixed rare earths carbonate rich in Neodymium and Praseodymium that are critical materials used in the manufacturing of permanent magnets found in new technology products including electric vehicles, renewable energy wind turbines, and electrical consumer products. The project is designed to mine one mtpa of ore for processing at an on site processing plant producing up to 15,000t of mixed rare earths carbonate per annum.<sup>1</sup>

Construction is planned to commence in late 2022 and will require \$658 million of capital spending. It is expected to require a workforce of around 500 personnel over the two year construction period with the peak of construction occurring during 2023 when 250 personnel will be located on site. Hastings Technology Metals as the developer has plans to spend as much as possible of the total capital cost with local businesses in the Shire of Carnarvon including on consumables and services. Local employment will be targeted during construction and it is estimated that up to 50 personnel will be employed locally depending on the availability of suitably qualified labour.

During operation, around 250 employees will be required with the company targeting locally based employees. For the purposes of this report, it has been assumed that around 22 employees will be based in Carnarvon whilst others will be housed in an on site accommodation village. Carnarvon will be a charter stop enroute to the Yangibana site during construction and operation providing the opportunity to maximise local employment.

The key spending and employment characteristics of the Yangibana rare earths project are presented in **Table 2.2**.

**Table 2.2** Key characteristics: Yangibana rare earths project

	Total	Carnarvon local content	Local content share
Capital spending	\$658 million		Less than 10 per cent
Construction workforce	500 over two years	Peak of 18	Working with TAFE to allow workforce to be job ready
Operations spending	More than \$200 per annum		Less than 10 per cent
Operations workforce	220 per annum	Around 17 per annum	Less than 10 per cent

Source: Hastings Technology Metals and ACIL Allen

<sup>1</sup> Hastings Technology Metals Ltd (2017), Yangibana Project Definitive Feasibility Study Executive Summary, Hastings Technology

### 2.3 Ningaloo Reef Resort and accommodation village



This project is comprised of two parts. The first is the construction of an accommodation village which is designed to house the workforce required to develop the Ningaloo Reef Resort and its workforce once it is operational. The second phase of the project is the upgrade and development of the resort to become a four star family beach resort.

The construction of the accommodation village is expected to cost around \$8.5 million and will require a peak workforce of around 100 workers of which around 10 will be sourced from the Shire. The upgrade of the Ningaloo Reef Resort will require \$40 million of construction spending over two years and will provide jobs for 250 workers.

Once operational, the resort will require an average of 40 workers with a further 15 staff required during peak times. Most staff are expected to be housed in the accommodation village. It is expected that around 25 permanent staff could be located permanently in Carnarvon.

The key spending and employment characteristics of the Ningaloo Reef Resort and accommodation village project are presented in **Table 2.3**.

**Table 2.3** Key characteristics: Ningaloo Reef Resort and accommodation village project

	Total	Carnarvon local content	Local content share
Accommodation village			
Capital spending	\$8.5m	\$0.63m	Less than 10 per cent
Construction workforce	100 over two years	Peak of 10	10 per cent
Ningaloo Reef Resort			
Capital spending	\$40m	\$3.00m	Less than 10 per cent
Construction workforce	250 over two years	Peak of 10	10 per cent
Operations workforce	Average 40 per annum	Around 25 per annum	10 per cent

Source: RAC and ACIL Allen

### 2.4 Carnarvon Barge Loading Facility



A study to examine the pre-feasibility of a barge loading facility in Carnarvon is currently underway with the aim of providing bulk loading facilities to service major projects proposed or planned for the Shire of Carnarvon and surrounds including renewable hydrogen projects.<sup>2</sup> The facility will provide current and future projects with access to reliable, cost-effective marine infrastructure to facilitate the movement of goods into and out of the Gascoyne region and nearby areas of the Pilbara and Mid West regions.

As the project is currently at pre-feasibility stage, there is no publicly available data describing it. For the purposes of this report, it is assumed that it would be constructed over 24 months commencing in mid-2024 so that it is operational prior to the commencement of major projects including the Gnaraloo and Green Energy hydrogen projects and the Babbage Island tourism development.

<sup>2</sup> <https://www.mediastatements.wa.gov.au/Pages/McGowan/2022/02/Carnarvon-barge-loading-study-paves-way-for-future-investment.aspx>

It is expected that the facility will require around 20 workers in each year of construction of which around 15 will be employed directly from Carnarvon. In operation, a workforce of around 20 workers will be required who will all be based in Carnarvon.

The key employment characteristics of the Carnarvon barge loading facility project are presented in **Table 2.4**.

**Table 2.4** Key characteristics: Carnarvon Barge Loading Facility

	Total	Carnarvon local content	Local content share
Construction workforce	Peak of 20	Peak of 15	75%
Operations workforce	20 per annum	20 per annum	100%

*Source: ACIL Allen*

## 2.5 Babbage Island Resort



The phased development of accommodation units, caravan park and camping ground at Babbage Island in Carnarvon will create 332 accommodation sites. The first phase of the project is expected to commence construction in 2023 with the redevelopment of 59 existing accommodation units and other infrastructure at the site that previously housed workers employed at a seafood processing facility. The first phase could also include the development of caravan and camping and built accommodation.<sup>3</sup> The subsequent construction phases of the resort will commence around 2028 with the construction of new accommodation and resort facilities including a swimming pool, water park, playground, amphitheater, and pump track.

It is estimated that the first phase of the project will require around 100 construction workers in each of the two years of construction while the second phase will require 200 construction workers in each year of construction. Once fully operational, the resort could employ as many as 40 staff of whom all will be located in Carnarvon as illustrated in **Table 2.5**.

**Table 2.5** Key characteristics: Babbage Island Resort

	Total	Carnarvon local content	Local content share
Construction workforce	Phase 1 = 100 peak	Peak of 8	7.5%
	Phase 2 = 200 peak	Peak of 15	
Operations workforce	40 per annum	40 per annum	100%

*Source: ACIL Allen*

<sup>3</sup> Halsall and Associates (2021), Shire of Carnarvon Scheme Amendment No. 2 to Local Planning Scheme No. 13 Lots 1044, 1198 and 626 Binning Road Babbage Island, Carnarvon

## 2.6 Old Justice Precinct: The Pier



There are plans to revitalise the former justice precinct site as a mixed use development including residential, retail, and other commercial uses. The development to be known as The Pier is expected to take place over stages with the first stage delivering 35 two bedroom two bathroom apartments and associated facilities including a resort style swimming pool. The second phase of the development will result in the development of a microbrewery and retail offering while the final phase will focus on the construction of conference facilities and office space.

It is expected that the project will require \$12.2 million of capital spending over a 12 to 24 month period with the first phase becoming operational after around 12 months. It is expected that the construction will require a peak of 100 jobs while there will be around 40 jobs created once the project is fully operational with most jobs employed by the microbrewery, conference facilities, and apartment complex. The estimated labour requirements of the project are presented in **Table 2.6**.

**Table 2.6** Key characteristics: The Pier

	Total	Carnarvon local content	Local content share
Construction workforce	Peak of 100	Peak of 8	7.5%
Operations workforce	40	40	100%

*Source: Shire of Carnarvon and ACIL Allen*

## 2.7 Gnaraloo Green Hydrogen Project



Fortescue Future Industries is currently investigating a potential green energy and hydrogen project including a renewable energy generation hub comprising wind turbines and infill solar arrays, and port facilities at Gnaraloo Station located around 150km north of Carnarvon.

The project is currently in its early stages and no publicly available information was available to inform the spending and employment estimates. It is estimated that the project could commence construction as early as mid-2027 with operation commencing around mid-2031. During the peak of construction, the project could employ as many as 4,000 personnel while in operations as many as 1,500 workers per annum could be required.

It is likely that the majority of workers required for the project will be employed on a fly in – fly out basis however the project will be located in proximity to the town of Carnarvon allowing workers and their households to move to the town to take up the long term job opportunities it offers. For the purposes of this report, a local content estimate of 7.5 per cent has been assumed for employment in the construction and operation phases as presented in **Table 2.7**.

**Table 2.7** Key characteristics: Gnaraloo Green Hydrogen project

	Total	Carnarvon local content	Local content share
Construction workforce	Peak of 4,000	Peak of 3,000 in 2029	Less than 10 per cent
Operations workforce	113 per annum	113 per annum	Less than 10 per cent

*Source: ACIL Allen*

## 2.8 HyEnergy™



Province resources has plans to develop the HyEnergy green hydrogen project adjacent to the north side of the town of Carnarvon. The \$1.5 billion<sup>4</sup> project has been recognised by the Western Australian Government as a significant project which is in the State’s interest. It will be developed in phases totalling up to eight gigawatts in installed renewable energy capacity generated from solar and wind farms. The project is proposed to generate 550,000 tonnes of renewables-based hydrogen per annum from an onshore hydrogen gas production facility for sale to the domestic market via the Dampier to Bunbury Natural Gas Pipeline, and to the export market via an offshore ship loading buoy.<sup>5</sup>

The project which is currently in feasibility stage could commence construction in 2025 and take place over an approximate seven year period with the peak construction period extending for around three years when 4,000 workers per annum are required. As many as 300 of these workers could relocate to Carnarvon. Production is expected to commence in around 2032 and will require a workforce of around 1,500 workers per annum once fully operational. Around 113 of these workers are expected to move to Carnarvon.

**Table 2.8** Key characteristics: HyEnergy project

	Total	Carnarvon local content	Local content share
Construction workforce	Peak of 4,000	Peak of 300	7.5%
Operations workforce	1,500 per annum	113 per annum	7.5%

*Source: Province Resources and ACIL Allen*

## 2.9 Aggregated demand for employment

The aggregated demand for employment from the nine major projects in the construction and operation phases are presented in **Figure 2.1**. The majority of the workforce is required for construction activities associated with the development of the major projects however, the operation phases of these projects also provide significant enduring job opportunities of around an additional 3,500 full time equivalent jobs per annum from 2032 onwards as well as around 90 full time equivalent seasonal jobs per annum. On a jobs basis, the seasonal jobs are equivalent to a combined total of around 255 jobs required for short periods of time during the peak planting, pruning, and harvesting periods and during peak the peak tourism season.

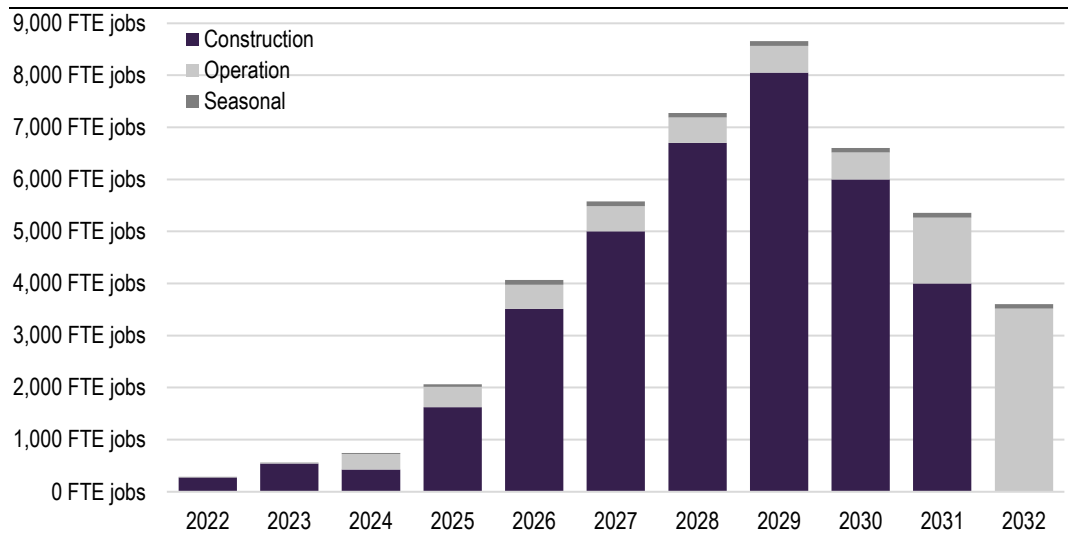
The peak demand for employment is expected to occur over the period from 2028 to 2030 inclusive when an average of nearly 7,500 workers are required each year. This is when both hydrogen projects are under construction along with the second phase of the Babbage Island Resort.

<sup>4</sup> [www.abc.net.au/news/2021-08-17/gascoyne-green-hydrogen-twiggy-forest-gnaraloo/100366480](http://www.abc.net.au/news/2021-08-17/gascoyne-green-hydrogen-twiggy-forest-gnaraloo/100366480)

<sup>5</sup> <https://research.csiro.au/hyresource/hyenergy-project/>



**Figure 2.1** Major projects: demand for employment: construction, operation, and seasonal workforces: full time equivalent jobs (FTE)

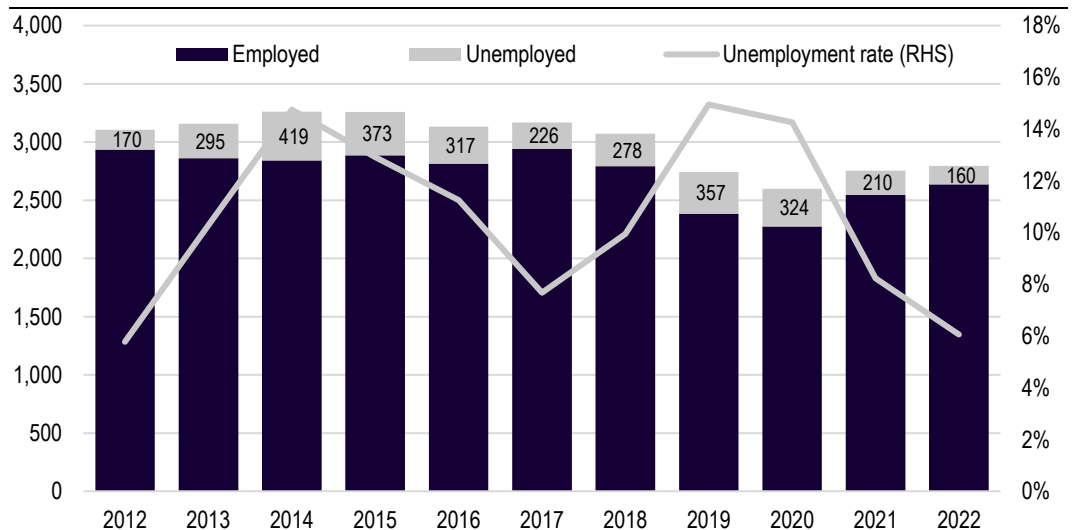


Source: ACIL Allen

## 2.10 Impact on the workforce in the Shire of Carnarvon

There is currently a workforce of around 2,800 people in the Shire of Carnarvon of which 200 are seeking employment. Over the past decade, there has been an average of 300 job seekers in each year and unemployment has remained above six per cent as illustrated in **Figure 2.2**.

**Figure 2.2** Employment and Unemployment: Shire of Carnarvon: number of persons

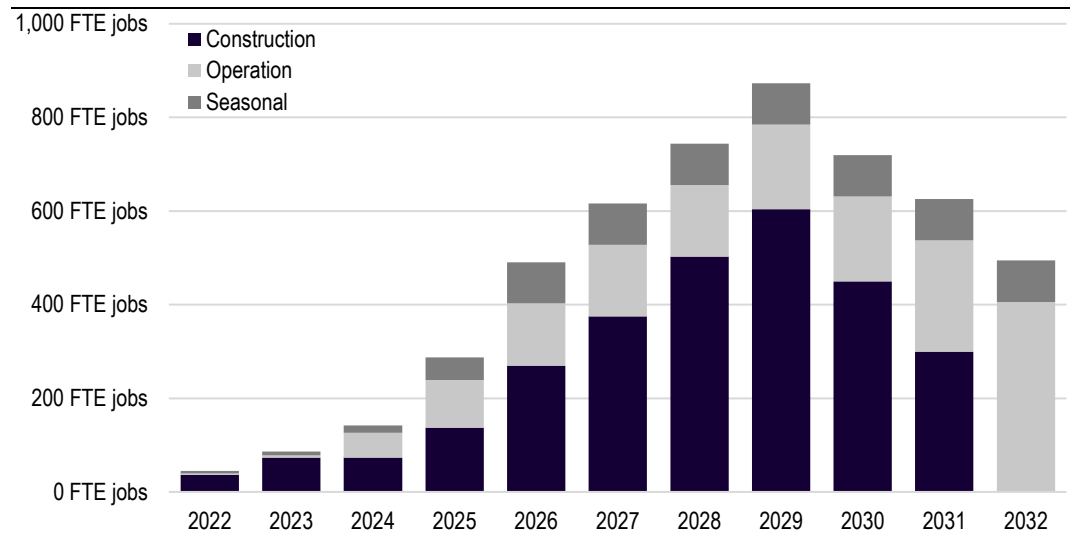


Source: Department of Employment

The proponents of the major projects identified in the Shire of Carnarvon indicate a potential to source employees from the Shire particularly during their operations phases. This is especially so for those projects in the agriculture and tourism sectors. Whilst there is a high number of unemployed people in the Shire, it is likely that the majority of the workers required by the major projects will need to move to the Shire because of the skill sets and work experience required by the project proponents.

The major projects indicate a potential net increase in the workforce from 2022 when the first of the projects commence construction with the first operations jobs coming on line in the second half of 2022 as illustrated in **Figure 2.3** which shows the potential workforce that will move to the Shire of Carnarvon to take up the work opportunities presented by the major projects. All projects are expected to be constructed by the end of 2031 resulting in an enduring permanent (excluding seasonal workers) operations workforce of around 400 full time equivalent workers from 2032 onwards. The two hydrogen projects result in the largest increases in permanent workforce accounting for around 225 permanent jobs and the remainder of the projects accounting for 180 permanent jobs in addition to seasonal workforces.

**Figure 2.3** Demand for locally based workforce: major projects: construction, operation, and seasonal workforces: full time equivalent jobs (FTE)



Source: ACIL Allen

## 2.11 Impact on demographics

Some of the workforce attracted to relocated to the Shire of Carnarvon to work on the nine major projects will bring additional household members including spouses and dependent children. An analysis was undertaken of the demographic profile of the working age population in Western Australia in order to determine the total impact on the population of the Shire of Carnarvon from the relocation of workers from elsewhere to the Shire.

It is assumed that 60 per cent of new employees moving to the Shire of Carnarvon will be aged between 25 and 44. A further 15 per cent of new employees will be aged between 18 and 24 and 25 years and 25 per cent between 45-64 years of age. The assumptions for new employees in presented in **Table 2.9**.

**Table 2.9** Assumed age profile of new employees

Age group	Share (%)
18-24	15.0
25-44	60.0
45-64	25.0
65+	0.0
<b>Total</b>	<b>100.0</b>

Source: ACIL Allen

Population multipliers were derived using 2021 Australian Bureau of Statistics Census data for Western Australia relating to relationships, family composition, education, and dependent children. For more detail explaining the steps in this derivation, see **Appendix B**.

The population multipliers are presented in **Table 2.10**. They imply that for every worker employed by the nine major projects that move to the Shire of Carnarvon, there will be on average a net inflow of between 1.26 and 1.97 people (including partners, and dependent children) depending on the age of the employee. The analysis implies that for every new employee aged between 25 and 64 years of age, there will be an average of a further 0.95 people including dependent children and/or partners.

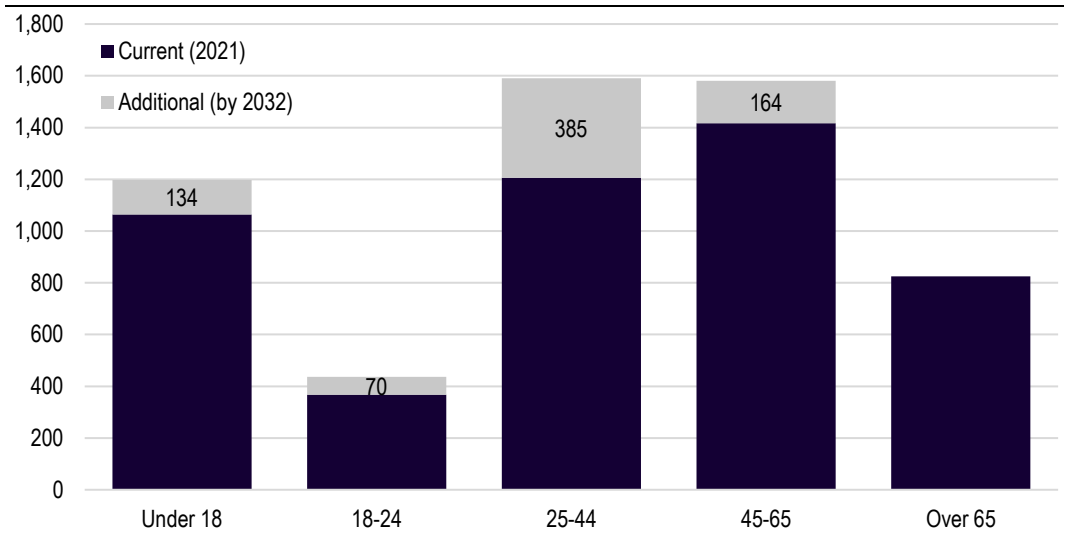
**Table 2.10** Population multipliers, by age group

Age	Population multiplier
18-24	1.26
25-44	1.95
45-64	1.97
65+	1.71

Source: ACIL Allen

Applying a standard demographic profile for the population of working age people and their families in Western Australia indicates an additional 619 adults and 134 dependent children in the Shire including 88 school aged children in kindergarten to year 12, 28 children of child care age, and 25 post school aged children. The demographic profile of the residents of the Shire of Carnarvon combined with the additional population created by the nine major projects is presented in **Figure 2.4**.

**Figure 2.4** Current and future demographic profile: Shire of Carnarvon: number of persons



Source: Australian Bureau of Statistics

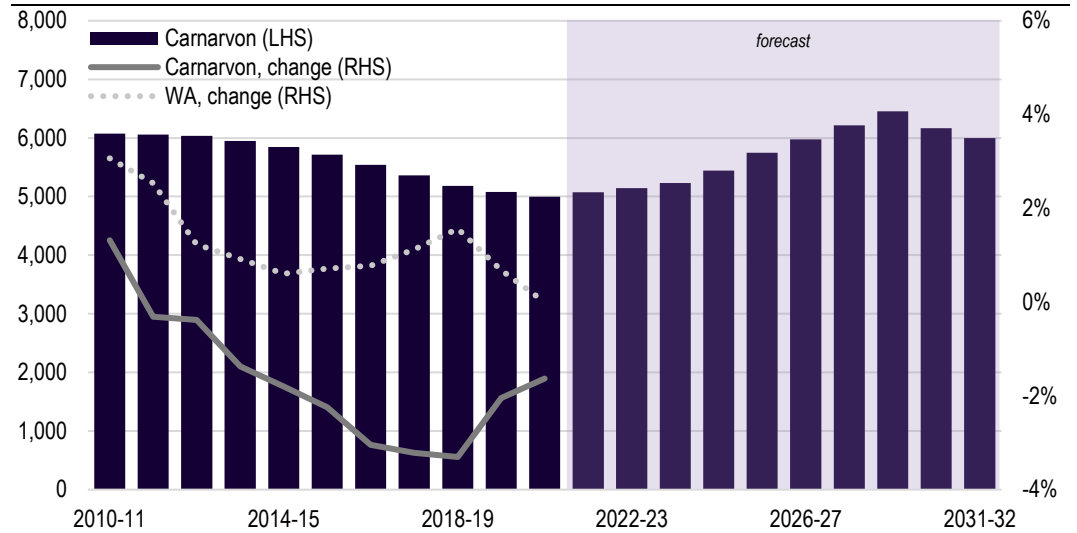
## 2.12 Impact on population

The population of the Shire of Carnarvon has experienced decline since 2010-11 and whilst rates of decline have slowed, they remain at 1.6 per cent which represents a loss of nearly 100 people per year. Assuming an average household size in Western Australia of 2.5 persons would indicate a loss of around 40 families per year from the Shire.

Assuming the existing residential population in the Shire remains constant into the future, the major projects will result in the population increasing from around 5,000 people in 2021 to a peak of 6,450 people in 2029-30, before softening to around 6,000 people by the end of the estimates period (Figure 2.5). The increase over the estimates period reflects an increase of around 1.9 per cent per annum.

The forecast increase in population over the decade to 2032 includes the construction and operational employees associated with the nine major projects and their partners and dependent children that are expected to relocate to the Shire of Carnarvon. The analysis excludes seasonal workers.

**Figure 2.5** Population and population growth: Shire of Carnarvon



Source: Australian Bureau of Statistics Cat 3218.0, ACIL Allen

# Social services and infrastructure

# 3

This chapter sets out the key current social services in the Shire of Carnarvon and makes estimates as to the resulting impact that the potential additional population that is attracted to the Shire because of the major projects will have. This analysis includes the **permanent operations workforce as of 2032** only and does not include the impact of the seasonal workers who are likely to be housed in temporary accommodation such as youth hostels and caravan parks.

## 3.1 Assumptions

The following assumptions have been made when calculating the impact on social services and infrastructure presented in this report.

### 3.1.1 Best estimates

The analysis uses best estimates provided by the proponents of the major projects, through publicly available information, or estimates provided by professionals with knowledge of the nine major projects. It is likely that market conditions may result in differences in some or all assumptions particularly as they relate to project timing, the size of the workforce, and the ability to source workers from the Shire of Carnarvon.

### 3.1.2 Nine major projects only

The analysis takes into account the projected workforces of the nine major projects only and does not take into consideration other projects that may also be in the pipeline.

### 3.1.3 Population projections

Population projections assume that the current residential population base will remain steady into the future and will not continue to decline (as observed between 2010-11 and 2020-21). The projected trend in future population projections only reflect the impact of major projects.

### 3.1.4 Enduring operations workforce as of 2032

**Figure 2.3** presents the projected construction and operations workforces that could be located in Carnarvon given the local content aspirations of the major projects noting that there are currently infrastructure limitations in the Shire that will impact the ability of the major projects to attract workers to the Shire. It shows that a permanent operations workforce of around 400 workers residing in the Shire is possible from 2032. If all projects proceed at the rate assumed in this report and local employment targets are achieved, the demand for social services will be realised as early as 2026 when a combined construction and permanent operations workforce of around 400 workers is required, and will peak in 2029 when a combined locally based construction and permanent operations workforce of around 780 workers is required. Further to these estimates are the seasonal workers and the employment requirements of other projects in the Shire which will place further demand on social services and infrastructure.

The information contained in this chapter refers to the impact of the enduring operations workforce of the nine major projects of around 400 workers on the social infrastructure and services in the

Shire of Carnarvon that is required from 2032 onwards, noting that if construction workforces also relocate to Carnarvon then a similar level of demand will be present from 2026.

### 3.1.5 Social services and infrastructure ratios

---

The report makes use of social services and infrastructure ratios based on the current structure of the population in the Shire of Carnarvon and the level of service and infrastructure provision. Future demand for social services and infrastructure is based on current ratios

## 3.2 Infrastructure limitations

---

The ability to attract new population to the Shire of Carnarvon will be limited by the ability of social infrastructure to attract and maintain new population. Some of the nine major projects on the horizon go towards addressing these shortfalls including The Pier which will provide contemporary office and retail space, a micro brewery, and modern apartment style housing.

Key impediments to population attraction and retention in the Shire of Carnarvon include the availability of a suitable quality of housing with supporting infrastructure including roads, streetscapes, sewerage, communications. This issue of inadequate social infrastructure impacting the ability of a regional town to attract workers is supported by CEDA which found there is a identified a widening gap in services and outcomes outside in regional areas of Australia and that in some parts of the country, the provision of infrastructure services remains below what is acceptable for a highly developed nation. The most pervasive issue is connectivity, in both a physical and a digital sense. Access to telecommunications and transport links are key factors influencing business decisions to invest in regional areas because of the limitation it places on people's capacity to communicate, innovate, and embrace data-reliant technologies. The article concluded that Innovative and adaptive infrastructure can unlock opportunities for growth and employment.<sup>6</sup>

The Australia Institute also found that the total absence of available housing for incoming workers to a regional area contributed toward:

- Higher labour costs as firms need to pay more to attract staff into localities with limited housing options
- Elevated staff turnover in enterprises as staff relocate to find more affordable housing
- Reduced living standards as some households pay unaffordable rents to secure a home of the standard they are seeking
- Lost business opportunities that enable existing businesses to grow and attract new firms as investors, whilst also being confronted by the absence of an available labour force.<sup>7</sup>

The availability of a high standard of housing in the Shire of Carnarvon is therefore key to the ability of the Shire to maximise the economic benefits of the major projects in terms of local employment, spending, and population growth.

## 3.3 Housing

---

The Australian Bureau of Statistics reports that in 2021 there were 1,583 houses and apartments in the Shire of Carnarvon of which 1,561 are located in the town and Carnarvon. A further 35 dwellings are planned for construction as part of The Pier development which is one of the major projects on our horizon.

---

<sup>6</sup> CEDA (2019), Addressing The Infrastructure Gap Between Our Cities And Regions, opinion article by Romily Madew

<sup>7</sup> Regional Australia Institute (2022), Building the Good Life: Foundations for Regional Housing

The current housing market in Carnarvon is limited with very few houses available for sale or rent. There are blocks of residential land available at NorthWater Estate including ten single dwelling, one duplex, and one grouped housing lot. Furthermore, the standard of housing available in the town that is suitable to accommodate employees of the major projects is a key limitation in attracting new population to the town.

Assuming the local employment content targets of the proponents of the major projects will require houses for an additional 405 permanent workers from 2032. In order to meet these local employment targets, around 370 new houses would be required which allows for the new accommodation at The Pier as well as an assumption that more than one resident of some new households will be employed by the major projects. For the purposes of this report, it is assumed that 15 per cent of households will include more than one resident employed by a major project.

New housing solutions will need to cater for a range of households as described in Section 2.11 which shows that the workforce attracted to the Shire will be a mix of single person, couple or share housing, and family households.

Further housing will also be required to house the additional social services and infrastructure employees that are required to cater for the additional population. There are two GROH houses currently under construction to accommodate police and education employees<sup>8</sup> and it is likely that a further 12 will be required as a result of the increase in demand for government services created by the major projects. In total, it is estimated that around 350 dwellings will be required.

**Key Finding 1** Key Finding: housing

A further 370 dwellings of a suitable standard are required to house the additional population in the town assuming the local employment content targets during the operations phases of the major projects in 2032. A further 12 will be required to accommodate additional social service and infrastructure employees resulting in a total housing demand of around 350 dwellings.

Source: ACIL Allen

### 3.4 Health

The primary health facilities in the Shire of Carnarvon are located at the Carnarvon Health Campus which includes hospital facilities and a GP clinic. The hospital comprises of 30 beds<sup>9</sup> indicating a bed to 1,000 population ratio of 6.01 which is above the average for very remote hospitals in Western Australia of 2.76 beds per 1,000 population and compared to a State average of 2.34 beds per 1,000 population. There are five practitioners at the GP clinic and five nurses indicating a ratio of 1,000 people for every GP and every nurse.

An increase in the population of Carnarvon will result in a decrease in the ratio of beds to population to 5.2 beds per 1,000 population. This ratio remains favourable compared to the State and very remote average however, in order to maintain the current level of service in the Shire of Carnarvon, an additional 4.5 beds will be required.

In order to maintain the current level of service at the GP clinic, an additional 0.75 GPs and 0.75 nurses will be required.

<sup>8</sup> Minister for Housing; Lands; Homelessness; Local Government (March 2022), Two homes for teachers and police underway in Carnarvon, <https://www.mediastatements.wa.gov.au/Pages/McGowan/2022/03/Two-homes-for-teachers-and-police-underway-in-Carnarvon.aspx>

<sup>9</sup> Hospital Resources 2020–21: Australian hospital statistics

**Key Finding 2** Key Finding: health

In order to maintain the current level of health services in the Shire of Carnarvon, an additional 4.5 hospital beds, 0.75 GPs, and 0.75 GP clinic nurses will be required.

Source: ACIL Allen

**3.5 Education**

Public education in the Shire of Carnarvon is provided by Carnarvon Community College which caters for students from kindergarten to year 12. Private education is provided by Carnarvon Christian School which caters for children from kindergarten to year six while St Mary Star of the Sea caters for students from kindergarten to year 12.

Applying a standard demographic profile to the approximately 400 permanent workers required by the major projects from 2032 indicates that there will be an additional 42 kindergarten to year six students and 46 year seven to year 12 students. An analysis of the current ratio of students to teachers at the Carnarvon Community College and the maximum allowable class sizes set out in the School Education Act Employees' General Agreement <sup>10</sup> estimates that an additional four kindergarten to year six teachers and two year seven to year twelve teachers will be required assuming all children attend the College.

**Key Finding 3** Key Finding: education

An additional four kindergarten to year six teachers and two year seven to year twelve teachers will be required in order to meet the class size requirements of the School Education Act Employees' General Agreement.

Source: ACIL Allen

**3.6 Child care**

There is one child care facility in Carnarvon that has a licence for 58 children. It is assumed that children attend day care from the age of birth up to aged four years as children are able to attend kindergarten at school once they have turned 4 years and six months. There are 259 children aged 4 and under in the Shire of Carnarvon which indicates a ratio of 0.22 childcare places per child. This is well below the average for Western Australia of 0.39<sup>11</sup>.

It is expected that the additional families that move to the Shire of Carnarvon because of the major projects will result in an additional 28 children of child care age. An additional six childcare places will be required in the Shire of Carnarvon in order to maintain the current number of childcare places to children. If the ratio of childcare places to children in Western Australia is to be achieved, a further 55 childcare places would be required in the Shire of Carnarvon to cater for the current and projected population.

<sup>10</sup> Western Australian Industrial Relations Commission, School Education Act Employees' General Agreement Section 12. Class sizes

<sup>11</sup> Based on data from the Department of Education, Skills and Employment showing the number of children attending centre based day care in Western Australia in June 2021 compared to the number of children aged less than four years as of the 2021 Australian Bureau of Statistics Census.



**Key Finding 4** Key Finding: child care

An additional six childcare places will be required in the Shire of Carnarvon in order to maintain the current number of childcare places to children. A total of 55 places are required to bring the Shire up to the average childcare service provision ratio in Western Australia.

Source: ACIL Allen

**3.7 Policing**

In 2020-21, there were 920 people for every police officer in the Perth Metropolitan Area. In regional areas of the State, the ratio was 373 people for each police officer.<sup>12</sup> In Carnarvon, the ratio was more favourable with around 150 to 180 people per police officer. The addition of a further 750 workers and their families in the Shire as a result of the additional employment created by the major projects would increase this ratio to 170 to 210 people per police officer. In order to maintain the current ratio of police officers to population, a further 4.5 full time equivalent police officers will be required.

**Key Finding 5** Key Finding: policing

A further 4.5 full time equivalent police officers will be required in the Shire of Carnarvon to maintain the current ratio of police officers to population.

Source: ACIL Allen

**3.8 Air services**

Carnarvon Airport is owned and operated by the Shire of Carnarvon. It hosts flights that operate between Carnarvon and Perth as well as flights to Monkey Mia. A comparison of the number of inbound passengers to the population of the Shire of Carnarvon shows that there is a fairly constant long term ratio of around 1.9 passengers per head of population<sup>13</sup>. If this ratio is applied to the population of the Shire in 2032, it implies an additional 900 inbound passengers each year. Assuming a capacity of 34 passengers per flight<sup>14</sup> indicates that an additional 26 flights will be required between Perth and Carnarvon each year to maintain the current level of air services in the Shire.

**Key Finding 6** Key Finding: air services

An additional 26 flights carrying an additional 900 inbound passengers will be required between Perth and Carnarvon each year to maintain the current level of air services in the Shire.

Source: ACIL Allen

<sup>12</sup> WA Police (2022), Western Australia Police Force 2021 Annual Report

<sup>13</sup> Average over 16 years from 2006 to 2021 inclusive

<sup>14</sup> Rex Airlines operates a Saab 340 aircraft between Carnarvon and Perth which has a passenger capacity of 36 seats <https://www.rex.com.au/AboutRex/OurCompany/fleet.aspx> with an assumption that not all seats are taken by passengers

# Image sources

A

The images used in this report are sourced from the following:

Yangibana - Hastings Technologies

Carnarvon Food Bowl – Business News

Ningaloo Reef Resort – Shire of Carnarvon

Gnaraloo Green Hydrogen – iStock

Babbage Island Resort – Shire of Carnarvon

Old Justice Precinct – Shire of Carnarvon

Carnarvon Barge Loading Facility – Google maps

HyEnergy – Fortescue Future Industries

Front Cover – Shire of Carnarvon

# Methodology: Population multipliers

## B

### B.1.1 Objective

The objective is to determine the net impact on the Shire of Carnarvon's permanent residential population as a result of new employees who move to the region. It excludes those employees on a fly-in fly-out, or drive-in drive-out basis. The analysis will consider the expected number of new employees plus their:

- Spouses or de facto partners; and
- Dependent children.

### B.1.2 Age categories

The first step was to profile potential employees by age, with the categories including **0-17**, **18-24**, **25-44**, **45-64**, and **over 65**. In doing so, the analysis can be more tailored to the expected profile of new employees who are expected to move to Carnarvon, and also enable the analysis to perform scenario testing. For example, the analysis will be able to assign a higher weight to people who are aged between 25-44 years of age, as they may be more likely to move to the region (from Perth, or another regional centre) compared to someone aged over 45.

### B.1.3 Data sources

The following data sources presented in were used in ACIL Allen's analysis. The aim of this analysis is to determine (on average), how many spouses/ partners, and dependent children an individual may have for each age bracket (as defined in the previous section). We can then determine the total expected inflow of people for a given number of employees (i.e. a population multiplier for every one employee in the Shire).

**Table B.1** List of data sources

Item	Data source	Data points
A	ABS Census 2016 Age by MDCP Social Marital Status Western Australia	Married in a registered marriage Married in a de facto marriage Not married Not applicable Overseas visitor
B	ABS Census 2016 Age by FMCFF Family composition (1 Digit Level) Western Australia	Couple family with no children Couple family with children One parent family Other family Not applicable
C	ABS Census 2016 Age by CDCF Count of Dependent Children in Family	Couple family with: No dependent children Couple family with: One dependent child Couple family with: Two dependent children Couple family with: Three dependent children

Source: ACIL Allen

**B.1.4 Methodology**

The following steps were applied to determine the residential population impact.

- **Step 1:** Profile the WA population into age categories of 0-17 (children and youth), 18-24 (young adults), 25-44 (young adults and middle age), 45-64 (middle age and older adults), over 65 (senior);
- **Step 2:** Identify the share of the population who are partnered and non partnered, by age category (Item A)
- **Step 3:** Determine the share of partnered and non partnered population who have children, by age category (Item B)
- **Step 4:** Determine the average number of dependent children that partnered and non partnered people have, by age category (Item C)
- **Step 5:** Determine the average distribution of children who attend an educational institution (assumed by ACIL Allen)
- **Step 6:** Multiply the relevant items above to determine the population multipliers and expected number of individuals, partners, and dependent children per employee.

ACIL Allen has determined the population multipliers for each age category based on 100 new employees moving to the Shire of Carnarvon (assumed to be 100 for each age category). Rounding has not been applied to this data until the end of the analysis.

**B.1.5 Results**

**Table B.2** presents the distribution of employed individuals by ‘partnered’ and ‘non partnered’, and having ‘dependent children’ and ‘not having dependent children’.

**Table B.2** Distribution of employed individuals, per 100 new employees, no rounding applied

Age	Individuals, Partnered, Dependents	Individuals, Partnered, No dependents	Individuals, Not partnered, Dependents	Individuals, Not partnered, No dependents	Total
18-24	2.91	10.61	9.23	77.25	100.00
25-44	16.05	42.22	5.98	35.75	100.00
45-64	26.19	36.08	4.18	33.55	100.00
65+	44.98	7.09	0.62	47.31	100.00

Source: ACIL Allen

**Table B.3** presents the distribution of the expected number of employee partners, per 100 new employees.

**Table B.3** Distribution of partners, by age, per 100 new employees, no rounding applied

Age	Partners, Partnered, Dependents	Partners, Partnered, No dependents	Partners, Not partnered, Dependents	Partners, Not partnered, No dependents	Total
18-24	2.91	10.61	0.00	0.00	13.52
25-44	16.05	42.22	0.00	0.00	58.27
45-64	26.19	36.08	0.00	0.00	62.27
65+	44.98	7.09	0.00	0.00	52.07

Source: ACIL Allen

**Table B.4** presents the distribution of the expected number of employee dependent children, per 100 new employees.

**Table B.4** Distribution of dependent children, by age, per 100 new employees, no rounding applied

Age	Children, Partnered, Dependents	Children, Partnered, No dependents	Children, Not partnered, Dependents	Children, Not partnered, No dependents	Total
18-24	3.60	0.00	8.98	0.00	12.58
25-44	29.06	0.00	7.82	0.00	36.89
45-64	32.02	0.00	3.15	0.00	35.17
65+	18.74	0.00	0.14	0.00	18.87

Source: ACIL Allen

The following two tables represent the distribution of the expected number of dependent children for partnered, and not partnered families across educational types (ie. figures in **Table B.5** and **Table B.6** sum to figures in **Table B.4**). The figures in these tables reflect ACIL Allen assumptions (for example, an employee aged over 65 is not likely to have a pre-school, primary or secondary school aged child).

**Table B.5** presents a distribution of dependent children of partnered parents, per 100 new employees.

**Table B.5** Distribution of children by education stage, children of partnered families, by age, per 100 new employees, no rounding applied

Age	Children, Partnered, Dependents, pre-school	Children, Partnered, Dependents, primary	Children, Partnered, Dependents, secondary	Children, Partnered, Dependents, post-school	Total
18-24	3.24	0.36	0.00	0.00	3.60
25-44	8.72	8.72	8.72	2.91	29.06
45-64	0.00	3.20	14.41	14.41	32.02
65+	0.00	0.00	0.00	18.74	18.74

Source: ACIL Allen

**Table B.6** presents a distribution of dependent children of non partnered parents, per 100 new employees.

**Table B.6** Distribution of children by education stage, children of unpartnered families, by age, per 100 new employees, no rounding applied

Age	Children, Not partnered, Dependents, pre-school	Children, Not partnered, Dependents, primary	Children, Not partnered, Dependents, secondary	Children, Not partnered, Dependents, post-school	Total
18-24	8.08	0.90	0.00	0.00	8.98
25-44	2.35	2.35	2.35	0.78	7.82
45-64	0.00	0.32	1.42	1.42	3.15
65+	0.00	0.00	0.00	0.14	0.14

Source: ACIL Allen

A summary of the results is presented in **Table B.7** and shows:

- For every 100 new employees aged between 18 and 24, there will be a net inflow of 126 people including partners and dependent children (multiplier 1.26);
- For every 100 new employees aged between 25 and 44, there will be a net inflow of 195 people including partners and dependent children (or a multiplier of 1.95)
- For every 100 new employees aged between 45 and 64, there will be a net inflow of 197 people including partners and dependent children (or a multiplier of 1.97)
- For every 100 new employees aged over 65, there will be a net inflow of 171 people (or a multiplier of 1.71).

A summary of population inflows (per 100 new employees) is presented in **Table B.7**.

**Table B.7** Summary of population inflows, per 100 new employees, by age category

Age	Individuals	Partners	Children, pre-school	Children, primary	Children, secondary	Children, post-school	Total (rounded)
18-24	100.00	13.52	11.32	1.26	0.00	0.00	126
25-44	100.00	58.27	11.07	11.07	11.07	3.69	195
45-64	100.00	62.27	0.00	3.52	15.83	15.83	197
65+	100.00	52.07	0.00	0.00	0.00	18.87	171

Source: ACIL Allen

### B.1.6 Population multipliers

A summary of the population multipliers is presented in **Table B.8**.

**Table B.8** Summary of population multipliers, by age category

Age	Individuals	Partners	Children, pre-school	Children, primary	Children, secondary	Children, post-school	Total
18-24	1.00	0.14	0.11	0.01	0.00	0.00	1.26
25-44	1.00	0.58	0.11	0.11	0.11	0.04	1.95
45-64	1.00	0.62	0.00	0.04	0.16	0.16	1.97
65+	1.00	0.52	0.00	0.00	0.00	0.19	1.71

Source: ACIL Allen

## B.2 Source data

**Table B.9** Age by MDCP Social Marital Status, Western Australia (1.00 = 100%)

Age	Married in a registered marriage	Married in a de facto marriage	Not married	Not applicable	Overseas visitor	Total
18-24	0.03	0.11	0.71	0.13	0.02	1.00
25-44	0.43	0.16	0.26	0.14	0.01	1.00
45-64	0.54	0.08	0.23	0.13	0.01	1.00
65+	0.49	0.03	0.30	0.17	0.01	1.00

Source: ABS Census 2016, Counting Persons, Place of Enumeration (MB), STATE by AGEP Age by MDCP Social Marital Status; ACIL Allen

**Table B.10** Age by FMCF - 1 Digit Level, Western Australia (1.00 = 100%)

Age	Couple family with no children	Couple family with children	One parent family	Other family	Not applicable	Total
18-24	0.11	0.40	0.14	0.03	0.32	1.00
25-44	0.17	0.45	0.07	0.01	0.29	1.00
45-64	0.27	0.37	0.08	0.01	0.28	1.00
65+	0.46	0.07	0.04	0.01	0.41	1.00

Source: ABS Census 2016, Counting Persons, Place of Enumeration (MB), STATE by AGE by FMCF - 1 Digit Level; ACIL Allen

**Table B.11** Age by CDCF Count of Dependent Children in Family, Couple family, Western Australia (1.00 = 100%)

Age	Couple family with: No dependent children	Couple family with: One dependent child	Couple family with: Two dependent children	Couple family with: Three dependent children	Couple family with: Four dependent children	Couple family with: Five dependent children	Couple family with: Six or more dependent children
<b>Children</b>	0	1	2	3	4	5	6
18-24	0.29	0.35	0.24	0.08	0.02	0.01	0.01
25-44	0.08	0.29	0.42	0.16	0.04	0.01	0.00
45-64	0.31	0.30	0.28	0.09	0.02	0.00	0.00
65+	0.75	0.14	0.08	0.03	0.01	0.00	0.00

Source: ABS Census 2016, Counting Persons, Place of Enumeration (MB), STATE by AGE by CDCF Count of Dependent Children in Family; ACIL Allen

**Table B.12** Age by CDCF Count of Dependent Children in Family, One parent family, Western Australia (1.00 = 100%)

Age	One parent family with: No dependent children	One parent family with: One dependent child	One parent family with: Two dependent children	One parent family with: Three dependent children	One parent family with: Four dependent children	One parent family with: Five dependent children	One parent family with: Six or more dependent children
<b>Children</b>	0	1	2	3	4	5	6
<b>18-24</b>	0.39	0.36	0.17	0.06	0.02	0.01	0.00
<b>25-44</b>	0.29	0.31	0.26	0.10	0.03	0.01	0.00
<b>45-64</b>	0.50	0.30	0.15	0.04	0.01	0.00	0.00
<b>65+</b>	0.85	0.09	0.04	0.01	0.00	0.00	0.00

Source: ABS Census 2016, Counting Persons, Place of Enumeration (MB), STATE by AGEP Age by CDCF Count of Dependent Children in Family; ACIL Allen

To determine the distribution of children

**Table B.13** Distribution of children by educational institution attendance, assumed for Western Australia (1.00 = 100%)

Age	Partnered, children, pre-school	Partnered, children, primary school	Partnered, children, secondary school	Partnered, children, post school
<b>18-24</b>	0.90	0.10	0.00	0.00
<b>25-44</b>	0.30	0.30	0.30	0.10
<b>45-64</b>	0.00	0.10	0.45	0.45
<b>65+</b>	0.00	0.00	0.00	1.00

Source: ACIL Allen



**Antonia Hodby**  
Principal  
a.hodby@acilallen.com.au  
0404 822 301

**Marshall Roberts**  
Analyst  
m.roberts@acilallen.com.au

**Melbourne**  
Suite 4, Level 19; North Tower  
80 Collins Street  
Melbourne VIC 3000 Australia  
+61 3 8650 6000

**Sydney**  
Suite 603, Level 6  
309 Kent Street  
Sydney NSW 2000 Australia  
+61 2 8272 5100

**Brisbane**  
Level 15, 127 Creek Street  
Brisbane QLD 4000 Australia  
+61 7 3009 8700

**Canberra**  
Level 6, 54 Marcus Clarke Street  
Canberra ACT 2601 Australia  
+61 2 6103 8200

**Perth**  
Level 12, 28 The Esplanade  
Perth WA 6000 Australia  
+61 8 9449 9600

**Adelaide**  
167 Flinders Street  
Adelaide SA 5000 Australia  
+61 8 8122 4965

ACIL Allen Pty Ltd  
ABN 68 102 652 148

[acilallen.com.au](http://acilallen.com.au)