
PROJECT PARADISE ECONOMIC IMPACT ASSESSMENT

MAYFAIR 101
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EXECUTIVE SUMMARY

BACKGROUND

Mayfair 101 are in the planning stages of the delivery of 'Project Paradise' in the Dunk Island/ Mission Beach area in the Cassowary Coast region of North Queensland. This project plans to redevelop Dunk Island and the Mission Beach mainland and transform the area into a 'tourism mecca'. This process will include the construction and redevelopment of existing and development of new resorts, hotels and other accommodation, as well as residential buildings, commercial/ retail precincts, sporting facilities and supporting infrastructure. This development is expected to attract a significant number of recreational and business tourists/ visitors to the region, as well as support population growth through the delivery of an estimated 750 residences in the region.

PURPOSE & APPROACH

This report provides an economic impact assessment of Project Paradise and analyses the direct and flow-on impacts expected to be realised in the surrounding regional economies of Townsville and Cairns.

This study uses Input-Output modelling techniques to assess the economic impacts of both construction and operations drivers associated with the project, including:

- Construction of Project Paradise, which is anticipated to deliver capital expenditure of approximately \$1.68 billion across a fifteen-year construction window. Construction will include site works, infrastructure development, utilities and professional services for the construction of residential buildings, non-residential buildings (resorts/ accommodation, commercial precincts, health and education) and infrastructure components.
- Visitation expenditure in the regional economy from attracting visitors to the region.
- Household expenditure in the regional economy through spending of new residents.

KEY FINDINGS

Key Activation Statistics

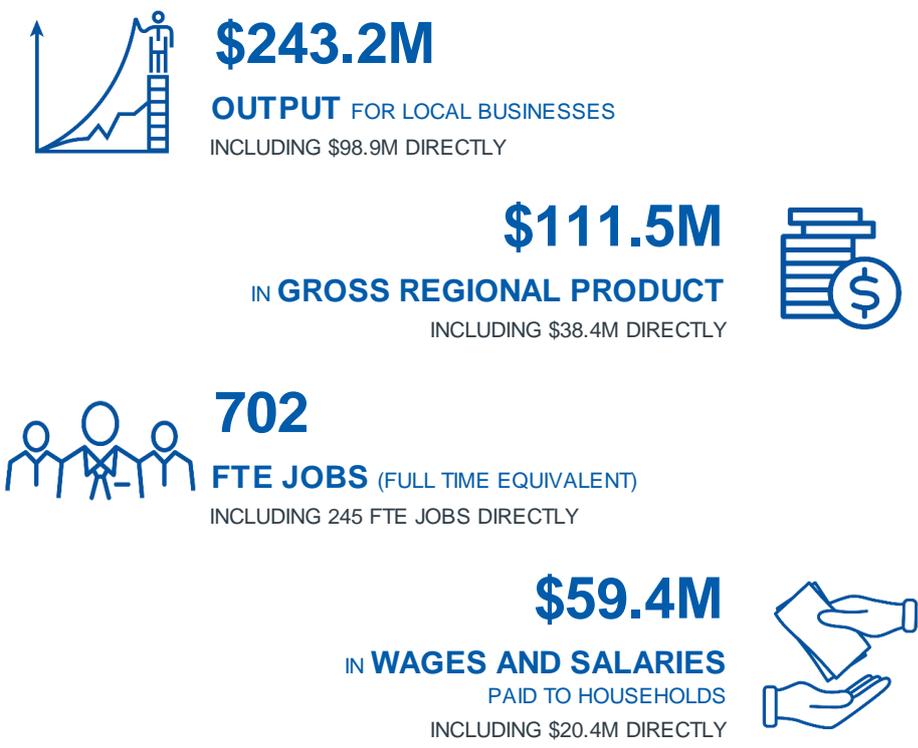
- Number of:
 - Resorts: 6
 - Accommodation Venues: 11
 - Residential Houses: 750
 - Commercial Precincts: 6
- Construction Spend: \$1.68 billion
- Operational Activity Activated: \$355.1 million
- Number of Tourists: 128,389 per annum
- Tourism Spend: \$116.4 million
- New Households: 750
- Household Spend: \$40.1 million

Economic Impact of Construction

The construction of Project Paradise and supporting infrastructure is estimated to cost approximately \$1.68 billion in total, with an estimated timeframe for full development of approximately 15 years. Over the 15-year construction period this \$1.68 billion equates to \$3.6 billion in output and \$1.7 billion in Gross Regional Product across the region (total, including direct and indirect). Construction activity is also anticipated to employ a total of 10,526 Full-time Employees (FTEs) during construction and pay an estimated \$891.3 million in wages (including direct and indirect effects).

On an average annual basis over the approximate 15-year construction timeline, this is expected to produce approximately \$243.2 million in output and generate \$111.5 million in Gross Regional Product across the region (total, including direct and indirect). Construction is also anticipated to employ a total of 702 FTEs during construction and pay an estimated \$59.4 million in wages from the expected investment of \$1.68 billion.

Average annual economic impacts over the construction period are outlined in the image below.



Source: AEC

Economic Impact of Ongoing Activity

The project, once fully developed and in steady state operations, will generate an estimated \$355.1 million in output through household expenditure and induced visitor spend from visitors travelling to and from the region as a result of the project (total, including direct and indirect). The project is also anticipated to generate \$191.8 million in Gross Regional Product (GRP) for the region annually once complete, whilst employing 1,580 FTEs and paying \$103.0 million in salaries each year.



\$355.1M

OUTPUT FOR LOCAL BUSINESSES
INCLUDING \$156.5M DIRECTLY

\$191.8M

IN **GROSS REGIONAL PRODUCT**
INCLUDING \$85.3M DIRECTLY



1580

FTE JOBS (FULL TIME EQUIVALENT)
INCLUDING 866 FTE JOBS DIRECTLY

\$103M

IN **WAGES AND SALARIES**
PAID TO HOUSEHOLDS
INCLUDING \$48.9M DIRECTLY



Source: AEC

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1. INTRODUCTION

1.1 BACKGROUND

Dunk Island is the largest Island in the Family Islands National Park and is located off the coast of Mission Beach (in the Cassowary Coast region), approximately 140 kilometres from Cairns and 235 kilometres from Townsville. The island was a popular tourism hotspot for Australians and international tourists, until it was devastated by Cyclone Yasi in 2011. Dunk Island was recently purchased by Mayfair 101, with plans to develop the island into a 'tourist mecca' as part of 'Project Paradise'. This project plans to redevelop Dunk Island and the Mission Beach mainland by constructing and redeveloping resort and accommodation, residential and commercial property capable of supporting its plans to attract local and international tourists, and new residents to the region.

Regarding construction activities on Dunk Island, the project plans to initially restore the island's existing 5-star resort. Plans also include the construction of a luxury 6-7-star resort and an upper market 4-star resort. The island is also expected to undertake construction of residential homes, a shopping village, and an upgrade of the current spit and expansion of the airport runway. Development of the Mission Beach mainland is also planned, with several resorts and accommodation venues anticipated to be built over the construction period, along with the construction of residential properties, commercial office spaces and shopping precincts. The project is anticipated to also spur demand for additional medical facilities, as well as schools, sporting facilities and revitalisation of a number of existing assets and tourism infrastructure, including aviation infrastructure.

1.2 PURPOSE OF THIS REPORT

This report provides an analysis of the potential direct and flow-on economic impacts of the planned investment by Mayfair 101 to redevelop Dunk Island and the Mission Beach mainland from construction activities, as well as the expenditure through the local economy from household spend and tourism visitors attracted to the region once fully developed and in steady state operations.

1.3 APPROACH

This report uses Input-Output modelling to assess the direct and flow-on economic activity supported through construction and ongoing operations of the project. A description of the Input-Output methodology used is provided in Appendix A. The assessment examines the economic impacts across the Cairns and Townsville Statistical Area 4 (SA4) geographies.

In undertaking this assessment AEC has examined the level of economic activity estimated to be supported by construction and operation of key components delivered by the project. No assessment has been made regarding the potential draw down of activity from other projects or facilities, nor other regions, and as such does not present an estimate of the net additional economic activity generated by the project.

The remainder of the report is structured as follows:

- **Chapter 2** provides an overview of the project and the component elements anticipated to be developed. This section describes the direct construction works over the approximate 15-year construction timeframe and ongoing economic activity anticipated to be realised once fully built and in steady state operation (i.e. household expenditure and visitor spend). This information represents the key drivers and assumptions used in undertaking the economic modelling.
- **Chapter 3** examines the economic activity generated using Input-Output modelling techniques, based on the drivers and assumptions presented in Chapter 2.

2. OVERVIEW OF DRIVERS

2.1 CONTRIBUTION FROM CONSTRUCTION ACTIVITIES

Construction activities for 'Project Paradise' are expected to last between ten and fifteen years in the Mission Beach area. Total capital expenditure on project development is estimated to be approximately \$1.68 billion, including site works, infrastructure development, utilities and professional service.

2.1.1 Residential Building Construction

The project expects to develop multiple residential buildings for both Mission Beach and Dunk Island. It is expected that fifty homes will be constructed on Dunk Island, whilst seven hundred homes are anticipated to be developed on the mainland. Information provided by Mayfair 101 indicates that the construction of new homes for Dunk Island will approximate to \$0.75 million each, equating to \$38 million in total. For Mission beach, approximately 100 homes are expected to be re-built in combination with the construction of 200 new apartments and 500 new homes for a total construction cost of \$290 million.

2.1.2 Non-Residential Building Construction

Planning of the project also highlights that three accommodation venues are expected to be constructed on Dunk Island, providing approximately 330 rooms to visitors. These accommodation venues are anticipated to be up-market and luxury accommodation options, ranging between 4 and 6-star ratings. The costs to restore and construct accommodation on Dunk Island is anticipated to be approximately \$280 million over the construction window.

For Mission Beach, a larger quantity and variety of accommodation options is expected to be offered to visitors. It is anticipated that three resorts, nine hotel accommodation options ranging between 3 and 5-star ratings, and two new back packer hostels will be constructed/ renovated, offering approximately 740 rooms to visitors. The planned accommodation is expected to vary by star grading and appeal to wider range of visitors with varying amounts of discretionary income. The construction costs of these accommodation venues are anticipated to cost approximately \$490 million.

In combination with the offering of hotels and resorts, the project also anticipates the construction of commercial precincts/ buildings and other non-residential developments. These developments are expected to include a shopping village on Dunk Island, as well as several commercial offices and a commercial precinct, a hospital, schools, fifteen new restaurants and an entertainment complex on the mainland. The construction of these assets is expected to cost approximately \$320 million.

2.1.3 Infrastructure Upgrades and Construction

The project is also expected to revitalise infrastructure in and around the area. It is anticipated that the mainland will experience the construction of an 18-hole golf course for approximately \$10 million (Creed, 2001), as well as additional sporting facilities for a construction cost of \$20 million. Project planning also anticipates an expansion of the Dunk Island airport runway for approximately \$10 million, as well as upgrades to both the Innisfail and Cardwell airports at \$30 million and \$50 million, respectively. The project also expects the development and upgrade of roads, utilities and marina facilities within the area, for a total construction cost of approximately \$110 million. The planned upgrade and development of aviation and supporting infrastructure will allow the region to satisfy future visitor demand.

For modelling purposes, the construction costs have been allocated to their respective ANZSIC industries. This breakdown was developed based on assumptions by AEC regarding the most appropriate ANZSIC industries for each activity.

For each element of the project, it was assumed that:

- 10% of capital expenditure will be spent on design and engineering (Professional, Scientific and Technical Services).

- 10% of capital expenditure will be spent on site clearing, excavation, landscaping (i.e. Construction Services)
- The remaining capital expenditure will be spent on their respective sectors, i.e.:
 - Residential building allocated to residential building construction
 - Hotel, resort, commercial, school, hospital, etc to non-residential building construction
 - Infrastructure and sporting facilities will be heavy and civil engineering construction sector.

The following table provides a summary of anticipated construction expenditure by relevant industry in the Input-Output model.

Table 2.1. Construction Costs by Industry

Industry	Cost (\$M)
Residential Building Construction	\$262.00
Non-Residential Building Construction	\$891.00
Heavy and Civil Engineering Construction	\$179.40
Construction Services	\$177.55
Professional, Scientific and Technical Services	\$167.55
Total	\$1,676.50

Source: ABS (2018), Mayfair 101 (unpublished), AEC.

- In terms of where activity will occur and goods and services are anticipated to be sourced from, it was assumed: That 100% of construction activity will occur locally but that 25% of design and engineering (Professional, Scientific and Technical Services) will occur outside of the region and 75% locally.
- For the construction activity, while this will 'occur' locally, it is assumed 10% is sourced from businesses and labour from outside the region (i.e. imported to the region).

2.2 CONTRIBUTION FROM ONGOING ACTIVITIES

For the purposes of assessing the economic activity delivered by the project post-construction, the assessment has examined the following two key drivers of economic activity the project will support:

- The economic activity supported within the regional economy through household expenditure of new residents.
- The economic activity supported within the regional economy through visitors attracted to the region and their spend as a result of the project.

In developing estimates of economic activity from the above avenues, occupancy rates for residential dwellings and visitor accommodation were used to develop estimates of households and visitors attracted. For this assessment, occupancy rates for visitor accommodation are based on star grading in Queensland from the Tourism Research Australia Accommodation Monitor (2017-18). While the project will involve development of a range of other components in addition to dwellings and accommodation (e.g. sport, commercial precincts, schools, health, etc.), the economic activity from these components is assumed to primarily be supported by the expenditure of households and visitors and thereby captured through flow-on activity. Inclusion of these components separately in the economic modelling would therefore double count impacts.

2.2.1 Household Expenditure

The project is anticipated to provide approximately 750 new dwellings to the region across the fifteen-year construction window. It is anticipated that 50 of these dwellings will be built on Dunk Island, and the remaining 700 dwellings will be built in Mission Beach. For this assessment it is assumed these new dwellings will be fully occupied, representing 750 households.

Economic activity supported by these households has been estimated based on the incomes and expenditure of these households in the region. Household expenditure estimates were sourced from detailed weekly household expenditure estimates for Queensland from the Australian Bureau of Statistics Household Expenditure Survey (ABS, 2017b) and allocated to their relevant Input-Output (IO) industry. For households developed on Dunk Island,

an estimate of household income and expenditure was developed in line with the highest quintile of household incomes/ expenditure in Queensland. For households developed in Mission Beach, an estimate of household income and expenditure in line with the middle quintile of household income/ expenditure in Queensland was applied.

Assumptions regarding the proportion of household expenditure spent within the regional economy are outlined in the table below, as well as estimated household expenditure in the region for households on Dunk Island and Mission Beach based on the approach outlined above.

Table 2.2. Expenditure of New Dwellings by Industry

Industry	Proportion Spent Locally	Local Spend Dunk Island (\$M)	Local Spend Mission Beach (\$M)
Retail Trade	75%	\$1.65	\$14.28
Ownership of Dwellings	100%	\$0.36	\$3.95
Food and Beverage Services	100%	\$0.29	\$2.83
Insurance and Superannuation Funds	50%	\$0.19	\$1.82
Finance	50%	\$0.18	\$1.67
Public Administration and Regulatory Services	90%	\$0.16	\$1.60
Primary and Secondary Education Services	90%	\$0.13	\$0.94
Rental and Hiring Services (except Real Estate)	90%	\$0.09	\$0.90
Health Care Services	90%	\$0.09	\$0.84
Construction Services	90%	\$0.08	\$0.77
Electricity Transmission, Distribution, On Selling	75%	\$0.08	\$0.72
Telecommunication Services	50%	\$0.06	\$0.71
Sports and Recreation	90%	\$0.06	\$0.68
Residential Care and Social Assistance Services	100%	\$0.06	\$0.50
Automotive Repair and Maintenance	90%	\$0.06	\$0.42
Technical, Vocational and Tertiary Education Services	90%	\$0.05	\$0.41
Personal Services	75%	\$0.05	\$0.35
Professional, Scientific and Technical Services	75%	\$0.04	\$0.29
Heritage, Creative and Performing Arts	75%	\$0.04	\$0.29
Road Transport	80%	\$0.03	\$0.26
Arts, Sports, Adult and Other Education Services	100%	\$0.02	\$0.18
Building Cleaning, Pest Control and Other Support Services	100%	\$0.01	\$0.15
Other Services	75%	\$0.01	\$0.12
Non-residential Property Operators and Real Estate Services	80%	\$0.01	\$0.12
Internet Service Providers, Publishing and Broadcasting	50%	\$0.01	\$0.11
Broadcasting (except Internet)	50%	\$0.01	\$0.10
Gambling	50%	\$0.01	\$0.07
Other Repair and Maintenance	90%	\$0.01	\$0.06
Motion Picture and Sound Recording	100%	\$0.01	\$0.06
Accommodation	50%	\$0.00	\$0.03
Rail Transport	25%	\$0.0	\$0.0
Gas Supply	100%	\$0.0	\$0.0
Postal and Courier Pick-up and Delivery Service	50%	\$0.1	\$0.7
Auxiliary Finance and Insurance Services	50%	\$0.0	\$0.1
Air and Space Transport	50%	\$0.0	\$0.1
Water, Pipeline and Other Transport	80%	\$0.0	\$0.0
Water Supply, Sewerage and Drainage Services	50%	\$0.0	\$0.0
Total		\$3.95	\$36.16

Source: ABS (2017a,b), ABS (2018), ABS (2019b), AEC.

The 750 households in the region by post-construction, equates to a total of approximately \$40.11 million in household expenditure in the region each year.

2.2.2 Visitor Expenditure

Post-construction, the project is anticipated to result in the following level of visitation to the local area:

- 39,098 daytrip leisure visitors per annum.
- 66,819 domestic overnight leisure visitors per annum, staying an average of 5.1 nights.
- 22,471 international leisure visitors per annum, staying an average of 7.3 nights

Estimates of domestic overnight and international visitation were developed using the following approach. Additional details regarding assumptions are provided in Table 2.3.

- Estimates of room nights occupied at the accommodation establishments developed as part of the project were developed based on the number of rooms anticipated to be developed during the construction stage and assumptions of occupancy rates by star grading in Queensland from the Tourism Research Australia Accommodation Monitor (2017-18) (TRA, 2018), assuming rooms are available 365 days a year.
- This was converted to an estimate of the number of guest arrivals based on average length of stay data for overnight visitors from the Tourism Research Australia visitor survey (for Tropical North Queensland region) (TEQ, 2018) and an assumption of approximately 1.8 people per room on average. Guest arrivals were allocated between domestic overnight (75%) and international overnight (25%) visitors (and length of stay) based on visitor shares in Port Douglas, as this location is expected to attract a similar distribution of visitors.

Table 2.3. Domestic & International Overnight Visitors

Name	Type	No. Rooms	Occupancy %	Room Nights	Rooms Available	Overnight Visitors	
						Domestic Overnight	International
Existing Resort	Luxury	150	78.2%	42,808	7,572	10,199	3,430
Resort #2	Luxury	30	78.2%	8,562	1,514	2,040	686
Resort #3	Upscale	150	72.4%	39,659	7,015	9,449	3,178
Palmae - 2 resorts	Upscale	200	72.4%	52,879	9,353	12,599	4,237
Elandra Resort	Upscale	50	72.4%	13,220	2,338	3,150	1,059
New 5-star accommodation x 3	Luxury	90	78.2%	25,685	4,543	6,120	2,058
New 4-star accommodation x 3	Upscale	150	72.4%	39,659	7,015	9,449	3,178
New 3-star accommodation x 3	Midscale	150	63.5%	34,788	6,153	8,288	2,787
New backpacker accommodation x 2	Midscale	100	63.5%	23,192	4,102	5,526	1,858
Total	-	1,070	71.8%	280,453	49,606	66,819	22,471

Note: average length of stay for the region based on TRA (2018) is 5.7 nights with an average persons per room of 1.8.
Source: Mayfair 101 (unpublished), TRA (2018), TRA (2019a, b)

In total, approximately 89,300 overnight visitors are estimated to be attracted to the area each year once the project is fully developed and in steady state levels of visitation.

Estimates of accommodation expenditure by overnight visitors was developed using the estimated number of room nights for each accommodation venue and an average daily room rate (ADR) based on data by star grading in Queensland from the Tourism Research Australia Accommodation Monitor (2017-18) (TRA, 2018), increased by 2.5% to account for inflation. The following table outlines the ADR applied for each accommodation venue.

Table 2.4. Accommodation Revenue for Overnight Visitors, (\$M)

Name	Type	Room Nights	Room Rate	Accommodation Revenue (\$M)
Existing Resort	Luxury	42,808	\$262	\$11.2
Resort #2	Luxury	8,562	\$262	\$2.2
Resort #3	Upscale	39,659	\$154	\$6.1
Palmae - 2 resorts	Upscale	52,879	\$154	\$8.2
Elandra Resort	Upscale	13,220	\$154	\$2.0
New 5-star accommodation x 3	Luxury	25,685	\$262	\$6.7
New 4-star accommodation x 3	Upscale	39,659	\$154	\$6.1
New 3-star accommodation x 3	Midscale	34,788	\$114	\$4.0
New backpacker accommodation x 2	Midscale	23,192	\$114	\$2.6
Total	-	280,453	-	\$49.2

Source: Mayfair 101 (unpublished), TRA (2018), TRA (2019a, b)

At steady state visitation levels, a total of \$49.2 million in accommodation revenue is estimated per annum.

In addition to overnight visitors, the development is also expected to receive patronage from day trip visitors attracted to the area by the high quality recreational and entertainment offerings. The number of day trip visitors was estimated based on the proportion of day trip visitors attracted to Port Douglas per overnight visitor in 2018 (TRA, 2019a and 2019b), which indicates that for every overnight visitor there is 0.43-day trip visitors. Based on this assumption, a total of approximately 39,100 day trip visitors are estimated to be attracted to the area each year once the project is fully developed and in steady state levels of visitation.

Visitors attracted to the region are also expected to spend on other, non-accommodation related items during their stay. Estimates of non-accommodation expenditure by visitors (e.g. spend on shopping, food, beverages, taxis, etc) were developed based on Tourism and Events Queensland visitor profile data for Tropical North Queensland (TEQ, 2019) a both domestic and overnight visitors, with expenditure allocated to expenditure items based on 2018 national splits from Tourism Research Australia visitor survey data (TRA, 2019a and 2019b). Only spending for relevant expenditure items were included, such as food/ beverages, shopping, rental vehicles, local public transport and entertainment. Some expenditure items were excluded as they would likely not be spent in the local economy (e.g. airfares are expected to be purchased from where the person resides). Accommodation expenditure for overnight visitors was also removed from the spend estimates as it is already captured in the accommodation expenditure estimated in Table 2.4 above. Based on this data, the following estimates of expenditure per visitor type were used:

- \$123.22 for daytrip visitors.
- \$134.97 for domestic overnight visitors.
- \$94.09 for international visitors.

For the luxury accommodation (i.e. 6/7 star) on Dunk Island (30 rooms), an expenditure multiplier of 1.5 was applied to non-accommodation expenditure for these visitors to conservatively reflect the anticipated higher level of discretionary expenditure of people staying in this accommodation.

Visitor expenditure by expenditure category was allocated to relevant Input-Output industries. The table below outlines the percent splits of expenditure across relevant Input-Output industries used in this study.

Table 2.5. Allocation of Expenditure per Leisure Visitor by Industry

Industry	Daytrip	Domestic Overnight	International
Water, Pipeline and Other Transport	0.4%	5.2%	19.0%
Rental and Hiring Services (except Real Estate)	0.3%	1.7%	3.5%
Retail Trade	64.6%	32.7%	20.2%
Road Transport	1.5%	1.8%	3.6%

Industry	Daytrip	Domestic Overnight	International
Accommodation	0.0%	32.7%	21.2%
Food and Beverage Services	24.5%	19.2%	24.8%
Heritage, Creative and Performing Arts	7.1%	5.7%	2.7%
Gambling	0.2%	0.4%	0.8%
Personal Services	0.0%	0.1%	2.5%
Total	100.0%	100.0%	100.0%

Source: TRA (2019a, b), AEC.

3. ECONOMIC IMPACT ASSESSMENT

3.1 APPROACH

Economic modelling in this section estimates the economic activity supported by the operations and construction activity generated by the project.

Input-Output modelling is used to examine the direct and flow-on activity expected to be supported within the regional economy (geographies examined are outlined in section 4.2). Modelling drivers used in the assessment are described in Chapter 2. A description of the Input-Output modelling framework used is provided in Appendix A.

The assessment examines the economic impacts across the Cairns and Townsville SA4s.

Input-output modelling describes economic activity by examining four types of impacts:

- **Output:** Refers to the gross value of goods and services transacted, including the costs of goods and services used in the development and provision of the final product. Output typically overstates the economic impacts as it counts all goods and services used in one stage of production as an input to later stages of production, hence counting their contribution more than once.
- **Gross product:** Refers to the value of output after deducting the cost of goods and services inputs in the production process. Gross product (e.g., Gross Regional Product (GRP)) defines a true net economic contribution and is subsequently the preferred measure for assessing economic impacts.
- **Income:** Measures the level of wages and salaries paid to employees of the industry under consideration and to other industries benefiting from the project.
- **Employment:** Refers to the part-time and full-time employment positions generated by the economic stimulus, both directly and indirectly through flow-on activity, expressed in number of jobs.

3.2 MODEL RESULTS

3.2.1 Construction

It is estimated that the \$1.68 billion capital investment will generate \$1.48 billion in initial stimulus (direct) output in the Dunk Island and Mission Beach area over an approximately 15-year development period. This activity is estimated to support an additional \$2.17 billion in output for businesses in the local economy through flow-on impacts in total over the 15 years.

Construction activity is also estimated to support, including the initial stimulus and flow-on impacts, \$1.67 billion in Gross Regional Product (GRP) for the regional economy in total over 15 years, and approximately 10,526 FTE jobs, paying \$891.3 million in wages and salaries in total.

On an annual average basis, including direct and flow-on activity, this equates to approximately:

- \$243.24 million in output for local businesses.
- \$111.53 million in GRP.
- 702 FTE jobs paying \$59.42 million in wages and salaries.

Table 3.1. Economic Activity Supported by Construction Phase

Impact	Output (\$M)	Gross Regional Product (\$M)	Incomes (\$M)	Employment (FTEs)
Total (15 Years)				
Initial Stimulus	\$1,483.0	\$576.6	\$306.0	3,678
Production Induced Impacts	\$1,037.9	\$463.7	\$265.7	2,863
Household Consumption Impacts	\$1,127.8	\$632.6	\$319.6	3,986
Total	\$3,648.6	\$1,673.0	\$891.3	10,526
Annual Average (15 Years)				
Initial Stimulus	\$98.9	\$38.4	\$20.4	245
Production Induced Impacts	\$69.2	\$30.9	\$17.7	191
Household Consumption Impacts	\$75.2	\$42.2	\$21.3	266
Total	\$243.2	\$111.5	\$59.4	702

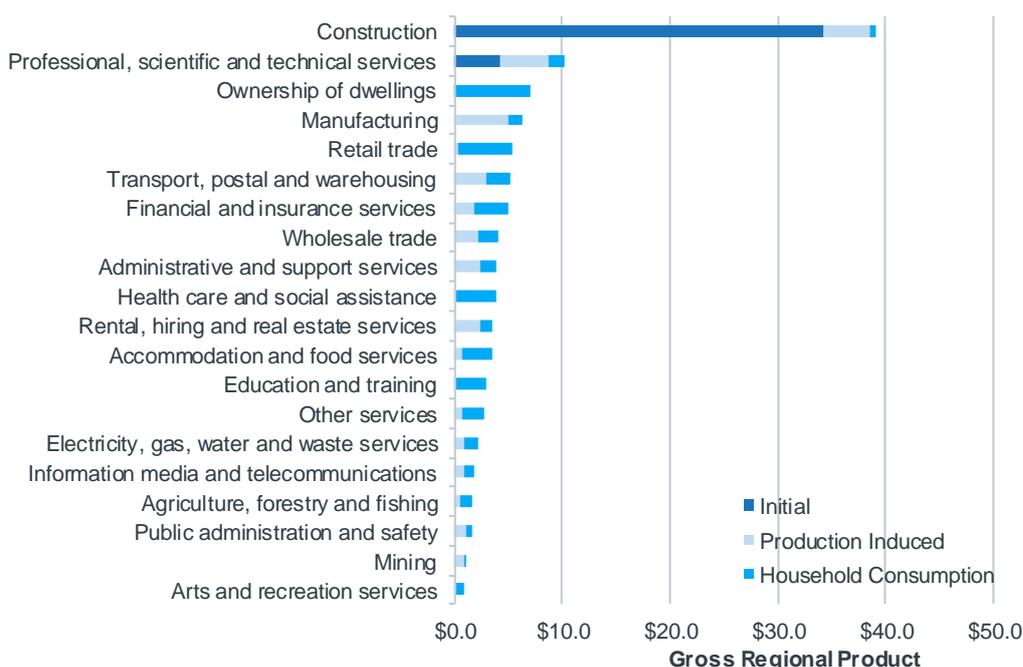
Note: Totals may not sum due to rounding.

Source: ABS (2012), ABS (2017a), ABS (2018b), ABS (2019b), AEC.

Both Type I and Type II flow-on impacts have been presented in this report. Refer to Appendix B for a description of each type of flow-on impact.

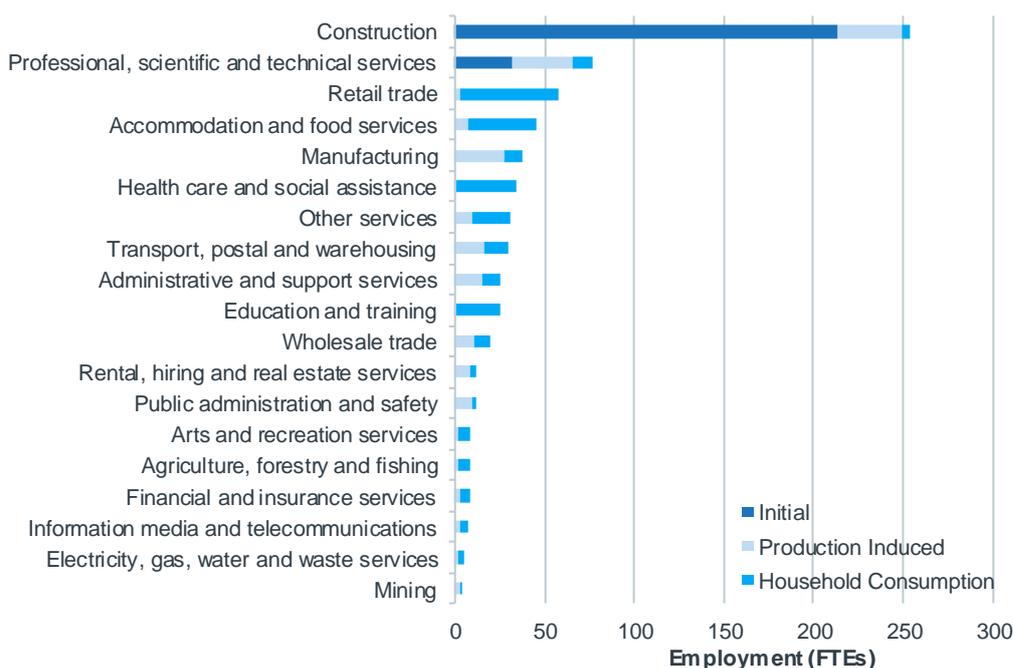
The largest contributing sector to GRP from the construction of the project in the region is the construction industry (\$39.1 million in total GRP). The construction industry will account for 89.0% of total initial stimulus and 5.9% of total flow-on effects realized in the regional economy each year. Other sectors which are major beneficiaries from the construction of the project include professional, scientific and technical services (\$10.3 million), ownership of dwellings (\$7.0 million) and manufacturing (\$6.3 million) (see Figure 3.1).

Figure 3.1. Annual Contribution to GRP by Industry in Catchment Area, Construction (\$M)



Source: AEC.

Regarding employment, the construction industry is anticipated to experience the largest increase in employment estimates as a result of the project (254 FTE's). Of this figure, 84% of jobs are expected to be directly impacted, whilst the remaining 16% are expected to be generated through type I and type II flow-on effects. The industries of professional, scientific and technical services, as well as retail trade, are also expected to record significant increases in FTE jobs, with 76 and 57, respectively.

Figure 3.2. Annual Contribution to Employment by Industry in Catchment Area, Construction (FTEs)


Source: AEC.

3.2.2 Ongoing Activity Post-Construction

Post-construction, the development of residential dwellings and tourism aspects is anticipated to attract additional household and visitor expenditure to the regional economy providing an initial stimulus to local businesses of approximately \$156.5 million per annum once fully developed and at steady state levels of visitation. This activity is estimated to support an additional \$198.5 million in output for businesses in the local economy through flow-on impacts.

The household and visitor expenditure resulting from the project are also estimated to support, on an annual basis including the initial stimulus and flow-on impacts, \$191.8 million in GRP for the regional economy and approximately 1,580 FTE jobs, paying \$103.0 million in wages and salaries in total.

Table 3.2. Annual Economic Activity Supported by Post-Construction Phase

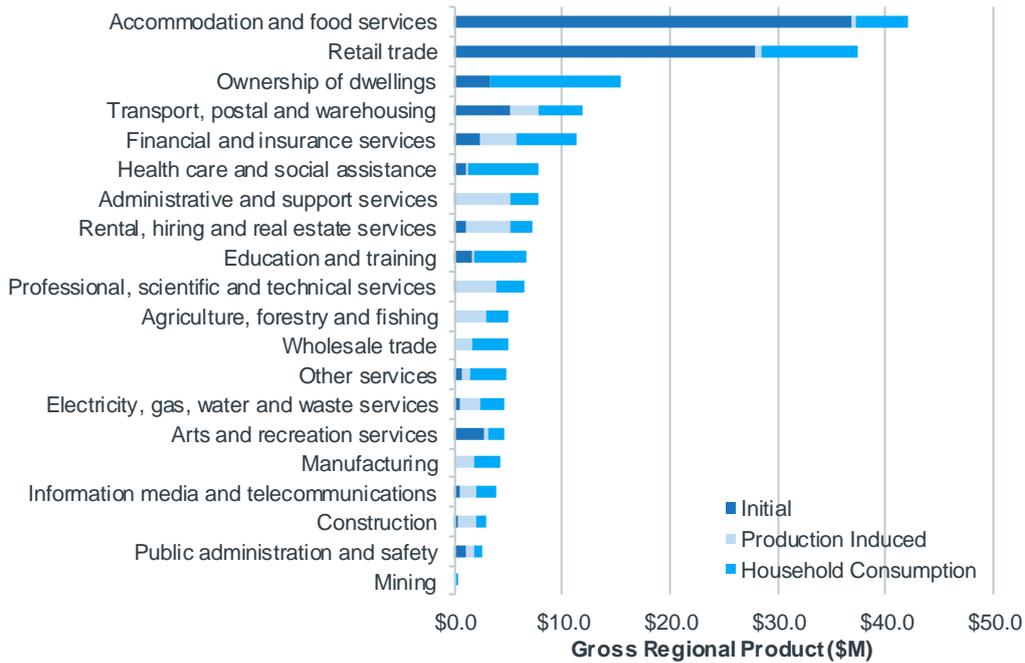
Impact	Output (\$M)	Gross Regional Product (\$M)	Incomes (\$M)	Employment (FTEs)
Initial Stimulus	\$156.5	\$85.3	\$48.9	866
Production Induced Impacts	\$67.4	\$32.9	\$17.0	203
Household Consumption Impacts	\$131.2	\$73.6	\$37.2	510
Total	\$355.1	\$191.8	\$103.0	1,580

Note: Totals may not sum due to rounding.

Source: ABS (2012), ABS (2017a), ABS (2018b), ABS (2019b), AEC.

Sectors which are major beneficiaries of household and visitor expenditure include accommodation and food services (\$42.1 million) and retail trade (\$37.4 million in total GRP). These industries account for 41.5% of total GRP contribution in the region. Other significant industries in the region include ownership of dwellings (\$15.4 million) and transport, postal and warehousing (\$11.8 million) (see Figure 3.3).

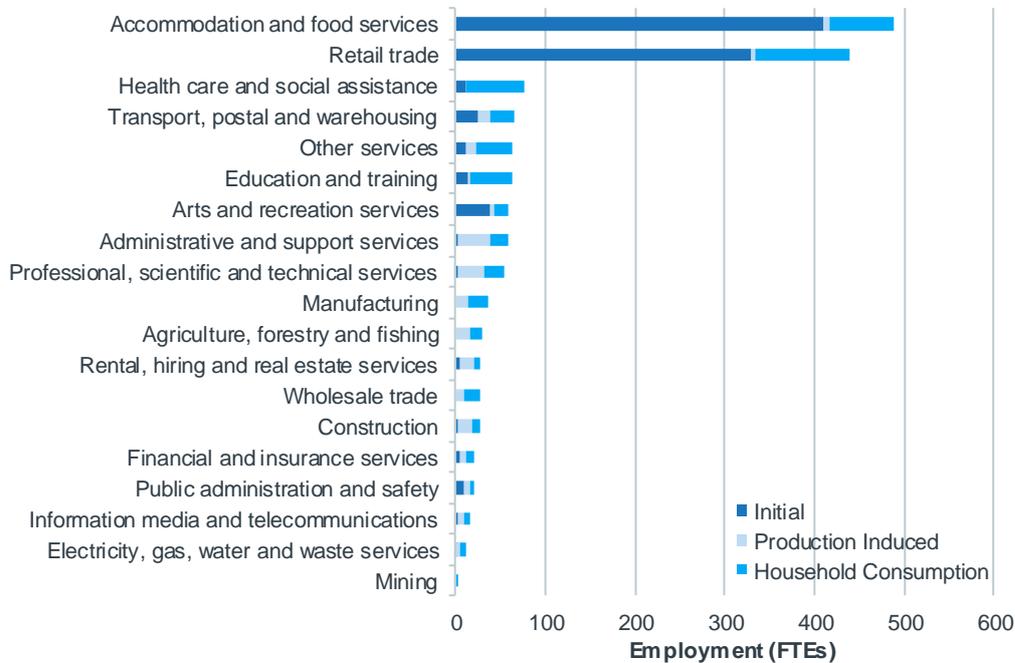
Figure 3.3. Annual Contribution to GRP by Industry in Catchment Area, Post-Construction (\$M)



Source: AEC.

Of the 1,580 FTEs supported annually post-construction, 58.8% is anticipated to be employed within the industries of accommodation and food services (31.0%) and retail trade (27.7%). The vast majority of this employment is anticipated to be supported through direct expenditure of households and visitors. Other industries benefiting from ongoing activity post-construction are expected to include health care and social assistance and transport, postal and warehousing, producing 77 and 65 FTEs, respectively.

Figure 3.4. Annual Contribution to Employment by Industry in Catchment Area, Post-Construction (FTEs)



Source: AEC.

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APPENDIX A: INPUT-OUTPUT METHODOLOGY

INPUT-OUTPUT MODEL OVERVIEW

Input-Output analysis demonstrates inter-industry relationships in an economy, depicting how the output of one industry is purchased by other industries, households, the government and external parties (i.e. exports), as well as expenditure on other factors of production such as labour, capital and imports. Input-Output analysis shows the direct and indirect (flow-on) effects of one sector on other sectors and the general economy. As such, Input-Output modelling can be used to demonstrate the economic contribution of a sector on the overall economy and how much the economy relies on this sector or to examine a change in final demand of any one sector and the resultant change in activity of its supporting sectors.

The economic contribution can be traced through the economic system via:

- **Direct impacts**, which are the first round of effects from direct operational expenditure on goods and services.
- **Flow-on impacts**, which comprise the second and subsequent round effects of increased purchases by suppliers in response to increased sales. Flow-on impacts can be disaggregated to:
 - **Industry Support Effects (Type I)**, which represent the production induced support activity as a result of additional expenditure by the industry experiencing the stimulus on goods and services in the intermediate usage quadrant, and subsequent round effects of increased purchases by suppliers in response to increased sales.
 - **Household Consumption Effects (Type II)**, which represent the consumption induced activity from additional household expenditure on goods and services resulting from additional wages and salaries being paid within the economic system.

These effects can be identified through the examination of four types of impacts:

- **Output:** Refers to the gross value of goods and services transacted, including the costs of goods and services used in the development and provision of the final product. Output typically overstates the economic impacts as it counts all goods and services used in one stage of production as an input to later stages of production, hence counting their contribution more than once.
- **Gross Product:** Refers to the value of output after deducting the cost of goods and services inputs in the production process. Gross product defines the true net contribution and is subsequently the preferred measure for assessing economic impacts.
- **Income:** Measures the level of wages and salaries paid to employees of the industry under consideration and to other industries benefiting from the project.
- **Employment:** Refers to the part-time and full-time employment positions generated by the economic shock, both directly and indirectly through flow-on activity, and is expressed in terms of full-time equivalent (FTE) positions.

Input-Output multipliers can be derived from open (Type I) Input-Output models or closed (Type II) models. Open models show the direct effects of spending in a particular industry as well as the indirect or flow-on (industrial support) effects of additional activities undertaken by industries increasing their activity in response to the direct spending.

Closed models re-circulate the labour income earned as a result of the initial spending through other industry and commodity groups to estimate consumption induced effects (or impacts from increased household consumption).

MODEL DEVELOPMENT

Multipliers used in this assessment are derived from sub-regional transaction tables developed specifically for this project. The process of developing a sub-regional transaction table involves developing regional estimates of gross production and purchasing patterns based on a parent table, in this case, the 2016-17 Australian transaction table (ABS, 2019a).

Estimates of gross production (by industry) in the study area were developed based on the percent contribution to employment (by place of work) of the study area to the Australian economy (ABS, 2017c), and applied to Australian gross output identified in the 2016-17 Australian table.

Industry purchasing patterns within the study area were estimated using a process of cross-industry location quotients and demand-supply pool production functions as described in West (1993).

Where appropriate, values were rebased from 2016-17 (as used in the Australian national Input-Output transaction tables) to current values using the Consumer Price Index (ABS, 2019).

MODELLING ASSUMPTIONS

The key assumptions and limitations of Input-Output analysis include:

- **Lack of supply-side constraints:** The most significant limitation of economic impact analysis using Input-Output multipliers is the implicit assumption that the economy has no supply-side constraints, so the supply of each good is perfectly elastic. That is, it is assumed that extra output can be produced in one area without taking resources away from other activities, thus overstating economic impacts. The actual impact is likely to be dependent on the extent to which the economy is operating at or near capacity.
- **Fixed prices:** Constraints on the availability of inputs, such as skilled labour, require prices to act as a rationing device. In assessments using Input-Output multipliers, where factors of production are assumed to be limitless, this rationing response is assumed not to occur. The system is in equilibrium at given prices, and prices are assumed to be unaffected by policy and any crowding out effects are not captured. This is not the case in an economic system subject to external influences.
- **Fixed ratios for intermediate inputs and production (linear production function):** Economic impact analysis using Input-Output multipliers implicitly assumes that there is a fixed input structure in each industry and fixed ratios for production. That is, the input function is generally assumed linear and homogenous of degree one (which implies constant returns to scale and no substitution between inputs). As such, impact analysis using Input-Output multipliers can be seen to describe average effects, not marginal effects. For example, increased demand for a product is assumed to imply an equal increase in production for that product. In reality, however, it may be more efficient to increase imports or divert some exports to local consumption rather than increasing local production by the full amount. Further, it is assumed each commodity (or group of commodities) is supplied by a single industry or sector of production. This implies there is only one method used to produce each commodity and that each sector has only one primary output.
- **No allowance for economies of scope:** The total effect of carrying on several types of production is the sum of the separate effects. This rules out external economies and diseconomies and is known simply as the “additivity assumption”. This generally does not reflect real world operations.
- **No allowance for purchasers’ marginal responses to change:** Economic impact analysis using multipliers assumes that households consume goods and services in exact proportions to their initial budget shares. For example, the household budget share of some goods might increase as household income increases. This equally applies to industrial consumption of intermediate inputs and factors of production.
- **Absence of budget constraints:** Assessments of economic impacts using multipliers that consider consumption induced effects (type two multipliers) implicitly assume that household and government consumption is not subject to budget constraints.

Despite these limitations, Input-Output techniques provide a solid approach for taking account of the inter-relationships between the various sectors of the economy in the short-term and provide useful insight into the quantum of final demand for goods and services, both directly and indirectly, likely to be generated by a project.

In addition to the general limitations of Input-Output Analysis, there are two other factors that need to be considered when assessing the outputs of sub-regional transaction table developed using this approach, namely:

- It is assumed the sub-region has similar technology and demand/ consumption patterns as the parent (Australia) table (e.g. the ratio of employee compensation to employees for each industry is held constant).

- Intra-regional cross-industry purchasing patterns for a given sector vary from the national tables depending on the prominence of the sector in the regional economy compared to its input sectors. Typically, sectors that are more prominent in the region (compared to the national economy) will be assessed as purchasing a higher proportion of imports from input sectors than at the national level, and vice versa.

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