CAIRNS SHIPPING DEVELOPMENT PROJECT

Revised Draft Environmental Impact Statement

APPENDIX H: AEC Demand Study Update 2016

CAIRNS SHIPPING DEVELOPMENT PROJECT

2016 DEMAND STUDY UPDATE

PORTS NORTH
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EXECUTIVE SUMMARY

PURPOSE

This report provides projected cruise ship visits for Cairns based on emerging changes in the Australian cruise industry and allocation of those cruise ship visits between Trinity Wharf and Yorkey's Knob anchorage based on channel modifications to Trinity Inlet.

The projections are an update of those previously undertaken in 2011 and 2014 for the *Cairns Shipping Development Project*.

TRENDS IN THE GLOBAL CRUISE SHIPPING INDUSTRY

Since 2011 and even 2014 the cruise shipping industry has continued to grow globally and in Australia. In 2015 over 1 million Australians went ocean cruising, an increase of 14.6% from 2014, with 71.3% departing from an Australian port to cruise in the South Pacific, Australia or New Zealand. The number of passengers represents a market penetration of 4.5% the second year in a row that a cruising region has broken through the 4% barrier. Seemingly impressive the South Pacific/Australia/New Zealand region represents 6.1% of total global available lower berth days.

As demand for cruising grows cruise lines have been adding capacity to the global fleet by building larger capacity ships to take advantage of economies of scale. As these new ships are added, older smaller ships are either refurbished and orientated to a particular market or decommissioned. Of the 81 ocean cruise ships for delivery between 2016-2026 59 are mega class ships and more than 60% of these are voyager class. No new regal or sun class ships are on order.

TRENDS IN THE AUSTRALIAN CRUISE SHIPPING INDUSTRY

In the 2015-16 season 46 cruise ships visited and/or operated in Australia, up from 42 in 2010-11 and 16 in 2004-05. Whilst the number of ships has increased so has their average size and capacity. Globally the majority of new ships on order are of the voyager class and these will replace smaller and older ships over time.

There were 1,015 cruise ship visits to Australian ports/destinations in 2015-16, an increase of 139 visits, or 15.9%, from the 2014-15 total of 876. Sydney (308), Brisbane (148), Melbourne (75), Fremantle (58), Cairns (50), Darwin (45), Moreton is (33) and Hobart (32) were the most frequently visited ports/destinations in 2015-16.

Sydney is regarded as a marque port by the cruise lines, however, it is rapidly becoming constrained with the Overseas Passenger Terminal fully booked for eight months of the year (October to April). Whilst there is still capacity at the White Bay Cruise Terminal, access is limited to those cruise ships that can fit under the Sydney Harbour Bridge. Collectively, Sydney cruise berth bookings were 365 for 2016-17 and 369 for 2017-18 as at 13 October 2016.

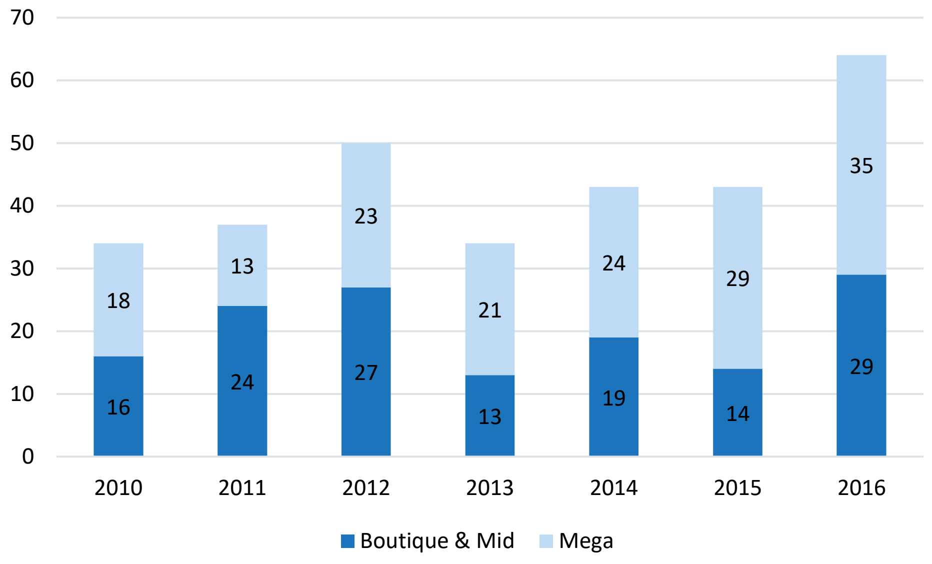
Australia's second most visited port Brisbane, is also constrained by the Gateway Bridges and the turning basin at Portside Cruise Terminal. However, Brisbane Port has recently announced the development of the Brisbane Cruise Terminal (BCT) at Luggage Point supported by both Carnival Australia and Royal Caribbean Cruise Lines (RCCL). It is expected that the BCT will be operational from 2019[1] and triple the size of the Brisbane cruise industry by 2035 although the development is still subject to commercial negotiations. Cruise lines have indicated that this facility could see the home porting of four ships in Brisbane. This increased traffic will have significant implications for visits to Cairns.

[1] As at the date of this report this dates seems overly optimistic.

CAIRNS CRUISE SHIPPING INDUSTRY

Cruise ships visiting Cairns either berth at Trinity Wharf or anchor 4km off shore at Yorkey's Knob and use tenders (catamarans) to get passengers ashore. Excluding adventure ships, the total number of cruise ship visits to Cairns in 2015 was 43, which has grown from 34 in 2010 or a CAGR of 4.8%.

Figure E1 Cairns Historical & Scheduled Ship Visits, Boutique, Mid & Mega Class by Location



Note: 2016 as at schedule dated 6 September 2016. Source: Ports North

The number of cruise ships (excluding Adventure class) visiting Trinity Wharf in 2015 was 20, which was up from 19 in 2010 (CAGR 1.0%). This number is scheduled to rise to 40 in 2016 due to:

- An additional 17 visits by P&O mid/sub-regal class ships (*Pacific Eden* & *Pacific Aria*), which are recent acquisitions to the P&O fleet.
- An additional 7 visits by Sun class (mega) ships, which have been diverted from the Yorkey's Knob anchorage following successful simulation outcomes.

In comparison. the share of ships to the Yorkey's Knob anchorage increased from 15 visits to 21 visits from 2010 to 2015 (a compound annual growth rate (CAGR) of 7.0%). The number is scheduled to increase to 24 for 2016 increasing the CAGR to 8.1% over the six-year period. This pattern reflects the increasing size of cruise ships visiting Cairns that cannot access the port.

For 2016, the scheduled total ship visits to Cairns is 64 (CAGR of 11.1% since 2010). This large increase in visitation reflects the transit and home porting of the P&O mid/sub-regal class ships, however even omitting these ships (17 visits) from the analysis, there is still significant extra growth in Cairns in 2016 with 48 other scheduled visits representing an CAGR of 5.5% since 2010.

More significant growth again is currently forecast for Cairns in 2017 with 80 ships (excluding adventure class) scheduled as at 6 September 2016.

PREVIOUS PROJECTIONS

Previous projections of cruise ship visits were undertaken in 2011 and 2014. These projections were based on a channel upgrade that could accommodate sun, vista, grand and voyager class vessels. The current study considers a channel upgrade that can accommodate vista and grand class vessels noting that sun class vessels can now enter the port following recent successful simulation outcomes. This study also considers the following emerging changes in the cruise industry that were not foreseen by the earlier studies:

- Home porting of mid classified ships in Cairns commencing 2016.

- Potential for future home porting of vista class vessels in Cairns.
- Relocation of additional larger cruise ships to the Australian market.
- Impacts associated with other port constraints/developments, in particular the proposed BCT.

PROJECTION METHODOLOGY

The projection methodology used in this report is different to that used in the 2011 and 2014 studies in that many more scenarios have been considered. The assumptions used in the projections have been informed through previous studies, consultation and AEC's experience in the sector.

The basic approach to undertaking the projections has been to project cruise ship visits to Cairns and then determine whether they can berth or have to anchor based on ship length. With no channel modifications, only ships 240m or less are typically assumed to berth, subject to the following:

- Due to limited manoeuvrability, no P&O regal class ships cannot berth but other regal class ships can.
- Sun class ships can now berth following successful simulation outcomes.

The fleet mix of visiting cruise ships that may visit Cairns has been modelled on the existing mix of cruise ships based in or visiting Australia modified for the known and expected change in fleet composition. For example, the replacement of P&O regal class ships with a larger class of ship, retirement of sun class ships as they reach their useful life and additions of grand class (approximately one every four years) and voyager class ships (one every second year).

A base line projection of ship visit growth (excluding home porting ships) was established at 5% per annum on which alternative scenarios are applied. Four alternatives to the base case are incorporated in the projections. The combination of alternatives gives sixteen scenarios. The alternatives are.

1 With or without development of the BCT expected to be in place by 2019.

2 With or without home porting.

3 With or without channel modifications, expected to be in place for 2021.

4 With or without availability of bunker.

Alternatives 3 and 4 are however assumed to coincide.

Assumptions used in the projections are as follows:

- Growth in cruise ship visits from the BCT is estimated to triple from 2019 to 2035 in a linear fashion based on mega class ships accounting for increases in the average size of cruise ships. Cairns is assumed to receive visits from 30% of these cruise ships.
- Home porting is assumed to number 20 ships visits per annum of sub-regal class with no channel modifications switching to 16 of vista class with channel modifications.
- Channel modifications will allow port access to vista and grand class ships commencing in 2021. Without channel modifications, only sub-regal, regal and sun class ships can enter the port. The additional access to the port is estimated to increase mega class visits to Cairns by 20% for regal, vista and grand class ships.
- Availability of bunker is estimated to increase all cruise ship visits for those that can access the port by 10%.
- The logistical constraints associated with ships anchoring and tendering passengers to Yorkey's Knob, especially as ship passenger capacity increases, has been estimated to reduce unconstrained ship visit projections to Yorkey's Knob by 35%. This reduction factor is phased in linearly from 2019 to 2025.

DEMAND PROJECTIONS

The alternatives present a total of 16 scenarios with both low, medium and high projections. The most pessimistic scenario of business as usual (BaU, no BCT, no homeporting and no channel modifications) still sees growth in ship visits reaching 97 in 2031 but with 43 of these at Yorkey's Knob versus 54 at Trinity Wharf. However, construction of the revised channel and bunker availability not only sees the total increase by 27 to 124 but 19 at Yorkey's Knob compared to 105 ships at Trinity Wharf (see Table E1).

Table E1 Projected Ship Visits (Business as Usual), Medium Projection

Scenario	Class	Trinity Wharf			Yorkey's Knob			Total Cairns		
		2021	2026	2031	2021	2026	2031	2021	2026	2031
Existing Channel										
Scenario 1 BaU, no homeporting	Sub-Regal	25	33	42				25	33	42
	Regal	3	2	2				3	2	2
	Sun	16	14	10				16	14	10
	Vista				15	15	11	15	15	11
	Grand				2	6	13	2	6	13
	Voyager				7	9	19	7	9	19
	Total	**44**	**49**	**54**	**24**	**30**	**43**	**68**	**79**	**97**
Revised Channel										
Scenario 4 BaU, no homeporting, channel modifications, bunker	Sub-Regal	28	36	45				28	36	45
	Regal	3	2	3				3	2	3
	Sun	18	15	11				18	15	11
	Vista	23	29	21				23	29	21
	Grand	3	11	25				3	11	25
	Voyager				7	9	19	7	9	19
	Total	**75**	**93**	**105**	**7**	**9**	**19**	**82**	**102**	**124**
Difference		*31*	*44*	*51*	*-17*	*-21*	*-24*	*14*	*23*	*27*

Source: AEC

Looking at the more optimistic scenario of the BCT and homeporting in Cairns, the overall number of ships visits is projected to reach 151 with 69 at Yorkey's Knob and 82 at Trinity Wharf. With construction of the revised channel and bunker availability the overall number is projected to increase by 33 to 183 with the Yorkey's Knob/ Trinity Wharf balance shifting to 31/152 (see Table E2).

Table E2 Projected Ship Visits (with Brisbane Cruise Terminal & Home Porting), Medium Projection

Scenario	Class	Trinity Wharf			Yorkey's Knob			Total Cairns		
		2021	2026	2031	2021	2026	2031	2021	2026	2031
Existing Channel										
Scenario 13 BCT, homeporting	Sub-Regal	45	53	62				45	53	62
	Regal	5	3	4				5	3	4
	Sun	31	25	16				31	25	16
	Vista				30	27	17	30	27	17
	Grand				4	10	21	4	10	21
	Voyager				13	16	31	13	16	31
	Total	**81**	**81**	**82**	**47**	**53**	**69**	**128**	**134**	**151**
Revised Channel										
Scenario 16 BCT, homeporting, channel modifications, bunker	Sub-Regal	28	36	45				28	36	45
	Regal	6	4	5				6	4	5
	Sun	33	26	17				33	26	17
	Vista	56	64	47				56	64	47
	Grand	6	18	38				6	18	38
	Voyager				13	16	31	13	16	31
	Total	**129**	**148**	**152**	**13**	**16**	**31**	**142**	**164**	**183**
Difference		*48*	*67*	*70*	*-34*	*-37*	*-38*	*14*	*30*	*32*

Note: Sub-Regal home porting has been replaced by vista class home porting with the revised channel.
Source: AEC

2014 CHANNEL DEMAND PROJECTIONS

The previous *Cairns Shipping Development Project Draft Environmental Impact Statement* (Ports North, 2014) allowed for all mega size ships to access Trinity Wharf. To model cruise ship demand under this situation two further scenarios (17 Business as Usual & 18 Brisbane Cruise Terminal) were added to the demand projections. The effect of the larger channel is to move the projected voyager class ships from Yorkey's Knob to Trinity Wharf as well as generate additional voyager ship visits by removing the assumed logistics and constraints reduction on voyager class ship visits to Yorkey's Knob. These projections were then used in the *2016 Economic Analysis* (AEC, 2017) to determine the additional economic benefits from the 2014 channel.

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1. INTRODUCTION

1.1 BACKGROUND

In June 2012, Ports North completed a *Cruise Shipping Development Strategy*, which included a *Demand Study* (BMT WBM, 2011) and a *Business Case* for improved cruise infrastructure in Cairns. The business case included a preliminary project scoping and design, preliminary environmental assessment, cost benefit analysis and financial model.

The business case concluded that there was sufficient benefits and flow on effects for the regional economy to justify Ports North proceeding with the preparation of an Environmental Impact Statement (EIS) for the 'Cairns Shipping Development Project' (CSDP). The project scope was based on accommodating the forecast demand for transit mega class cruise vessels in the sun, vista, grand and voyager class (see Table 1.2 for definitions).

The CSDP involved upgrading of the following infrastructure:

- Expansion of the existing shipping channel (by widening the existing channel to 130m and deepening it by 1.1m) and the shipping channel swing basin.
- Expansion of the existing marine dredge material placement area.
- Establishment of a new swing basin to support future expansion of the HMAS Cairns Navy base.
- Structural upgrade of the existing shipping wharves.
- Provision and upgrade of services to the wharves.

The EIS required an assessment of the economic benefits of the project for the Cairns Region based on the increased cruise ship visitations that would result from the proposed infrastructure improvements, especially the channel upgrade. To enable this assessment, it was decided that the 2011 *Demand Study* (BMT WBM, 2011) should be updated to reflect the latest growth trends. Consequently, BMT WBM were recommissioned to undertake the *2014 Demand Study Update* (BMT WBM, 2014) as input to the EIS economic assessments.

Subsequent to the commencement of the EIS, the Federal Government's regulation on sea disposal and the State Government's *Sustainable Ports Development Act 2015* have impacted the project. The banning of capital dredging sea disposal has significantly impacted on the project viability, particularly on the financial, economic and environmental aspects. From an environmental perspective, in order for the project to proceed, both the Federal and State Government will need to approve a revised draft EIS based on land disposal and as such the project scope is being recalibrated.

As part of this recalibration, Ports North is considering changes to the target cruise shipping class and assessing the impact on channel design to reduce dredge volumes and costs. The original scope was based on target ships classes including grand, vista and voyager class. Ports North is now considering vista and grand class vessels as an alternative for defining project scope, particularly when the original demand study showed that the largest number of additional cruise ships forecast for Cairns were vista class vessels.

Ports North has completed an assessment of channel designs and completed comprehensive simulations using the Smartship simulator facility in Brisbane on the preferred alignment for both vista and grand class vessels. As a result of the simulation the Regional Harbour Master (RHM) has approved the preferred channel alignment for vista and grand class vessels. The channel upgrade may also include channel deepening for improved access. The feasibility of the revised project will therefore be more critically dependant on demand for transit visits by vessel sizes in the vista and grand classes and on home porting opportunities for vista class vessels. This is subject to port access for sun class vessels using the existing channel, which has now been granted.

1.2 2016 DEMAND STUDY UPDATE

AEC has been engaged to prepare a 2016 *Demand Study Update* to forecast the increased number of cruise ship visits to Cairns resulting from the proposed channel upgrade and the emerging changes in the cruise industry, including:

- Home porting of mid-size ships in Cairns commencing 2016.
- Potential for future home porting of vista class vessels in Cairns.
- Relocation of additional cruise ships to the Australian market.
- Impacts associated with other port constraints/developments.

While the demand forecasts for the channel design for the vista and grand class vessels will be the primary focus, the previous forecasts for the larger channel design suitable for the voyager class will also be retested. This retesting is to inform any long term port planning requirements.

Ports North will use these forecasts initially in a preliminary 'high level' assessment of project viability and then in the detailed economic benefits assessments to be carried out for the revised draft EIS.

The consultancy brief for the *2016 Demand Study Update* is contained in Ports North (2015).

1.3 SHIP CLASSIFICATIONS

Cruise ships can be commonly classified into four broad categories:

- *Expedition and adventure cruise ships*: Pax around or less than 150 (e.g. *National Geographic Orion*). Smaller vessels which can access more destinations and because of their size have the lowest infrastructure demands and impacts. This class is also generally characterised by higher passenger return visits and higher base port spends. In some destinations, such as the Great Barrier Reef, this class competes with day trip tour boats putting downward pressure on the cruise operator's yield.
- *Boutique cruise ships*: Pax between 150 and 500 (e.g. *Silver Cloud*). The product offer is targeted at quality provision of services and experience with according implications for shore facilities. This product is targeted at the high yield end of the market.
- *Mid-size cruise ships*: Pax between 500 and 2,000 (e.g. *Pacific Aria*) These vessels have greater port infrastructure demands than previous classes requiring greater channel depths and generally requiring wharf berthing. Their size generates significant demand for a range of shore tours and facilities.
- *Mega-cruise ships*: Pax over 2,000 (e.g. *Queen Victoria*) These vessels are among the largest cruise vessels and have significant port infrastructure needs including greater channel depth, longer wharfs for side berthing, air space under bridges and high quality terminal facilities with baggage handling and international passenger processing facilities. These vessels generally limit visits to major capital city or tourist destination centres. For the purposes of this report the ship categories from Regal class and up are considered Mega-cruise ships.

Ship classification by passenger capacity is important for the logistics of passenger movements, supplies and expenditure.

Table 1.1 Ship Classification by Passengers (Pax Class)

Category	Pax
Adventure	Under 150
Boutique	151 to 500
Mid	501 to 2,000 although those ships with length classification of Sun are classified as Mega
Mega	Over 2,000

Source: AEC

Ship classification by length is important for channel widths, wharf length and turning basins.

Table 1.2 Ship Classification by Length (Length Class)

Category	Length	Example	GRT	LOA	Beam	Draft	Pax
Sub-Regal	Less than 240m	Pacific Aria	55,451	219	30.80	7.50	1,258
Regal	240m to 260m	Pacific Dawn	70,285	245	32.25	7.83	2,050
Sun	260m to 290m	Sun Princess	77,441	261	32.28	8.01	1,950
Vista	290m to 300m	Queen Victoria	90,049	294	32.26	8.00	2,014
Grand	300m to 310m	Emerald Princess	113,561	290	36.05	8.50	3,080
Voyager	>310m	Voyager of the Seas	137,276	312	38.60	8.80	3,138

Note: Grand class also considered 270m to 310m but also characterised as having draft of 8.50m or more.
Source: Ports North & AEC

Ship classification by draft is important for channel and wharf depths. The categories are under 8.0m, 8.01 to 8.50m and over 8.5m.

1.4 THIS DOCUMENT

This document contains preliminary demand projections of future cruise ships visits to Cairns. It is made up of the following sections:

- *Section 2 Trends in the Cruise Shipping Industry*, examines Australian cruising demand, global cruise trends, visiting ship characteristics and port constraints and developments in Sydney and Brisbane.
- *Section 3 Cruise Ship Trends in Cairns* examines the Port of Cairns, visiting ship characteristics and itineraries.
- *Section 4 Previous Projections and Outcomes* looks at the 2011 and 2014 ships visit projections for Cairns and compares then to outcomes.
- *Section 5 Industry Consultation* summarises the key outcomes of discussions with selected industry players that has assisted in forming assumptions for the 2016 projections.
- *Section 6 Projection Methodology* describes the basic and scenario settings for the projections.
- *Section 7 Logistics & Constraints* examines the issues associated with Yorkey's Knob that constrain the projections.
- *Section 8 Demand Projections* summarises the alternative projection scenarios.
- *Section 9 2014 Channel Demand Projections* presents two additional demand scenarios based on the previous 2014 channel configuration.
- *Appendix A Scenario Projections* contains all the individual alternative projection scenarios.

The report should also be read in conjunction with WBM BMT (2014) which contained a number of other observations on the global, national and regional cruise industry.

2. TRENDS IN THE CRUISE SHIPPING INDUSTRY

This section examines trends in the cruise shipping industry that will impact on Cairns.

2.1 AUSTRALIAN OCEAN CRUISING DEMAND

2.1.1 Passenger Growth

The Cruise Line Industry Association Australasia (CLIAA, 2016) maintains figures on where Australians are cruising. Over the past 10 years, Australian ocean cruise passenger numbers have grown nearly six-fold, from a base of 186,666 in 2005 to 1,058,781 in 2015. During the same time the Australian ocean cruise industry has averaged an annual growth rate in passenger numbers of 19.2%.

The most popular ocean cruise destination for Australians in 2015 was the South Pacific with 36.3% followed by Australia with 25.5%. Collectively, South Pacific, Australia and New Zealand made up 71.3% of ocean cruising destinations for Australians.

The fastest growing markets between 2014 and 2015 for Australians were Asia (71.5%), Australia (42.2%), Northern Europe (22.3%) and Alaska (19.4%). World Voyages (-down 12.7%), Caribbean (down 10.7%) and South Pacific (down 2.2%) were the only declining markets.

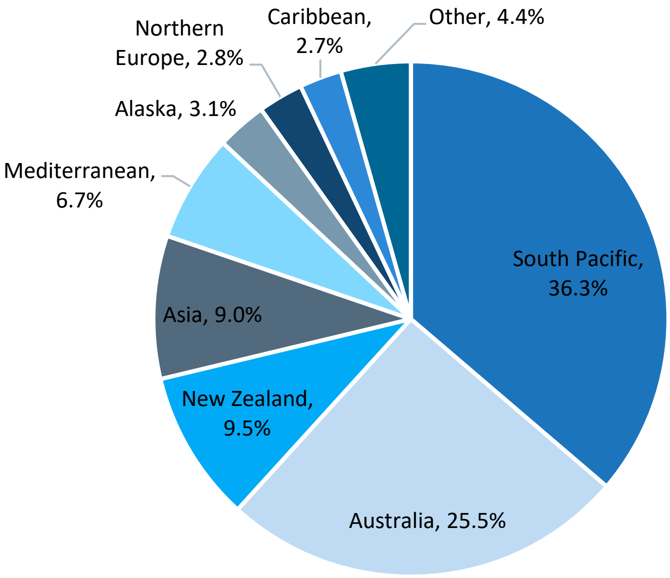
These changes reflect Australian's response to growing capacity and fresh itinerary offerings. CLIAA (2016, p5) notes that to reach an industry target of two million ocean cruise passengers in 2020 will require an average annual growth rate of 13.6% over the next five years.

Table 2.1 Australian Ocean Cruise Passengers Destination Growth

Destination	2014	2015	Growth	Share
South Pacific	392,549	383,889	-2.2%	36.3%
Australia	189,796	269,915	42.2%	25.5%
New Zealand	88,685	100,642	13.5%	9.5%
Asia	55,399	95,016	71.5%	9.0%
Mediterranean	69,030	71,459	3.5%	6.7%
Alaska	27,901	33,315	19.4%	3.1%
Northern Europe	24,499	29,960	22.3%	2.8%
Caribbean	31,482	28,099	-10.7%	2.7%
Other America	16,596	17,226	3.8%	1.6%
World Voyages	12,299	10,737	-12.7%	1.0%
Other Destinations	7,130	9,105	27.7%	0.9%
South America	4,794	5,289	10.3%	0.5%
Mexico	3,566	4,129	15.8%	0.4%
Total	**923,726**	**1,058,781**	**14.6%**	**100.0%**

Source: CLIAA (2016)

Figure 2.1 Australian Ocean Cruise Passengers, 2015



Source: CLIAA (2016)

For Cairns the popularity of the South Pacific and Australia are of interest as well as linkages to the fast growing Asia markets.

2.1.2 Market Penetration

Market penetration is a key industry statistic and refers to the percentage of the population that went on an ocean cruise in a particular year. Market penetration in Australia was 4.5% in 2015, 4.2% in 2014, and 3.6% in 2013. This is the second time Australia has broken through the 4% barrier, and compares to the "mature" North American market which achieved 3.4% in 2014. Although this is the highest compared to other countries the industry still believes there is room for more growth (CLIAA, 2015).

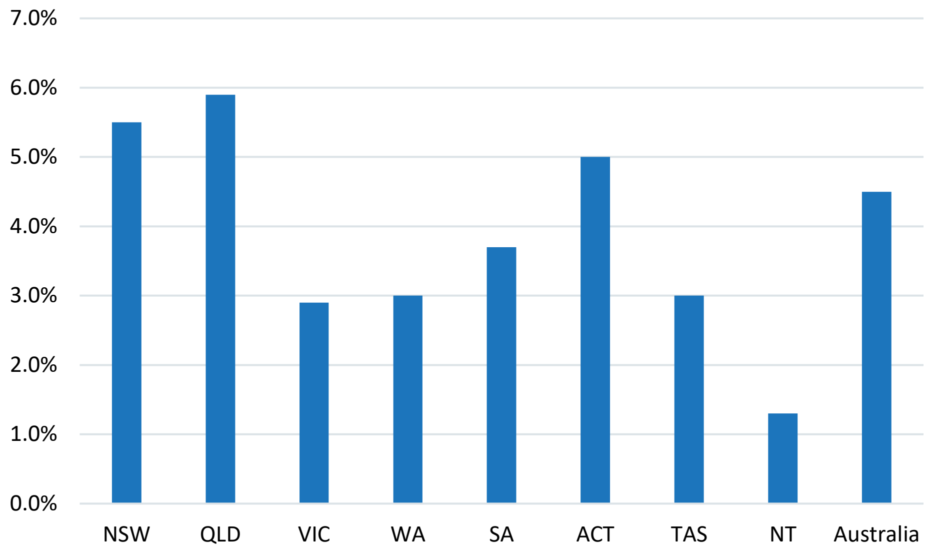
Within Australia the largest cruise market is NSW with 421,950 (39.9%) passengers in 2015, followed by Queensland with 282,618 (26.7%). NSW penetration rates were 5.4% and Queensland 4.9% in 2014 and 5.5% and 5.9% respectively in 2015 (CLIAA, 2015, 2016).

Table 2.2 Australian Ocean Cruise Passenger Origin

State	2014	2015	Growth	Share	Penetration
NSW	377,803	421,950	11.7%	39.9%	5.5%
QLD	218,001	282,618	29.6%	26.7%	5.9%
VIC	161,652	174,321	7.8%	16.5%	2.9%
WA	67,432	78,881	17.0%	7.5%	3.0%
SA	52,653	62,772	19.2%	5.9%	3.7%
ACT	24,016	19,572	-18.5%	1.8%	5.0%
TAS	16,627	15,411	-7.3%	1.5%	3.0%
NT	5,542	3,254	-41.3%	0.3%	1.3%
Australia	**923,726**	**1,058,781**	**14.6%**	**100.0%**	**4.5%**

Source: CLIAA (2016)

Figure 2.2 Australian Market Penetration, 2015



Source: CLIAA (2016)

Cruising demand drives supply (assuming no infrastructure constraints). Therefore, if demand measured by penetration is increasing cruise lines are likely to increase the frequency of visitation. Demand can be driven by a number of factors such as price, competiveness against other destinations, novelty and word of mouth. The high penetration rates in Queensland is of benefit to Cairns and may have played a part in Carnival Australian home porting *Pacific Eden* in Cairns for the 2016-17 and 2017-18 seasons.

2.2 GLOBAL CRUISE TRENDS

2.2.1 Global Deployment

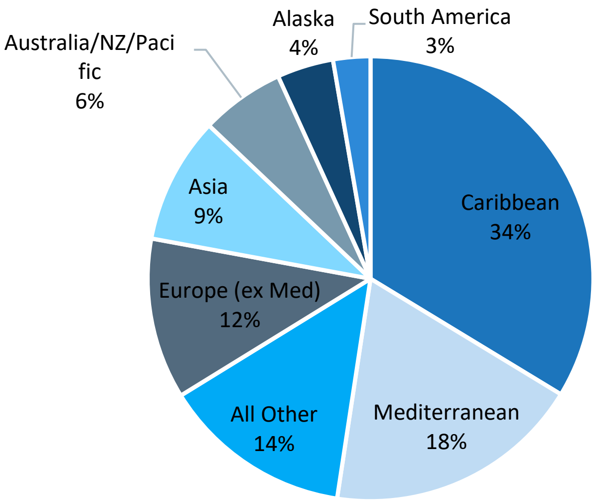
Cruise lines divide the globe into various regions with cruise ships servicing a particular region based on demand and season. Being mobile assets cruise ships can be reallocated between regions. On a global basis, Australia, New Zealand and the Pacific have 6.1% of global available lower berth days making the region the 6th largest market (CLIA, 2015a).

Table 2.3 Cruise Line Deployment by Region, available lower berth day, 2016

State	Share
Caribbean	33.7%
Mediterranean	18.7%
All Other	13.8%
Europe (ex Mediterranean)	11.7%
Asia	9.2%
Australia/NZ/Pacific	6.1%
Alaska	4.1%
South America	2.7%
Total	**100.0%**

Source: CLIA (2015a)

Figure 2.3 Cruise Line Deployment by Region, available lower berth day, 2016



Source: CLIA (2015a)

2.2.2 New Ship Trends

As demand for cruising grows cruise lines have been adding capacity to the global fleet by building larger capacity ships to take advantage of economies of scale. As these new ships are added, older smaller ships are either refurbished and orientated to a particular market or decommissioned.

The Cruise Ship Orderbook has 81 announced ocean cruise ships for delivery between 2016-2026. Analysis of these (based on GRT or pax - length or draft is not available) reveal that 59 are mega class ships and more than 60% of these ships are voyager class that are over 114,000GRT or 3,000 pax. There are no regal or sun class ships on order.

Table 2.4 New Mega Cruise Ship Orders by Length Class, 2016-22

Delivery Year	Regal	Sun	Vista	Grand	Voyager	Total
2016			2	2	3	**7**
2017			1	1	5	**7**
2018			2	2	3	**7**
2019			2	2	8	**12**
2020			1	2	6	**9**
2021			1	2	4	**7**
2022			1	1	3	**5**
2023				1		**1**
2024					2	**2**
2025					1	**1**
2026					1	**1**
Total	**0**	**0**	**10**	**13**	**36**	**59**
Share	*0%*	*0%*	*16.9%*	*22.0%*	*61.0%*	*100.0%*

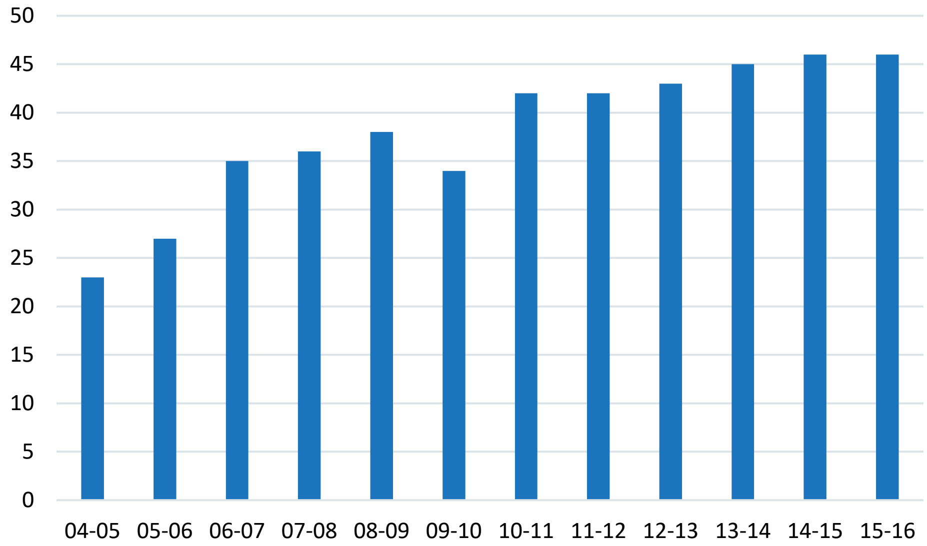
Source: Cruise Industry News (2016)

2.3 SHIPS VISITING AUSTRALIA

2.3.1 Ship Characteristics & Classifications

The number of individual cruise ships operating in Australia was 46 in the 2015-16 season. Whilst this number has grown modestly from 42 over the last five years the compound average growth rate (CAGR) from the 23 in 2004-05 was 6.5%.

Figure 2.4 Number of Ships Visiting Australia



Source: ACA (2016), AEC

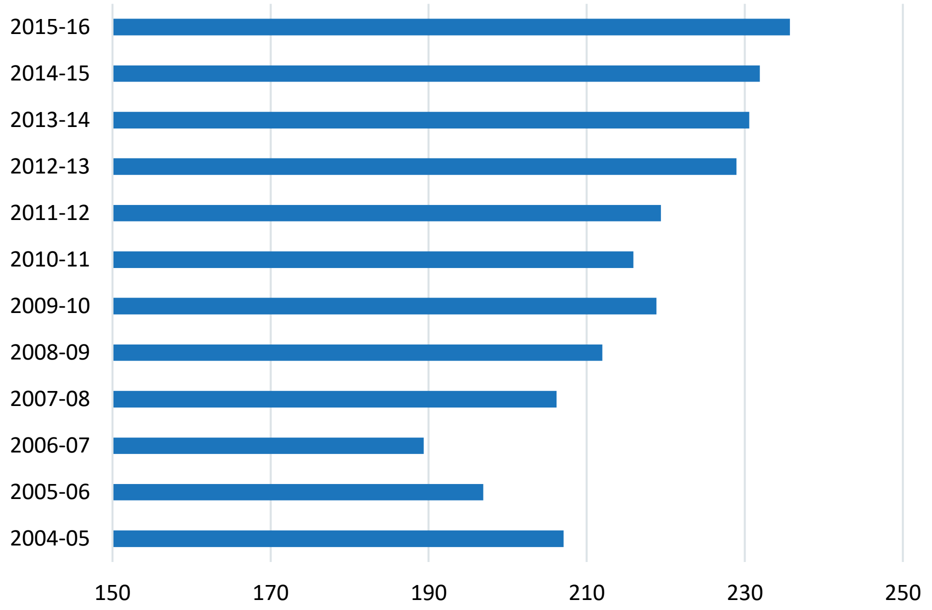
Not only have the number of ships visiting Australia increased but their length, gross registered tonnes (GRT), passenger and crew capacity have also increased. This growth in size has implications for port access and passenger handling.

Table 2.5 Characteristics of Australian Visiting Fleet

		Average			
Year	Number	Length (m)	GRT (tonnes)	Pax	Crew
2004-05	23	207	41,128	1,060	477
2005-06	27	197	37,951	927	439
2006-07	35	189	35,382	876	408
2007-08	36	206	42,635	1,089	503
2008-09	38	212	48,043	1,112	520
2009-10	34	219	51,307	1,230	539
2010-11	42	216	48,952	1,173	519
2011-12	42	219	51,395	1,287	548
2012-13	43	229	58,901	1,443	629
2013-14	45	231	58,940	1,406	624
2014-15	46	232	60,751	1,481	643
2015-16	46	236	63,999	1,586	679

Source: ACA (2016), AEC

Figure 2.5 Average Length of Australian Visiting Fleet, m



Source: ACA (2016), AEC

Table 2.6 presents more detail on the classification composition of the ship fleet visiting Australia over the last five years.

Table 2.6 Australian Fleet Classifications

	Number					% Share				
	11-12	12-13	13-14	14-15	15-16	11-12	12-13	13-14	14-15	15-16
Classified by Pax										
Adventure	2	4	4	4	4	4.8%	9.3%	8.9%	8.7%	8.7%
Boutique	7	7	7	5	4	16.7%	16.3%	15.6%	10.9%	8.7%
Mid	16	12	13	12	13	38.1%	27.9%	28.9%	26.1%	28.3%
Mega	17	20	21	25	25	40.5%	46.5%	46.7%	54.3%	54.3%
Total	**42**	**43**	**45**	**46**	**46**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Classified by Length										
Sub-Regal	25	23	24	21	21	59.5%	53.5%	53.3%	45.7%	45.7%
Regal	6	4	4	6	4	14.3%	9.3%	8.9%	13.0%	8.7%
Sun	6	7	7	8	9	14.3%	16.3%	15.6%	17.4%	19.6%
Vista	3	5	6	7	7	7.1%	11.6%	13.3%	15.2%	15.2%
Grand	1	1	1	1	1	2.4%	2.3%	2.2%	2.2%	2.2%
Voyager	1	3	3	3	4	2.4%	7.0%	6.7%	6.5%	8.7%
Total	**42**	**43**	**45**	**46**	**46**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Classified by Draft										
Under 8.0m	30	28	29	30	27	71.4%	65.1%	64.4%	65.2%	58.7%
8.01m to 8.50m	9	11	12	12	14	21.4%	25.6%	26.7%	26.1%	30.4%
Over 8.50m	3	4	4	4	5	7.1%	9.3%	8.9%	8.7%	10.9%
Total	**42**	**43**	**45**	**46**	**46**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: ACA (2016), AEC

The following trends are apparent:

- *Pax classification*: Both adventure class (up 2) and mega class (up 8) have increased at the expense of boutique (down 3) and mid (down 3).

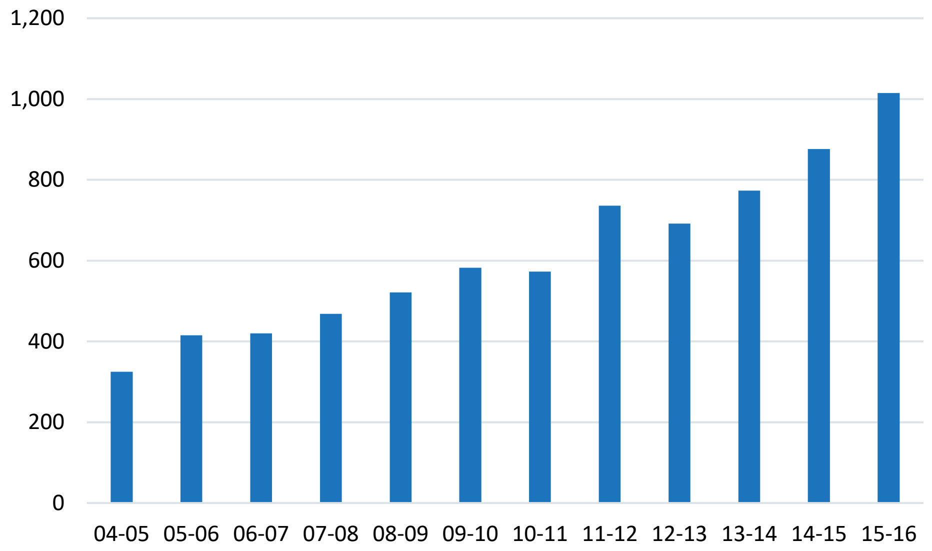
- *Length classification*: Sub-regal class (down 4) has decreased whilst sun (up 3), vista (up 4) and voyager (up 3) have increased.
- *Draft classification*: The 8.01m to 8.50m draft (up 5) and over 8.50m (up 2) lengths have increased.

Again, these trends indicate the growing size of the ship fleet visiting Australia.

2.3.2 Ship Visit Characteristics

The number of cruise ship visits to Australian ports, has grown more rapidly than the number of ships at a CAGR of 10.9% from 2004-05 to 2015-16.

Figure 2.6 Number of Ship Visits to Australian Ports

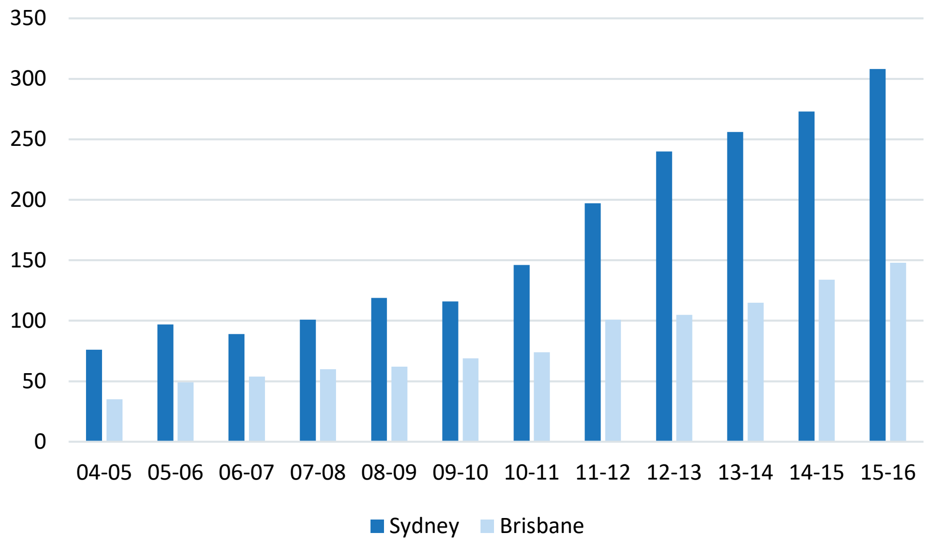


Source: ACA (2016) and AEC

Overall, there were 1,015 cruise ship visits to Australian ports in 2015-16, an increase of 139 visits, or 15.9%, from the 2014-15 total of 876. Sydney (308), Brisbane (148), Melbourne (75), Fremantle (58), Cairns (50), Darwin (45), Moreton is (33) and Hobart (32) were the most frequently visited ports/destinations in 2015-16.

Comparing Sydney and Brisbane, Australia's most visited ports, Sydney has grown from 76 visits in 2004-05 to 308 in 2015-16, a CAGR of 13.6% whilst Brisbane has grown from 35 in 2004-05 to 148 in 2015-16 a CAGR of 14.0%.

Figure 2.7 Number of Ship Visits, Sydney and Brisbane



Source: ACA (2016), AEC

The number of future ship visits to both Sydney and Brisbane will have flow on effects for Cairns depending on itineraries.

2.4 PORT CONSTRAINTS & DEVELOPMENTS

Several port constraints and developments are critical to understanding constraints and opportunities for the Australian and Cairns cruise industry.

2.4.1 Sydney Harbour Constraints

Sydney has two cruise terminals:

- *Overseas Passenger Terminal*, The Rocks has capacity for one cruise ship and has recently been upgraded to improve efficiency and capacity.
- *White Bay Cruise Terminal*, Roxelle, has capacity for two cruise ships at White Bay 5 and White Bay 4 (bare berth only). Ship access is constrained by clearance below the Sydney Harbour Bridge which is 49m midspan (vessels must maintain a minimum of 2m clearance under the bridge).

Cruise ships can also be anchored at Athol Buoy, Point Piper Buoy, Neutral Bay or moored at Garden Island if approved by the Department of Defence.

The number of cruise ship visits to Sydney was 308 in 2015-16, however, the current schedules for 2016-17 and 2017-18 show 356 and 369 bookings (as at 13 October 2016), respectively.

Table 2.7 Sydney Cruise Ship Visit Schedule, Number of Ship Visits

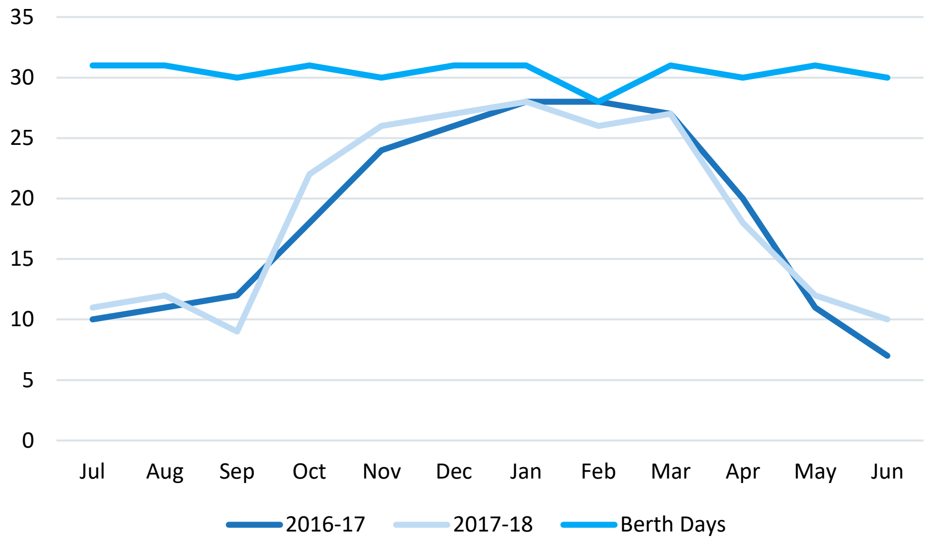
Month	Days in Month	2016-17				2017-18			
		OPT	WBCT	Other	Total	OPT	WBCT	Other	Total
July	31	10	6		16	11	2		13
August	31	11			11	12	1		13
September	30	12	5		17	9	3		12
October	31	18	8	1	27	22	4		26
November	30	24	15		39	26	20		46
December	31	26	15		41	27	20		47
January	31	28	23	3	54	28	24	3	55
February	28	28	19	4	51	26	26	7	59
March	31	27	15	2	44	27	20		47
April	30	20	8		28	18	8		26
May	31	11	5		16	12	1		13
June	30	7	5		12	10	2		12
Total	**365**	**222**	**124**	**10**	**356**	**228**	**131**	**10**	**369**

Note: OPT = Overseas Passenger Terminal, WBCT = White Bay Cruise Terminal, Other = Athol Buoy, Point Piper Buoy or Neutral Bay.
Source: Port Authority of NSW (as at 13 October 2016), AEC

As can be seen there are several months of the year when the number of scheduled ship visits to the OPT (Figure 2.8) is close to the number of days in 2017-18 (November through to March). Capacity at White Bay is not yet being approached and may not given the increasing trend for larger cruise ships that may not fit under the Sydney Harbour Bridge.

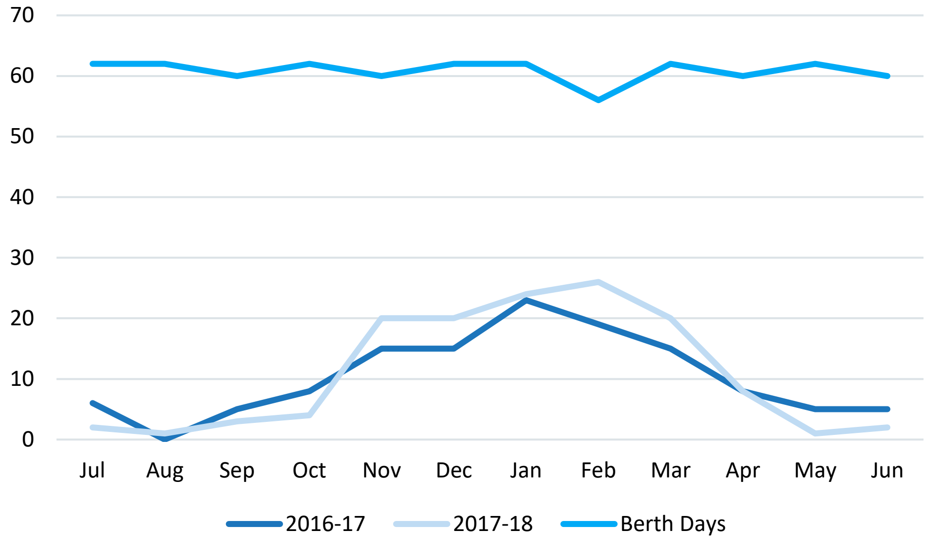
The capacity constraint for five months of the year is a constraint on the growth of the cruise shipping industry as Sydney is considered a marque port. The lack of any workable solution for Sydney has opened the door for other ports to develop solutions (see Brisbane below).

Figure 2.8 Sydney Overseas Passenger Terminal Cruise Ship Schedule, Number of Ship Visits



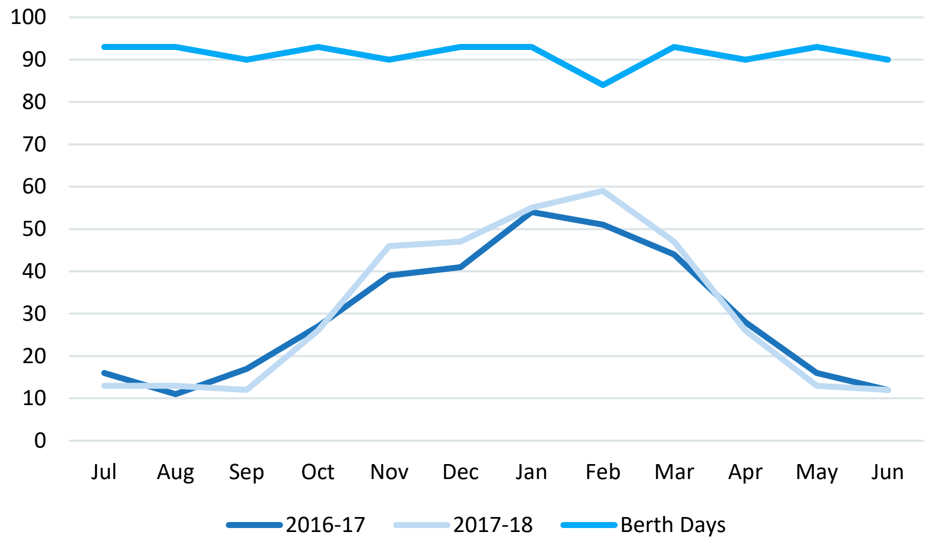
Source: Port Authority of NSW (as at 13 October 2016), AEC

Figure 2.9 Sydney White Bay Cruise Ship Schedule, Number of Ship Visits



Source: Port Authority of NSW (as at 13 October 2016), AEC

Figure 2.10 Sydney Cruise Ship Schedule, Number of Ship Visits



Source: Port Authority of NSW (as at 13 October 2016), AEC

2.4.2 Brisbane Cruise Terminal

The majority of cruise ships berth at the Portside Wharf Cruise Terminal located at Hamilton whilst the Port of Brisbane hosts periodical cruise ships transit visits at the Multi-user Terminal which has limited facilities. Ship access to Portside is constrained by clearance below the Sir Leo Hielscher Bridges which is 59.2m midspan (airdrafts between 53.5m and 46.4m subject to tidal and transit restrictions) and to ships 270m in length.

On 12 February 2016 Port of Brisbane (PoB, 2016) announced a new $100 million cruise ship facility to be constructed at Luggage Point on the north side of the Brisbane River. Relevant comments from the media release are:

> *"Cruise ships are getting longer and currently there is no dedicated facility in Brisbane to accommodate 'mega ships' (vessels longer than 270 metres). By 2020, mega ships will represent approximately 60% of Brisbane's vessel calls and without a new facility Brisbane, and Queensland, may miss out on future visits*
>
> *A new cruise facility will potentially triple the size of Brisbane's cruise industry over the next 20 years, growing to support 3,750 jobs, bringing 766,260 international and domestic cruise visitors annually to the*

> *City and State, and contributing approximately $1 billion in gross output annually to Queensland's economy.*
>
> *Mr Cummins said the proposed cruise facility has the full support of Carnival Australia and Royal Caribbean International, which together represent the majority of the Australian cruise industry.*
>
> *"The cruise industry wants to expand in Brisbane, and has the future demand to support it. Cruise has been one of the standout performers of Australia's tourism industry over recent years, and this is Brisbane—and Queensland's—opportunity to grow its share of the cruise market," he said*
>
> *"A dedicated facility would support the industry's planned expansion and enable Brisbane to become a base port for international and domestic cruises and a major cruise destination."*

No completion date has been put forward although 2019[2] has been mentioned.

This substantial increase in capacity has the potential to dramatically increase the number of cruise ship visits to Cairns.

[2] 2 As at the date of this report this dates seems overly optimistic.

3. CRUISE SHIP TRENDS IN CAIRNS

This section examines trends in the cruise shipping industry in Cairns.

3.1 PORT OF CAIRNS

Cruise ships visiting Cairns either berth at Trinity Wharf or anchor 4km off shore at Yorkey's Knob and use tenders (catamarans or the ship's tenders) to get passengers ashore. Trinity Wharf lies on the western side of the inlet adjacent to the city.

The Crystal Basin is the principal swing basin used by cruise ships to access wharves 1–5. The turning basin is 360m in diameter at draughts of 7.0m, and 380m diameter at draughts of 6.3m.

Sea access to the port is via a 7.1 nautical mile long channel comprised of the 5.3nm Entrance Channel and 1.8nm Trinity Channel. The average width of the channel is 90m and the channel has a design depth of 8.3m below lowest astronomical tide (LAT).

3.2 SHIPS VISITING CAIRNS

3.2.1 Historical Trends in Ship Visits

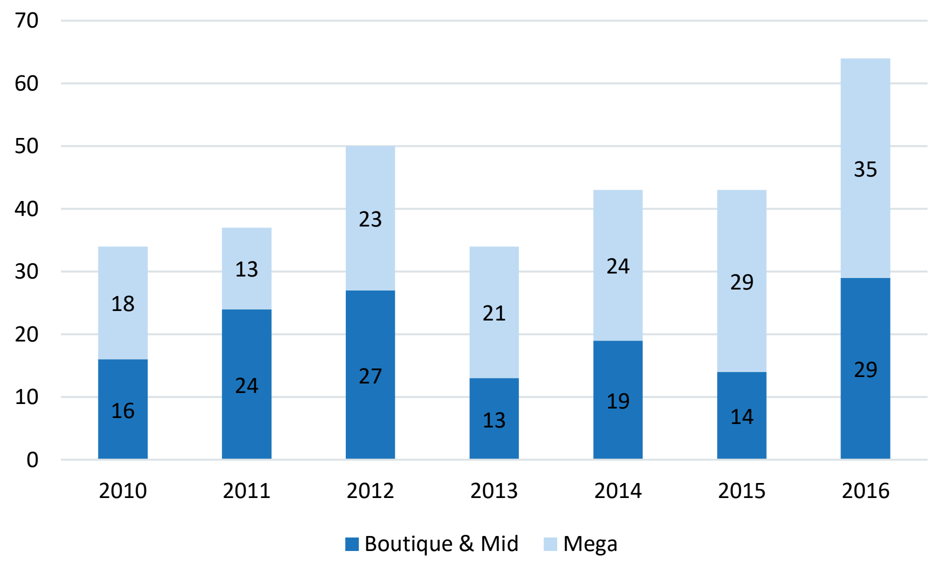
Excluding adventure ships, the total number of cruise ships to visit Cairns in 2015 was 43, which has grown from 34 in 2010 or a CAGR of 4.8%. For 2016, the scheduled total visits to Cairns is 64 (CAGR of 11.1% since 2010). This large increase in visitation reflects the transit and home porting of the P&O mid/sub-regal ships *Pacific Aria* and *Pacific Eden*.

Table 3.1 Cairns Historical & Scheduled Ship Visits by Pax Classification

Category	2010	2011	2012	2013	2014	2015	2016
Adventure	9	3	8	5	6	2	1
Boutique & Mid	16	24	27	14	20	16	29
Mega	18	13	23	20	23	27	35
Total	**43**	**40**	**58**	**39**	**49**	**45**	**65**
CAGR since 2010 (excl. Adventure)						*4.8%*	*11.1%*
CAGR since 2010 (no Pacific Aria/Eden)						*4.8%*	*5.5%*

Note: 2016 as at schedule dated 6 September 2016. Source: Ports North, AEC

Figure 3.1 Cairns Historical & Scheduled Ship Visits by Pax Classification



Note: 2016 as at schedule dated 6 September 2016. Source: Ports North, AEC

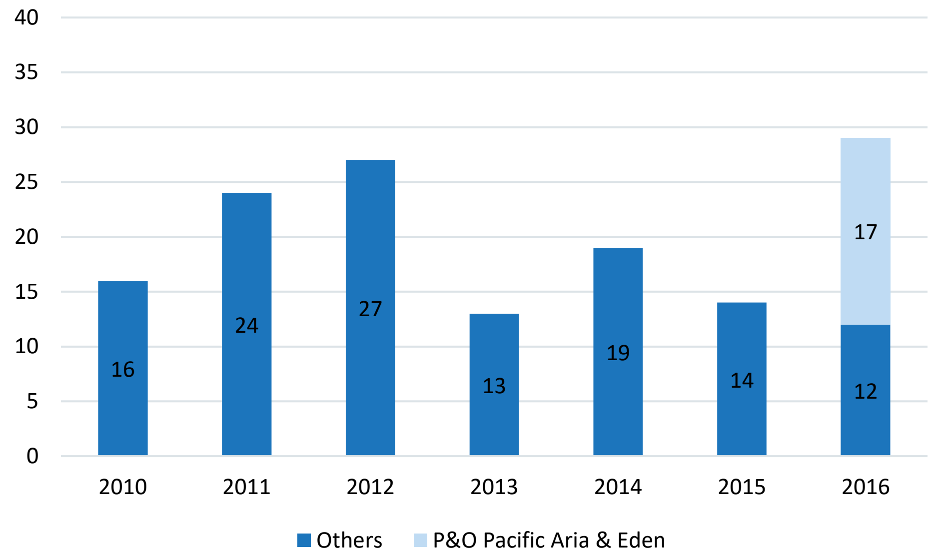
However, even omitting *Pacific Aria* and *Pacific Eden* (17 visits) from the analysis, there is still significant extra growth in Cairns in 2016 with 47 other scheduled visits representing an CAGR of 5.5% since 2010.

Table 3.2 Cairns Historical & Scheduled Ship Visits, Boutique & Mid Class

Category	2010	2011	2012	2013	2014	2015	2016
Others	16	24	27	14	20	16	12
P&O Pacific Aria & Eden							17
Total	**16**	**24**	**27**	**14**	**20**	**16**	**29**
CAGR since 2010						*0.0%*	*10.4%*
CAGR since 2010 (no Pacific Aria/Eden)						*0.0%*	*-4.7%*

Note: 2016 as at schedule dated 6 September 2016. Source: Ports North, AEC

Figure 3.2 Cairns Historical & Scheduled Ship Visits, Boutique & Mid Class



Note: 2016 as at schedule dated 6 September 2016. Source: Ports North, AEC

The number of cruise ships (excluding adventure class) visiting Trinity Wharf in 2015 was 22, which was up from 19 in 2010 (CAGR 3.0%). This number is scheduled to rise to 40 in 2016 due to:

- The additional 17 visits by P&O mid/sub-regal ships (*Pacific Eden* & *Pacific Aria*).
- An additional 7 visits by Sun class (mega) ships, which have been diverted from the Yorkey's Knob anchorage following successful simulation outcomes.

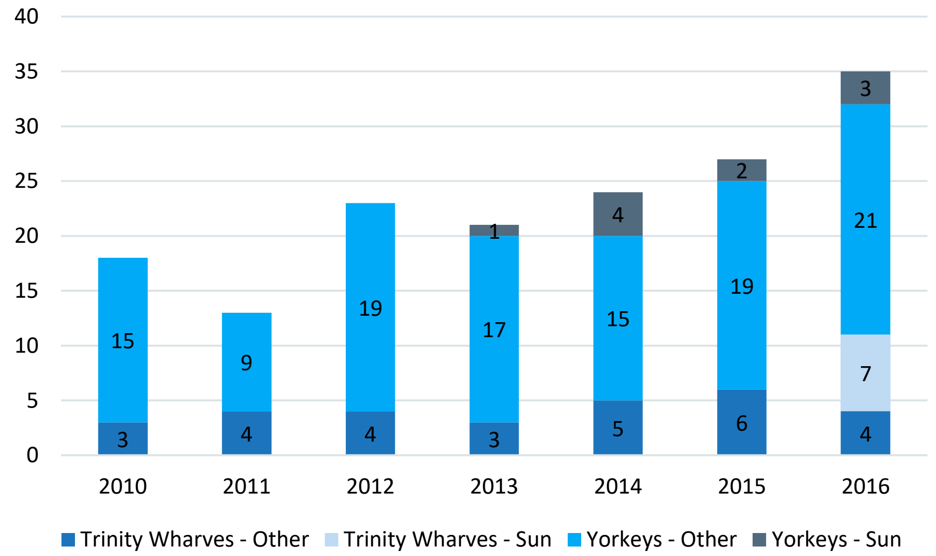
In comparison. the share of Mega ships to the Yorkey's Knob anchorage increased from 15 visits to 21 visits from 2010 to 2015 (a compound annual growth rate (CAGR) of 7.0%). The number is scheduled to increase to 24 for 2016 increasing the CAGR to 8.1% over the six-year period. This pattern reflects the increasing size of cruise ships visiting Cairns that cannot access the port.

Table 3.3 Cairns Historical & Scheduled Ship Visits, Mega Class by Location

Location/Category	2010	2011	2012	2013	2014	2015	2016
Trinity Wharf							
Other	3	4	4	3	5	6	4
Sun							7
Subtotal	***3***	***4***	***4***	***3***	***5***	***6***	***11***
Yorkey's Knob							
Other	15	9	19	17	15	19	21
Sun				1	4	2	3
Subtotal	***15***	***9***	***19***	***18***	***19***	***21***	***24***
Total	**18**	**13**	**23**	**21**	**24**	**27**	**35**
CAGR since 2010 Yorkey's Knob						7.0%	8.1%
CAGR since 2010 Trinity Wharf						14.9%	24.2%

Note: 2016 as at schedule dated 6 September 2016. Source: Ports North, AEC

Figure 3.3 Cairns Historical & Scheduled Ship Visits, Mega Class by Location



Note: 2016 as at schedule dated 6 September 2016. Source: Ports North, AEC

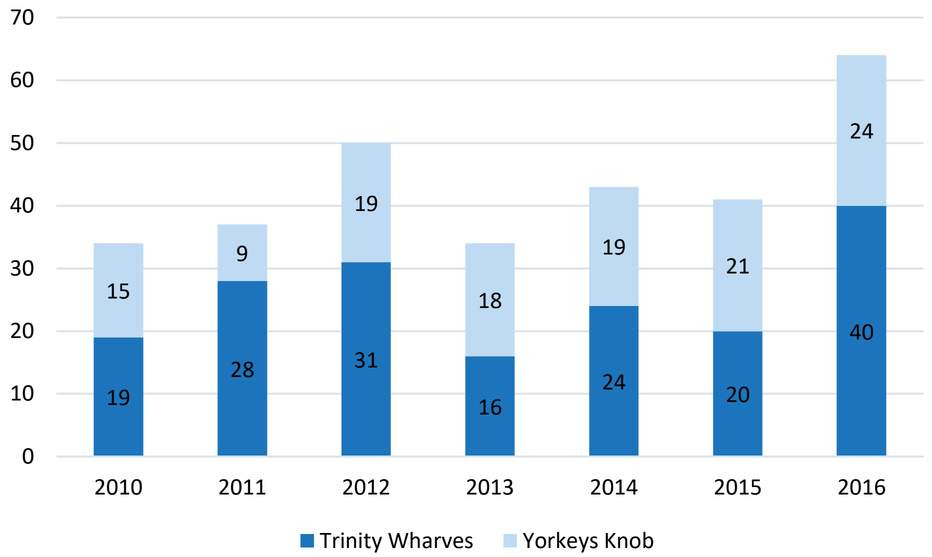
Overall all ship visits (excluding adventure class) to both Trinity Wharf and Yorkey's Knob continue to show a strong upward trend with CAGR over the last six years of 13.2% and 8.1%, respectively.

Table 3.4 Cairns Historical & Scheduled Ship Visits, Boutique, Mid & Mega Class by Location

Location	2010	2011	2012	2013	2014	2015	2016
Trinity Wharf	19	28	31	17	25	22	40
Yorkey's Knob	15	9	19	18	19	21	24
Total	**34**	**37**	**50**	**35**	**44**	**43**	**64**
CAGR Yorkey's Knob since 2010						*7.0%*	*8.1%*
CAGR Trinity Wharf since 2010						*3.0%*	*13.2%*

Note: 2016 as at schedule dated 6 September 2016. Source: Ports North, AEC

Figure 3.4 Cairns Historical & Scheduled Ship Visits Visits Boutique, Mid & Mega Class by Location

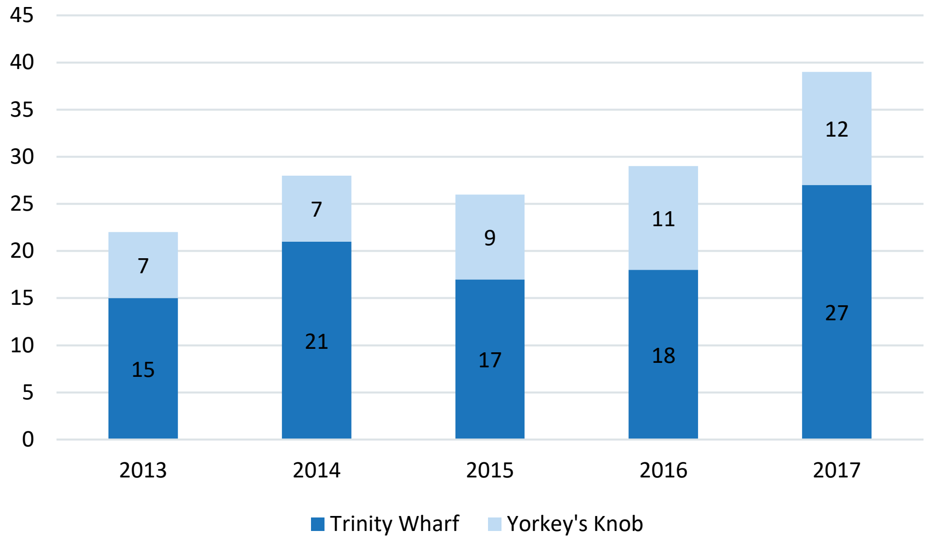


Note: 2016 as at schedule dated 6 September 2016. Source: Ports North, AEC

3.2.2 Ship Classifications

The number of individual cruise ships scheduled to visit Cairns in 2017 is 39 with 27 able to access Trinity Wharf and 12 anchoring at Yorkey's Knob.

Figure 3.5 Historical & Scheduled Ships Visiting Cairns



Note: 2016 & 2017 as at schedule dated 6 September 2016. Source: Ports North, AEC

Over the five years from 2013 to 2017 the following trends in the ship fleet composition visiting Cairns are apparent:

- *Pax classification*: Adventure class (down 2) has decreased whilst boutique class (up 1), mid (up 10) and mega (up 8) have increased.
- *Length classification*: all classes except regal have increased. No grand class ships have visited Cairns.
- *Draft classification*: the under 8.0m (up 7), 8.01m to 8.50m (up 9) and over 8.50m drafts have increased.

These trends indicate the growing size of the ship fleet visiting Cairns.

Table 3.5 Cairns Historical & Scheduled Fleet Classifications

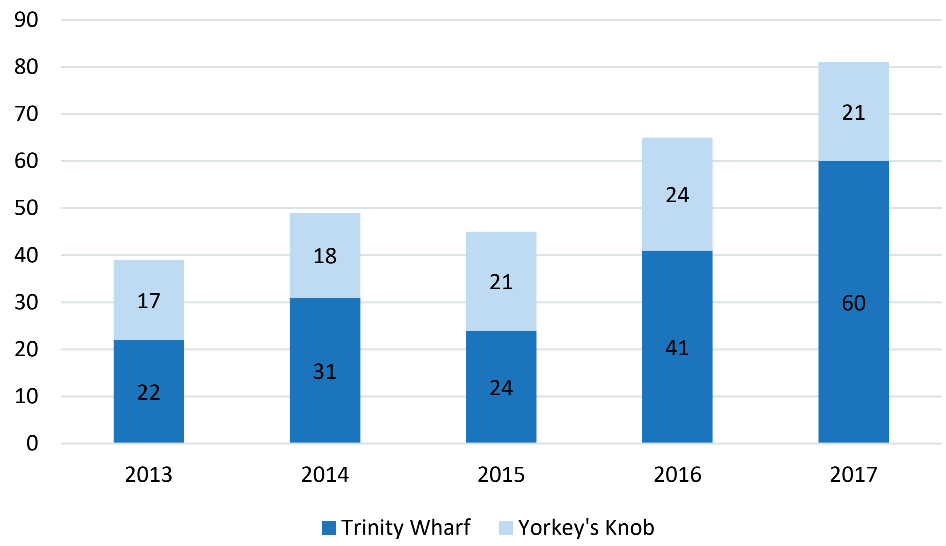
	Number					% Share				
Category	**2013**	**2014**	**2015**	**2016**	**2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Classified by Pax										
Adventure	3	4	1	1	1	13.6%	14.3%	3.8%	3.4%	2.6%
Boutique	4	7	3	4	5	18.2%	25.0%	11.5%	13.8%	12.8%
Mid	6	8	8	9	16	27.3%	28.6%	30.8%	31.0%	41.0%
Mega	9	9	14	15	17	40.9%	32.1%	53.8%	51.7%	43.6%
Total	**22**	**28**	**26**	**29**	**39**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Classified by Length										
Sub-Regal	13	19	12	14	22	59.1%	67.9%	46.2%	48.3%	56.4%
Regal	3	4	5	3	3	13.6%	14.3%	19.2%	8.3%	7.7%
Sun	2	3	4	6	8	9.1%	10.7%	15.4%	20.7%	20.5%
Vista	2	1	4	3	3	9.1%	3.6%	15.4%	8.3%	7.7%
Grand	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%
Voyager	2	1	1	3	3	9.1%	3.6%	3.8%	8.3%	7.7%
Total	**22**	**28**	**26**	**29**	**39**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Classified by Draft										
Under 8.0m	15	21	18	14	22	68.2%	75.0%	69.2%	48.3%	56.4%
8.01m to 8.50m	5	6	7	12	14	22.7%	21.4%	26.9%	41.4%	35.9%
Over 8.50m	2	1	1	3	3	9.1%	3.6%	3.8%	8.3%	7.7%
Total	**22**	**28**	**26**	**29**	**39**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Note: 2016 & 2017 as at schedule dated 6 September 2016. Source: Ports North, AEC

3.2.3 Ship Visit Classifications

The number of cruise ships visits scheduled to visit Cairns in 2017 (as at 6 September 2016) is 81, however, this is subject to change. The scheduled number of ship visits to the Yorkey's Knob anchorage is 21 whilst those visits scheduled for Trinity Wharf will number 60.

Figure 3.6 Historical & Scheduled Ship Visits to Cairns



Note: 2016 & 2017 as at schedule dated 6 September 2016. Source: Ports North, AEC

Over the five years from 2013 to 2017 the following trends in ship visit composition to Cairns are apparent:

- *Pax classification*: Both adventure class (down 4) and boutique class (down 1) have decreased whilst mid (up 34) and mega (up 13) have increased.
- *Length classification*: All classes except regal and voyager have increased with sub-regal (up 29 mainly due P&O *Pacific Aria* & *Pacific Eden*) showing the greatest increase with sun (up 12) also increasing. No grand class ships have visited Cairns.
- *Draft classification*: The under 8.0m (up 27) and 8.01m to 8.50m drafts (up 15) have increased.

The large increases in the mid and sub-regal ship visits in 2016 and 2017 are due to home porting of P&O ships.

Table 3.6 Cairns Historical & Scheduled Ship Visit Classifications

Category	Number					% Share				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Classified by Pax										
Adventure	5	6	2	1	1	12.8%	12.2%	4.4%	1.5%	1.2%
Boutique	6	9	3	4	5	15.4%	18.4%	6.7%	6.2%	6.2%
Mid	7	10	11	25	41	17.9%	20.4%	24.4%	38.5%	50.6%
Mega	21	24	29	35	34	53.8%	49.0%	64.4%	53.8%	42.0%
Total	**39**	**49**	**45**	**65**	**81**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Classified by Length										
Sub-Regal	18	25	16	30	47	46.2%	51.0%	35.6%	46.2%	58.0%
Regal	11	13	16	11	11	28.2%	26.5%	35.6%	16.9%	13.6%
Sun	4	9	8	14	16	10.3%	18.4%	17.8%	21.5%	19.8%
Vista	3	1	4	5	4	7.7%	2.0%	8.9%	7.7%	4.9%
Grand	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%
Voyager	3	1	1	5	3	7.7%	2.0%	2.2%	7.7%	3.7%
Total	**39**	**49**	**45**	**65**	**81**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Category	Number					% Share				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Classified by Draft										
Under 8.0m	21	34	25	31	48	53.8%	69.4%	55.6%	47.7%	59.3%
8.01m to 8.50m	15	14	19	29	30	38.5%	28.6%	42.2%	44.6%	37.0%
Over 8.50m	3	1	1	5	3	7.7%	2.0%	2.2%	7.7%	3.7%
Total	**39**	**49**	**45**	**65**	**81**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Note: 2016 & 2017 as at schedule dated 6 September 2016. Source: Ports North, AEC

3.2.4 Comparisons to the Australian Fleet

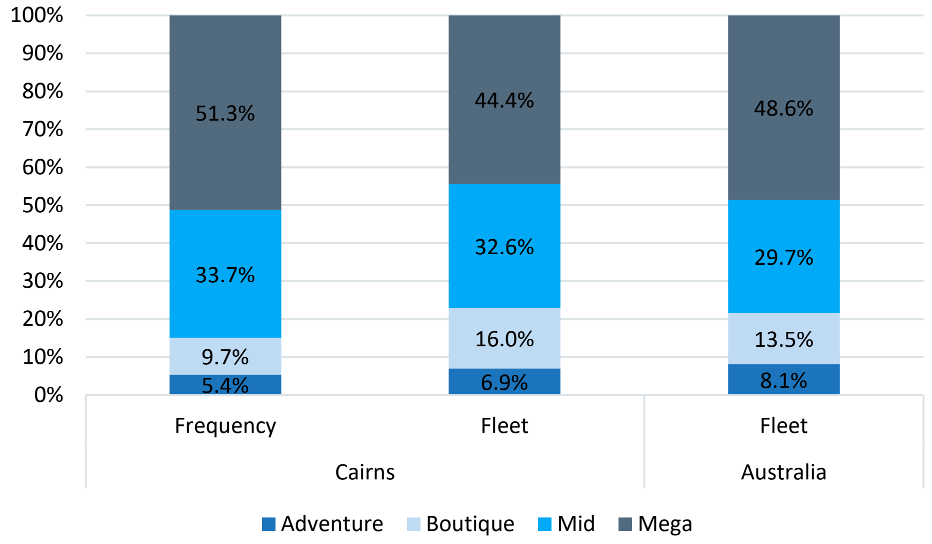
Comparisons of the Cairns visiting ship fleet (averaged over 2013 to 2017) to the Australian visiting ship fleet (averaged over 2011-12 to 2015-16) using all three classifications reveal only minor differences. This is an important validation for predicting visiting ships to Cairns in the future. The largest difference is in the 8.01m to 8.50m draft classification where the ship fleet visiting Cairns is 4.4% larger than for Australia. Conversely, the next largest difference is the mega pax classification is 4.2% less for Cairns than the Australian fleet.

Table 3.7 Cairns Ship Visits & Visiting Fleet v Australian Fleet Classifications, % share

Category	Cairns		Australia	
	Frequency	Fleet	Fleet	Fleet Difference
Classified by Pax				
Adventure	5.4%	6.9%	8.1%	-1.2%
Boutique	9.7%	16.0%	13.5%	2.5%
Mid	33.7%	32.6%	29.7%	2.9%
Mega	51.3%	44.4%	48.6%	-4.2%
Total	**100.0%**	**100.0%**	**100.0%**	
Classified by Length				
Sub-Regal	48.7%	55.6%	51.4%	4.2%
Regal	22.2%	12.5%	10.8%	1.7%
Sun	18.3%	16.0%	16.7%	-0.7%
Vista	6.1%	9.0%	12.6%	-3.6%
Grand	0.0%	0.0%	2.3%	-2.3%
Voyager	4.7%	6.9%	6.3%	0.6%
Total	**100.0%**	**100.0%**	**100.0%**	
Classified by Draft				
Under 8.0m	57.0%	62.5%	64.9%	-2.4%
8.01m to 8.50m	38.4%	30.6%	26.1%	4.4%
Over 8.50m	4.7%	6.9%	9.0%	-2.1%
Total	**100.0%**	**100.0%**	**100.0%**	

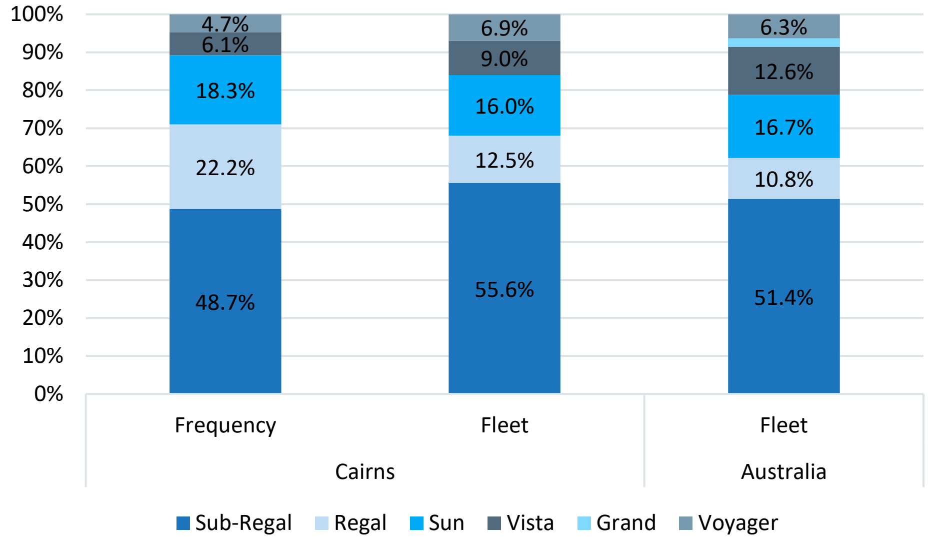
Source: ACA (2016), Ports North, AEC

Figure 3.7 Cairns Ship Visits & Visiting Fleet v Australian Fleet, % share classified by pax



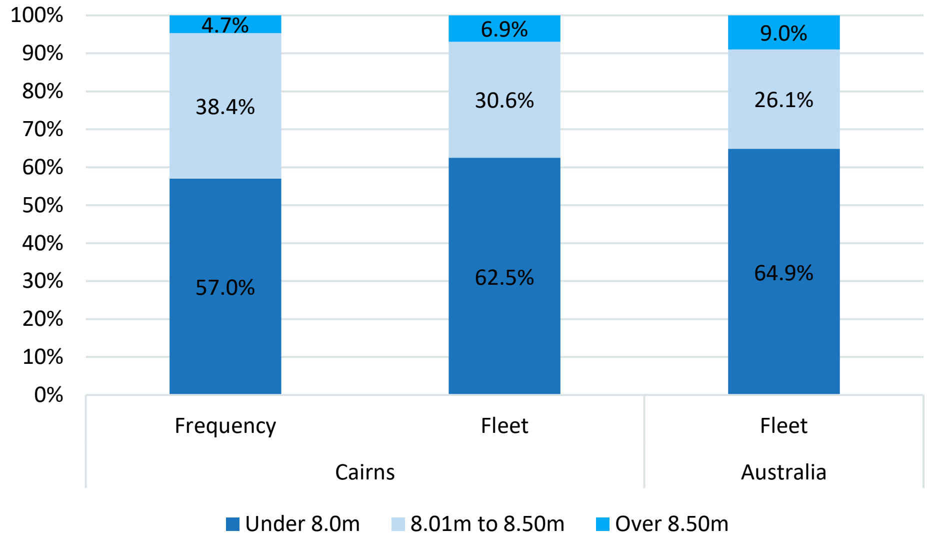
Source: ACA (2016), Ports North, AEC

Figure 3.8 Cairns Ship Visits & Visiting Fleet v Australian Fleet, % share classified by length



Source: ACA (2016), Ports North, AEC

Figure 3.9 Cairns Ship Visits & Visiting Fleet v Australian Fleet, % share classified by draft



Source: ACA (2016), Ports North, AEC

3.3 CAIRNS HOMEPORT ITINERARIES

Cruise itineraries for home porting ships fit into 14 day blocks with typical lengths of 7, 10, 13, 4 or 3 nights duration. A selection of itineraries for *Pacific Eden* is contained in the table below. The prices indicated are advertised prices but in most cases are discounted by up to 50%.

Table 3.8 Cairns P&O Homeport Itineraries, 2016-17

Name	Ports	Nights	Price	Itinerary
New Guinea Island Encounter	4	7	$949	Cairns, Alotau, Kitava, Kiriwina Island, Trobriand Islands, Conflict Islands, Cairns
Solomon Sea Islands	5	10	$799	Cairns, Alotau, Kitava, Rabaul, Gizo Island, Honiara, Cairns
Discover Vanuatu	4	11	$1,399	Cairns, Santo, Port Vila, Mystery Island, Noumea, Cairns
Comedy	1	3	$599	Cairns, Willis Island (Drop Anchor), Cairns
Whitsundays	1	4	$549	Cairns, Airlie Beach, Sydney
Alotau	2	4	$679	Cairns, Alotau, Kawanasausau Strait & Milne Bay (Scenic Cruising Port), Cairns
Classic	1	3	$529	Cairns, Hamilton Island, Brisbane

Source: P&O

These Cairns based itineraries are in contrast to those of Brisbane P&O homeport itineraries on *Pacific Aria*, *Pacific Dawn* and *Pacific Eden*. With the exception of Airlie Beach and Hamilton Island, for the itineraries show there are different destinations available to Cairns and Brisbane.

Table 3.9 Brisbane P&O Homeport Itineraries, 2016-17

Name	Ports	Nights	Cost	Itinerary
Pacific Island Hopper	3	7	$949	Brisbane, Noumea, Mare, Port Vila, Brisbane
Hamilton Island	1	4	$699	Brisbane, Hamilton Island, Brisbane
Barrier Reef Discovery	3	7	$1,049	Brisbane, Hamilton Island, Cairns, Willis Island (Drop Anchor), Brisbane
Classic		2	$499	Brisbane, Sydney
Fiji Adventure	5	12	$1,249	Brisbane, Isle of Pines, Suva, Port Denarau, Port Vila, Pentecost, Brisbane
Melanesian Discovery	4	9	$1,099	Brisbane, Lifou, Port Vila, Mystery Island, Isle Of Pines, Brisbane
Comedy		3	$549	Brisbane, Brisbane
Whitsundays	1	4	$599	Brisbane, Airlie Beach, Brisbane
State of Origin	3	7	$1,049	Brisbane, Moreton Island, Newcastle, Sydney, Brisbane
Food & Wine		3	$549	Brisbane, Brisbane
Pacific Explorer	5	11	$1,199	Brisbane, Santo, Pentecost, Port Vila, Mystery Island, Isle Of Pines, Brisbane
Polynesian Passage	8	18	$1,981	Brisbane, Santo, Port Vila, Port Denarau, Vava'u, Nuku'alofa, Apia, Dravuni Island, Suva, Brisbane
Vanuatu Explorer	5	10	$1,099	Brisbane, Santo, Port Vila, Mystery Island, Lifou, Noumea, Brisbane
New Guinea Islands Unearthed	5	10	$1,199	Brisbane, Alotau, Kitava, Rabaul, Kiriwina Island, Trobriand Islands, Conflict Islands, Brisbane
Music Rock		3	$554	Brisbane, Brisbane
Christmas	3-5	7-12	$1,199	Brisbane, Noumea, Lifou, Port Vila, Brisbane
New Years	3-4	7-11	$1,298	Brisbane, Airlie Beach, Cairns, Willis Island (Drop Anchor), Brisbane
Australia Day	1	4	$649	Brisbane, Sydney, Brisbane
Indonesian Explorer	5	14	$1,499	Brisbane, Port Douglas, Darwin, Timor L'Este (Dili), Komodo Island, Benoa, Bali, Singapore
Ultimate New Guinea Islands	8	14	$1,599	Brisbane, Alotau, Madang, Wewak, Vitu Islands (Scenic Cruising Port), Rabaul, Kiriwina Island, Trobriand Islands, Kitava, Conflict Islands, Brisbane
Fraser Island	1	4	$629	Brisbane, Fraser Island, Brisbane
Bounty Adventure	7	14	$1,606	Brisbane, Noumea, Nuku'alofa, Vava'u, Bounty Mutiny (Scenic Cruising Port), Suva, Port Denarau, Port Vila, Brisbane
Christmas in July		3	$599	Brisbane, Brisbane
Melbourne Cup	1	7	$949	Brisbane, Melbourne, Brisbane

Source: P&O

The difference in these itineraries are important as they demonstrate sufficient division in destinations available between Cairns and Brisbane.

4. PREVIOUS PROJECTIONS & OUTCOMES

This section examines previous projections and actual outcomes.

4.1 2011 STUDY

As mentioned in the introduction Ports North first commissioned a Demand Study (BMT WBM, 2011) as part of its *Cruise Shipping Development Strategy* in 2011 to examine current and future demand for cruise shipping in Cairns. A key aspect of the study was to assess the effect improved infrastructure at the Port (in the form of a wider shipping channel and provision of bunker fuel) could have to expand tourism cruise ship opportunities by allowing larger vessels to enter the port.

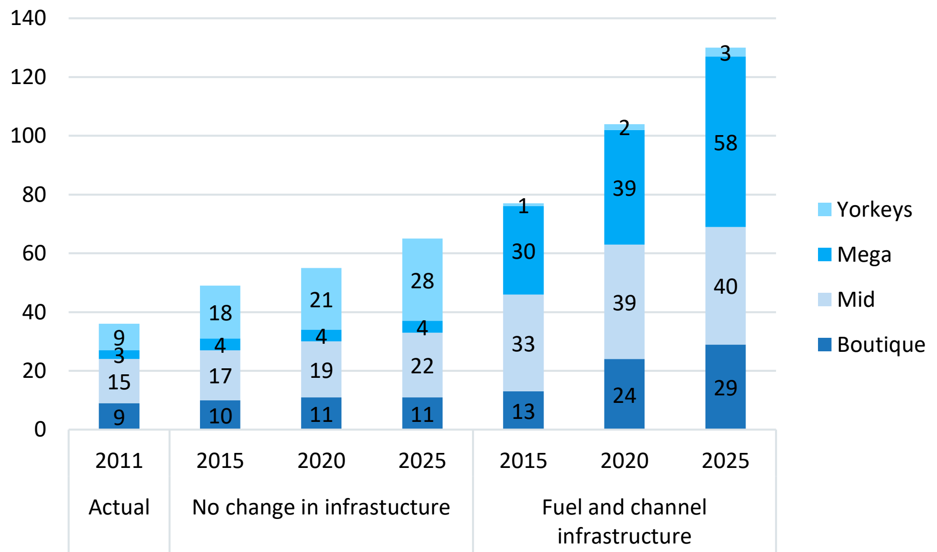
The medium demand projection showed 49 ship visits in 2015 growing to 65 by 2025 with no change to infrastructure and from 77 ship visits in 2015 to 103 ships in 2025 with fuel and channel infrastructure.

Table 4.1 2011 Cruise Ship Visits, Medium Projection (excluding Adventure Class)

	Actual	No change in infrastucture			Fuel and channel infrastructure		
Classification	**2011**	**2015**	**2020**	**2025**	**2015**	**2020**	**2025**
Boutique	9	10	11	11	13	24	29
Mid	15	17	19	22	33	39	40
Mega	3	4	4	4	30	39	58
Yorkeys	9	18	21	28	1	2	3
Total	**36**	**49**	**55**	**65**	**77**	**104**	**130**

Source: BMT WBM (2011)

Figure 4.1 2011 Cruise Ship Visits, Medium Projection (excluding Adventure Class)



Source: BMT WBM (2011)

4.2 2014 STUDY

An update to the 2011 study was completed in 2014 (BMT WBM, 2014).

The medium demand projection showed 67 ship visits in 2016 growing to 79 by 2026 with no change to infrastructure and from 69 ship visits in 2016 to 103 ships in 2026 with fuel and channel infrastructure.

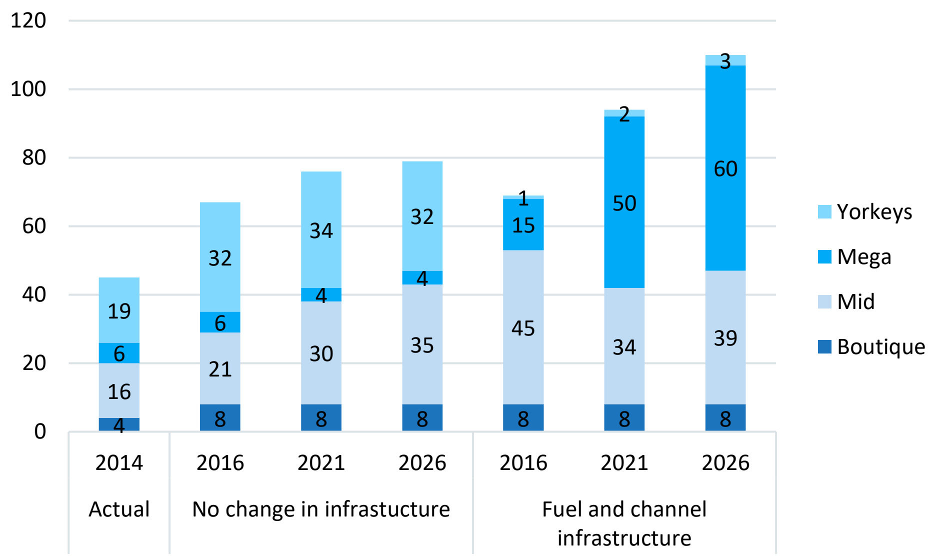
Compared to 2011 predictions the 2014 predictions were higher for no change in infrastructure and lower with fuel and channel infrastructure.

Table 4.2 2014 Cruise Ship Visits, Medium Projection (excluding Adventure Class

	Actual	No change in infrastucture			Fuel and channel infrastructure		
Classification	2014	2016	2021	2026	2016	2021	2026
Boutique	4	8	8	8	8	8	8
Mid	16	21	30	35	45	34	39
Mega	6	6	4	4	15	50	60
Yorkeys	19	32	34	32	1	2	3
Total	**45**	**67**	**76**	**79**	**69**	**94**	**110**

Source: BMT WBM (2014)

Figure 4.2 2014 Cruise Ship Visits, Medium Projection (excluding Adventure Class)



Source: BMT WBM (2014)

4.3 COMPARISONS WITH ACTUAL/SCHEDULED OUTCOMES

A comparison of the medium ship visit projections from the 2011 (2015 projection v actual) and 2014 Demand Studies (2016 projection v scheduled) shows that for the business as usual scenario:

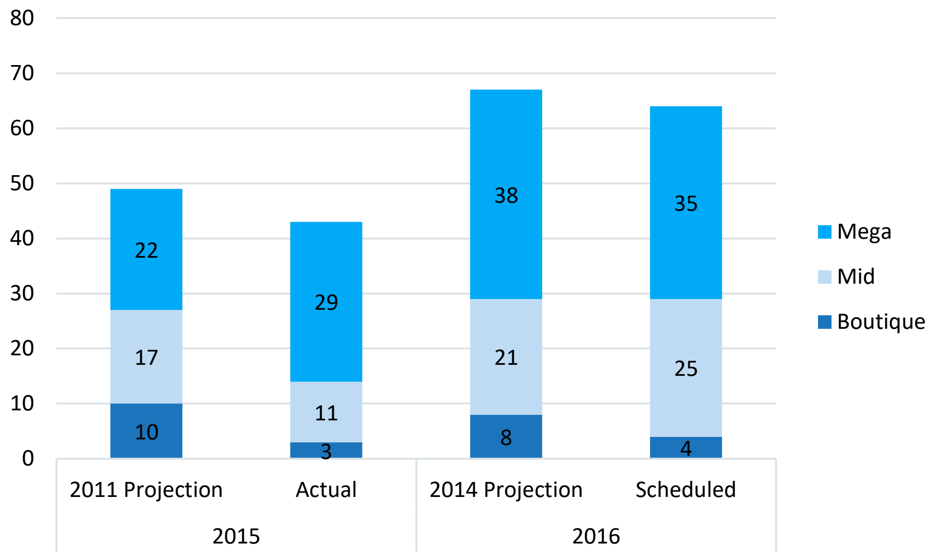
- Less boutique ship visits occurred than were projected.
- The number of mid-size ship visits varied significantly in 2016 than projected due to the deployment of P&O Pacific Aria and Pacific Eden, which was not forecast by the Studies.
- The mega ship projections from the 2014 Study, which reviewed and increased the projections from the 2011 Study, were more than 2016 scheduled visits.
- Overall slightly fewer ship visits occurred in 2015 than projected by the 2011 Study (8% fewer) and only 3 less ship visits scheduled for 2016 than projected by the 2014 Study.

Table 4.3 2011 & 2014 Ship Visit Projections (medium projection no infrastructure improvements) v Actual/Scheduled (excluding Adventure Class)

	2015			2016		
Classification	**2011 Projection**	**Actual**	**% Diff**	**2014 Projection**	**Scheduled**	**% Diff**
Boutique	10	3	-70%	8	4	-50%
Mid	17	13	-24%	21	25	19%
Mega	22	27	23%	38	35	-8%
Total	**49**	**43**	**-8%**	**67**	**64**	**-4%**

Source: BMT WBM (2011 & 2014), Ports North, AEC

Figure 4.3 2011 & 2014 Ship Visit Projections (medium projection no infrastructure improvements) v Actual/Scheduled (excluding Adventure Class)



Source: BMT WBM (2011 & 2014), Ports North, AEC

The variation in projections to actual outcomes even just a few years into the future and especially for ship classifications, demonstrates the challenge of projecting cruise ship visits.

5. INDUSTRY CONSULTATION

This section details the outcomes of industry consultation which were used to inform the demand update. Given the previous levels of consultation undertaken by WBM BMT (2011 & 2014) a more narrowly targeted consultation was considered for the 2016 demand update.

5.1 PURPOSE

The purpose of the consultation was to obtain views on industry growth/constraints and growth in visits to Cairns under no change and under the proposed channel design and with supply of bunker fuel, over the next ten years for both transit visits and home porting. Responses were compared with consultation undertaken in 2011 and 2014 to identify any key changes.

Following the initial drafting of the *2016 Demand Study Update* both Carnival Australia and RCCL were given an opportunity to comment on the projections.

5.2 TARGET STAKEHOLDERS

Consultation was held with the following stakeholders:

- Australian Cruise Association (formerly Cruise Down Under (CDU)).
- Cruise Line Industry Association Australasia (CLIAA).
- Tourism & Events Queensland (TEQ).
- Major cruise companies that regularly call Cairns (Carnival Australia & Royal Caribbean Cruise Lines (RCCL)).
- Selected cruise companies that have had their vessels call at Cairns since 2013 and who are planning visits in 2016 and 2017.

Table 5.1 2016 Stakeholder Questions

ACA, CLIA, TEQ
• What is your per annum forecasted growth for the industry over the next ten years? For Ships? Port calls? Passengers? • What, if any, constraint on industry growth is Sydney? • What is being done to alleviate these constraints? By Sydney Ports? By other Australian Ports? • What are cruise companies doing to alleviate this constraint in terms of growing elsewhere?
Cruise Companies
• From 2013 to 2017 you have had and are scheduled to have the following port calls in Cairns: [INSERT BY YEAR FOR THIS COMPANY] • Given the current Cairns Port access and facilities what is your per annum forecasted growth (numbers or percentage) for your vessels visiting Cairns over the next ten years? For Ships? Port calls (Transit (day /overnight), way port, home port)? Passengers? • Assuming the channel infrastructure is improved would you consider your existing vessels calling more frequently or new vessels calling at Cairns and if so what number of annual calls would you envisage? For Ships? Port calls (transit (day /overnight), way port, home port)? Passengers? • If bunker fuel was available in Cairns Port would you use it? • Assuming bunker fuel is made available, would you consider your existing vessels calling more frequently or new vessels calling at Cairns and if so what number of annual calls would you envisage? For Ships? Port calls (transit (day visits/overnight), way port, home port)? Passengers? • What circumstances would alter these figures? • Do you have any suggestions or requirements that might be included in the recommendations to Ports North that would improve the infrastructure and/or operation of Cairns Port for your ships and passengers?

Source: AEC

5.3 RESPONSE

Initial consultation occurred over the period 27 January 2016 to 26 February 2016. All target stakeholders were send an email with the Ports North 'Letter of Introduction'. Depending on the type of stakeholder a list of questions was also supplied (see Table 5.1).

The major industry stakeholders were consulted either face-to-face or by phone.

Of the cruise companies Carnival Australia and Royal Caribbean Cruise Lines (RCCL) were consulted face-to-face. Emails were only returned from Ponant and Paul Gauguin Cruises.

Email contact was made with the newly appointed Managing Director Asia Pacific for Norwegian Cruise Lines (also Oceania and Regent Seven Seas) but as this is mainly a sales function we were referred back to NCL for itinerary planning from which there was nil response.

Due to strategic and confidentiality reasons the cruise lines also did not provide direct answers to the questions posed.

5.4 INITIAL CONSULTATION OUTCOMES

5.4.1 Industry Growth

Due to the commercially sensitive nature of the information, none of the industry stakeholders were able to provide forecasts of the cruise industry for Australia although it is understood that the 25-year cruise ship master plan, being undertaken for the NSW Government by Deloitte, has adopted a 5-6% annual growth rate up to when the market is saturated. A 10% penetration rate (considered saturation) is expected to take up to 25-years with these growth rates.

In regards to the future it is passenger demand that will drive supply (assuming no infrastructure constraints) and this demand will grow whilst cruising is competitively priced against destinations such as Bali.

The source of passengers is important being intrastate (within), interstate and international. To determine future demand, it was suggested to look at passenger demand based on the 10-year average annual growth rate, consider population growth rates and make assumptions about growth for the three markets. Penetration rates are also important in assessing market size.

However, passenger growth does not easily translate into ship visits because ships are getting larger and they can to some extent absorb the growth so number of ships and number of port calls are unlikely to change a lot. Berths dictated by ship size translate into required port infrastructure.

Current trends for cruise lines ships are to redeploy older, less manoeuvrable, regal class ships and replace them with sun and vista class ships. WBM BMT (2014) found:

> *Mega class vessels currently calling at Cairns (including the older Mid-Size Regal Class P&O vessels) will likely be replaced with larger ships between 2016 and 2021 (or earlier). WBM BMT (2014, p.iv)*
>
> *P&O Australia - although Mid-size these Regal class ships cannot access Trinity Wharves so will continue to visit Yorkeys Knob, but as they are 23-25 years old they will probably be replaced by Mega cruise ships from the Carnival Group. WBM BMT (2014, p.8)*

Recently, P&O Cruises Australia announced that *Pacific Pearl* (regal class) will leave Australia in April 2017 via a trade sale to be replaced with *Pacific Explorer* (ex Dawn Princess, sun class)[3]. P&O president Steve Myrmell commented "*Farewelling Pacific Pearl is a natural progression in which we are increasing the size of the fleet while redefining modern cruising in this part of the world," he said, with the departure "part of our long term commitment to grow the cruise market*".

[3] Pacific Pearl (length 247m, beam 32m, draft 8.2m, pax 1,800, crew 514, regal class) Pacific Explorer (previously Dawn Princess) (length 261m, beam 32m, draft 8.2m, pax 1,950, crew 925, sun class).

P&O Cruises Australia has also commissioned a new voyager class ship, the first to be built specifically for Australia, with GRT 135,500 and 4,200 pax. This will be the largest ship based in Australia from 2020.

China/Asia will become a dominant cruise market in the future and will have some influence on ship mix. Cruise lines will deploy larger ships to Chine/Asia and these will then migrate to suitable Australian destinations. Chinese companies may look at cruising to Australia but these ships are likely to be vista class. There may be a future tie in with the casino development proposed for Yorkey's Knob.

Norwegian Cruise Lines (NCL) and MSC will enter the Australian market following establishment in China/Asia markets. Unlikely to be nothing smaller than vista class.

5.4.2 Constraints Posed by Sydney

Most ships are home berthed in Sydney and service the South Pacific and New Zealand. Regional ports in Australia need Sydney to grow to assure their growth.

Destination NSW commissioned a cruise infrastructure study in 2015 which has not been released and is with the NSW Department of Premier and Cabinet. Deloitte have now been commissioned to undertake a similar study.

Brisbane is also constrained but has recently announced the Brisbane Cruise Terminal (BCT) thought to be operational in 2019 (see section 2.4.2). BCT will be a game changer and it is to be expected that cruise lines will change as follows:

- Princess Cruises – sun class replaced by grand class.
- P&O – regal class most likely replaced by larger mega class.
- Others currently unable to access Portside but wanting to visit Brisbane.

BCT will also will relieve Sydney especially for north focused itineraries and have significant growth impacts for Cairns as the new facility will allow home porting of four ships year round. North bound destinations of PNG and Solomon Islands will be a growth market.

5.4.3 Growth for Cairns

Both the major cruise lines are operating different strategies.

Carnival Australia (2-3 year planning cycles) will continue to home port all P&O branded ships in Australia. Other Carnival Australia brands are deployed where demand occurs. General upgrade path will be replacing regal and sun class with vista and grand class. Unlikely with current port infrastructure that P&O would homeport a larger ship than currently planned (*Pacific Eden/Aria*).

RCCL (5-year planning cycle) will have 8 seasonally deployed ships in Australia in the future but by 2020 not one will be under 300m (e.g. *Voyager of the Seas* 311m, *Solstice of the Seas* 315m, *Ovation of the Seas* 355m). One Azamarra ship per year will come through Cairns. One 300m ship will make two calls per year and 320m ships will make 10 to 15 calls per year through to 2022. Out of 100 Australia departures perhaps 10 would include Cairns in the itinerary.

Both cruise lines prefer to use a wharf but also have no real issue with anchoring and tendering. Current tendering is not really adequate but works.

Where simulation studies show that a port is accessible for a larger ship then cruise lines are happy to do so with appropriate government approvals.

Some smaller cruise lines are seeking to increase their presence in Australia and see Cairns as a turnaround port. Generally, these vessels are not restricted by the current port infrastructure so any channel modifications would not influence future plans.

In regards to home porting the target market is domestic passengers. The cost of flying passengers to Cairns (incorporated as part of the package) is a consideration and sourcing of passengers from South East Asia is unlikely. Cairns runway is not big enough for an A380 aircraft therefore inbound passengers in significant numbers that would arrive Cairns for cruising holiday is difficult to envisage.

However, other developments such as Yorkey's Knob Casino development will also drive demand for anchoring and tendering ashore.

5.4.4 Would Improved Port Access Increase Visits?

Cruise lines would be willing to simulate larger ships if the Cairns channel is expanded and would be willing to share the cost of the simulation with Ports North. However, the level of port charges following the expansion are a consideration as the market is competitive for both passengers and ports (e.g. Eden, Geelong which don't have such constraints as Cairns are developing cruise ship strategies). The port charges would need to be competitive with anchoring at Yorkey's Knob or Port Douglas and tendering passengers.

Consideration also needs to be given to the size of ships in the future especially considering RCCI's strategy of bringing larger ships to Australia. Recent trends are for the redeployment of regal class ships substituted by sun or vista class.

Generally, there was little difference in consultation outcomes in 2016 with that in 2014. Obviously since 2014 the largest change has been Carnival Australia home porting a sub-regal class ship from Cairns and now the announcement of the BCT.

5.4.5 Availability of Bunker Fuel

Bunker fuel is essential for home porting (depending on itinerary) but needs to be cost competitive. Cruise lines are sensitive to bunker price and ports need fuel volume to be able to offer competitive prices. Bunker fuel also has a shelf life of 12 months.

Carnival Australia ships need fuel every voyage but some other brands carry larger volumes of fuel. Would need a fuel barge in Cairns of 2,000 to 3,000 tonnes with weekly re-supply.

Cruise lines that visit once or twice a year are unlikely to increase their visitation frequency but availability of bunker fuel may change that thinking.

For boutique ships IFO, HFO (180 CST) and/or MGO is preferred and would be used. This class of ship is possibly less price sensitive.

Generally, there was little difference in consultation outcomes in 2016 with that in 2014 in regard to availability of bunker fuel.

5.4.6 Other Observations/Suggestions for Cairns

Cairns is potentially one of the only appealing ports north of Gladstone and has great potential but it is remote. Cairns as home of rainforest and the reef attracts strong interest but the market is only really around Cairns – long way to anything else of interest. Cairns would need to work harder to make the destination more relevant for cruise itineraries.

As Cairns is a transit port, port infrastructure needs to go hand in hand with the regional tourism strategy. Cairns' attractiveness is based on the range of things to do. If passenger numbers increase significantly then Cairns will need to look at ground capacity – e.g. 3,000 passenger ship equals 15 plane loads of people in one go. These larger vessels would need more ground infrastructure for passenger handling (e.g. overhead gangways, permanent x-ray equipment), comfort (e.g. air conditioning, shops) and improved ground transportation access.

Cairns is not part of South East Asian cruise itineraries. Three opportunities for Cairns are:

- Catch ships on their way through to Sydney. North to South ships – Internationals. South to North – Australians.
- Brisbane Cruise Terminal will allow many more ships to home port out of Brisbane.
- Possibility of Cairns being a home port for smaller ships. A home ported ship could possibly service Chinese, South East Asians and local Australians. Gaming on the ships is important to Asian passengers.

Again in general terms little changed in regard to the various rounds of consultation outcomes in regards to suggestions for Cairns.

5.5 DRAFT REPORT CONSULTATION CONSULTATION OUTCOMES

Both Carnival Australia and RCCL were sent a final draft of the *2016 Demand Study Update* in late May 2016 and invited to comment. Both provided comments and as a consequence updates to the report and projection methodology were made.

5.6 LOGISTICS & CONSTRAINT CONSULTATION

Consideration of the possible logistics and constraints associated with Yorkey's Knob were discussed with local stakeholders during September 2016. These included: Ports North, shipping agents, Cairns Regional Council, Customs, GBRMPA, Yorkey's Knob Boat Club, Cairns Reef Fleet and Cairns Taxis. The findings were then tested with Carnival Australia and RCCL, both of which responded and made useful suggestions.

6. PROJECTION METHODOLOGY

This section explains the projection methodology which has been informed through previous studies (BMT WBM, 2011 and 2014), consultation and AEC's experience in the sector.

6.1 CONSIDERATIONS

Projecting, what cruise ships and how often may visit Cairns in the future is a challenging exercise. Not only are cruise ships mobile assets, cruise line's planning cycles only confirm ship itineraries 2-3 years in advance.

The exception to the above is where a port is approaching congestion particularly in peak times and so wharf bookings extend further into the future. Sydney is a case in point which takes bookings approximately four years into the future. Popular anchorages in the Great Barrier Reef Marine Park are another.

Furthermore, with the Australian market dominated by two cruise lines (Carnival Australia and RCCL) oligopolistic forces are at play which manifests in fierce competition and closely guarded strategic intent.

6.2 BASIC APPROACH

The basic approach to undertaking the projections has been to project cruise ship visits to Cairns and then determine whether they can berth or have to anchor based on ship length. With no channel modifications typically only ships 240m or less can berth (without simulation) and due to limited manoeuvrability no regal class ships can berth.

The starting scenario or base case is considered business as usual which assumes no change to the status quo but does remove the 2016 and 2017 home porting of *P&O ships*. The base case growth in visiting cruise ships is set at 5% per annum. This is half the Australian CAGR of 10.4% (from 2004-05 to 2014-15) and below the 7.0% CAGR for Cairns from 2010 to 2016 (less adventure ships and home porting) and was chosen as a base line on top of which other scenarios are added.

6.2.1 Visiting Fleet Mix

Due to limited intelligence on cruise ship schedules post 2017, the fleet mix of visiting cruise ships that may visit Cairns has been modelled on the existing mix of cruise ships based in or visiting Australia and the historical frequency of cruise ships visiting Cairns (see section 3.2.4). The mix of ships and frequency of visitation has then been changed over time given cruise line consultation, announcements, retirement at 30 years of age and ship size trends.

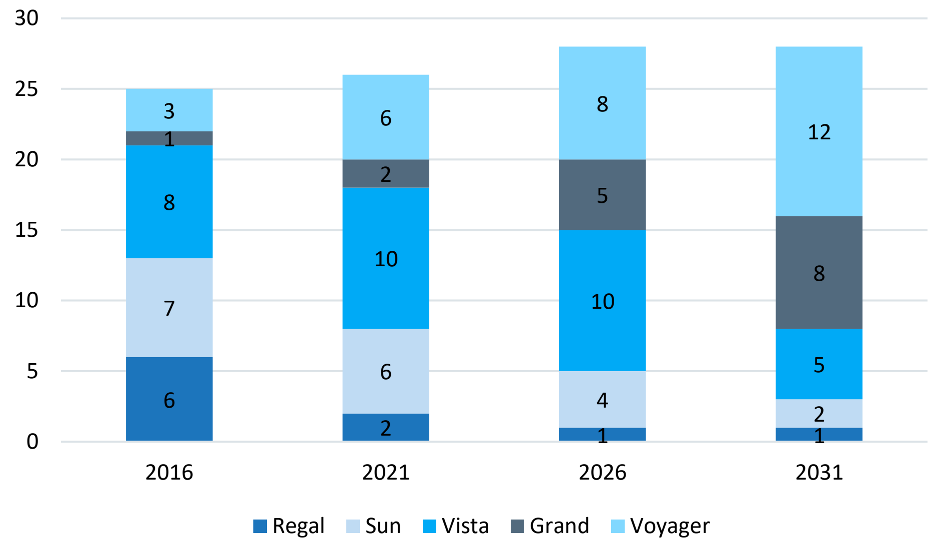
The fleet mix and frequency mix post 2017 has been varied as follows:

- **Sub-regal class** – no change has been made to the number of ships or frequency of visitation. Assumed *Pacific Aria* (1993) and *Pacific Eden* (1994) (or similar continue operating around Australia).
- **Regal class** (currently 6 ships, launched between 1988 and 2003):
  - *Pacific Pearl* (1988) removed in 2017 by *Pacific Explorer* (ex *Dawn Princess*, sun class).
  - *Pacific Jewel* (1989) and *Pacific Dawn* (1990) retired in 2019, replaced by new P&O voyager class ship.
  - *Asuka II* (1989) retired in 2019.
  - *Celebrity Century* (1995) retired in 2025.
  - *Crystal Serenity* (2003) retired in 2033.
  - The P&O regal ships cannot access Trinity Wharf. Once P&O regal ships are retired (assumed by 2019) all remaining regal ships will be able to access Trinity Wharf.
  - Assume no additional/replacement regal class ships join the fleet.

- **Sun class** (currently 7 ships. launched between 1994 and 2004):
    - *Legend of the Seas* (1994) departing 2016, replaced by *Ovation of the Seas* (2016), voyager class.
    - *Sun Princess* (1995) retired in 2025.
    - *Pacific Explorer* (1996) retired in 2026.
    - *Sea Princess* (1998) retired in 2028.
    - *Aurora* (2000) retired in 2030.
    - *Oosterdam* (2003) retired in 2033.
    - *Arcadia* (2004) retired in 2034.
    - Visitation frequency retained at 2 per ship per annum.
    - Assume no additional/replacement sun class ships join the fleet.
- **Vista class** (currently 9 ships launched between 2001 and 2010):
    - All ships retired from 2031 on as they turn 30.
    - Visitation frequency retained at 1.3 per ship per annum.
    - Assume no additional/replacement vista class ships join the fleet. However, it is noted that there are 10 potential vista class ships being ordered although nearly all of these have pax capacity of 2,500 or more and may in fact be grand or voyager class.
- **Grand class** (currently 1 ship, Emerald Princess (2004):
    - On average a grand class ship is added to the fleet every four years or as a replacement for selected regal or sun class ship retirements. A grand class ship has been added in 2018, 2022, 2025, 2026, 2028, 2030, 2031, 2037, 2040. The growth is based on the new twelve grand class ships on order.
    - Visitation frequency retained at 1 per ship per annum.
- **Voyager class** (currently 3 ships launched between 1998 and 2008):
    - *Ovation of the Seas* (2015) visiting from 2017.
    - A voyager class ship is added every odd year from 2019 with an extra vista ship added in 2030 where there are several retirements. The growth is based on the new 24 voyager class ships on order.
    - Visitation frequency retained at 1 per ship per annum.

The resulting projected Australian mega class fleet mix is as follows.

Figure 6.1 Historical & Projected Australian Mega Class Fleet Mix



Source: ACA (2016) & AEC

The combination of projected Australian mega class fleet mix and visitation frequency is used to calculate a ship visit allocation percentage for each length class (excluding sub-regal class). This ship allocation percentage is then used to allocate the predicted number of mega class ships visiting Cairns across the length classes (excluding sub-regal).

6.2.2 Low, Medium, High Projections

Each projection is considered a medium projection and error bounds of low and high are placed either side of the medium projection. The low bound is set at 80% and the high bound at 120%.

6.3 SCENARIO SETTINGS

Four alternatives to the base case are incorporated in the projections. The combination of alternatives gives 16 scenarios. The alternatives are.

1. With or without development of the Brisbane Cruise Terminal.
2. With or without home porting.
3. With or without channel modifications.
4. With or without availability of bunker.

Alternatives 3 and 4 are however assumed to coincide. Each of these are discussed below.

6.3.1 Development of the Brisbane Cruise Terminal

Based on comments in PoB (2016) the BCT was mentioned to "*potentially triple the size of Brisbane's cruise industry over the next 20 years*". It has been assumed that the facility commences operations in 2019 and that a tripling in activity occurs through to 2035.

The number of cruise ships visiting Brisbane has remained fairly static over the last three years but the number of ship visits has grown from 105 in 2012-13 to 134 in 2014-15 (13% CAGR). Since 2004-05 Brisbane has experienced a CAGR of 14.4%. Given current access restrictions the number of visits with no BCT has been assumed to grow at a conservative 5% pa.

With the BCT assumed becoming operational in 2019 the number of ship visits to Brisbane is then tripled from 2019 to 2035 in a linear fashion.

As cruise ships are getting larger, the number of cruise ships visits calculated above needs to reflect this. Therefore, the number of projected ship visits is adjusted by growing the average size of visiting ships.

Although future itineraries out of Brisbane are not known it has been assumed that 30% will visit Cairns from 2019 and be of mega class.

6.3.2 Home Porting

Factors influencing the home porting of a ship are numerous but are primarily dependent on demand since the majority of passengers are sourced from the local area. Demand is also influenced by cost competitiveness compared to other holiday opportunities.

Other factors determining home porting are:

- Population cruise conversion (% of population that will take a cruise).
- Cost of cruise and cost to get to the port.
- Availability and quality of itineraries (including pre, post tours and shore-based tours).
- Availability of airlift and capacity.
- Availability of bunker fuel.
- Availability and quality of passenger terminal infrastructure and facilities.
- Availability of ship services (water, waste water, waste disposal, shore power, provisions).

The catchment area for home porting from Cairns is North Queensland which can be considered to comprise Cairns, Townsville, Mackay and Outback Queensland. This area was projected to contain approximately 665,000 persons as at 30 June 2015. Applying the cruising penetration rate for Queensland of 5% (see Table 2.2) and ship sizes of 2,000 and 1,500 pax, the catchment would potentially support 16 or 22 annual cruises, respectively. Of course the cruise would be sold more broadly than in just the catchment area.

Table 6.1 Cruising Population Catchment and Potential Cruising Demand

SA4	Population (at 30 Jun 2015)	% share	Potential Demand	Ship Visits (2,000 pax ship)	Ship Visits (1,500 pax ship)
Cairns	244,052	5.3%	12,203	6	8
Townsville	238,233	5.2%	11,912	5	7
Mackay	182,303	4.0%	9,115	4	6
Queensland - Outback	88,232	1.9%	4,412	2	2
Total NQ	***664,588***	***14.5%***	***33,229***	***16***	***22***
Darling Downs - Maranoa	129,084	2.8%	6,454	3	4
Fitzroy	235,784	5.2%	11,789	5	7
Wide Bay	289,196	6.3%	14,460	7	9
SEQ	3,460,202	75.7%	173,010	86	115
Queensland	**4,778,854**	**104.6%**	**238,943**	**119**	**159**

Notes: Potential market penetration = 5%. Source: ABS (2016), AEC

With the home porting alternative and no channel modifications an additional 20 ships per annum of mid/sub-regal class (e.g. *Pacific Eden*) is assumed from 2018.

Combined with channel modifications and availability of bunker it may be expected that larger cruise ships will homeport. In this case the default is reduced to 16 mega class ships per annum (vista class) to account for greater capacity.

In all home porting scenarios it is assumed that the home porting continues every year.

6.3.3 Channel Modifications

Channel modifications will allow larger ships to berth. Berthing is always preferred by cruise lines and passengers to tendering. However, a cruise line's decision whether to berth or not is heavily dependent on port charges which need to be competitive against the cost of anchoring and tendering and other ports.

The default with channel modification alternative is to move all larger ships (vista and grand but not voyager class) into the port and to increase the number of mega size ship visits by 20%. The modified channel is assumed to be available from 2021.

6.3.4 Availability of Bunker

The availability of bunker is critical to home porting and desirable for transit visits. However, cruise lines are sensitive to the cost and may decline to refuel if a cheaper alternative is available at another port.

Based on consultation comments, it has been assumed that bunkering will increase all cruise ship visits by 10%. Bunkering is assumed to be available from 2021.

6.4 CALCULATIONS

6.4.1 Unconstrained Projections

Projection calculations are applied to boutique, mid and mega pax size classifications as follows:

Boutique

$$CY = PY * (1 + GR)$$

Mid

$$CY = (PY - HPNC) * (1 + GR + BGR) + HPNC$$

Mega

$$CY = (PY - BR - HPCM) * (1 + GR + BGR + CMGR) + BR + HPCM$$

Where

CY = current year ship visits

PY = previous year ship visits

GR = BaU growth rate (5%)

BGR = bunker growth rate (10%)

HPNC = home porting no channel modifications additional number ship visits (20 mid/sub-regal class pa)

HPCM = home porting channel modifications additional number ship visits (16 mega/vista class pa)

BR = BCT additional number of ship visits

CMGR = Channel modifications growth rate (20% mega class only)

The total number of ships is then allocated across the ship length classification according to the calculated ship visit allocation percentage (see section 6.2.1). A number of adjustments are then made depending on the scenario as follows:

- **Regal class**: since these ships (except P&O which are assumed to be retired by 2019) can currently enter the port growth from channel modifications is not applied.
- **Sun class**: since these ships can currently enter the port growth from channel modifications is not applied.
- **Vista class**: since these ships cannot enter the port growth from bunker availability is not applied where the channel is not modified.

- **Grand class**: since these ships cannot enter the port growth from bunker availability is not applied where the channel is not modified.
- **Voyager class**: since these ships cannot currently enter the port, nor can they with the proposed channel modifications growth from bunker availability or channel modifications is not applied.

6.4.2 Constrained Projections

Ship visits that anchor and tender to Yorkey's Knob are impacted by a number of logistics and constraints issues applicable to the achchorage. Therefore, a projection reduction factor has been applied to the 'unconstrained' projections determined by section 6.4.1. The approach to determining this factor is contained in the next section.

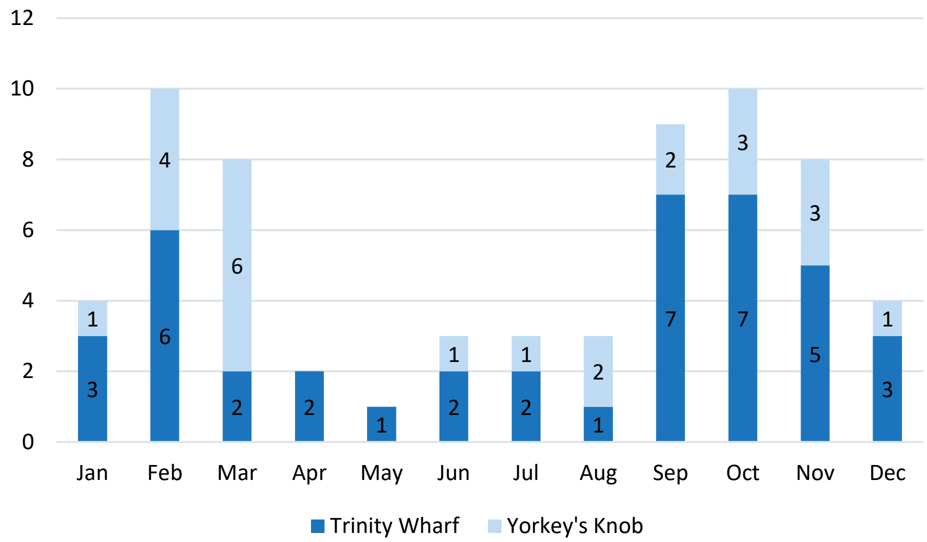
7. LOGISTICS & CONSTRAINTS ANALYSIS

This section examines the logistics and constraints imposed by the increased number of ship visits and passenger arrivals to Yorkey's Knob which may dissuade cruise companies from visiting the destination.

7.1 SHIP VISIT SEASONALITY

Cruise ship visits are not evenly spread over the year. As seen below the majority of ship visits in 2016 occur in the months from September to March. As the number of projected cruise ship visits increase there is likely to arise congestion in some months.

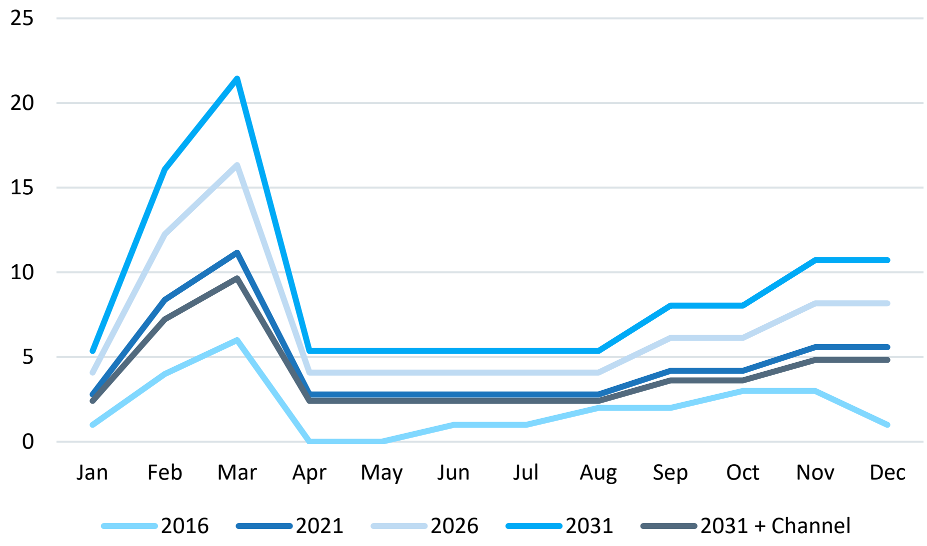
Figure 7.1 Cairns Cruise Ship Visit Distribution, number of visits, 2016



Note: 2016 as at schedule dated 6 September 2016. Source: Ports North, AEC

To observe when congestion may occur, a similar ship visit arrival pattern to 2016 has been applied to the 2021, 2026 and 2031 medium projections for Yorkey's Knob and Trinity Wharf based on scenario 13, that is with the Brisbane Cruise Terminal and home porting with no channel modifications. For comparison the 2031 medium projection with channel modifications (scenario 16) has also been included.

Figure 7.2 Yorkey's Knob Potential Cruise Ship Visit Distribution, number of visits

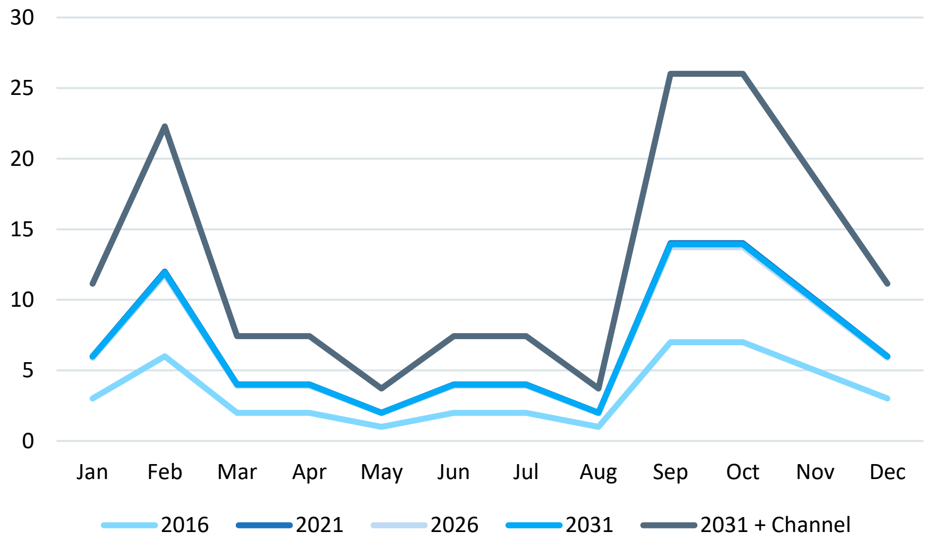


Source: PN, AEC

As can be seen for Yorkey's Knob:

- There is a substantial increase in the number of ship visits from 2016 for each of the projection years. For example, March increases from 6 in 2016 to 11 in 2021.
- Based on the 2016 seasonal pattern, March will experience the largest number of ship visits which represents almost 70% of available days in the month by 2031.
- If the channel modifications are undertaken then only the voyager class ships will anchor at Yorkey's Knob which, whilst still a substantial increase by 2031, returns the number of ship visits back to 2021 (no channel modifications) levels.

Figure 7.3 Trinity Wharf Potential Cruise Ship Visit Distribution, number of visits



Source: PN, AEC

As can be seen for Trinity Wharf:

- The 2021, 2026 and 2031 projections, whilst higher than 2016 contain little growth compared to Yorkey's Knob as growth occurs mainly in the vista, grand and voyager class.

- The maximum monthly visits occur in September and October at just under 50% of available days in the month.
- Should channel modifications be in place the 2031 projections show higher ship visits (due to vista and grand class ships accessing the port) and therefore September (87%) and October (84%) achieve very high daily utilisation.

It should be noted that Trinity Wharf can handle two cruise ships at once therefore the percentage of days in the month that encounter ship visits could potentially halve.

7.2 CRUISE COMPANY ISSUES

7.2.1 Decision Drivers

The analysis of logistics and constraint issues is undertaken from a cruise company perspective based on their key decision drivers grouped as passenger satisfaction, ship operations, commercial and social aspects, which impact on their decision to visit Yorkey's Knob. The issues have been identified from PN (2015) and though consultation with stakeholders and importance weightings of the driver groups have been suggested.

Table 7.1 Cruise Company Destination Decision Drivers, Weighting & Issues

Passenger (50%)	Ship Operation (20%)	Commercial (20%)	Social (10%)
• Destination perception • Shore access • Shore location • Shore facilities • Shore passenger services • Time ashore • Tours • Ground transport • Cruise itinerary	• Tenders • Fuel consumption • Ship services • Ship maintenance • Provisioning • Bunkering • Regulatory requirements • Crew	• Itinerary • Turnarounds • Homeporting • Tender risks • Tours • Availability of wharf/mooring • Port fees	• Facility operator • Facility tenants • Facility users • Local residents

Source: AEC

7.2.2 Issue Assessment Approach

Ultimately a cruise company with a vessel that cannot berth at Trinity Wharf must decide if using Yorkey's Knob anchorage is acceptable from a passenger satisfaction, ship operation, commercial and social point of view.

The assessment of issues uses a risk-based approach. Firstly, the issue can be either negative, neutral or positive. Secondly, the overall impact of the issue is determined by the likelihood of the issue occurring (or worsening) and the significance of that issue. The approach is based on that used in PN (2015) for risk analysis.

The tables below describe the likelihood of an issue occurring and significance of the issue if it does occur.

Table 7.2 Likelihood of Issue Occurring

Likelihood of Issue Occuring	Description
Highly unlikely	Highly unlikely to occur but theoretically possible
Unlikely	May occur but probability well below 50%; unlikely but not negligible
Possible	Less likely than not but still appreciable; probability of about 50%
Likely	Likely to occur; probability greater than 50%
Almost certain	Very likely to occur; could occur multiple times during relevant impacting period

Source: PN (2015), AEC

Table 7.3 Significance of Issue on Decision Making

Issue Significance	Description
Very High	The impact is considered critical to the decision making process
High	The impact is considered likely to be important to decision making
Moderate	The effects of the issue are relevant to decision making
Minor	Issues are recognizable/detectable but acceptable.
Negligible	Minimal change to berthing.

Source: PN (2015), AEC

The likelihood and significance are combined to give a degree of influence on decision making matrix which indicates the degree of influence of the issue on cruise company decision making. Up to five levels of influence (negligible, low, medium, high and extreme) are possible.

Table 7.4 Degree of Influence on Decision Making

Likelihood	Significance				
	Negligible	Minor	Moderate	High	Very High
Highly unlikely	Negligible	Negligible	Low	Medium	High
Unlikely	Negligible	Low	Low	Medium	High
Possible	Negligible	Low	Medium	Medium	High
Likely	Negligible	Medium	Medium	High	Extreme
Almost certain	Low	Medium	High	Extreme	Extreme

Source: PN (2015), AEC

Each degree of influence is given a value from 0 (Negligible) to 4 (Extreme). These are then summed and expressed as a percentage of all the issues if they were all assessed as extreme. An equal weight for each issue is used. This percentage is then used as a proxy to reduce the number of projected cruise ship visits to Yorkey's Knob (reduction factor).

For example, if there were ten issues then a maximum score, if all issues were rated as having an extreme influence on decision making, would be 40. Should the influence scores be 5 negligible, 3 medium and 2 extreme a score of 14 would be obtained which expressed as a percentage of the maximum score would result in a 35% reduction factor. We would then interpret this as *35% of projected cruise ship visits may consider the logistics and constraints issues significant enough to preclude Yorkey's Knob from an itinerary.* Therefore, we would reduce the unconstrained projected number of cruise ships to Yorkey's Knob by 35%.

Note: This assessment approach is used solely to obtain a proxy reduction factor for the unconstrained ship visit projections that may not visit Yorkey's Knob. It should not be interpreted as the actual decision making approach of cruise lines, or the percentage of ships scheduled to anchor at Yorkey's Knob that may bypass.

7.2.3 Effects of Mitigation

Mitigation occurs where actions are taken to reduce the likelihood or significance of an issue occuring. For this assessment no mitigation actions are undertaken to improve the issue impact assessment of Yorkey's Knob and therefore reduce the percentage used to reduce the number of projected cruise ships to Yorkey's Knob. That is not to say this exercise could occur and could be used with the assessment to reduce the percentage of cruise lines by passing Yorkey's Knob.

7.2.4 Assessment of Issues

Identified logistics and constraint drivers are detailed in the table below relative to Trinity Wharf and Yorkey's Knob. Given a preference for berthing at Trinity Wharf the likelihood and significance on decision making from the alternative of Yorkey's Knob are then assessed.

Table 7.5 Logistics & Constraint Issues, Trinity Wharf v Yorkey's Knob

Decision Driver	Issue	Impact	
		Trinity Wharf	Yorkey's Knob
Passenger Satisfaction	Destination perception	Arrive in the centre of Cairns.	Passenger perception that they are arriving into Cairns and when found not to be the case has negative impacts on passenger experience. Negative. Likely to occur with moderate significance.
	Shore access	Via gangway.	Less than maximum take opportunity to go ashore (75%) as reluctant to disembark at a tender destination. If rough weather, then no passengers may go ashore or the ship may bypass the anchorage (said to impact 10% of visits). Negative impact on passenger experience. Negative. Likely to occur with moderate significance.
	Shore facilities	Full range of facilities within walking distance.	Limited facilities, lack of shade structures and long waits for coaches and tenders combined with tropical weather conditions can be challenging having a negative impact on passenger experience. Negative. Almost certain to occur with moderate significance.
	Shore passenger services	Full range of passenger services within walking distance including visitor information services.	Limited services provided by inbound tour operator. Independent visitors not booked on a tour may have a diminished experience. Their only option is to pay for a bus transfer to Cairns which they may then enjoy. The club says it welcomes passengers but is not open early enough. Negative. Almost certain to occur with high significance.
	Time ashore	Maximum time ashore once docked	Total time lost approximately 3.5 hours. As ship sizes increase then time ashore may be further minimised due to logistics constraints. Negative. Likely to occur with moderate significance.

Decision Driver	Issue	Impact	
		Trinity Wharf	Yorkey's Knob
	Tours	Maximum time available for tours.	Tour time reduced by 2.5 hours thereby limiting choice of reef tours, economic benefits to tour operators and cruise lines. Negative. Almost certain to occur with moderate significance.
	Bus transport	Bus departures can be more easily staggered.	Difficult to stagger bus departures as large numbers of passengers arrive at once and don't want to hang around. Particular problem for Skyrail departures. Passengers also have to pay for the bus into Cairns. Negative. Almost certain to occur with moderate significance.
	Taxi transport	No identified issues.	No identified issues although no taxi rank as such. Boat Club will call taxis for passengers. Neutral.
	Cruise itinerary	Berth visit to break up tendering destinations either side, e.g. Port Douglas, Cooktown, Thursday Is to North, Whitsundays to South.	Anchoring destinations either side (e.g. Whitsundays, Port Douglas, Thursday Is), Townsville closest proclaimed port (limited to 237m). However, needs to be recognised that as ships get larger Brisbane and Gladstone currently only ports available so tendering more the norm for large ships. Potential negative but treated as neutral.
	Cruise itinerary – nights ashore	Possible if two day stay.	Not possible. Potential negative but treated as neutral.
	Cruise itinerary – homeporting	Possible.	Not possible. Potential negative but treated as neutral.
Ship Operations	Tender - capacity	N/A	Tender capacity remains an issue. Mix of capacity depending on catamarans used. No problem with availability as potentially more profitable to operator than reef trip. However, by using the catamarans normally used for tours, capacity of shore excursions is decreased, which has a negative knock on effect on onboard revenue. Highly unlikely to occur with minor significance.
	Tender – access to shore	N/A	Shallow depth of dredged entrance constrains larger tender vessels so some delays possible. Possibility of occurring some days with minor significance

Decision Driver	Issue	Impact	
		Trinity Wharf	Yorkey's Knob
	Tender – safety	N/A	Increased safety risks via ship to tender transfer. Ships tenders are not regulated by AMSA/MSQ although AMSA inspections are always done on all ships calling into Australia. Highly unlikely an incident will occur but moderate significance
	Fuel consumption	Engines can be turned off saving fuel consumption.	Engine must remain operating. Almost certain to occur with minor significance.
	Ship services	Full access to all available utilities.	No access. Negative. Almost certain to occur with negligible significance.
	Ship maintenance	Full access to all available maintenance facilities.	No access. Negative. Almost certain to occur with negligible significance.
	Provisioning	Dockside loading.	Minor supplies only (1-2 boxes) send on tender. Neutral.
	Bunker availability	Bunker available.	No access. Neutral.
	Regulatory requirements - MSQ	Pilot required.	Pilot required. Neutral.
	Regulatory requirements - Customs	No identified issues.	No identified issues. Travel to/from ship on tender. Neutral.
	Regulatory requirements - GBRMPA	No issue as in the shipping channel.	No issue as anchorage in the shipping channel. Neutral.
	Crew – shore access	No impact as via gangway	Limited opportunity and have to wait for an 'open tender' before going ashore (0-10% disembark only). Negative. Likely to occur with negligible significance.
	Crew – time ashore	Maximum time ashore once docked if permitted, or quick access for nearby shopping.	Limited opportunity (0-10% disembark only) Negative. Likely to occur with negligible significance.
	Crew - satisfaction	Time ashore may boost morale	Long periods at sea may reduce morale Negative. Likely to occur with negligible significance.
Commercial	Itinerary – no of tender destinations	Allows more flexibility for tender destinations either side of Cairns	Limits nearby destinations to tenders as well. However, needs to be recognised that as ships get larger Brisbane and Gladstone currently only ports available so tendering more the norm for large ships. Potential negative but treated as neutral.

Decision Driver	Issue	Impact	
		Trinity Wharf	Yorkey's Knob
	Itinerary – stopover duration	Ability to stop overnight.	Unlikely to stop overnight. Potential negative but treated as neutral.
	Turnarounds	Possible Opportunity for cruise packages to include shore accommodation & flights. Opportunity for shorter cruise itineraries to Pacific Is than from Brisbane.	Not possible. Potential negative but treated as neutral.
	Homeporting	Possible Opportunity for cruise packages to include shore accommodation & flights. Opportunity for shorter cruise itineraries to Pacific Is than from Brisbane.	Not possible. Potential negative but treated as neutral.
	Tender risks – passenger satisfaction	N/A	Limited access and time ashore reducing passenger satisfaction with destination reflected in surveys. Negative. Almost certain to occur with moderate significance.
	Tender risks – adverse weather	N/A	Fewer or no passengers tendered ashore. Estimated to incur 10% of visits. Negative. Possible occurrence with moderate significance.
	Tours	N/A	Limited selection of tours due to less time availability and use of catamarans for tendering. Fewer passengers booking tours. Result is less revenue to Cruise Company from tour sales. Negative. Almost certain to occur with minor significance
	Availability of wharf/mooring	Two berths available	Multiple anchorages available. Neutral.
	Port fees	Port charges and passenger levy.	Wharf access charge, tender hire. Neutral but potentially positive or negative depending on relative costs.
Social	Security	Licenced security required which has to be paid for.	Ships security used so no cost but they have no legal grounding for action against unacceptable behaviour. Therefore if an issue have to call law enforcement. Negative. Incidents unlikely to occur with high significance.

Decision Driver	Issue	Impact	
		Trinity Wharf	Yorkey's Knob
	Facility operator - congestion	Ports North Little impact.	Yorkey's Knob Boating Club and Half Moon Bay Marina Increased and more frequent congestion from more tenders, passengers and ground transport. Separation has been improved and stated by Club as not an issue. Negative. Possible occurrence with minor significance.
	Facility tenants - congestion	Little impact.	Half Moon Bay Marina tenants. More tender and ground transport activity likely to restrict access and parking and create more noise. Stated by Club as not an issue. Negative. Possible occurrence with minor significance.
	Facility users - congestion	Little impact.	Public Boat Ramp Users More tender and ground transport activity likely to restrict access and parking. Separation has been improved and stated by Club as not an issue. Negative. Possible occurrence with minor significance.
	Local residents- noise & traffic	Little impact.	More ground transport activity likely to restrict access, parking and create more noise. Stated as not an issue. Negative. Possible occurrence with minor significance.

Source: AEC

7.3 IMPACT ON DEMAND PROJECTIONS

Using the assessment and scoring of issues above derives the following reduction factors for each decision driver and in total.

Table 7.6 Assessed Reduction Factors for Unconstrained Ship Visit Projections to Yorkey's Knob

Decision Driver	Total Score (a)	Max Score (b)	Unweighted % (c = a / b)	Weighting (d)	Reduction Factor (e = c * d)
Passenger Satisfaction	21	44	48%	50%	24%
Ship Operation	7	52	13%	20%	3%
Commercial	8	36	22%	20%	4%
Social	7	20	35%	10%	4%
Total	**43**	**152**	**28%**	**100%**	**35%**

Source: AEC

The reduction factor for passenger satisfaction should be interpreted thus:

> *The logistics and constraint issues posed by Yorkey's Knob and impacting on passenger satisfaction are such that their degree of influence results in 48% of unconstrained ship visit projections unlikely to visit Yorkey's Knob.*

Passenger satisfaction issues are assessed as having the largest weighting reduction factor (24%) whilst ship operations have the least (3%). Obviously, some decision drivers have a larger impact on cruise company decisions than others and therefore the weighting system has been adopted to reflect this. Applying the adopted weightings to the decision drivers results in a reduction factor of 35%. In reality, the reduction factor could likely range from 15% to 50%.

7.4 SUMMARY

An assessment of the logistics and constraints issues concerning Yorkey's Knob versus Trinity Wharf has resulted in an unconstrained projection reduction factor of 35%. That is 35% of the unconstrained projected ship visits to Yorkey's Knob may not occur due to negative factors associated with the destination impacting cruise line decisions. To avoid impacting the unconstrained projections too severely, the demand reduction factor is phased in linearly over time from 2019 to 2025.

Whilst the demand reduction is applied to all ship sizes that could potentially anchor at Yorkey's Knob, the reduction may be more severe with increasing ship size and at peak times.

8. DEMAND PROJECTIONS

8.1 ALTERNATIVE SCENARIOS

As mentioned above there are 16 scenarios to consider and three projection variations within each (medium, low, high). The combination of alternatives in the scenarios is as follows:

Table 8.1 Projection Scenarios

#	Scenario	BCT		Home Porting		Channel Modifications		Bunker Available	
		No	Yes	No	Yes	No	Yes	No	Yes
1	BaU, no home porting	X		X		X		X	
2	BaU, no home porting, ch mods	X		X			X	X	
3	BaU, no home porting, bunker	X		X		X			X
4	BaU, no home porting, ch mods, bunker	X		X			X		X
5	BaU, home porting	X			X	X		X	
6	BaU, home porting, ch mods	X			X		X	X	
7	BaU, home porting, bunker	X			X	X			X
8	BaU, home porting, ch mods, bunker	X			X		X		X
9	BCT, no home porting		X	X		X		X	
10	BCT, no home porting, ch mods		X	X			X	X	
11	BCT, no home porting, bunker		X	X		X			X
12	BCT, no home porting, ch mods, bunker		X	X			X		X
13	BCT, home porting		X		X	X		X	
14	BCT, home porting, ch mods		X		X		X	X	
15	BCT, home porting, bunker		X		X	X			X
16	BCT, home porting, ch mods, bunker		X		X		X		X

Note: BaU = Business as usual, BCT = Brisbane Cruise Terminal
Source: AEC

The tables below present summaries for four of the medium projection scenarios with and without the channel modifications. All of the individual projections for each scenario are contained in **Appendix A**.

8.2 SCENARIO PROJECTIONS

8.2.1 Business as Usual

In the business as usual scenario (no BCT and no home porting) there is growth in the total number of cruise ship visits in line with the assumption of 5% per annum reaching 97 visits in 2031 with 54 at Trinity Wharf and 43 at Yorkey's Knob anchorage.

With the channel modifications and availability of bunker the total number of visits in 2031 increases by 27 to 124 with the split being 105 at Trinity Wharf and 19 at Yorkey's Knob anchorage.

Table 8.2 Projected Ship Visits, Medium Projection

Scenario	Class	Trinity Wharf			Yorkey's Knob			Total Cairns		
		2021	2026	2031	2021	2026	2031	2021	2026	2031
Existing Channel	Sub-Regal	25	33	42				25	33	42
Scenario 1 BaU, no homeporting	Regal	3	2	2				3	2	2
	Sun	16	14	10				16	14	10
	Vista				15	15	11	15	15	11
	Grand				2	6	13	2	6	13
	Voyager				7	9	19	7	9	19
	Total	**44**	**49**	**54**	**24**	**30**	**43**	**68**	**79**	**97**
Revised Channel	Sub-Regal	28	36	45				28	36	45
Scenario 4 BaU, no homeporting, channel modifications, bunker	Regal	3	2	3				3	2	3
	Sun	18	15	11				18	15	11
	Vista	23	29	21				23	29	21
	Grand	3	11	25				3	11	25
	Voyager				7	9	19	7	9	19
	Total	**75**	**93**	**105**	**7**	**9**	**19**	**82**	**102**	**124**
Difference		*31*	*44*	*51*	*-17*	*-21*	*-24*	*14*	*23*	*27*

Source: AEC

8.2.2 Brisbane Cruise Terminal

With the Brisbane Cruise Terminal (no home porting) there is growth in the total number of cruise ship visits in line with the assumptions reaching 131 visits in 2031 with 62 at Trinity Wharf and 69 at Yorkey's Knob anchorage.

With the channel modifications and availability of bunker the total number of visits in 2031 increases by 37 to 167 with the split being 136 at Trinity Wharf and 31 at Yorkey's Knob anchorage.

Table 8.3 Projected Ship Visits (with Brisbane Cruise Terminal), Medium Projection

		Trinity Wharf			Yorkey's Knob			Total Cairns		
Scenario	**Class**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Existing Channel	Sub-Regal	25	33	42				25	33	42
Scenario 9 BCT, no homeporting	Regal	5	3	4				5	3	4
	Sun	31	25	16				31	25	16
	Vista				30	27	17	30	27	17
	Grand				4	10	21	4	10	21
	Voyager				13	16	31	13	16	31
	Total	**61**	**61**	**62**	**47**	**53**	**69**	**108**	**114**	**131**
Revised Channel	Sub-Regal	28	36	45				28	36	45
Scenario 12 BCT, no homeporting, channel modifications, bunker	Regal	6	4	5				6	4	5
	Sun	33	26	17				33	26	17
	Vista	40	48	31				40	48	31
	Grand	6	18	38				6	18	38
	Voyager				13	16	31	13	16	31
	Total	**113**	**132**	**136**	**13**	**16**	**31**	**126**	**148**	**167**
Difference		*52*	*71*	*74*	*-34*	*-37*	*-38*	*18*	*34*	*36*

Source: AEC

8.2.3 Home Porting

With business as usual (with home porting) there is growth in the total number of cruise ship visits in line with the assumptions reaching 117 visits in 2031 with 74 at Trinity Wharf and 43 at Yorkey's Knob anchorage.

With the channel modifications and availability of bunker the total number of visits in 2031 increases by 23 to 140 with the split being 121 at Trinity Wharf and 19 at Yorkey's Knob anchorage.

Table 8.4 Projected Ship Visits (with Home Porting), Medium Projection

Scenario	Class	Trinity Wharf			Yorkey's Knob			Total Cairns		
		2021	2026	2031	2021	2026	2031	2021	2026	2031
Existing Channel	Sub-Regal	45	53	62				45	53	62
Scenario 5 BaU, homeporting	Regal	3	2	2				3	2	2
	Sun	16	14	10				16	14	10
	Vista				15	15	11	15	15	11
	Grand				2	6	13	2	6	13
	Voyager				7	9	19	7	9	19
	Total	**64**	**69**	**74**	**24**	**30**	**43**	**88**	**99**	**117**
Revised Channel	Sub-Regal	28	36	45				28	36	45
Scenario 8 BaU, homeporting channel modifications, bunker	Regal	3	2	3				3	2	3
	Sun	18	15	11				18	15	11
	Vista	39	45	37				39	45	37
	Grand	3	11	25				3	11	25
	Voyager				7	9	19	7	9	19
	Total	**91**	**109**	**121**	**7**	**9**	**19**	**98**	**118**	**140**
Difference		*27*	*40*	*47*	*-17*	*-21*	*-24*	*10*	*19*	*23*

Note: Sub-Regal home porting has been replaced by vista class home porting with the revised channel. Source: AEC

8.2.4 Brisbane Cruise Terminal & Home Porting

With the Brisbane Cruise Terminal (with home porting) there is growth in the total number of cruise ship visits in line with the assumptions reaching 151 visits in 2031 with 82 at Trinity Wharf and 69 at Yorkey's Knob anchorage.

With the channel modifications and availability of bunker the total number of visits in 2031 increases by 33 to 183 with the split being 152 at Trinity Wharf and 31 at Yorkey's Knob anchorage.

Table 8.5 Projected Ship Visits (with Brisbane Cruise Terminal & Home Porting), Medium Projection

Scenario	Class	Trinity Wharf			Yorkey's Knob			Total Cairns		
		2021	2026	2031	2021	2026	2031	2021	2026	2031
Existing Channel	Sub-Regal	45	53	62				45	53	62
Scenario 13 BCT, homeporting	Regal	5	3	4				5	3	4
	Sun	31	25	16				31	25	16
	Vista				30	27	17	30	27	17
	Grand				4	10	21	4	10	21
	Voyager				13	16	31	13	16	31
	Total	**81**	**81**	**82**	**47**	**53**	**69**	**128**	**134**	**151**
Revised Channel	Sub-Regal	28	36	45				28	36	45
Scenario 16 BCT, homeporting, channel modifications, bunker	Regal	6	4	5				6	4	5
	Sun	33	26	17				33	26	17
	Vista	56	64	47				56	64	47
	Grand	6	18	38				6	18	38
	Voyager				13	16	31	13	16	31
	Total	**129**	**148**	**152**	**13**	**16**	**31**	**142**	**164**	**183**
Difference		*45*	*53*	*62*				*45*	*53*	*62*

Note: Sub-Regal home porting has been replaced by vista class home porting with the revised channel. Source: AEC

9. 2014 CHANNEL DEMAND PROJECTIONS

The previous *Cairns Shipping Development Project Draft Environmental Impact Statement* (Ports North, 2014) allowed for "*a channel upgrade capable of allowing access for all mega class ships to berth at Trinity wharf and involved 4,400,00m3 of dredging*". This includes access by voyager class ships to access Trinity Wharf whereas the current CSDP does not. This section considers projected cruise ship demand if voyager ships could access Trinity Wharf. Two additional scenarios were added to the projections as follows:

- Scenario 17: Business as usual (no Brisbane Cruise Terminal), homeporting and 2014 channel modifications.
- Scenario 18: Brisbane Cruise Terminal, homeporting and 2014 channel modifications.

Section 7 assessed that logistics and constraints issues at Yorkey's Knob versus Trinity Wharf would result in an unconstrainted projection reduction of 35%. That is 35% of the unconstrained projected ship visits to Yorkey's Knob may not occur due to negative factors associated with the destination impacting cruise line decisions. To avoid impacting the unconstrained projections too severely, the demand reduction factor was phased in linearly over time from 2019 to 2025.

With the ability of voyager class ships to access Trinity Wharf under the 2014 channel configuration this demand reduction factor is removed and hence the number of voyager class vessels visiting Cairns is expected to increase.

9.1 2014 CHANNEL SCENARIO PROJECTIONS

9.1.1 Business as Usual with Homeporting

The most pessimistic scenario of business as usual (BaU, no BCT, homeporting and no channel modifications) sees growth in ship visits reaching 117 in 2031 but with 43 of these at Yorkey's Knob versus 74 at Trinity Wharf. However, construction of the 2014 channel sees the total increase by 25 to 142 all at Trinity Wharf..

Table 9.1 Projected Ship Visits (Business as Usual with Home Porting), Medium Projection

		Trinity Wharf			Yorkey's Knob			Total Cairns		
Scenario	**Class**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Existing Channel										
Scenario 5 BaU, homeporting	Sub-Regal	45	53	62				45	53	62
	Regal	3	2	2				3	2	2
	Sun	16	14	10				16	14	10
	Vista				15	15	11	15	15	11
	Grand				2	6	13	2	6	13
	Voyager				7	9	19	7	9	19
	Total	**64**	**69**	**74**	**24**	**30**	**43**	**88**	**99**	**117**
2014 Channel										
Scenario 17 BaU, homeporting, channel modifications, no bunker	Sub-Regal	25	33	42				25	33	42
	Regal	3	2	3				3	2	3
	Sun	16	14	10				16	14	10
	Vista	37	43	35				37	43	35
	Grand	3	10	23				3	10	23
	Voyager	8	14	29				8	14	29
	Total	**92**	**116**	**142**	**0**	**0**	**0**	**92**	**116**	**142**
Difference		*28*	*47*	*68*	*-24*	*-30*	*-43*	*4*	*17*	*25*

Source: AEC

9.1.2 Brisbane Cruise Terminal with Homeporting

Looking at the more optimistic scenario of the BCT and homeporting in Cairns, the overall number of ships visits is projected to reach 151 with 69 at Yorkey's Knob and 82 at Trinity Wharf. With the 2014 channel there is an increase in total ship visits to 192, all at Trinity Wharf.

Table 9.2 Projected Ship Visits (Brisbane Cruise Terminal with Home Porting), Medium Projection

		Trinity Wharf			Yorkey's Knob			Total Cairns		
Scenario	**Class**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Existing Channel										
Scenario 13 BCT, homeporting	Sub-Regal	45	53	62				45	53	62
	Regal	5	3	4				5	3	4
	Sun	31	25	16				31	25	16
	Vista				30	27	17	30	27	17
	Grand				4	10	21	4	10	21
	Voyager				13	16	31	13	16	31
	Total	**81**	**81**	**82**	**47**	**53**	**69**	**128**	**134**	**151**
2014 Channel										
Scenario 18 BCT, homeporting, channel modifications, no bunker	Sub-Regal	25	33	42				25	33	42
	Regal	6	3	4				6	3	4
	Sun	31	25	16				31	25	16
	Vista	54	62	46				54	62	46
	Grand	6	17	36				6	17	36
	Voyager	16	25	48				16	25	48
	Total	**138**	**165**	**192**	**0**	**0**	**0**	**138**	**165**	**192**
Difference		*57*	*84*	*110*	*-47*	*-53*	*-69*	*10*	*31*	*41*

Source: AEC
Note: Sub-Regal home porting has been replaced by vista class home porting with the revised channel.
Source: AEC

REFERENCES

ABS (Australian Bureau of Statistics) (2014) *Regional Population Growth, Australia, 2014–15*. Cat. No. 3218.0, released 30 March 2016.

BMT WBM Pty Ltd (2011). *Cairns Cruise Shipping Development Strategy - Demand Study Final Report*. Report prepared for Ports North, 18 November 2011.

BMT WBM Pty Ltd (2014). *Cairns Cruise Shipping Development - Demand Study Update 2014 (Final)*. Report prepared for Ports North, 18 November 2011.

ACA (Australian Cruise Association) (2016). *Economic Impact of the Australian Cruise Shipping Industry 2015-16*. Report prepared by AEC Group Pty. Ltd., September 2016.

AEC Group Pty Ltd (2017). *Cairns Shipping Development Project 2016 Economic Analysis Update*. Report prepared for Ports North, June 2017.

CLIA (Cruise Line Industry Association) (2015a). *2016 Cruise Industry Outlook*.

CLIAA (Cruise Line Industry Association Australasia) (2015). *Cruise Industry Source Market Report, Australia 2014*.

CLIAA (Cruise Line Industry Association Australasia) (2016). *Cruise Industry Source Market Report, Ocean Cruise Passengers, Australia 2015*.

Cruise Industry News (2016). *Cruise Ship Order Book*. Accessed from http://www.cruiseindustrynews.com/cruise-news/cruise-ship-orderbook.html on 14 October 2016.

PoB (Port of Brisbane) (2016). *Port of Brisbane to deliver a $100 million mega shop cruise facility for South-east Queensland*. Media Release dated 12 February 2016.

Port Authority of NSW (2016). *Cruise Schedule*. Accessed from http://www.sydneyports.com.au/port_operations/cruise_schedule on 2 June 2016 and 13 October 2016.

Ports North (2014). *Cairns Shipping Development Project Draft Environmental Impact Statement*. July 2015.

Ports North (2015). *Cairns Shipping Development Project 2016 Demand Study Update Consultancy Brief*. Tender PN 0617, October 2015.

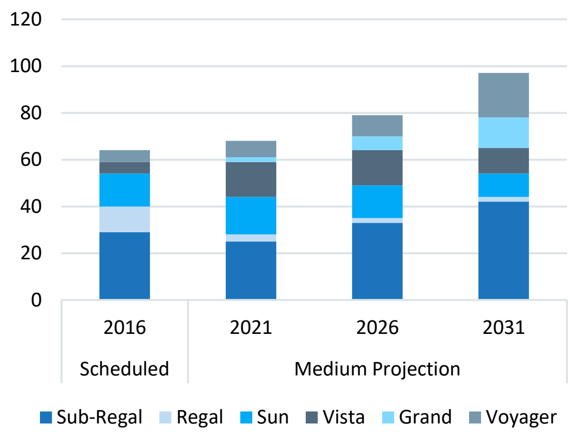
Ports North (2016a). *Cairns Cruise Liner Schedule 2016 as at 6 September 2016*. Accessed from http://www.portsnorth.com.au on 13 October 2016.

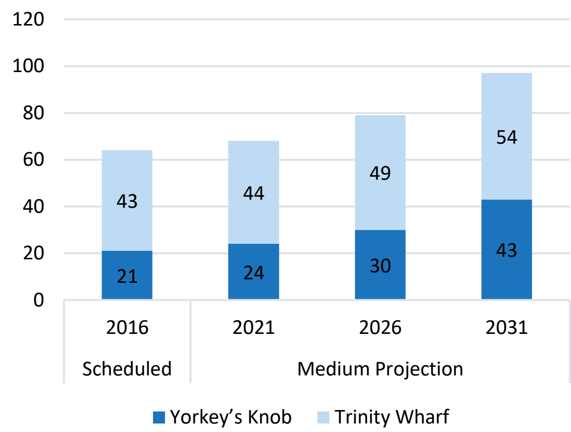
Ports North (2016b). *Cairns Cruise Liner Schedule 2017 as at 6 September 2016*. Accessed from http://www.portsnorth.com.au on 13 October 2016.

APPENDIX A SCENARIO PROJECTIONS

Scenario 1 Business as Usual, No Home Porting

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	6	6	7	9
Mid	25	20	27	34	17	21	28	23	33	41
Mega	35	43	46	55	34	37	44	52	55	66
Total	**64**	**68**	**79**	**97**	**55**	**63**	**78**	**81**	**95**	**116**
Yorkey's Knob	21	24	30	43	19	24	34	29	36	52
Trinity Wharf	43	44	49	54	36	39	44	52	59	64
Total	**64**	**68**	**79**	**97**	**55**	**63**	**78**	**81**	**95**	**116**
Sub-Regal	29	25	33	42	20	26	34	30	40	50
Regal	11	3	2	2	2	2	2	4	2	2
Sun	14	16	14	10	13	11	8	19	17	12
Vista	5	15	15	11	12	12	9	18	18	13
Grand	0	2	6	13	2	5	10	2	7	16
Voyager	5	7	9	19	6	7	15	8	11	23
Total	**64**	**68**	**79**	**97**	**55**	**63**	**78**	**81**	**95**	**116**

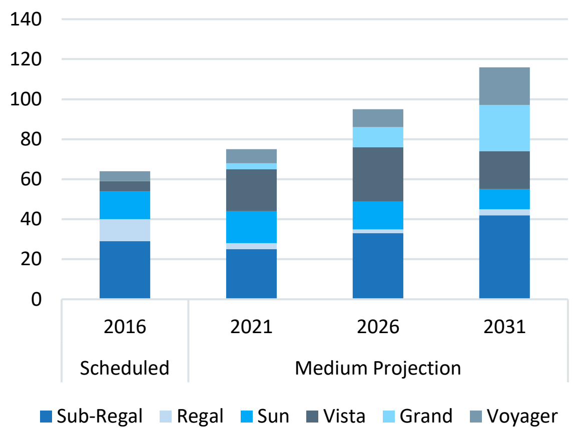


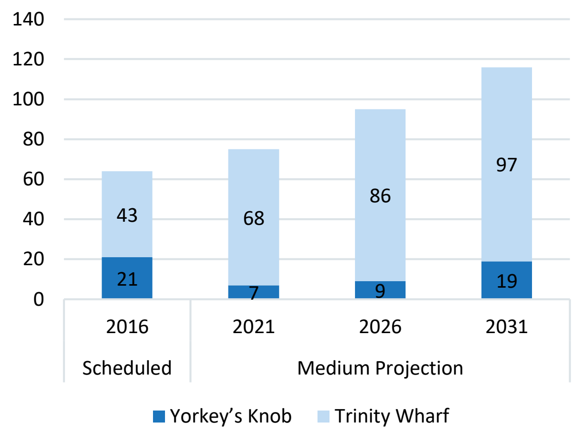


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 2 Business as Usual, No Home Porting, Channel Modifications

Classification	Sched	Medium Projection			Low Projection			High Projection		
	2016	2021	2026	2031	2021	2026	2031	2021	2026	2031
Boutique	4	5	6	8	4	5	6	6	7	9
Mid	25	19	27	33	17	21	27	25	32	41
Mega	35	51	62	75	41	50	60	61	75	89
Total	**64**	**75**	**95**	**116**	**62**	**76**	**93**	**92**	**114**	**139**
Yorkey's Knob	21	7	9	19	6	7	15	8	11	23
Trinity Wharf	43	68	86	97	56	69	78	84	103	116
Total	**64**	**75**	**95**	**116**	**62**	**76**	**93**	**92**	**114**	**139**
Sub-Regal	29	25	33	42	20	26	33	31	39	50
Regal	11	3	2	3	3	2	2	4	2	3
Sun	14	16	14	10	13	11	8	19	17	12
Vista	5	21	27	19	17	22	16	26	33	23
Grand	0	3	10	23	3	8	19	4	12	28
Voyager	5	7	9	19	6	7	15	8	11	23
Total	**64**	**75**	**95**	**116**	**62**	**76**	**93**	**92**	**114**	**139**

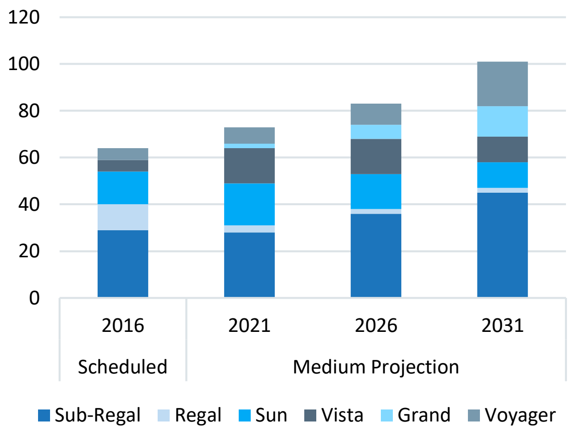


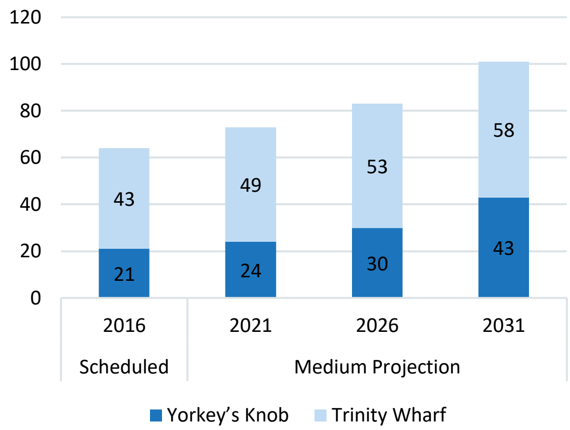


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 3 Business as Usual, No Home Porting, Bunker

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	7	6	8	10
Mid	25	23	30	37	18	23	29	26	35	45
Mega	35	45	47	56	36	38	45	54	56	67
Total	**64**	**73**	**83**	**101**	**58**	**66**	**81**	**86**	**99**	**122**
Yorkey's Knob	21	24	30	43	19	24	34	29	36	52
Trinity Wharf	43	49	53	58	39	42	47	57	63	70
Total	**64**	**73**	**83**	**101**	**58**	**66**	**81**	**86**	**99**	**122**
Sub-Regal	29	28	36	45	22	28	36	33	43	55
Regal	11	3	2	2	2	2	2	4	2	2
Sun	14	18	15	11	14	12	9	21	18	13
Vista	5	15	15	11	12	12	9	18	18	13
Grand	0	2	6	13	2	5	10	2	7	16
Voyager	5	7	9	19	6	7	15	8	11	23
Total	**64**	**73**	**83**	**101**	**58**	**66**	**81**	**86**	**99**	**122**

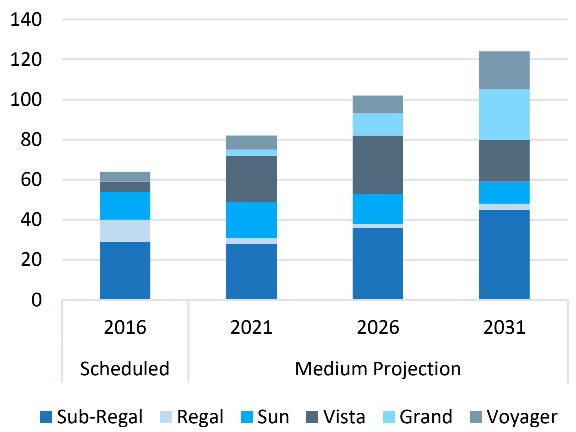


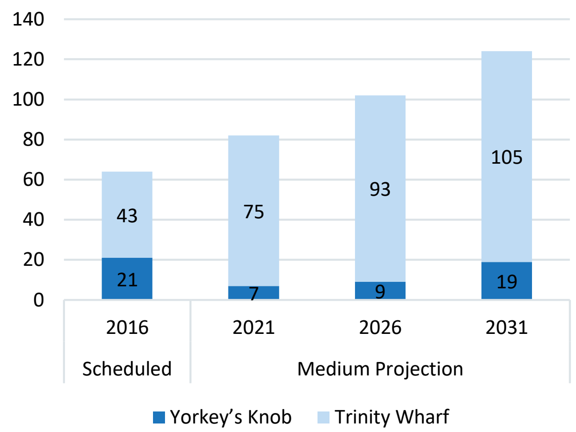


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 4 Business as Usual, No Home Porting, Channel Modifications, Bunker

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	7	6	8	10
Mid	25	22	29	37	18	24	30	26	35	45
Mega	35	55	67	79	44	53	63	66	80	95
Total	**64**	**82**	**102**	**124**	**66**	**82**	**100**	**98**	**123**	**150**
Yorkey's Knob	21	7	9	19	6	7	15	8	11	23
Trinity Wharf	43	75	93	105	60	75	85	90	112	127
Total	**64**	**82**	**102**	**124**	**66**	**82**	**100**	**98**	**123**	**150**
Sub-Regal	29	28	36	45	22	28	36	33	43	55
Regal	11	3	2	3	3	2	3	4	3	4
Sun	14	18	15	11	14	12	9	21	18	13
Vista	5	23	29	21	18	24	17	28	35	25
Grand	0	3	11	25	3	9	20	4	13	30
Voyager	5	7	9	19	6	7	15	8	11	23
Total	**64**	**82**	**102**	**124**	**66**	**82**	**100**	**98**	**123**	**150**

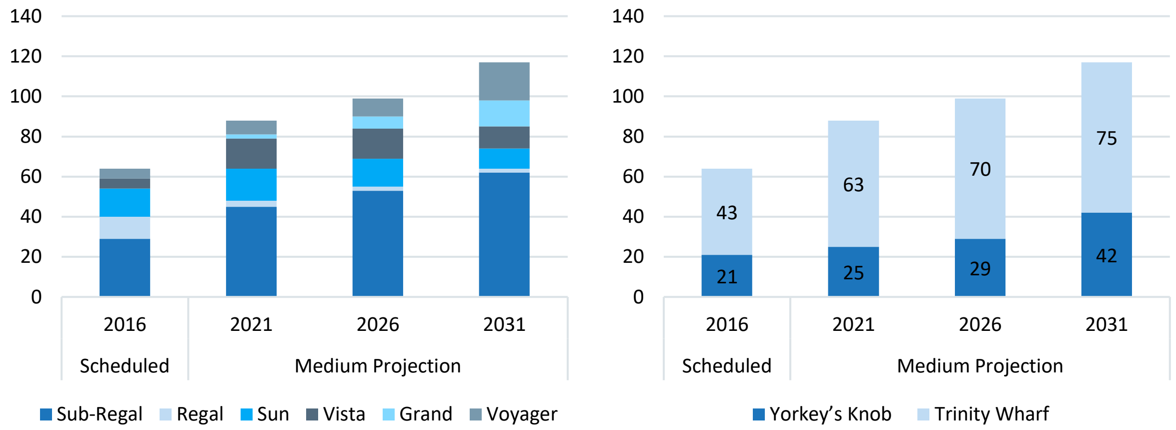




Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 5 Business as Usual, Home Porting

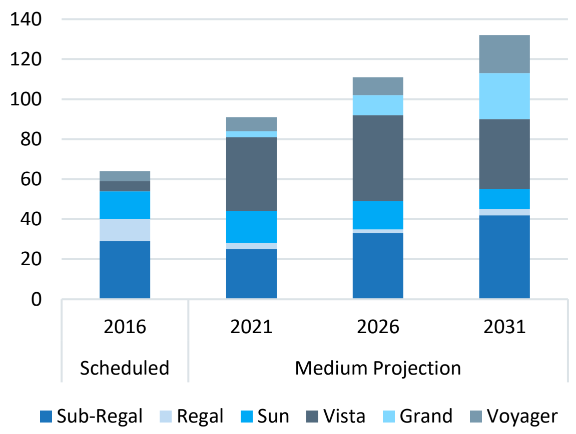
Classification	Sched	Medium Projection			Low Projection			High Projection		
	2016	2021	2026	2031	2021	2026	2031	2021	2026	2031
Boutique	4	5	6	8	4	5	6	6	7	9
Mid	25	40	48	55	32	36	42	48	56	66
Mega	35	43	45	54	35	36	44	52	54	65
Total	**64**	**88**	**99**	**117**	**71**	**77**	**92**	**106**	**117**	**140**
Yorkey's Knob	21	25	29	42	20	24	34	29	35	51
Trinity Wharf	43	63	70	75	51	53	58	77	82	89
Total	**64**	**88**	**99**	**117**	**71**	**77**	**92**	**106**	**117**	**140**
Sub-Regal	29	45	53	62	36	42	49	55	63	74
Regal	11	3	2	2	2	1	2	3	2	3
Sun	14	16	14	10	13	11	8	19	16	12
Vista	5	15	15	11	12	12	8	18	18	13
Grand	0	2	6	13	2	4	10	3	7	15
Voyager	5	7	9	19	6	7	15	8	11	23
Total	**64**	**88**	**99**	**117**	**71**	**77**	**92**	**106**	**117**	**140**

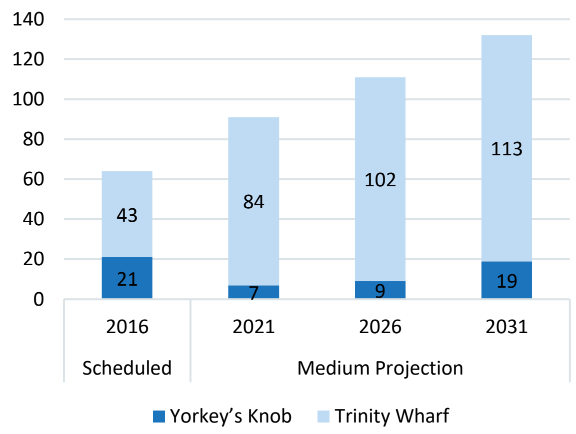


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 6 Business as Usual, Home Porting, Channel Modifications

Classification	Sched	Medium Projection			Low Projection			High Projection		
	2016	2021	2026	2031	2021	2026	2031	2021	2026	2031
Boutique	4	5	6	8	4	5	6	6	7	9
Mid	25	19	27	34	18	21	27	25	31	41
Mega	35	67	78	90	53	63	72	80	94	108
Total	**64**	**91**	**111**	**132**	**75**	**89**	**105**	**111**	**132**	**158**
Yorkey's Knob	21	7	9	19	6	7	15	8	11	23
Trinity Wharf	43	84	102	113	69	82	90	103	121	135
Total	**64**	**91**	**111**	**132**	**75**	**89**	**105**	**111**	**132**	**158**
Sub-Regal	29	25	33	42	20	26	33	31	39	50
Regal	11	3	2	3	3	2	2	4	2	3
Sun	14	16	14	10	13	11	8	19	16	12
Vista	5	37	43	35	30	35	28	45	52	42
Grand	0	3	10	23	3	8	19	4	12	28
Voyager	5	7	9	19	6	7	15	8	11	23
Total	**64**	**91**	**111**	**132**	**75**	**89**	**105**	**111**	**132**	**158**

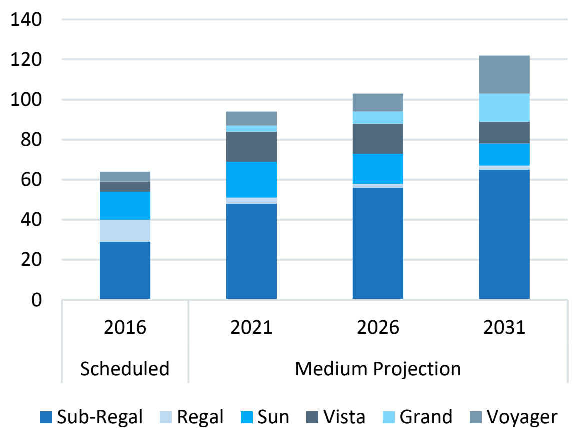


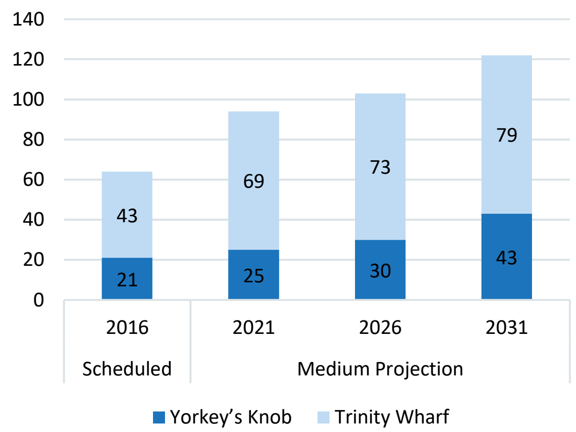


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 7 Business as Usual, Home Porting, Bunker

Classification	Sched	Medium Projection			Low Projection			High Projection		
	2016	2021	2026	2031	2021	2026	2031	2021	2026	2031
Boutique	4	5	6	8	4	5	7	6	8	10
Mid	25	44	50	57	34	39	45	50	59	70
Mega	35	45	47	57	36	37	45	54	56	68
Total	**64**	**94**	**103**	**122**	**74**	**81**	**97**	**110**	**123**	**148**
Yorkey's Knob	21	25	30	43	20	24	35	30	36	52
Trinity Wharf	43	69	73	79	54	57	62	80	87	96
Total	**64**	**94**	**103**	**122**	**74**	**81**	**97**	**110**	**123**	**148**
Sub-Regal	29	48	56	65	38	44	52	57	67	79
Regal	11	3	2	2	2	1	2	3	2	3
Sun	14	18	15	11	14	12	9	21	18	13
Vista	5	15	15	11	12	12	8	18	18	13
Grand	0	3	6	14	2	5	11	3	7	17
Voyager	5	7	9	19	6	7	15	8	11	23
Total	**64**	**94**	**103**	**122**	**74**	**81**	**97**	**110**	**123**	**148**

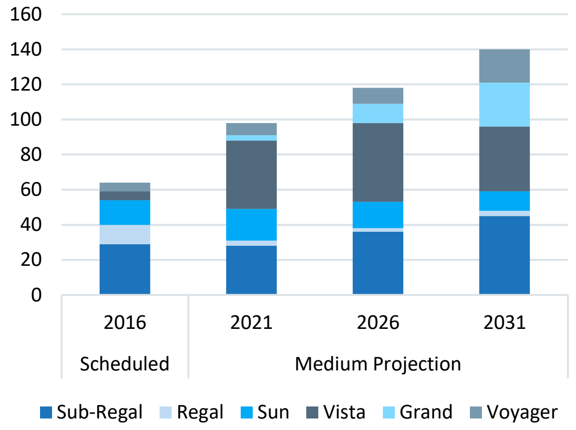


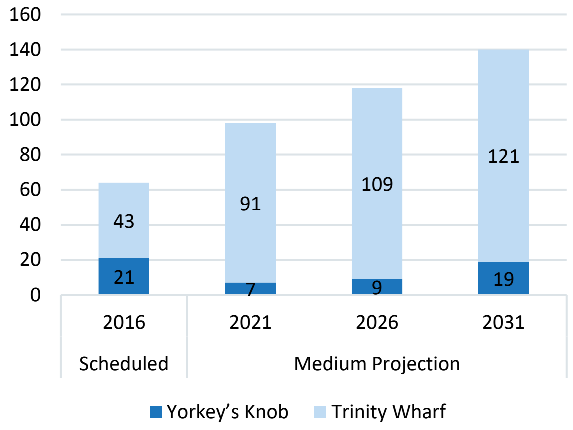


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 8 Business as Usual, Home Porting, Channel Modifications, Bunker

Classification	Sched	Medium Projection			Low Projection			High Projection		
	2016	2021	2026	2031	2021	2026	2031	2021	2026	2031
Boutique	4	5	6	8	4	5	7	6	8	10
Mid	25	22	29	37	19	23	30	26	35	45
Mega	35	71	83	95	56	66	76	85	99	114
Total	**64**	**98**	**118**	**140**	**79**	**94**	**113**	**117**	**142**	**169**
Yorkey's Knob	21	7	9	19	6	7	15	8	11	23
Trinity Wharf	43	91	109	121	73	87	98	109	131	146
Total	**64**	**98**	**118**	**140**	**79**	**94**	**113**	**117**	**142**	**169**
Sub-Regal	29	28	36	45	22	28	36	33	43	55
Regal	11	3	2	3	3	2	3	4	3	4
Sun	14	18	15	11	14	12	9	21	18	13
Vista	5	39	45	37	31	36	30	47	54	44
Grand	0	3	11	25	3	9	20	4	13	30
Voyager	5	7	9	19	6	7	15	8	11	23
Total	**64**	**98**	**118**	**140**	**79**	**94**	**113**	**117**	**142**	**169**

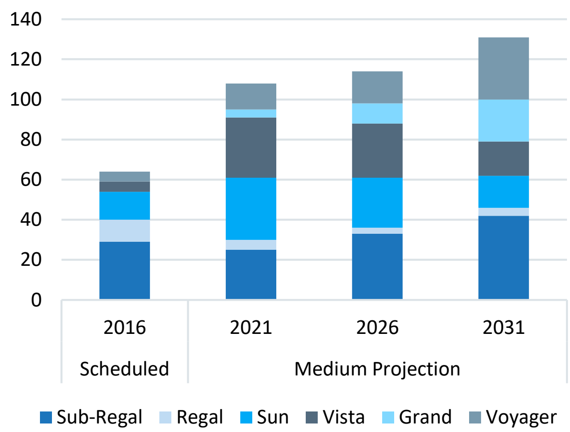


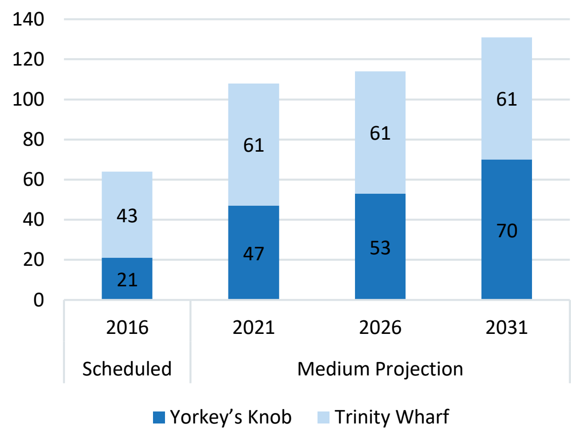


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 9 Brisbane Cruise Terminal, No Home Porting

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	6	6	7	9
Mid	25	19	27	33	17	21	27	25	32	41
Mega	35	84	81	90	67	65	72	101	97	108
Total	**64**	**108**	**114**	**131**	**88**	**91**	**105**	**132**	**136**	**158**
Yorkey's Knob	21	47	53	70	38	42	56	57	64	84
Trinity Wharf	43	61	61	61	50	49	49	75	72	74
Total	**64**	**108**	**114**	**131**	**88**	**91**	**105**	**132**	**136**	**158**
Sub-Regal	29	25	33	42	20	26	33	31	39	50
Regal	11	5	3	4	4	2	3	6	4	5
Sun	14	31	25	16	25	20	13	38	30	19
Vista	5	30	27	17	24	22	14	36	32	21
Grand	0	4	10	21	4	8	17	5	12	25
Voyager	5	13	16	31	11	13	25	16	19	38
Total	**64**	**108**	**114**	**131**	**88**	**91**	**105**	**132**	**136**	**158**

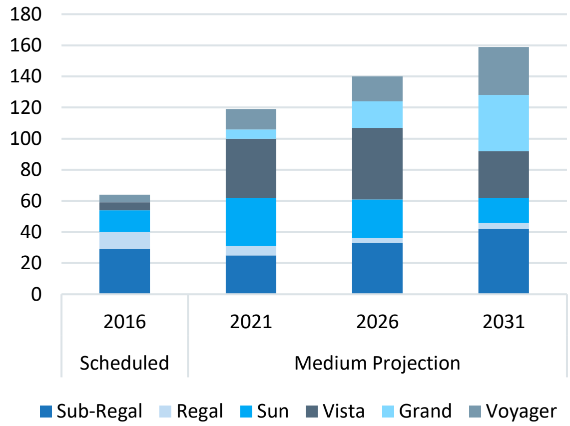


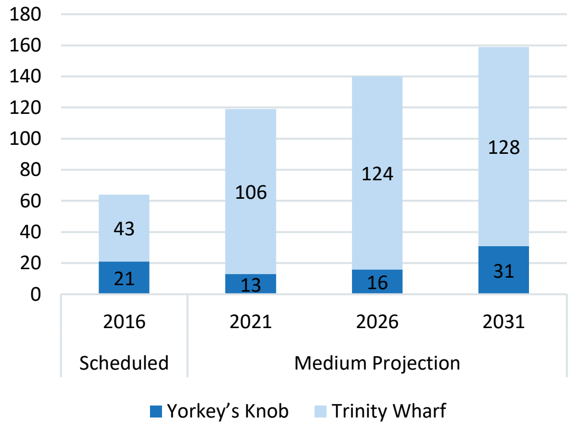


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 10 Brisbane Cruise Terminal, No Home Porting, Channel Modifications

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	6	6	7	9
Mid	25	19	27	33	17	22	28	26	32	41
Mega	35	95	107	118	76	86	94	113	129	141
Total	**64**	**119**	**140**	**159**	**97**	**113**	**128**	**145**	**168**	**191**
Yorkey's Knob	21	13	16	31	11	13	25	16	19	38
Trinity Wharf	43	106	124	128	86	100	103	129	149	153
Total	**64**	**119**	**140**	**159**	**97**	**113**	**128**	**145**	**168**	**191**
Sub-Regal	29	25	33	42	20	26	33	31	39	50
Regal	11	6	3	4	5	3	4	7	4	5
Sun	14	31	25	16	25	20	13	38	30	19
Vista	5	38	46	30	31	37	24	46	55	36
Grand	0	6	17	36	5	14	29	7	21	43
Voyager	5	13	16	31	11	13	25	16	19	38
Total	**64**	**119**	**140**	**159**	**97**	**113**	**128**	**145**	**168**	**191**

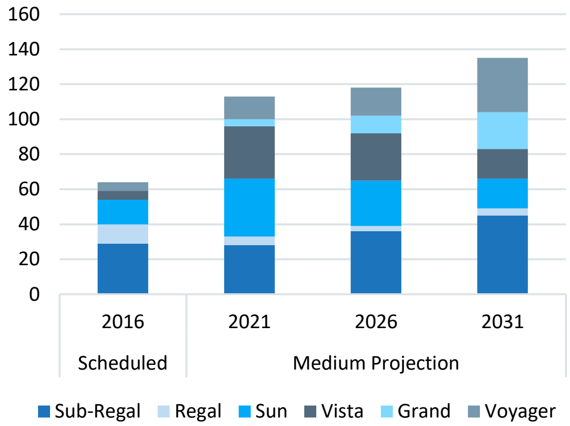


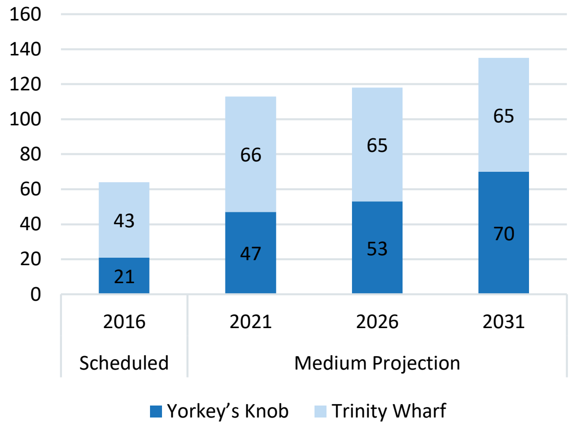


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 11 Brisbane Cruise Terminal, No Home Porting, Bunker

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	7	6	8	10
Mid	25	22	30	36	18	23	29	27	34	45
Mega	35	86	82	91	69	66	73	103	99	109
Total	**64**	**113**	**118**	**135**	**91**	**94**	**109**	**136**	**141**	**164**
Yorkey's Knob	21	47	53	70	38	42	56	57	64	84
Trinity Wharf	43	66	65	65	53	52	53	79	77	80
Total	**64**	**113**	**118**	**135**	**91**	**94**	**109**	**136**	**141**	**164**
Sub-Regal	29	28	36	45	22	28	36	33	43	55
Regal	11	5	3	4	4	2	3	6	4	5
Sun	14	33	26	17	26	21	14	40	31	20
Vista	5	30	27	17	24	22	14	36	32	21
Grand	0	4	10	21	4	8	17	5	12	25
Voyager	5	13	16	31	11	13	25	16	19	38
Total	**64**	**113**	**118**	**135**	**91**	**94**	**109**	**136**	**141**	**164**

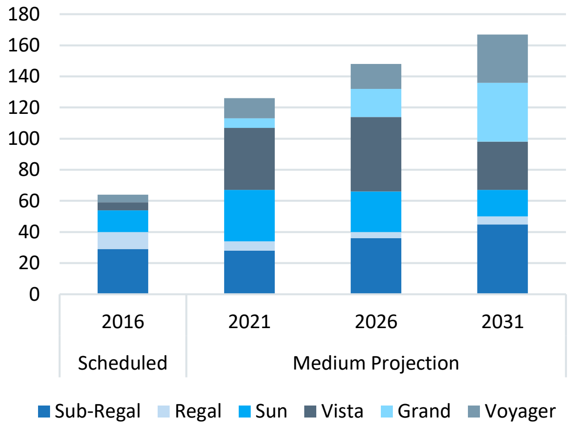


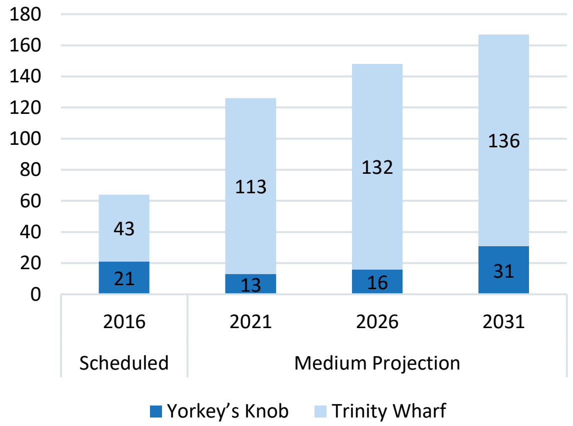


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 12 Brisbane Cruise Terminal, No Home Porting, Channel Modifications, Bunker

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	7	6	8	10
Mid	25	23	30	37	18	23	29	27	34	45
Mega	35	98	112	122	79	89	98	118	134	147
Total	**64**	**126**	**148**	**167**	**101**	**117**	**134**	**151**	**176**	**202**
Yorkey's Knob	21	13	16	31	11	13	25	16	19	38
Trinity Wharf	43	113	132	136	90	104	109	135	157	164
Total	**64**	**126**	**148**	**167**	**101**	**117**	**134**	**151**	**176**	**202**
Sub-Regal	29	28	36	45	22	28	36	33	43	55
Regal	11	6	4	5	5	3	4	7	4	6
Sun	14	33	26	17	26	21	14	40	31	20
Vista	5	40	48	31	32	38	25	48	57	38
Grand	0	6	18	38	5	14	30	7	22	45
Voyager	5	13	16	31	11	13	25	16	19	38
Total	**64**	**126**	**148**	**167**	**101**	**117**	**134**	**151**	**176**	**202**

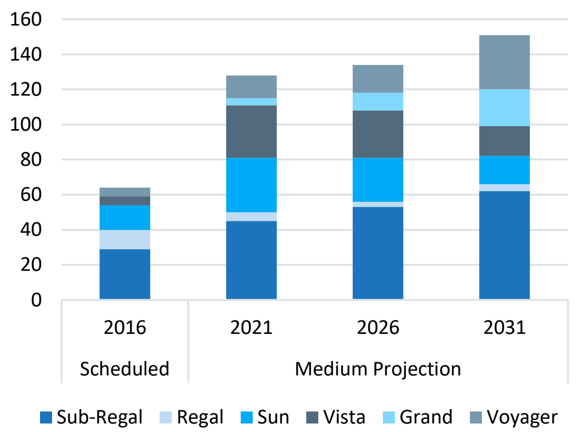


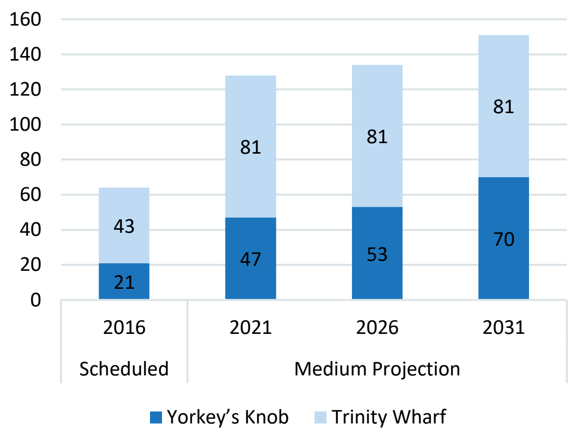


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 13 Brisbane Cruise Terminal, Home Porting

Classification	Sched 2016	Medium Projection 2021	Medium Projection 2026	Medium Projection 2031	Low Projection 2021	Low Projection 2026	Low Projection 2031	High Projection 2021	High Projection 2026	High Projection 2031
Boutique	4	5	6	8	4	5	6	6	7	9
Mid	25	39	47	53	33	37	43	49	56	65
Mega	35	84	81	90	67	65	72	101	97	108
Total	**64**	**128**	**134**	**151**	**104**	**107**	**121**	**156**	**160**	**182**
Yorkey's Knob	21	47	53	70	38	42	56	57	64	84
Trinity Wharf	43	81	81	81	66	65	65	99	96	98
Total	**64**	**128**	**134**	**151**	**104**	**107**	**121**	**156**	**160**	**182**
Sub-Regal	29	45	53	62	36	42	49	55	63	74
Regal	11	5	3	4	4	2	3	6	4	5
Sun	14	31	25	16	25	20	13	38	30	19
Vista	5	30	27	17	24	22	14	36	32	21
Grand	0	4	10	21	4	8	17	5	12	25
Voyager	5	13	16	31	11	13	25	16	19	38
Total	**64**	**128**	**134**	**151**	**104**	**107**	**121**	**156**	**160**	**182**

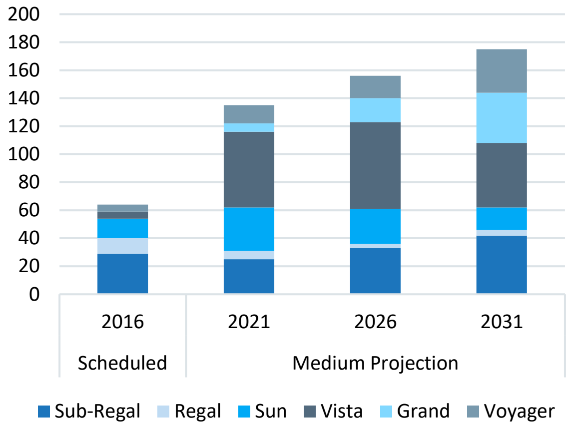


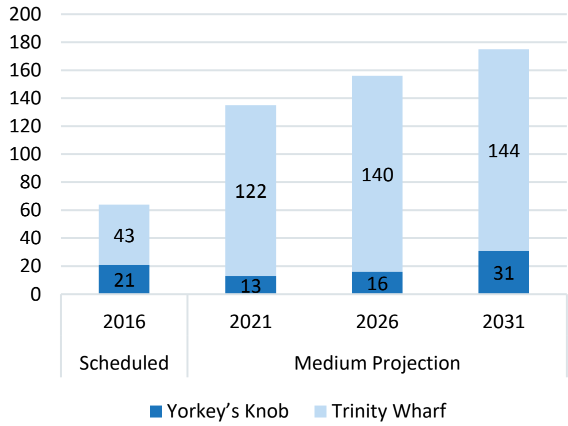


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 14 Brisbane Cruise Terminal, Home Porting, Channel Modifications

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	6	6	7	9
Mid	25	19	27	33	17	21	28	25	32	41
Mega	35	111	123	134	88	99	107	133	148	160
Total	**64**	**135**	**156**	**175**	**109**	**125**	**141**	**164**	**187**	**210**
Yorkey's Knob	21	13	16	31	11	13	25	16	19	38
Trinity Wharf	43	122	140	144	98	112	116	148	168	172
Total	**64**	**135**	**156**	**175**	**109**	**125**	**141**	**164**	**187**	**210**
Sub-Regal	29	25	33	42	20	26	33	31	39	50
Regal	11	6	3	4	5	3	4	7	4	5
Sun	14	31	25	16	25	20	13	38	30	19
Vista	5	54	62	46	43	49	37	65	74	55
Grand	0	6	17	36	5	14	29	7	21	43
Voyager	5	13	16	31	11	13	25	16	19	38
Total	**64**	**135**	**156**	**175**	**109**	**125**	**141**	**164**	**187**	**210**

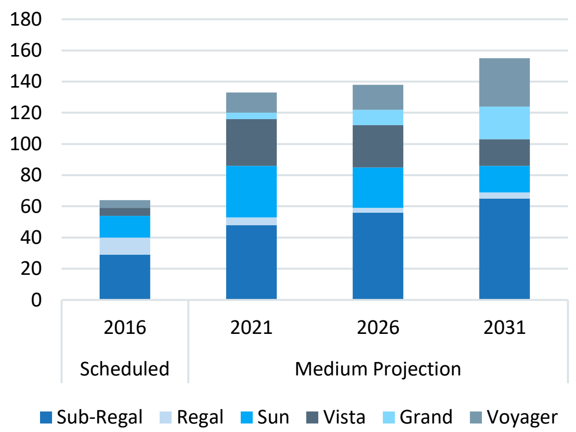


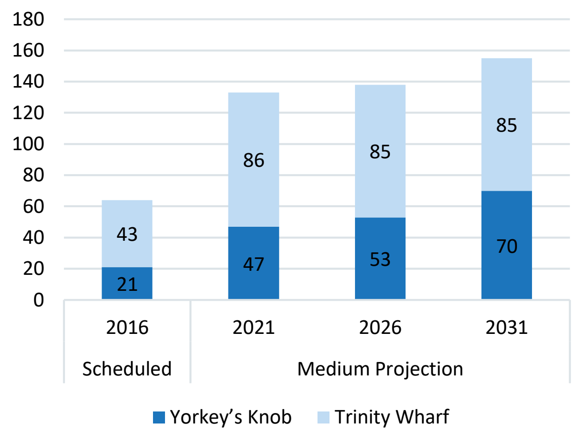


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 15 Brisbane Cruise Terminal, Home Porting, Bunker

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	7	6	8	10
Mid	25	42	50	56	34	39	45	51	58	69
Mega	35	86	82	91	69	66	73	103	99	109
Total	**64**	**133**	**138**	**155**	**107**	**110**	**125**	**160**	**165**	**188**
Yorkey's Knob	21	47	53	70	38	42	56	57	64	84
Trinity Wharf	43	86	85	85	69	68	69	103	101	104
Total	**64**	**133**	**138**	**155**	**107**	**110**	**125**	**160**	**165**	**188**
Sub-Regal	29	48	56	65	38	44	52	57	67	79
Regal	11	5	3	4	4	2	3	6	4	5
Sun	14	33	26	17	26	21	14	40	31	20
Vista	5	30	27	17	24	22	14	36	32	21
Grand	0	4	10	21	4	8	17	5	12	25
Voyager	5	13	16	31	11	13	25	16	19	38
Total	**64**	**133**	**138**	**155**	**107**	**110**	**125**	**160**	**165**	**188**

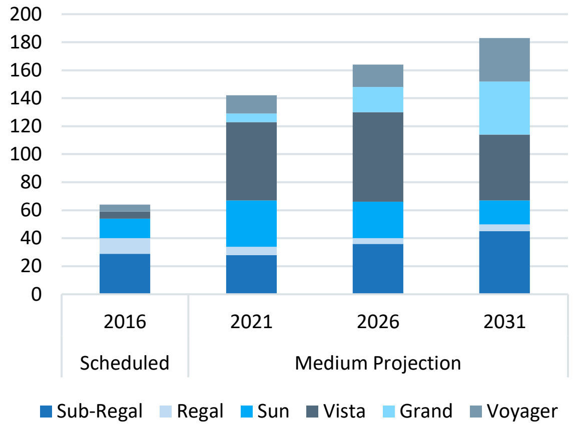


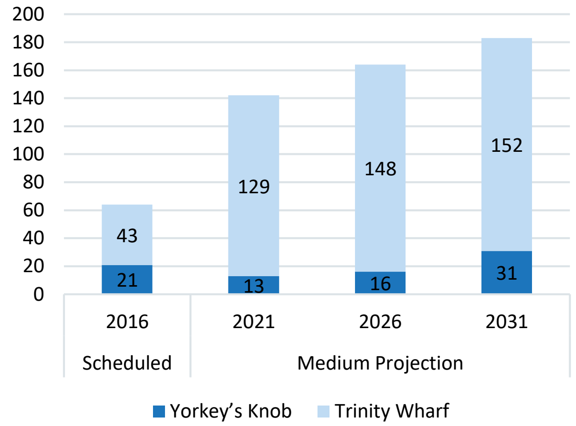


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 16 Brisbane Cruise Terminal, Home Porting, Channel Modifications, Bunker

Classification	Sched	Medium Projection			Low Projection			High Projection		
	2016	2021	2026	2031	2021	2026	2031	2021	2026	2031
Boutique	4	5	6	8	4	5	7	6	8	10
Mid	25	23	30	37	19	23	29	27	35	45
Mega	35	114	128	138	91	102	111	137	153	166
Total	**64**	**142**	**164**	**183**	**114**	**130**	**147**	**170**	**196**	**221**
Yorkey's Knob	21	13	16	31	11	13	25	16	19	38
Trinity Wharf	43	129	148	152	103	117	122	154	177	183
Total	**64**	**142**	**164**	**183**	**114**	**130**	**147**	**170**	**196**	**221**
Sub-Regal	29	28	36	45	22	28	36	33	43	55
Regal	11	6	4	5	5	3	4	7	4	6
Sun	14	33	26	17	26	21	14	40	31	20
Vista	5	56	64	47	45	51	38	67	77	57
Grand	0	6	18	38	5	14	30	7	22	45
Voyager	5	13	16	31	11	13	25	16	19	38
Total	**64**	**142**	**164**	**183**	**114**	**130**	**147**	**170**	**196**	**221**

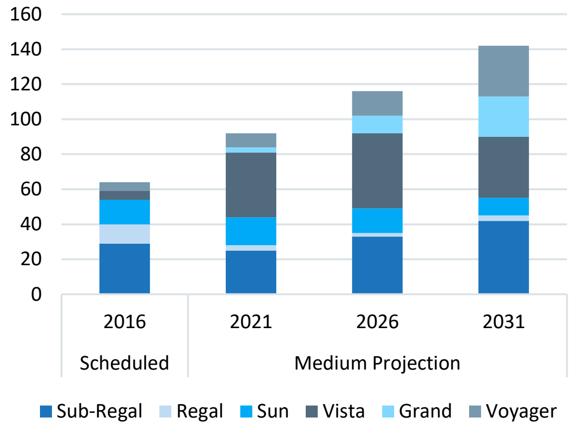


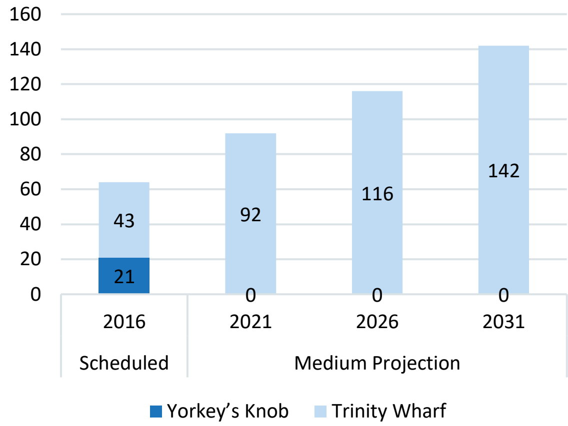


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 17 Business as Usual, Home Porting, 2014 Channel Modifications

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	6	6	7	9
Mid	25	19	27	33	18	22	27	25	31	40
Mega	35	68	83	101	54	66	80	82	100	121
Total	**64**	**92**	**116**	**142**	**76**	**93**	**113**	**113**	**138**	**170**
Yorkey's Knob	21	0	0	0	0	0	0	0	0	0
Trinity Wharf	43	92	116	142	76	93	113	113	138	170
Total	**64**	**92**	**116**	**142**	**76**	**93**	**113**	**113**	**138**	**170**
Sub-Regal	29	25	33	42	20	26	33	31	39	50
Regal	11	3	2	3	3	2	2	4	2	3
Sun	14	16	14	10	13	11	8	19	16	12
Vista	5	37	43	35	30	35	28	45	52	42
Grand	0	3	10	23	3	8	19	4	12	28
Voyager	5	8	14	29	7	11	23	10	17	35
Total	**64**	**92**	**116**	**142**	**76**	**93**	**113**	**113**	**138**	**170**

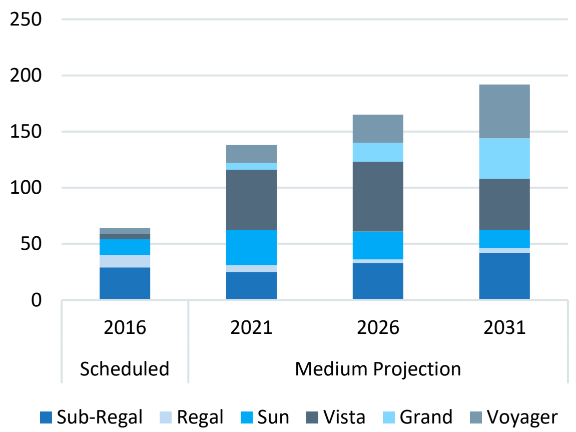


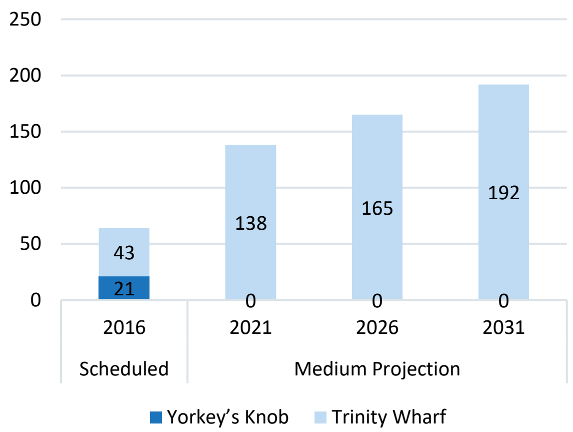


Note: Excludes Adventure class. Source: Ports North, AEC

Scenario 18 Brisbane Cruise Terminal, Home Porting, 2014 Channel Modifications

	Sched	Medium Projection			Low Projection			High Projection		
Classification	**2016**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**	**2021**	**2026**	**2031**
Boutique	4	5	6	8	4	5	6	6	7	9
Mid	25	20	27	33	17	21	29	26	33	40
Mega	35	113	132	151	90	106	120	135	158	181
Total	**64**	**138**	**165**	**192**	**111**	**132**	**155**	**167**	**198**	**230**
Yorkey's Knob	21	0	0	0	0	0	0	0	0	0
Trinity Wharf	43	138	165	192	111	132	155	167	198	230
Total	**64**	**138**	**165**	**192**	**111**	**132**	**155**	**167**	**198**	**230**
Sub-Regal	29	25	33	42	20	26	33	31	39	50
Regal	11	6	3	4	5	3	4	7	4	5
Sun	14	31	25	16	25	20	13	38	30	19
Vista	5	54	62	46	43	49	37	65	74	55
Grand	0	6	17	36	5	14	29	7	21	43
Voyager	5	16	25	48	13	20	39	19	30	58
Total	**64**	**138**	**165**	**192**	**111**	**132**	**155**	**167**	**198**	**230**





Note: Excludes Adventure class. Source: Ports North, AEC

DIFFERENCES FROM SCENARIO 1

#	Scenario	Sched	Medium Projection			Low Projection			High Projection		
		2016	2021	2026	2031	2021	2026	2031	2021	2026	2031
	Total										
1	BaU, no homeporting (Actual)	64	68	79	97	55	63	78	81	95	116
2	BaU, no homeporting, ch mods	0	7	16	19	7	13	15	11	19	23
3	BaU, no homeporting, bunker	0	5	4	4	3	3	3	5	4	6
4	BaU, no homeporting, ch mods, bunker	0	14	23	27	11	19	22	17	28	34
5	BaU, homeporting	0	20	20	20	16	14	14	25	22	24
6	BaU, homeporting, ch mods	0	23	32	35	20	26	27	30	37	42
7	BaU, homeporting, bunker	0	26	24	25	19	18	19	29	28	32
8	BaU, homeporting, ch mods, bunker	0	30	39	43	24	31	35	36	47	53
9	BCT, no homeporting	0	40	35	34	33	28	27	51	41	42
10	BCT, no homeporting, ch mods	0	51	61	62	42	50	50	64	73	75
11	BCT, no homeporting, bunker	0	45	39	38	36	31	31	55	46	48
12	BCT, no homeporting, ch mods, bunker	0	58	69	70	46	54	56	70	81	86
13	BCT, homeporting	0	60	55	54	49	44	43	75	65	66
14	BCT, homeporting, ch mods	0	67	77	78	54	62	63	83	92	94
15	BCT, homeporting, bunker	0	65	59	58	52	47	47	79	70	72
16	BCT, homeporting, ch mods, bunker	0	74	85	86	59	67	69	89	101	105
17	BaU, homeporting, 2014 ch	0	24	37	45	21	30	35	32	43	54
18	BCT, homeporting, 2014 ch	0	70	86	95	56	69	77	86	103	114
	Yorkey's Knob										
1	BaU, no homeporting (Actual)	21	24	30	43	19	24	34	29	36	52
2	BaU, no homeporting, ch mods	0	-17	-21	-24	-13	-17	-19	-21	-25	-29
3	BaU, no homeporting, bunker	0	0	0	0	0	0	0	0	0	0
4	BaU, no homeporting, ch mods, bunker	0	-17	-21	-24	-13	-17	-19	-21	-25	-29
5	BaU, homeporting	0	1	-1	-1	1	0	0	0	-1	-1
6	BaU, homeporting, ch mods	0	-17	-21	-24	-13	-17	-19	-21	-25	-29
7	BaU, homeporting, bunker	0	1	0	0	1	0	1	1	0	0
8	BaU, homeporting, ch mods, bunker	0	-17	-21	-24	-13	-17	-19	-21	-25	-29
9	BCT, no homeporting	0	23	23	27	19	18	22	28	28	32
10	BCT, no homeporting, ch mods	0	-11	-14	-12	-8	-11	-9	-13	-17	-14
11	BCT, no homeporting, bunker	0	23	23	27	19	18	22	28	28	32
12	BCT, no homeporting, ch mods, bunker	0	-11	-14	-12	-8	-11	-9	-13	-17	-14
13	BCT, homeporting	0	23	23	27	19	18	22	28	28	32
14	BCT, homeporting, ch mods	0	-11	-14	-12	-8	-11	-9	-13	-17	-14
15	BCT, homeporting, bunker	0	23	23	27	19	18	22	28	28	32
16	BCT, homeporting, ch mods, bunker	0	-11	-14	-12	-8	-11	-9	-13	-17	-14
17	BaU, homeporting, 2014 ch	0	-24	-30	-43	-19	-24	-34	-29	-36	-52
18	BCT, homeporting, 2014 ch	0	-24	-30	-43	-19	-24	-34	-29	-36	-52
	Trinity Wharf										
1	BaU, no homeporting (Actual)	43	44	49	54	36	39	44	52	59	64
2	BaU, no homeporting, ch mods	0	24	37	43	20	30	34	32	44	52
3	BaU, no homeporting, bunker	0	5	4	4	3	3	3	5	4	6
4	BaU, no homeporting, ch mods, bunker	0	31	44	51	24	36	41	38	53	63
5	BaU, homeporting	0	19	21	21	15	14	14	25	23	25
6	BaU, homeporting, ch mods	0	40	53	59	33	43	46	51	62	71
7	BaU, homeporting, bunker	0	25	24	25	18	18	18	28	28	32
8	BaU, homeporting, ch mods, bunker	0	47	60	67	37	48	54	57	72	82
9	BCT, no homeporting	0	17	12	7	14	10	5	23	13	10
10	BCT, no homeporting, ch mods	0	62	75	74	50	61	59	77	90	89
11	BCT, no homeporting, bunker	0	22	16	11	17	13	9	27	18	16
12	BCT, no homeporting, ch mods, bunker	0	69	83	82	54	65	65	83	98	100
13	BCT, homeporting	0	37	32	27	30	26	21	47	37	34
14	BCT, homeporting, ch mods	0	78	91	90	62	73	72	96	109	108
15	BCT, homeporting, bunker	0	42	36	31	33	29	25	51	42	40
16	BCT, homeporting, ch mods, bunker	0	85	99	98	67	78	78	102	118	119
17	BaU, homeporting, 2014 ch	0	48	67	88	40	54	69	61	79	106
18	BCT, homeporting, 2014 ch	0	94	116	138	75	93	111	115	139	166

Note: Excludes Adventure class. Source: Ports North, AEC

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