

Port of Melbourne



Photo Source: Port of Melbourne website

Port of Melbourne Future Containership Fleet Analysis, 2023-2050

TECHNICAL REFERENCE PAPER



Table of Contents

1. Introduction	1
1.1 Background	1
1.2 Scope	1
2. Global Containership Fleet Analysis	2-7
2.1 Size Class Development	2-3
2.2 Vessel Order Book	4
2.3 Global Fleet Key Changes since Last Analysis	5
2.4 Global Fleet Detailed Size and Age Analysis per July 2022	6
2.5 IMO new regulations (EEXI and CII)	7
3. Melbourne-Calling Fleet Analysis	8-10
3.1 Melbourne Deployed Fleet Overview	8
3.2 Melbourne Fleet Key Changes since Last Analysis	9
3.3 Historical Development of Port of Melbourne international containership visits	10
4. Future Fleet Modelling Approach	11-18
4.1-4.7 Modelling Assumptions used for Estimating Future Fleet Visits	11-14
4.8 Modelling using two future fleet scenarios (A&B)	15
4.9 Modelled International Containership Services Overview	16-17
4.10 Reference Containership Size Class Dimensions	18
5. Fleet Modelling Results – Scenario A (Business-as-Usual)	19-30
6. Fleet Modelling Results – Scenario B (With Increased Swanson Dock Max. Vessel Size Access)	31-42
7. Key Conclusions	43-44
Appendix A – Port of Melbourne Main Trade Route Developments (last 10 years)	45-48
Appendix B – Port of Melbourne International Containership Visits (last 10 years)	49-50
Appendix C – Summary Stats. Scenario A	51-56
Appendix D – Summary Stats. Scenario B	57-62



Port of Melbourne Future Containership Fleet Analysis

1.1 Background

GHD Advisory has been engaged by the Port of Melbourne (PoM) to undertake regular monitoring of developments in the Global and Melbourne-calling Containership Fleets as well as the provision of Containership Fleet Visits Forecasts which model the possible composition, by nominal TEU size class, of containership visits to international container berths at the Port of Melbourne.

This document is a Technical Reference Paper outlining the analysis of global containership fleet developments and the modelling of possible containership fleet visits as part of future development planning for port container capacity and large-ship access to the Swanson Dock precinct. Due to the continuing normalisation of the shipping market after the one-off impacts of the COVID-19 pandemic, the modelling focusses on two future scenarios – ‘Business-As-Usual’ (Scenario A), and ‘Swanson Dock extended maximum vessel size access’ (Scenario B) which is included as a result of initial stakeholder consultation feedback (see Section 4.8 for further details on the Scenarios). The results of the future fleet visits modelling are being used as input for capacity modelling of Swanson and Webb Docks.

The estimated future fleet visits and vessel size compositions may change subject to any future changes in the assumptions used and industry operational decision-making concerning market supply/demand developments, service level coverage on trade-lanes, port access developments along shipping routes, and carrier partnering arrangements.

1.2 Scope

The Scope of the analysis covers:

- Review of global containership fleet developments in terms of containership sizes in service and on order, and the fleet visiting the Port of Melbourne
- International containerships visiting berths at the Port of Melbourne (Swanson Dock and Webb Dock precincts) on a regular (scheduled service) basis – this forms the modelling current baseline
- Bass Strait domestic roll-on/roll-off containerships are excluded
- Future period of FY2022-23 to FY2049-50 inclusive, with specified assumptions used to model the future period.



Developments in the Global Containership Fleet

2.1 Deployed Global Containership Fleet – Size class composition (Q2 2023)

Table 1 Global Containership Fleet – Size class composition & development (Q2 2023)

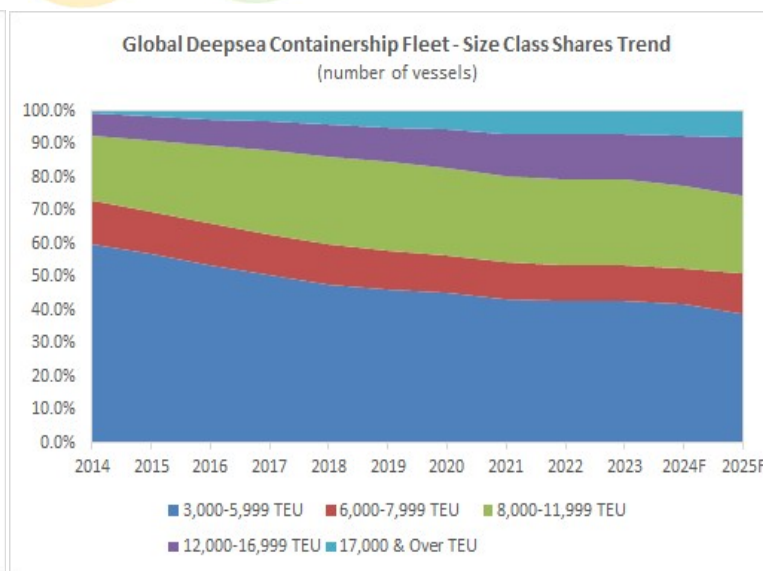
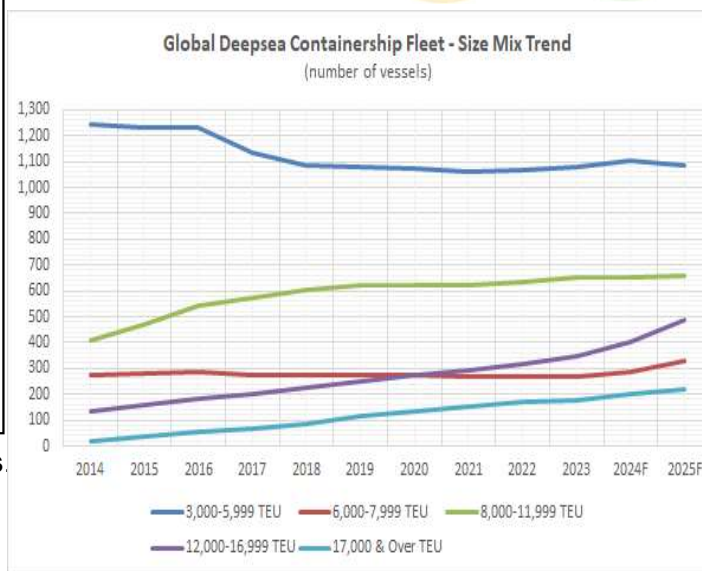
Start Year	Feeder 100-2,999		Intermediate 3,000-5,999		Intermediate 6,000-7,999		Neo-Panamax 8,000-11,999		Neo-Panamax 12,000-16,999		Post-Panamax 17,000+		Total Fleet	
	No.	,000 TEU	No.	,000 TEU	No.	,000 TEU	No.	,000 TEU	No.	,000 TEU	No.	,000 TEU	No.	,000 TEU
2014	3,086	4,132.1	1,243	5,542.7	277	1,848.4	409	3,690.9	133	1,785.7	18	319.4	5,166	17,319.2
2015	3,023	4,061.1	1,234	5,524.3	282	1,881.2	467	4,238.2	160	2,157.2	34	612.1	5,200	18,474.1
2016	3,021	4,063.4	1,230	5,514.2	285	1,901.7	542	4,942.9	182	2,477.5	57	1,038.5	5,317	19,938.2
2017	2,999	3,994.0	1,136	5,091.4	275	1,837.6	576	5,273.7	199	2,724.3	69	1,268.0	5,254	20,189.2
2018	2,994	3,999.4	1,084	4,850.3	273	1,825.4	603	5,559.0	223	3,069.9	88	1,655.4	5,265	20,959.4
2019	3,041	4,102.5	1,082	4,833.9	273	1,825.4	621	5,755.8	249	3,440.1	114	2,180.9	5,380	22,138.6
2020	3,072	4,166.3	1,072	4,778.0	273	1,825.4	623	5,779.4	274	3,793.3	137	2,681.7	5,451	23,024.1
2021	3,111	4,281.6	1,062	4,720.7	270	1,804.6	623	5,780.8	291	4,024.4	154	3,084.6	5,511	23,696.7
2022	3,199	4,454.1	1,068	4,741.3	270	1,804.6	636	5,932.2	318	4,421.6	168	3,414.3	5,659	24,768.1
2023	3,320	4,668.2	1,080	4,782.1	270	1,804.6	650	6,096.5	346	4,832.4	175	3,581.8	5,841	25,765.6
2024(f)		4,824.0		4,874.5		1,927.8		6,131.3		5,603.1		4,170.9		27,531.6
2025(f)		4,615.9		4,799.1		2,186.8		6,170.4		6,817.1		4,529.7		29,119.1
% capacity growth														
2023(f)		3.3%		1.9%		6.8%		0.6%		15.9%		16.4%		6.9%
2024(f)		-4.3%		-1.5%		13.4%		0.6%		21.7%		8.6%		5.8%

Outlook Indicators:

- Melbourne historic workhorse size class of **3,000-5,999 TEU** has **bottomed out***. Forecast 1,084 vessels by 2025 (= back to 2019).
- Melbourne historic upper size class of **6,000-7,999 TEU** continuing to **rapidly grow***. Forecast 327 vessels by 2025 (= record high).
- Melbourne relevant Neo-Panamax size class of **8,000-16,999 TEU** still **rapidly increasing***. Forecast 1,146 vessels by 2025. **Sub-class 12-16,999 TEU driving growth**. Sub-class 8-11,999 TEU stable.

(*) **Net of Deliveries & Demolitions**

Source: GHD analysis of Clarksons
SIN Quarterly Containership
Market Review, Q2 2023





Developments in the Global Containership Fleet

2.2a Global Containership Fleet – Vessel Order Book (Q2 2023)

Outlook Indicators (June 2023):

1. Vessel Orderbook for Melbourne **3,000-5,999 TEU size class continues to turn with 109 vessels, but likely most for Intra Asia trades.**
2. Vessel Orderbook for Melbourne **6,000-7,999 TEU size class continues to be firm with 105.**
3. Vessel Orderbook for Melbourne **Neo-Panamax 8,000-10,999 TEU size class increasing interest with 40**
4. Vessel Orderbook for Melbourne **Neo-Panamax 11,000-11,999 TEU size class at 23** (lesser interest, but 20 are by MSC).
5. Vessel Orderbook for Melbourne **Neo-Panamax 12,000-12,999 TEU size low at 2** (drying-up).
6. Vessel Orderbook for Melbourne **Neo-Panamax 13,000-13,999 TEU size at 66** (still popular with 18 by CMA CGM).

Table 2 Global Containership Fleet – Orderbook (April 2023)

Start	Feeder 100-2,999 No. ,000 TEU		Intermediate 3,000-5,999 No. ,000 TEU		Intermediate 6,000-7,999 No. ,000 TEU		Neo-Panamax 8,000-11,999 No. ,000 TEU		Neo-Panamax 12,000-16,999 No. ,000 TEU		Post-Panamax 17,000+ No. ,000 TEU		Total Orderbook No. ,000 TEU	
Apr-23	320	587.6	119	491.2	110	780.3	63	605.7	238	3,515.2	67	1,558.9	917	7,538.8
% of Flt	10%	13%	11%	10%	41%	43%	10%	10%	84%	91%	28%	34%	15.7%	28.9%
For delivery in:														
2023	167	312.3	46	187.1	24	164.3	3	35.1	57	846.9	27	646.8	324	2,192.5
2024	136	248.0	56	245.8	62	443.1	16	142.1	99	1,459.0	13	310.1	382	2,848.2
2025	17	27.3	13	43.9	24	172.9	34	321.1	64	954.8	13	266.0	165	1,786.0
2026+	-	-	4	14.3	-	-	10	107.3	18	254.5	14	336.0	46	712.1

Table 3 Global Containership Fleet – Orderbook with further detailing by size class (June 2023)

TEU Size up to 14,000 TEU	Number vessels On Order (per June 2023)	Remarks
3,000-5,999	109 (of which only 10 possibly relevant)	Majority for Intra Asia trade; 10 x 5,500 TEU CMA CGM
6,000-7,999	105 (continued interest)	25 x 7,000 TEU Seaspan (for charter); 5 x 6,014 TEU CMA CGM; 10 x 7,000 TEU CMA CGM; 9 x 7,900 TEU CMA CGM; 6 x 7,900 TEU MSC; remainder for Intra Asia trade or unknown/for charter
8,000-10,999	40 (continued interest)	10 x 8,100 TEU MSC; 9 x 9,000 TEU HMM; 4 x 8,200 TEU PIL; remainder unknown/for charter
11,000-11,999	23 (lesser interest)	20 x 11,400/11,500 TEU MSC; remainder Asian owners
12,000-12,999	2 (drying-up)	Asian owner (RCL)
13,000-13,999	66 (still popular)	12 x 13,000 TEU HMM; 18 x 13,000 TEU CMA CGM; 20 x 13,700 TEU ONE; remainder Asian owners/for charter

Source: GHD analysis of Clarksons SIN Global Containership On Order Database, 27/06/2023



Developments in the Global Containership Fleet

2.2b Vessel Order Book (June 2023) – Implications for Port of Melbourne Access

Table 4 Vessel Orderbook (above 3,000 TEU size) – Implications for Port of Melbourne

TEU Size Class	Port of Melbourne Access*	Number vessels On Order (per June 2023)	Remarks
3,000-5,999	All Docks (Swanson & Webb)	109 (of which only 10 possibly relevant to PoM)	Majority for Intra Asia trade; 10 x 5,500 TEU CMA CGM
6,000-7,999	All Docks (Swanson & Webb)	105 (continued interest)	25 x 7,000 TEU Seaspan (for charter); 5 x 6,014 TEU CMA CGM; 10 x 7,000 TEU CMA CGM; 9 x 7,900 TEU CMA CGM; 6 x 7,900 TEU MSC; remainder other
8,000-9,999	All Docks (Swanson & Webb)	35 (continued interest)	10 x 8,100 TEU MSC; 9 x 9,000 TEU HMM; 4 x 8,200 TEU PIL; remainder other
10,000-10,999	Webb Dock Only	5 (lack of interest)	Size range continues to have minimal interest
11,000-11,999	Webb Dock Only	23 (continued interest)	20 x 11,400/11,500 TEU MSC; remainder Asian owners
12,000-12,999	Webb Dock Only	2 (drying-up)	Asian owner (RCL)
13,000-13,999	Webb Dock Only	66 (still popular)	12 x 13,000 TEU HMM; 18 x 13,000 TEU CMA CGM; 20 x 13,700 TEU ONE; remainder other
14,000-14,999	Heads Constrained**	12 (declining)	For East-West trades (COSCO, etc.)
15,000-15,999	Heads Constrained**	88 (popular)	For East-West trades (Evergreen, CMA, Zim, etc.)
16,000-16,999	Heads Constrained**	69 (increasingly popular)	For East-West trades (MSC, Maersk, etc.)
17,000-22,999	Heads Constrained**	6 (declining)	Previously for East-West trades (Maersk)
23,000+	Heads Constrained**	53 (popular)	For East-West trades (Cosco/OOCL, Hapag, MSC, etc.)

(*) **Swanson Dock Max. Vessel Size of 10,000 TEU** assumed to be max. LOA 337m x Beam 45.6m, and LOA 316m x 48.2m with max. operating draught of 14.0m and 50.1m air draught passing under the Westgate Bridge (WGB).

(**) **Webb Dock & Heads Max. Vessel Size of 14,000 TEU** assumed to be ultimate max. LOA 366m x Beam 51m with max. operating draught of 14.0m. Currently, Webb max. is LOA 347m with LOA 350m (trial). There may be a limited scope for vessels up to 18,000 TEU to pass the Heads.



Developments in the Global Containership Fleet

2.3 Global Containership Fleet – Key Changes since Last Analysis (2023 vs. 2022)

Table 5 Global Containership Fleet – Summary of Key Changes since Last Analysis (2023 vs. 2022)

Global Fleet - Key Changes	7/2017	7/2018	10/2019	1/2021	10/2022	3/2023	Change	% Change	Comment (Note: excludes vessels on order as of March 2023)
1. Size-classes (# Vessels)									
- 3,000 to 5,999 TEU	1,140	1,088	1,077	1,066	1,069	1,080	11	1.0%	Stable since last 2022 Analysis
- 6,000 to 7,999 TEU	272	270	270	267	270	270	0	0.0%	Stable since last 2022 Analysis
- 8,000 to 11,999 TEU	576	603	623	623	636	650	14	2.2%	Moderate Increase since last 2022 Analysis
- 12,000 to 16,999 TEU	190	210	274	291	318	346	28	8.8%	Further Rapid Increase since last 2022 Analysis
- 17,000 & Over TEU	78	101	137	154	168	175	7	4.2%	Further Rapid Increase, but all East-West Trades
Total Fleet >3,000 TEU	2,256	2,272	2,381	2,401	2,461	2,521	60	2.4%	Overall Moderate Increase in Vessel Numbers
2. Average Age (Years)									
- 3,000 to 5,999 TEU	10.5	11.2	12.2	13.3	15.0	15.2	0.2	1.3%	Further Average Ageing since last 2022 Analysis
- 6,000 to 7,999 TEU	10.3	11.3	12.6	13.8	15.6	16.1	0.5	3.2%	Further Average Ageing since last 2022 Analysis
- 8,000 to 11,999 TEU	6.5	7.2	8.4	9.6	11.0	11.5	0.5	4.5%	Further Average Ageing since last 2022 Analysis
- 12,000 to 16,999 TEU	4.2	4.8	5.4	6.3	6.9	7.0	0.1	1.4%	Minor Ageing on a relatively Young age base
- 17,000 & Over TEU	2.7	2.7	3.3	4.0	5.3	5.6	0.3	5.7%	Minor Ageing on a relatively Young age base

Note: Changes in Global Fleet = Net of Demolitions (-), Losses (-) and Newbuild Deliveries (+) during period of change.

Implications for Future View Relevant to Melbourne Since Last Analysis:

1. Confirming Continuing Aging of Global 3-6,000 TEU work-horse fleet traditionally used by Carriers for Australia-Asia & Australia-Europe Routes – **possible continued supply for Melbourne**
2. Confirming Continuing Aging of Global 6-8,000 TEU size fleet (average age of size-class now over 16 years), **BUT recent New Orders for 6-8,000 TEU vessels (105) show new interest to replace class with a possible future supply source for Melbourne – Recommend monitor this**
3. Confirming Continuing Interest for Global Replacements in 8-12,000 TEU size range (in particular **40 orders in the sub-size class of 8-11,000 TEU**)
4. Confirming Continuing Global Preference by Carriers for 12-17,000 TEU size vessels

Source: GHD analysis of Clarksons SIN Quarterly Containership Market Review, 4Q 2022 & 3Q 2023, & June 2023 Orders.



Developments in the Global Containership Fleet

2.4 Global Containership Fleet – Detailed Size Class & Age Analysis per June 2023

Table 6 Global Containership Fleet – Detailed size class & future age analysis (per June 2023)

GLOBAL CONTAINERSHIP FLEET - Nominal TEU Size Class (per 27/06/2023)	Vessels Currently Globally Operating (Number)	% Share* of Current Global Fleet >2,999 TEU	Average Age (Years)	Vessels Deployed on PoM Services, 4Q2022 (Number)	PoM Deployed Fleet as % Current Global Size Class*	Vessels On Order Globally (Number)	Vessels on Order with Alternative Fuel ## (Number)	Vessels On Order as % Current Global Size Class*	Remaining Vessels Operational in 2030** (Number)	Remaining in 2030 of which Owned by 10 Main PoM Carriers****	Remaining Vessels Operational in 2035** (Number)	Remaining Vessels Operational in 2040** (Number)
750-999 TEU	325	-	17	1	0.3%	0	0	-	58	-	26	5
1,000-1,999 TEU	1,433	-	13	13	0.9%	197	23M, 29L & 28H	-	844	-	638	429
2,000-2,999 TEU	805	-	14	24	3.0%	96	7M & 17L	-	415	-	363	239
3,000-3,999 TEU***	277	12.5%	14	17	6.1%	60	4M & 9L	21.7%	184	58	121	89
4,000-4,999 TEU	546	24.7%	15	26	4.8%	11	0	2.0%	205	100	33	25
5,000-5,999 TEU	273	12.4%	17	25	9.2%	38	6M	13.9%	97	25	46	40
6,000-6,999 TEU	227	10.3%	16	11	4.8%	16	5A	7.0%	79	36	21	17
7,000-7,999 TEU	46	2.1%	16	0	0.0%	89	5A&M, 6M & 45L	193.5%	102	35	92	92
8,000-8,999 TEU	298	13.5%	14	13	4.4%	26	14L	8.7%	183	114	50	26
9,000-9,999 TEU	180	8.2%	12	13	7.2%	9	9M	5.0%	123	61	76	9
10,000-10,999 TEU	81	3.7%	10	1	1.2%	5	0	6.2%	72	19	38	5
11,000-11,999 TEU	92	4.2%	7	0	0.0%	23	20A&L	25.0%	94	43	84	52
12,000-12,999 TEU	31	1.4%	6	0	0.0%	2	0	6.5%	33	13	22	20
13,000-13,999 TEU	157	7.1%	9	0	0.0%	66	20A&M, 18L & 12M	42.0%	217	134	104	78
Total Fleet (>2,999 TEU):	2,208	100.0%	14	106	4.8%	345	173	15.6%	1,389	638	687	453

Notes: (*) Based on vessel numbers. (**) Based on assumed vessel operational life of 20 years, no losses, all current Orders delivered, and no new vessel Orders placed. PoM = Port of Melbourne. Source data is Clarksons SIN (27/06/2023). (***) Size Class is typically serving Intra Regional trades (i.e. Intra Asia). (****) 10 Main PoM Carriers are CMA-CGM (incl. ANL), COSCO (incl. OOCL), Evergreen, Hapag-Lloyd, HMM, Maersk, MSC, ONE, PIL, and Yang Ming. (##) Alternative-fuel refers ready/capable for ammonia (A), LNG (L), methanol (M), hydrogen (H), or battery/hybrid (BH).

Implications for 2050 Future View Relevant to Melbourne and Modelling Assumptions:

1. There are **Vessels Remaining in all Melbourne size classes by 2035** (assuming 20 year life & no future orders). Possible that by 2035 new orders for 9,000-10,999 TEU size range to fill 2040 emerging gap
2. Fleet Modelling to assume that there is **sufficient supply of vessels across all size classes to 2050**



Developments in the Global Containership Fleet

2.5 IMO new regulations (EEXI+CII) in 2023 – Potential Impacts on the Global Fleet

As of 1st January 2023, it is now mandatory for all ships to calculate their attained Energy Efficiency Existing Ship Index (EEXI) to measure their energy efficiency and to initiate the collection of data for the reporting of their annual operational carbon intensity indicator (CII) and CII rating. **The IMO's CII regulation is likely to have a real impact on the deployment of the existing global containership fleet in the short- and medium- term**, since only around 1% of existing containerships (or 2.9% in TEU capacity terms) have alternative (greener) fuel capability, noting this rises to 29% of vessels on order or 43% in TEU capacity terms.

Table 7 Global Containership Fleet with Alternative Fuels Readiness and/or Capability (March 2023)

Vessel Type	Fleet No.	% Total Fleet No.	Fleet m TEU	% Total Fleet m TEU	Orderbook No.	% Total Obk No.	Orderbook m TEU	% Total Obk m TEU
Sub-3,000 TEU	19	0.6%	0.02	0.4%	31	9.7%	0.05	7.9%
3,000-5,999 TEU	5	0.5%	0.02	0.4%	9	7.6%	0.03	6.5%
6,000-7,999 TEU					45	40.9%	0.33	42.6%
8,000-11,999 TEU	1	0.2%	0.01	0.2%	43	68.3%	0.42	70.0%
12,000-16,999 TEU	26	7.3%	0.39	8.0%	104	43.7%	1.56	44.4%
17,000+ TEU	15	8.3%	0.32	8.7%	38	56.7%	0.86	55.2%
Total	66	1.1%	0.76	2.9%	270	29.4%	3.26	43.2%

Source: Clarksons SIN Quarterly Containership Market Review, 2Q 2023.

The IMO GHG emission targets and mandatory use of the CII as of 2023 will likely push shipping lines, combined with the use of other technical abatement measures and the ordering of 'greener' replacement vessels, to slow steam even further and deploy larger vessels for economies of scale to ensure the desired CII ratings and carbon reduction targets are met each year.

Implications for 2050 Future View Relevant to Melbourne and Modelling Assumptions:

- 1. Some Lines have the possibility to introduce larger vessels on the NE Asia trade to reduce carbon intensity by consolidating two existing services (strings) into one, i.e. 2 x 5,000 TEU vessel strings becoming a 1 x 10,000 TEU vessel string**
- 2. Some Lines operate services on long, multi-sector shipping routes and have the possibility to reduce carbon intensity by deploying larger more energy-efficient vessels sailing at slower speeds, i.e. the Europe-Med. / Middle East / Australia trade route**



Developments in the Melbourne-Calling Containership Fleet

3.1 Current Melbourne International Containership Fleet Deployed on Aus Routes

Analysis for period 1/10-31/12/2022 shows that:

- Melbourne directly called by **28 scheduled container services** covering 8 shipping routes.
- The Melbourne direct calling services require the deployment of a **Containership Fleet of total 144 vessels (106 >3,000 TEU size)**. Average age for Melbourne Fleet same as for Global.
- Melbourne Containership Fleet now has **27 vessels >8,000 TEU size with maximum size 10,926 TEU (nominal)**.
- As of June 2023**, a net reduction of 3 small vessel services (5 opportunistic ceased, and 2 normal started).

Table 8 Melbourne-calling International Containership Fleet (Scheduled, Oct.-Dec. 2022)

Shipping Route (Region)	Number Scheduled Vessels Deployed	Average Vessel Size (TEU)	Vessel Size Range (TEU)	Number & Frequency of Services
East Asia	47	4,724	1,700-8,888	7 x Weekly, 1 x 10 days, 1 x 14 days, 1 x 18 days, 1 x 30 days
SE Asia	47	5,143	1,732-9,200	8 x Weekly (incl. 1 with NZ calls)
N. America EC (Dedicated via Panama)	11	3,397	3,028-3,752	1 x Weekly (incl. NZ calls)
N. America WC	9	4,436	3,884-5,085	1 x Weekly (incl. NZ calls)
Europe (via Suez)	15	9,241	8,266-10,926	1 x Weekly (incl. S/SE Asia & Indian Ocean calls)
Europe (via Panama)	7	2,356	2,200-2,506	1 x 10 days (incl. N.America EC & NZ calls)
New Zealand (Dedicated)	5	1,752	1,102-2,702	1x Weekly, 1 x 10 days, & 1 x 21 days
S. Pacific Islands / PNG (Dedicated)	3	1,280	981-1,550	2 x 20-21 days (= 1 x 10 days)
TOTAL (excl. extra loaders)	144 (avg. age 14 years)	4,922	981-10,926	28 (of which 19 weekly)

Key observations: CY2022 has seen service performance markedly improve at 90% service delivery, and continuing to normalize towards business-as-usual levels of 95-98% in the post-COVID19 era. With this normalization of market conditions, a total of 5 opportunistic small vessel services have ceased.

Note: Overall Weighted Average Vessel Size calculated by the number of vessels deployed on the shipping route and average vessel size on the route.

Port of Melbourne International Visits (Actuals, PoM reporting, CY2022)	Arr.	Dep.
Total Containership Visits	996	
Webb Dock Containership Moves with Airdraught > Westgate Bridge Airdraught Limit of 50.1m	85	87
% PoM Visits with Airdraught > Westgate Bridge Airdraught Limit of 50.1m *	9%	9%

(*) Note: These vessels may still have been able to pass under the WGB if visiting Swanson Dock if a collapsible mast is used and the vessel operating draught is 14m



Developments in the Melbourne-Calling Containership Fleet

3.2 Melbourne-calling Fleet Deployed – Changes since Last Analyses (2015 – 4Q2022)

Table 9 Melbourne-calling International Fleet – Summary of Key Changes since Last Analyses (2015 – 4Q2022)

Melbourne Fleet - Key Changes	2015	2016	2017	2018	2019	1/2021	1/2022	4Q2022*	Comment (Note: Scheduled, excl. extra loaders)
1. Vessels Deployed									
- Total Fleet on services	151	141	148	141	143	134	143	144	Increased fleet size due to increased services.
- Fleet > 3,000 TEU size	119	112	115	120	115	107	105	106	Decreased fleet size due to less use of vessels >3,000 TEU.
- % of 3,000+ TEU > 8,000 TEU	-	-	-	8%	22%	23%	24%	25%	Slight increase in share of 8,000+ TEU vessels.
2. Vessel Sizes (TEU)									
- Average	3,871	4,252	4,522	4,792	4,566	5,162	4,798	4,922	Average size increasing again, but still below pre-COVID19 era due to opportunistic small vessel services operating (note many of these now ceased/ceasing in 1H2023).
- Minimum	777	777	777	652	646	907	981	981	Reflects South Pacific Route needs.
- Maximum	5,888	7,455	7,455	8,814	9,472	10,622	10,622	10,926	Continuing at limit of PoM (Westgate/Swanson) access.
- Maximum on Route/Carrier	N&E Asia / OOCL	Europe / MSC	Europe / MSC	N&E Asia / COSCO	N&E Asia / COSCO	SE Asia / Maersk	SE Asia / Maersk	Europe / CMA CGM	Europe (Suez) Route driver of Max. Ship Size (9,600 TEU MSC-Europe at Swanson, & 10,926 TEU CMA CGM-Europe at Webb).
3. Fleet Age (Years)									
- Average	10.2	10.4	10.7	10.9	12.7	13.0	13.3	13.6	Increasing ageing, same as Global Fleet ageing.
4. Services (strings)									
- Total Services	24	24	24	24	23	22	25	28	Net increase (ASL, TSL & Zim).
- Asia Route Services	14	13	13	14	14	15	17	19	Net increase (ASL & TSL).

(*) Note: As of June 2023, 4 services ceased (1 x ASL, 3 x Zim, BAL ceased start of Oct. 2022) and 2 new services started (1 x Maersk Trans-Tasman & 1 x NPD Pacific Islands).

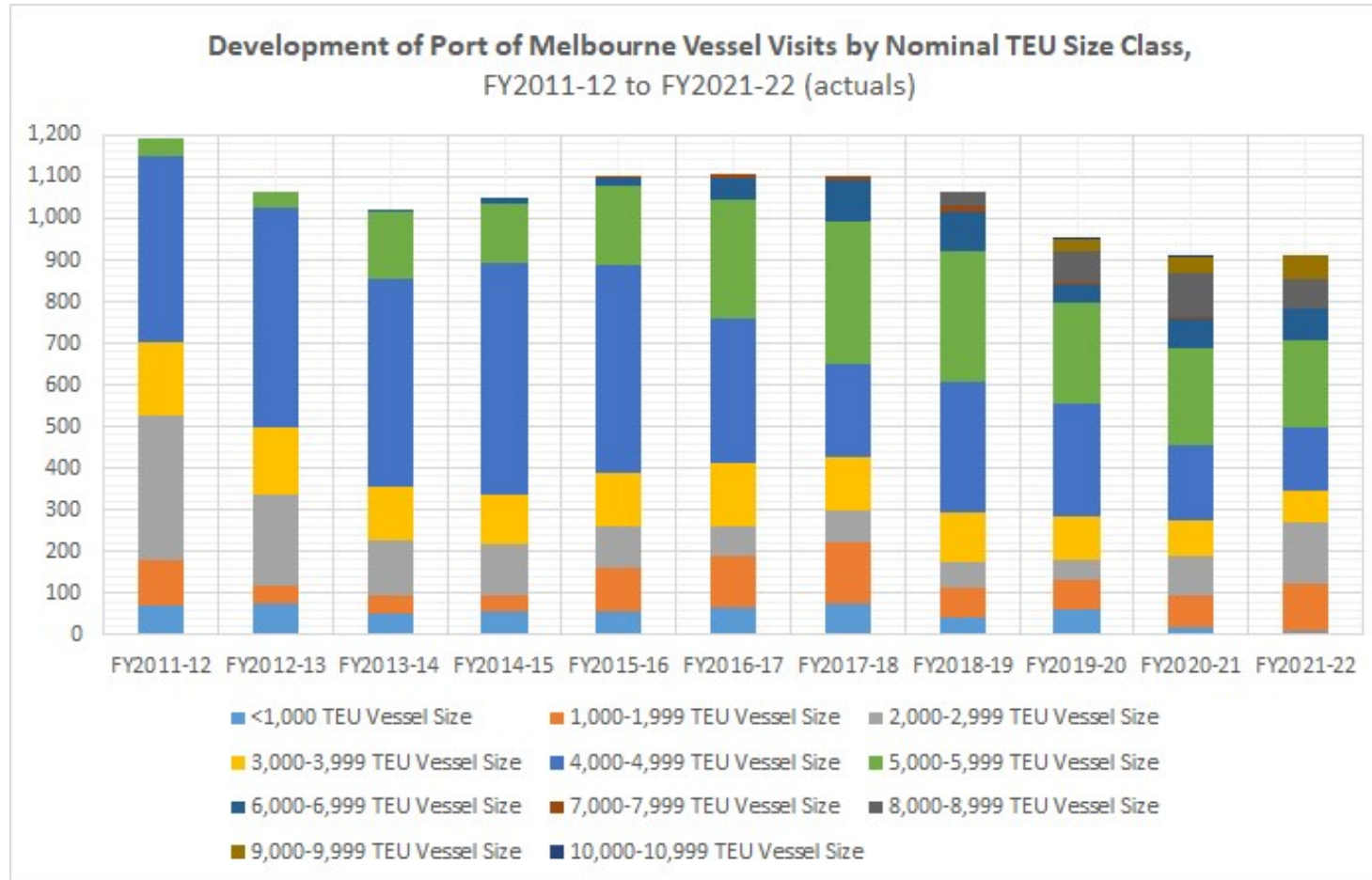
Implications for Future View Since Last Analysis:

1. Confirming Increasing Calling of Large 8,000+TEU Vessels pushing Swanson access
2. Confirming Continuing Ageing of Melbourne-calling Fleet due to global fleet trends in ageing
3. Increased Number of Services since last analysis, but return to post-COVID19 business-as-usual is seeing minor/small vessel services terminated in 1H2023 which will drive increase in average ship sizes once again.

Developments in the Melbourne-Calling Containership Fleet

3.3 Historic development of Port of Melbourne international containership visits

Figure 1



Source: GHD analysis of PoM actual vessel visits data, 2011-2022.

Observations of the historic development and implications for modelling assumptions:

1. Total vessel visits have fluctuated from a high of almost 1,200 in FY2011-12 to a low of around 900 in FY2020-21 and FY2021-22. CY2022 has seen visits increase once again to 996 as schedule performance has improved in the post-COVID19 era. Apart from the effects of the COVID19 era, there is an apparent general trend of a decline in or flattening of total vessel visits due to use of larger vessels
2. In FY2011-12, 97% of visits were vessels under 5,000 TEU. In FY2021-22, this was 54% of vessels visits



Modelling Assumptions used for Estimating Future Fleet Visits

4.1 Container Trade Demand

Growth in container trade demand is assumed to be the key driver of supplied containership capacity. The supply of containership capacity is provided on a shipping route basis by vessels deployed on scheduled (typically fixed-day, weekly) multi-port direct calling services such that overall indicative Port of Melbourne container trade demand is assessed for each of the main shipping routes and services grouped by TEU size classes.

These main shipping routes, with indicative container trade demand, comprise Asia (North/East & SouthEast), North America (East & West Coast), Europe (via Panama Canal and Suez Canal), and NZ and Pacific Islands (NZ only, Pacific Islands/PNG). In general, the Port of Melbourne direct calling services involve connections with one trade region such that the growth for that trade region is relevant. In the case of the Europe via Suez services, the Australian route is typically an extension of the larger Europe – Middle East trade with the vessels sized for this latter trade region.

The indicative full container demand for each of the shipping routes is divided into two directions - exports and imports, with the head-haul full direction determining the required level of deployed shipping capacity on the respective route and service. Regional container trade demand forecasts, as provided by the PoM (Deloitte medium scenario data, per 26/06/2023), is used in the modelling. The long-run overall compound annual growth rate (CAGR) is forecast by PoM (Deloitte) at 2.7% with forecasts for specific regions varying from 2.5% to 2.9%. These growth rates form the basis of route demand analysis.

4.2 Scale Economies of Ship Size, Access Impacts, and the Splitting of services

The economics of operating containerships generally dictates that, without any other constraints, it is more cost-effective on a Per TEU slot basis to increase the ship size to respond to trade growth than to increase the number of vessel visits (i.e. deploy more vessels) when a fixed-day weekly service level exists. This is the primary demand-side assumption in determining the future size of containerships deployed on shipping routes.

The exception is on routes/services where non-weekly service levels exist of vessel visits every 8-10, 14 or 30 days in which case it is assumed that the first goal is to move towards fixed-day fortnightly then weekly service levels with increased ship size thereafter.

Furthermore, there are situations where more ports of call are added to a service by shipping lines and the port range widens with increased roundtrip times. The shipper requirement for express transit times forces the service to be split into two (or more) services which, for a given level of demand, results in the deployment of smaller vessels. An example of this over the last 10 years is the North/East Asia shipping route which now has multiple services covering the port range.



Modelling Assumptions used for Estimating Future Fleet Visits

4.3 Containership Supply and assumed access constraints

If ongoing access constraints occur (i.e. canals, channels, swing basins, berths etc. at ports on the shipping route) and the maximum ship size is reached on the shipping route, then it is assumed that trade is not lost, but that shipping lines respond to the growth in demand by increasing the number of vessel visits of a maximum (constrained) ship size. As a starting position (the baseline year), the modelling assumes that services will remain at their current respective Port of Melbourne dock precinct until a constraint is hit.

Route specific access constraints are assumed relating to the Port of Melbourne (i.e. Heads and channels of max. 14,000 TEU), the Panama Canal (max. 13,000 TEU), and NZ/Pacific Islands ports (max. 5,000 TEU). At the Port of Melbourne berths, **a general large ship maximum of 10,000 TEU at Swanson Dock (SD)** is assumed for the modelling (vessels larger than 10,000 TEU start to become constrained by the Westgate Bridge (WGB) vessel air-draught maximum of 50.1m when vessels are operating at normal operating draughts on Asia trades and have fixed masts). **A general large ship maximum of 14,000 TEU is assumed at Webb Dock** (i.e. Heads constrained as the ultimate constraint) for the modelling. These Swanson Dock and Webb Dock general maximums were provided by PoM.

Research of the existing global containership fleet, on order, and targeted discussions with some shipping lines has shown that there are around 40 x 10,000-11,568 TEU (nominal) modern vessels (incl. 20 on order with LOA 335m x beam 45.6m) which could access SD under current rules. Some vessels of LOA 330m x Beam 48m with a collapsible mast and a size of around 11,000 TEU (nominal) could theoretically pass under the WGB, but would likely need to ballast down compared with their current operating draughts on the Asia trades. The availability of the above vessels to major lines serving the Port of Melbourne should continue to be monitored.

Table 10

Dimensions - LOA x Beam x Max. Summer Draught (m) x Depth (m)	Keel to Mast Height, incl. mast collapsed (m)	Operator	Average Nominal TEU Size	Air draught at 12.0 m loaded draught	Air draught at 14.0 m loaded draught	Able to pass WGB at 12.0m loaded draught	Able to pass WGB at 14.0m loaded draught	Min. loaded draught (m) to pass under WGB
300 x 48 x 14.8 x 24.6	62.0	Existing Lines calling PoM	9,500 - 10,600	50.0	48.0	YES	YES	11.9
314 x 48 x 13.6/14.5 x 24.8 (no collapsible mast)	62.5	Global line	11,568	50.5	48.5	NO	YES	12.4
335 x 45.6 x 14.5	N/A	Global line	11,400	N/A	N/A	TBC	TBC	TBC
330* x 48 x 16.0 x 27.2	62.2	Global line	11,037	50.2	48.2	NO	YES	12.1
334* x 48 x 16.0 x 26.8	65.0	Asian line 1	11,714	53.0	51.0	NO	NO	14.9
334* x 48 x 15.5 x 26.8	64.9	Asian line 2	11,888	52.9	50.9	NO	NO	14.8

Note: (*) Not currently permitted to access Swanson Dock, but subject to current simulation exercise of LOA 330-334m x 48m Beam vessel size by the harbour master.



Modelling Assumptions used for Estimating Future Fleet Visits

4.4 Containership Supply from the global fleet

In the past (2017-2021), there had been a continued ageing and lack of re-ordering of the 6,000 to 8,000 TEU size class. In fleet forecasts before 2022, it had been assumed that by 2026 no 6,000 to 8,000 TEU vessels will be deployed on Australian routes with vessels jumping from 2026 and onwards from 6,000 TEU straight to 8,000+ TEU size as trade grows. However, analyses of the global fleet (see section 2.4 above), since 2022, have shown that this gap in the 6,000 to 8,000 TEU size class has been reversed with significant ordering of new vessels of around 7,000 TEU. Consequently, the 2023-2050 fleet forecasts assume that all vessel size classes in the global fleet are available to Melbourne services.

There is often discussion in the shipping industry of ‘cascading’ large vessels from major (East-West) trades-lanes to minor (North-South) trade-lanes. However, it is assumed in the modelling that these cascaded vessels will still need to be operated profitably which requires adequate utilisations (i.e. available capacity still needs to be matched to available demand). It is also assumed that the required sizes of vessels are equally available to all lines and services – this may vary in reality as some lines are more global or regional in their focus with differing fleet profiles and/or differing shares of owned versus chartered-in vessels.

4.5 Normalisation of shipping market conditions (post COVID-19 situation)

Analysis of actual versus scheduled annual vessel visits to the Port of Melbourne in CY2022 has shown that carriers have started to return to normalized operating conditions with a **service delivery level of around 90%**. **Typical levels of service delivery are 95-98%** (i.e. before the COVID-19 related global supply chain and port congestion issues). It is assumed that shipping markets will steadily normalize again (business-as-usual) to reach an assumed **100% service delivery level for planning purposes** (see section 4.8 below on the assumptions used in the modelling).

The normalization of shipping market conditions has also lead to a rapid decline in the peak freight rates and charter rates experienced in the COVID-19 period which provided one-off opportunities for small vessel operators to enter the market. The return to ‘business-as-usual’ operating margins has seen many of the opportunistic small vessel services ceasing in 1H2023. Consequently, the modelling assumes a ‘business-as-usual’ future situation with the focus on optimizing vessel economics matched to a growing trade demand.



Modelling Assumptions used for Estimating Future Fleet Visits

4.6 Vessel Voyage Utilisations and Seasonality

The modelling assumes that vessels on all services operate at an **average maximum utilization of 85% of nominal TEU capacity on head-haul voyages** which is set at this level to take account of seasonality (peak season) demand. This vessel utilization accounts for all Australian port calls such that Port of Melbourne containers represent a share of the capacity used (this relative share between other Australian ports is assumed fixed). **The Port of Melbourne share of available vessel space is generally set an assumed 35%** for a typical East-coast main-port rotation of Melbourne / Sydney / Brisbane. Lower shares are assumed for services with more Australian port calls.

If a vessel service is calculated as having a Port of Melbourne head-haul demand growth in excess of the maximum Port of Melbourne vessel space-share then a larger vessel is assumed to be deployed to match the demand growth. Otherwise the demand growth is assumed to be absorbed by the available unused Port of Melbourne space, i.e. the vessel size remains constant. Also, if modelled average utilization drops when extra calls per year are introduced (i.e. 26 for an extra fortnightly service, or 52 for an extra weekly service) to overcome a size constraint then excess vessel capacity is assumed to be first used up to respond to demand growth before the vessel size is increased again.

4.7 Shipping line and service consolidation impacts (consortia / alliances)

Over the last 10-15 years, shipping lines have sought to achieve further economies of scale (use larger vessels) and reduce costs as well as expand global port coverage by consolidating both companies (takeovers/mergers) and forming consortia/operating alliances. The timings of these industry-lead changes are sporadic and hard to predict. **The IMO decarbonisation 2023 regulations may well be the next driver of these service (vessel string) consolidations resulting in larger vessels deployed on some shipping routes to reduce carbon intensity.**

This service consolidation effect is discussed in section 7.3 (Sensitivity), and as such provides the potential for the Port of Melbourne in the long-term to under-estimate the possible 'latent' demand for larger containerships and the speed of their introduction as access is provided.

A reverse trend can also occur in exceptionally favourable market conditions (i.e. the recent COVID-19 years) for carriers whereby smaller (niche) carriers and new entrants decide to establish new services with small vessels matching their relatively small market shares. This is, however, a rare, unexpected occurrence and is not considered further in modelling.

Modelling Assumptions used for Estimating Future Fleet Visits

4.8 Modelling using two scenarios – A (Business-as-Usual) and B (Increased Access)

Due to the continued return to normalization of shipping operations, the modelling assumes a ‘Business-as-Usual’ situation (Scenario A) for the future period FY2022-23 through FY2049-50. As a result of feedback from initial stakeholder consultations by PoM, a Scenario B is included which assumes that max. 11,500 TEU vessels can access Swanson Dock.

Table 11 Overview of Modelled Scenarios

Key Modelling Assumptions used for Fleet Forecasts	Scenario A	Scenario B
1. Scenario Description	Business-as-Usual (BAU)	Increased Swanson Dock Vessel Size Access
2. Swanson Dock Access - Maximum Vessel TEU Size	10,000 TEU	11,500 TEU
3. Vessel Service transferring between PoM Dock Precincts	When Swanson Dock (SD) capacity is reached due to trade growth, assumed that the largest vessels currently constrained at SD are transferred to Webb Dock (WD) leaving smaller (unconstrained) vessels at SD and under-utilised capacity at SD	When Swanson Dock (SD) capacity is reached due to trade growth, assumed that a mix of large size-constrained and some smaller (size unconstrained) vessels are transferred to WD matching the shortfall in available capacity at SD
4. Baseline Container Services	Grouped by shipping routes, vessel size classes and PoM precinct visited	
5. Container Trade Demand	PoM Medium Forecast (Deloitte Regional forecasts, version 26th June 2023)	
6. Normalisation of Service Delivery (% of scheduled visits performed)	90% in FY2022-23 and 100% (for planning purposes) from FY2023-24 onwards	
7. Recent Opportunistic Small Vessel Services	Services ceased in 1H2023 are assumed not to re-emerge with market shares re-allocated to remaining lines and services	
8. Vessel sizes reaching PoM Dock Precinct Access Constraints	For services assumed remaining at the Dock Precinct, additional vessel capacity introduced with 26 visits per year increments (26 visits = extra fortnightly service, 52 visits = extra weekly service) with initially average smaller vessels to ensure economic utilisations	

Modelling – Services Analysed

4.9 Modelled International Containership Services

Table 12 Port of Melbourne Container Services Overview (Baseline per CY2022)

Asia Shipping Routes Services - Baseline Actuals (SD = Swanson Dock, WD = Webb Dock)	Number of Services x Frequency	Average Vessel TEU Size	Min. Vessel TEU Size	Max. Vessel TEU Size	Total Vessel Visits in CY2022
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	3 x Weekly	5,620	2,743	6,039	112
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	1 x Weekly & 3 x 10-18 Days	3,150	1,740	5,576	127
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	2 x Weekly	7,116	5,023	8,888	85
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD (ceased 1H2023)	1 x Weekly & 1 x Monthly	1,963	1,700	5,059	36
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	4 x Weekly	5,431	4,250	6,648	192
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	2 x Weekly	2,847	1,732	4,957	75
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	1 x Weekly	8,791	6,554	9,200	47
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	1 x Weekly	4,317	4,250	4,506	35
Other Shipping Routes Services - Baseline Actuals	Number of Services x Frequency	Average Vessel TEU Size	Min. Vessel TEU Size	Max. Vessel TEU Size	Total Vessel Visits in CY2022
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	1 x Weekly	3,364	3,028	3,752	55
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	1 x Weekly	4,402	3,884	5,085	37
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	1 x 10 Days	2,353	2,200	2,506	25
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	1 x Weekly	8,922	6,350	9,580	34
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD		9,338	9,200	10,926	19
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	1 x Weekly	2,066	1,730	2,702	41
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	1 x 10 Days & 1 x 21 Days	1,125	1,102	1,730	34
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	2 x 20-21 Days	1,275	981	1,550	27
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	(Variable)	2,155	1,810	4,178	9
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	(Variable)	3,654	1,496	9,578	4

Modelling – Services Analysed

4.9 Modelled International Containership Services

Table 12 (cont.) Port of Melbourne Container Services Overview (assumed Future FY2023-24) - continued

Asia Shipping Routes Services - Future FY2023-24	Number of Services x Frequency	Average Vessel TEU Size	Total Vessel Visits per year
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	3 x Weekly	5,618	156
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	1 x Weekly & 3 x 10-18 Days	3,182	128
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	2 x Weekly	7,400	104
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	(ceased)		
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	4 x Weekly	5,785	208
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	1 x Weekly	3,300	44
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	1 x Weekly	8,971	52
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	1 x Weekly	4,317	52
Other Shipping Routes Services - Future FY2023-24	Number of Services x Frequency	Average Vessel TEU Size	Total Vessel Visits per year
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	1 x Weekly	3,364	52
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	1 x Weekly	4,402	47
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	1 x 10 Days	2,353	26
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	1 x Weekly	8,922	33
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD		9,338	19
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	2 x Weekly	2,007	104
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	2 x 14 Days	1,115	52
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	2 x 20-21 Days & 1 x 14 Days	1,491	54
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	(Variable)	3,500	9
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	(Variable)	3,500	4



Modelling – Services Analysed

4.10 Reference Containership Size Class Dimensions

Table 13 Reference Container Vessel Size Class Dimensions

Reference Container Vessel Size Class Dimensions (Nominal TEU)	PoM Dock	Dimensions - LOA x Beam (m)	Vessel Name (& Operator)	TEU	Year of Build	PoM Routes
<1,000 TEU	SD+WD	L 158 x B 22	Kokopo Chief (Swire)	981	1991	Pac./PNG
1,000-1,999 TEU	SD+WD	L 176 x B 27	Hansa Freyburg (ANL)	1,740	2003	NZ only
2,000-2,999 TEU	SD+WD	L 225 x B 30 / L 217 x B 32	Porto (Zim)	2,790	2010	Eur.(PC)/Asia
3,000-3,999 TEU	SD+WD	L 254 x B 32	Spirit of Singapore (HSud)	3,630	2007	N. America
4,000-4,999 TEU	SD+WD	L 294 x B 32 / L 255 x B 37	Hyundai Integral (HMM)	4,728	2008	Asia
5,000-5,999 TEU	SD+WD	L 277-281 x B 40	CMA CGM Chopin (CMA)	5,782	2004	Asia
6,000-6,999 TEU	SD+WD	L 304-306 x B 40	Al Rawdah (HL)	6,921	2008	Asia
7,000-7,999 TEU	SD+WD	L 300-323 x B 43	Santa Catarina (Maersk)	7,154	2011	Asia
8,000-8,999 TEU	SD+WD	L 335 x B 43 / L 300 x B 48	OOCL Miami (OOCL)	8,888	2013	Asia
9,000-9,999 TEU	SD+WD	L 328-337 x B 45-46 / L 300 x B 48	MSC Susanna (MSC)	9,178	2005	Eur.(Sz)/Asia
10,000-10,999 TEU	(SD)+WD	L 300 x B 48	CMA CGM Estelle* (CMA CGM)	10,926	2018	Europe (Suez)
11,000-11,999 TEU	WD	L 330-334 x B 48	Ever Fame	11,888	2021	-
12,000-12,999 TEU	WD	L 366 x B 48	Rome Express (Hapag-Lloyd)	12,552	2010	-
13,000-13,999 TEU	WD	L 366 x B 51	ONE Manchester (ONE)	13,870	2015	-
14,000-14,999 TEU	WD	L 366-369 x B 51	COSCO Shipping Denali	14,500	2018	-

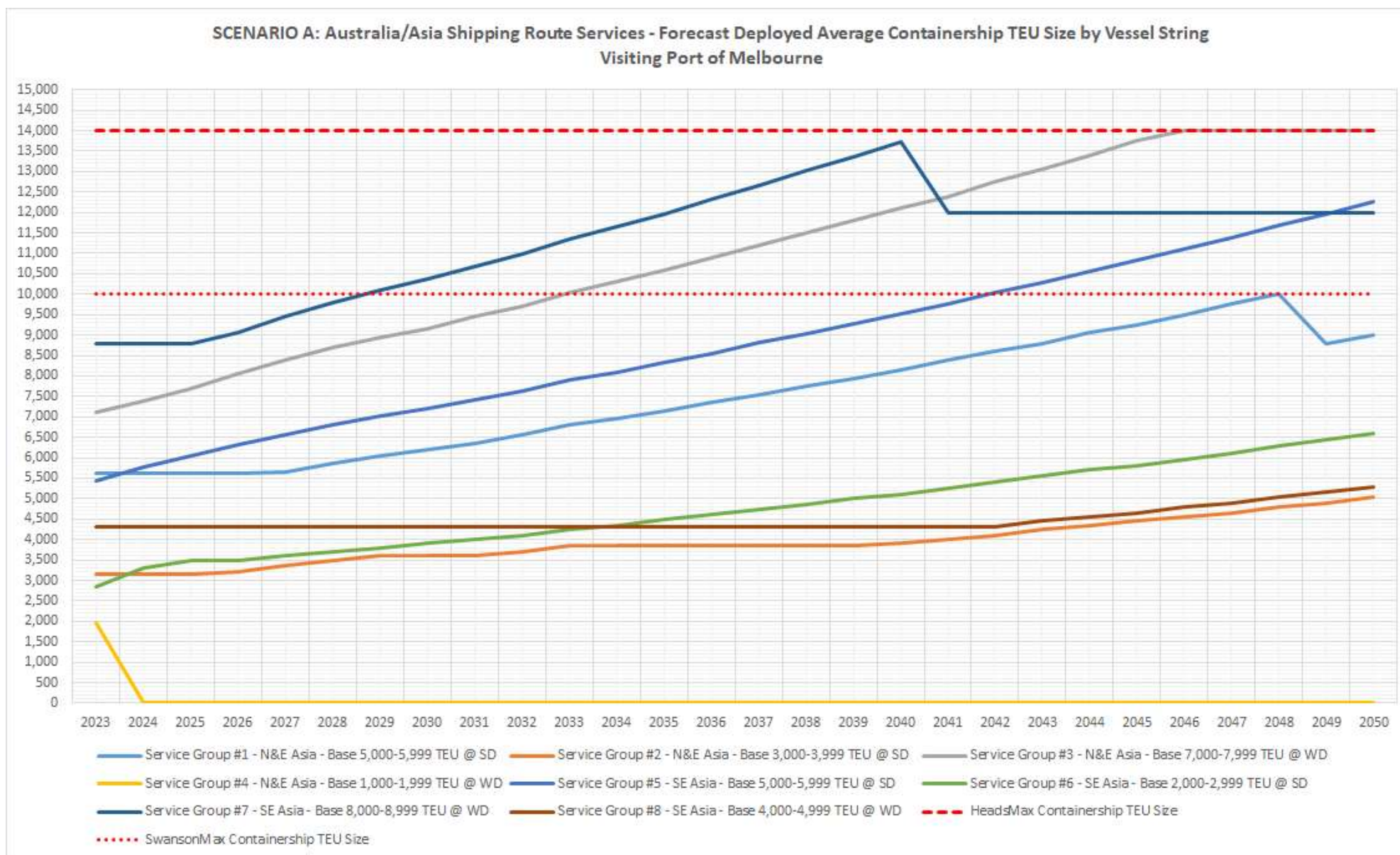
(*) Note: Maximum Nominal TEU size of vessel to have called PoM in the recent past (CY2022).



Modelling Results – Scenario A

5.1 Development of Future Containership Sizes – Asia Services

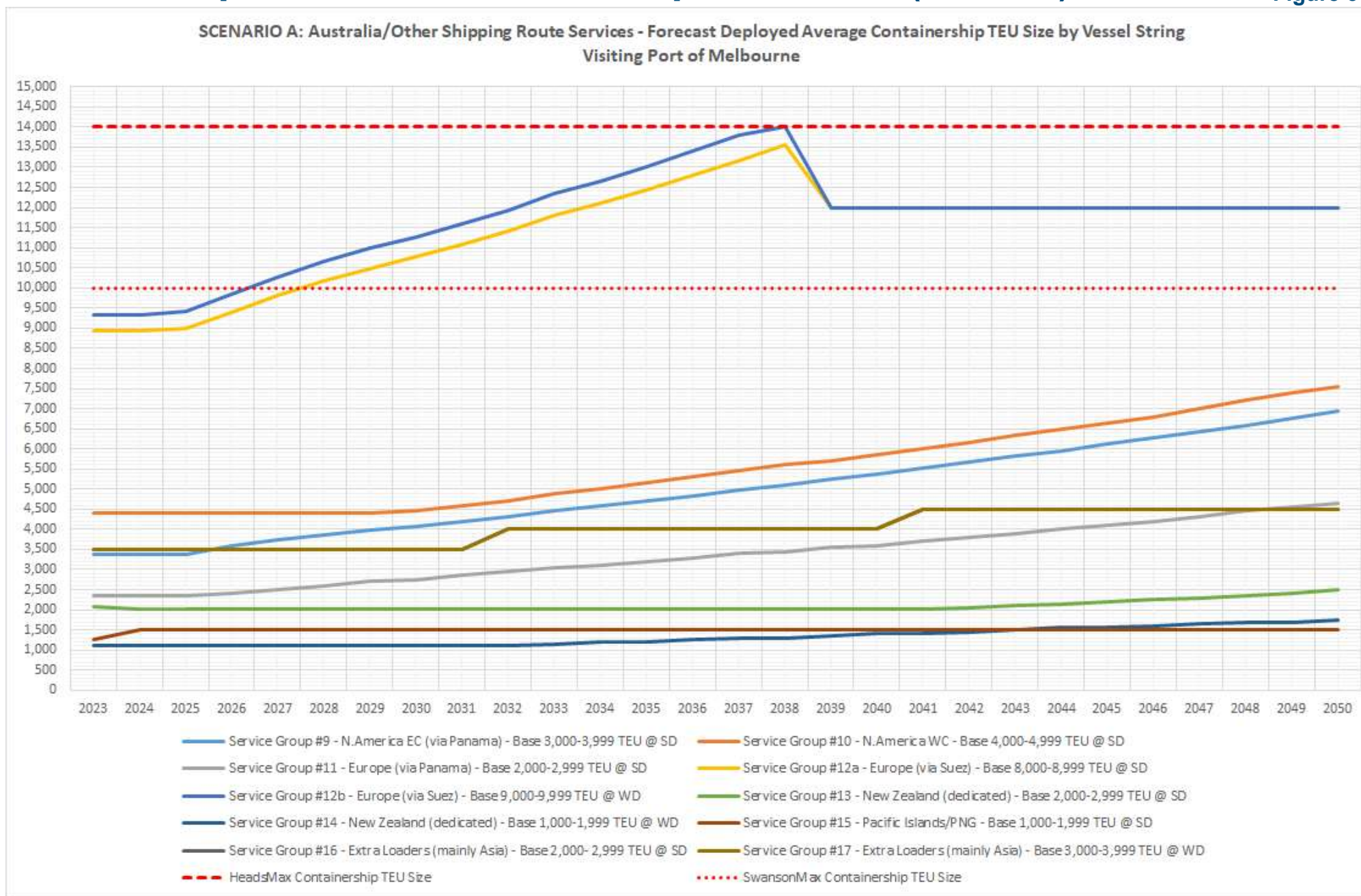
Figure 2



Modelling Results – Scenario A

5.2 Development of Future Containership Sizes – Other (Non-Asia) Services

Figure 3





Modelling Results – Scenario A

5.3 Containership Services at suggested Dock Precinct (2023 to 2030)

Table 14 Containership Services at Port of Melbourne Dock Precincts based on vessel size access

Asia Services - Suggested Dock subject to Capacity & Berth Utilisations	2023	2024	2025	2026	2027	2028	2029	2030
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Other Services - Suggested Dock subject to Capacity & Berth Utilisations	2023	2024	2025	2026	2027	2028	2029	2030
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	SD	SD	SD	SD	SD	WD	WD	WD
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD



Modelling Results – Scenario A

5.4 Containership Services at suggested Dock Precinct (2031 to 2040)

Table 15 Containership Services at Port of Melbourne Dock Precincts based on vessel size access

Asia Services - Suggested Dock subject to Capacity & Berth Utilisations	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Other Services - Suggested Dock subject to Capacity & Berth Utilisations	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD



Modelling Results – Scenario A

5.4 Containership Services at suggested Dock Precinct (2041 to 2050)

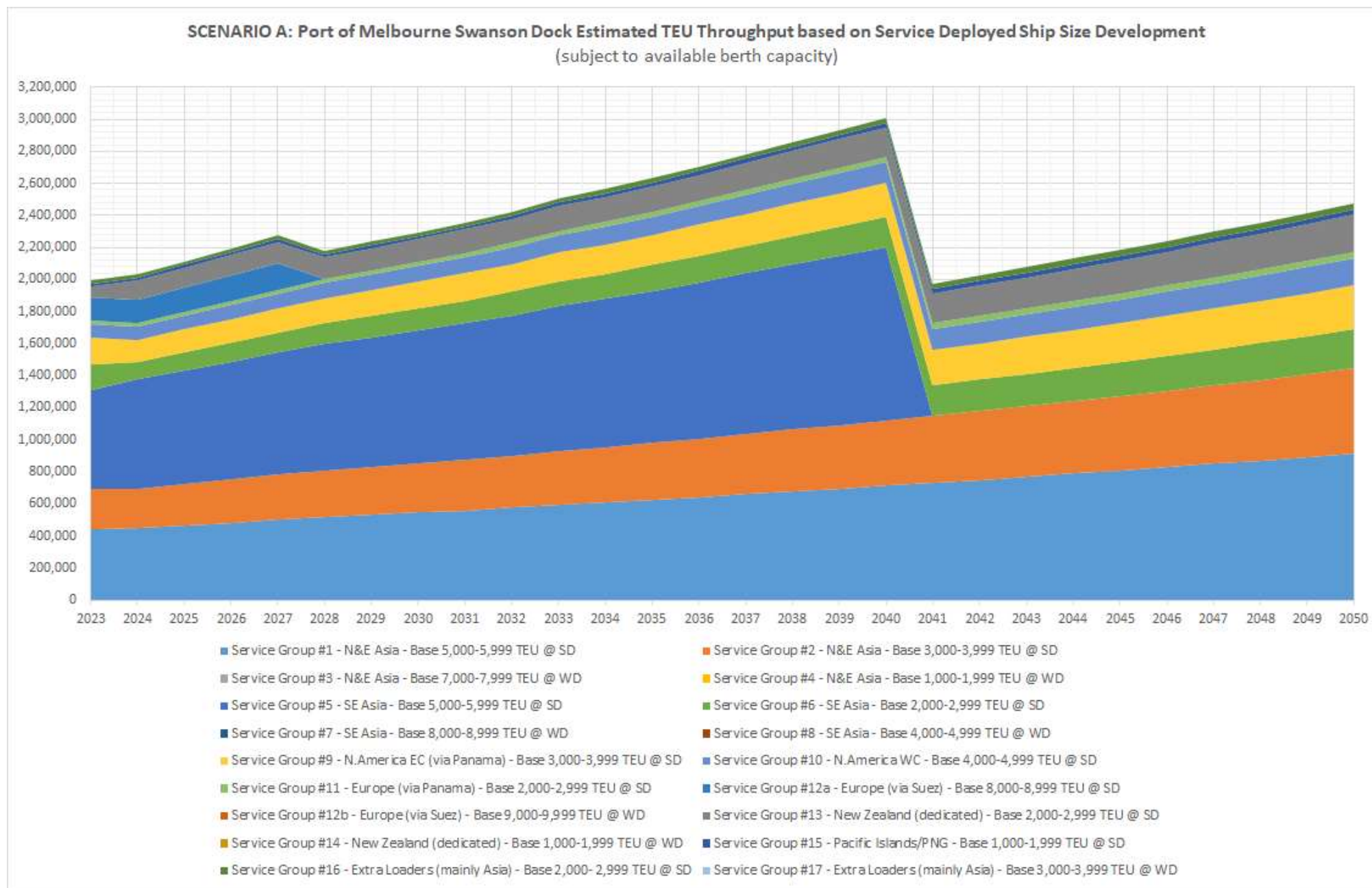
Table 16 Containership Services at Port of Melbourne Dock Precincts based on vessel size access

Asia Services - Suggested Dock subject to Capacity & Berth Utilisations	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Other Services - Suggested Dock subject to Capacity & Berth Utilisations	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD

Modelling Results – Scenario A

5.5 Swanson Dock Est. Future Throughput with max. 10,000 TEU access

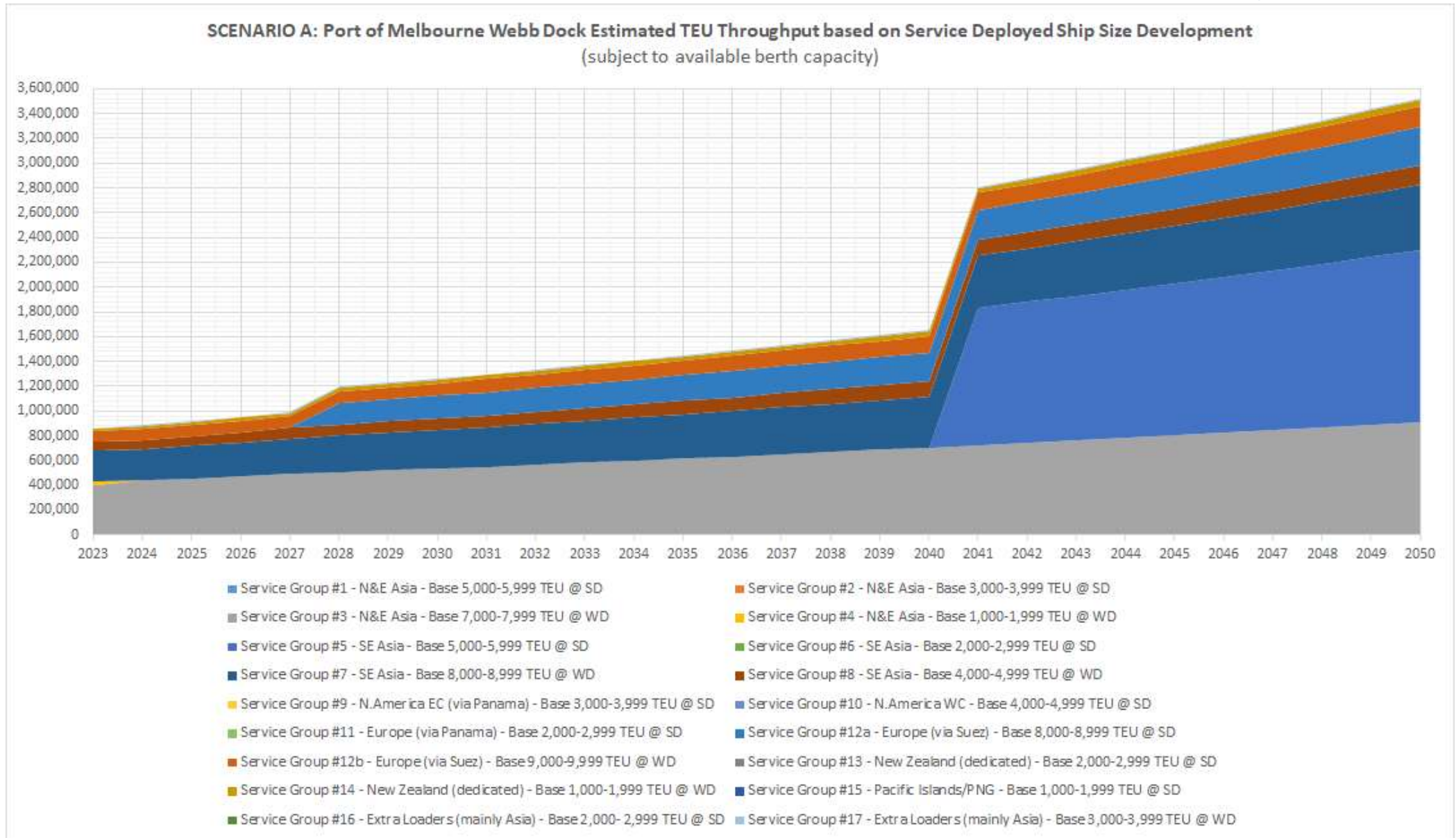
Figure 4



Modelling Results – Scenario A

5.6 Webb Dock Est. Future Throughput with max. 14,000 TEU access

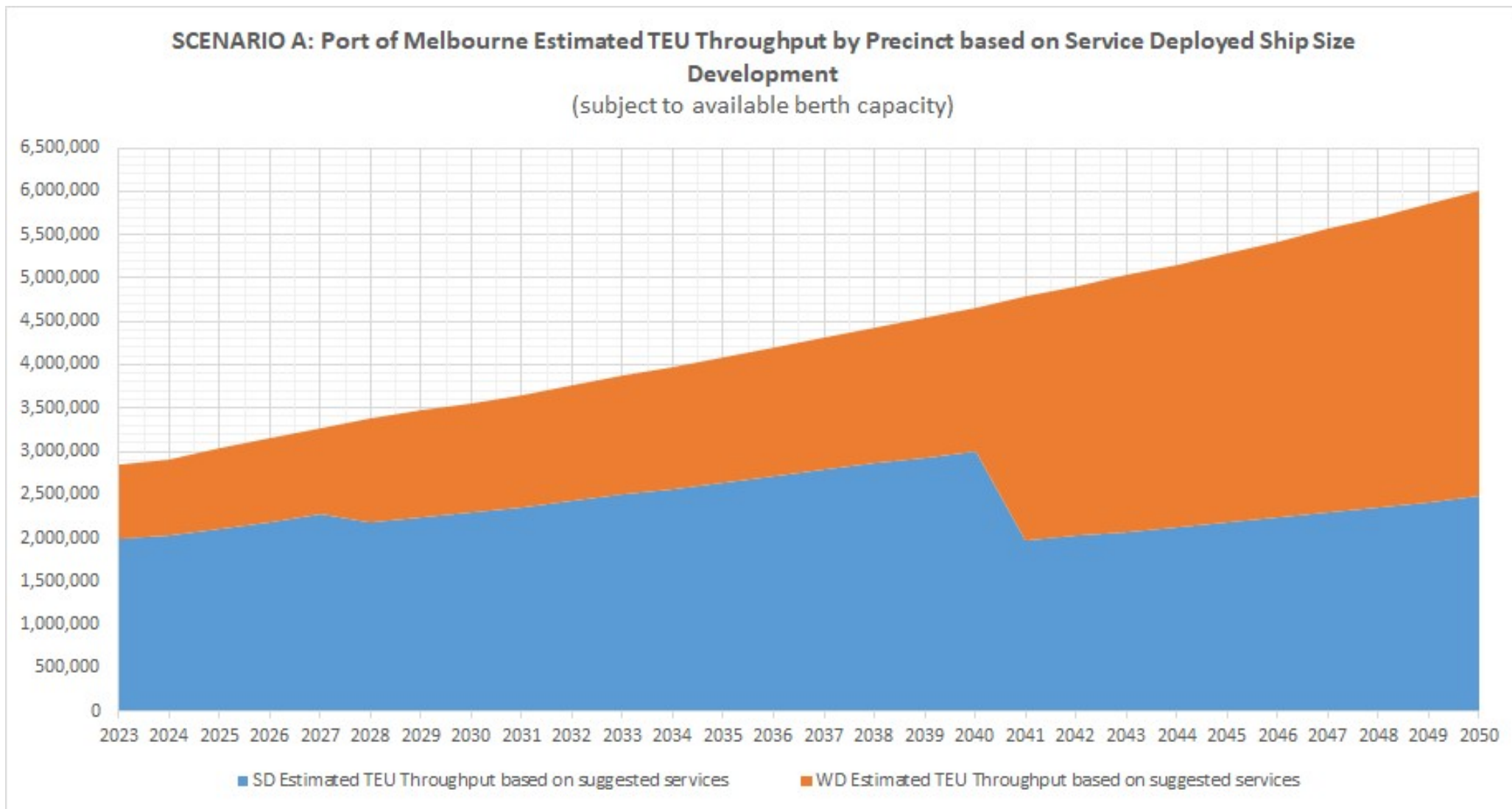
Figure 5



Modelling Results – Scenario A

5.7 Port of Melbourne Throughput by Precinct given ship size development

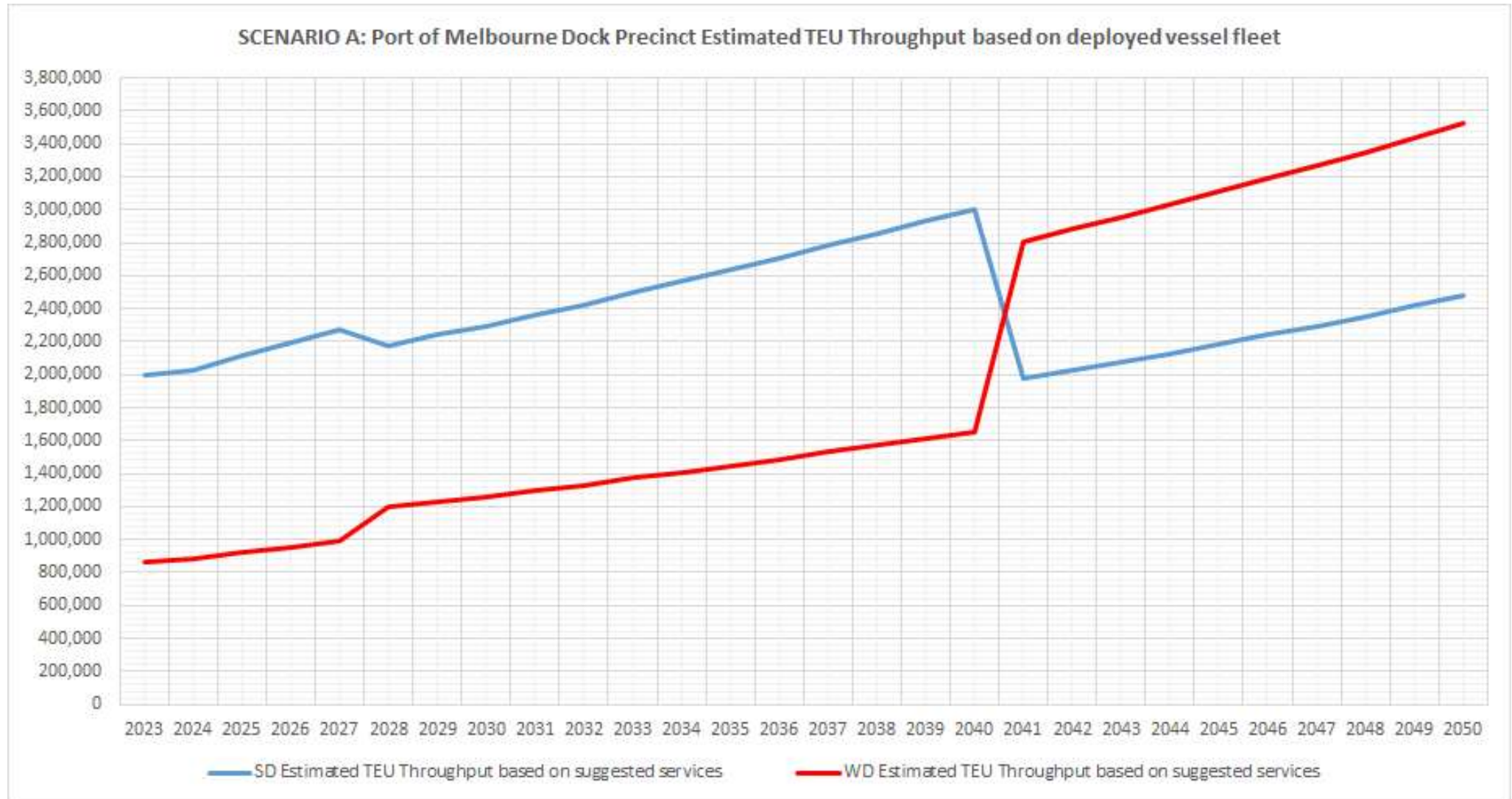
Figure 6



Modelling Results – Scenario A

5.8 Port of Melbourne – Estimated Throughput by Precinct

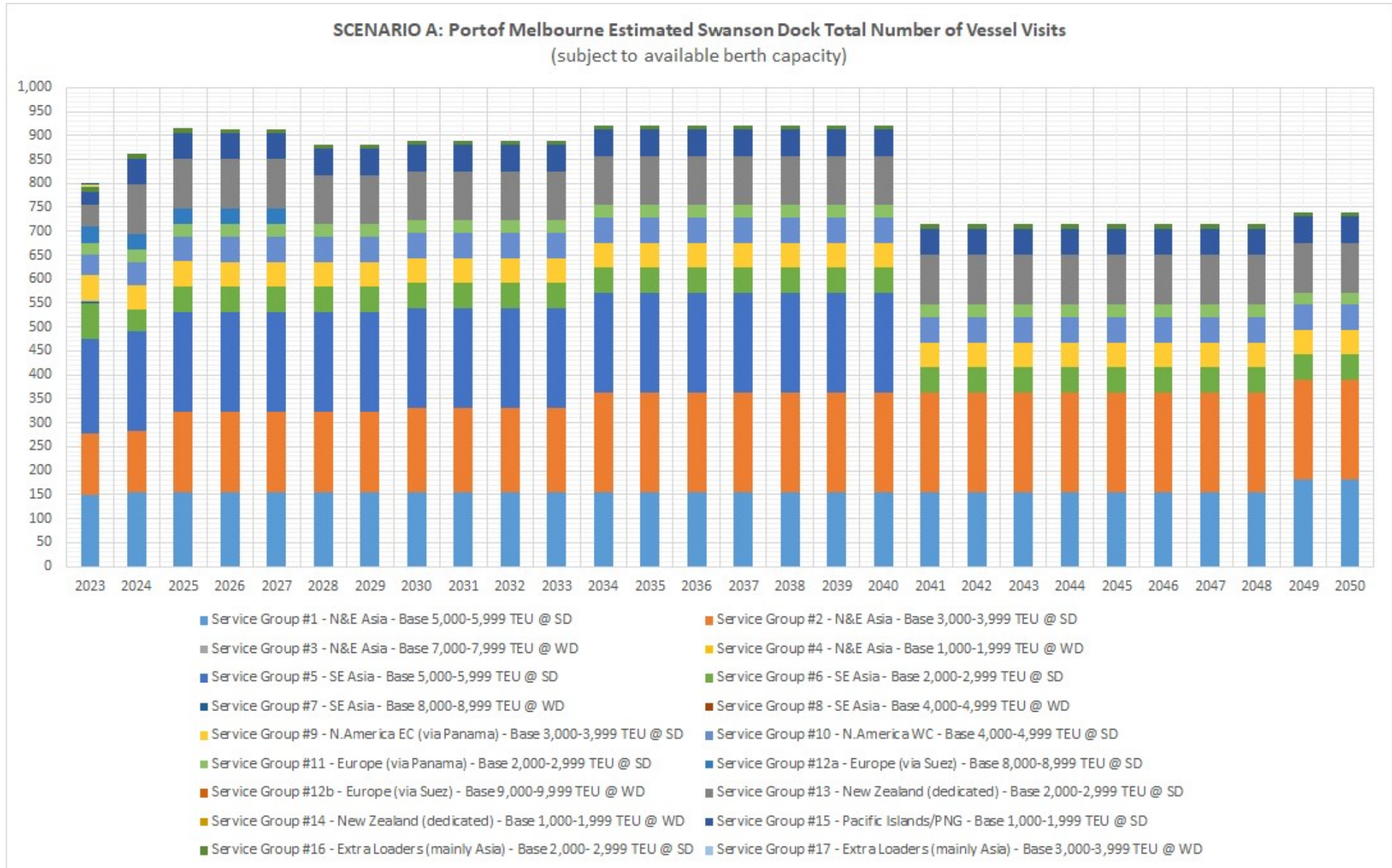
Figure 7



Modelling Results – Scenario A

5.9 Estimated Number of Future Vessel Visits by Service – Swanson Dock

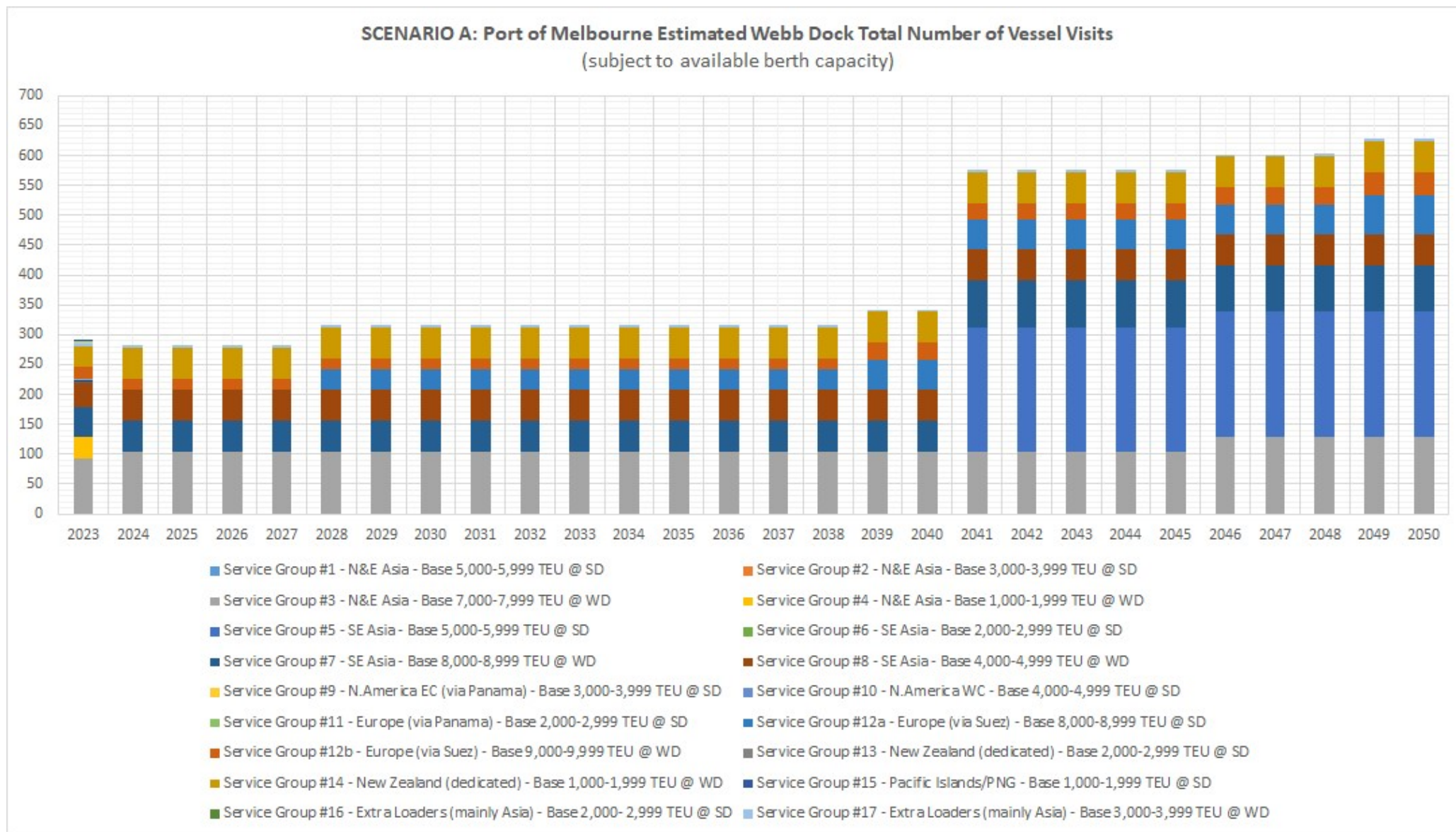
Figure 8



Modelling Results – Scenario A

5.10 Estimated Number of Future Vessel Visits by Service – Webb Dock

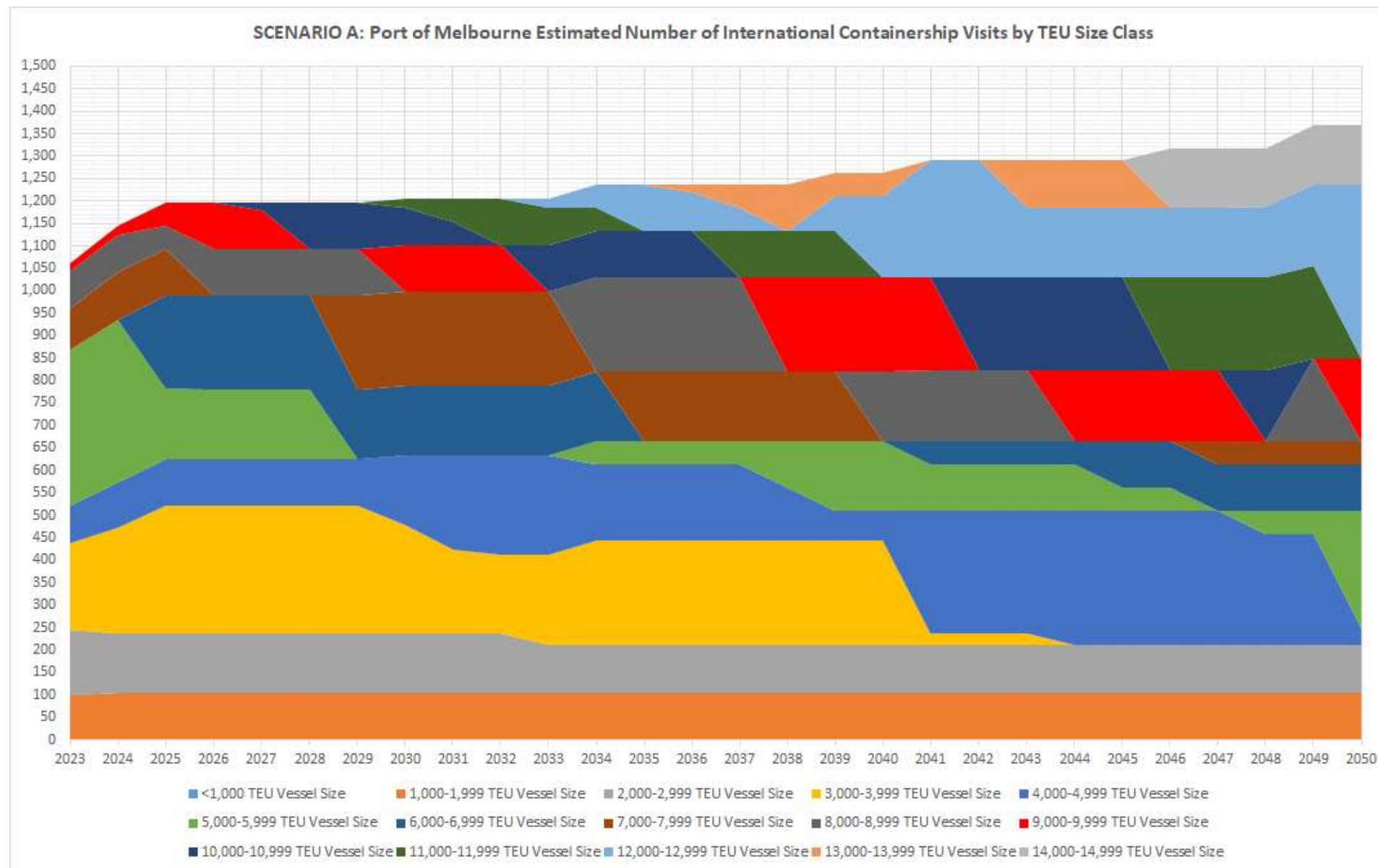
Figure 9



Modelling Results – Scenario A

5.11 Port of Melbourne Future Vessel Visits by Vessel TEU Size Class

Figure 10

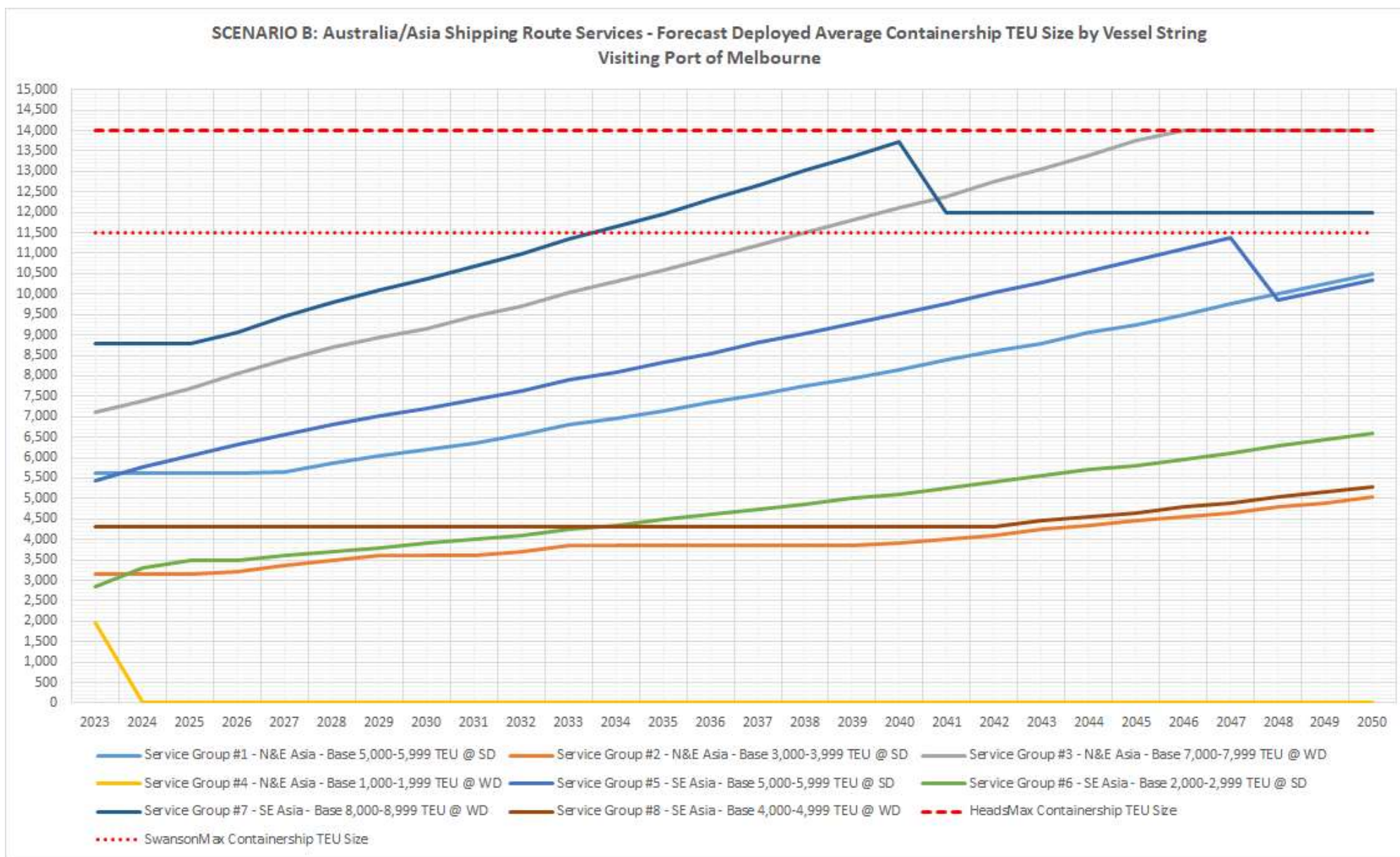




Modelling Results – Scenario B

6.1 Development of Future Containership Sizes – Asia Services

Figure 11

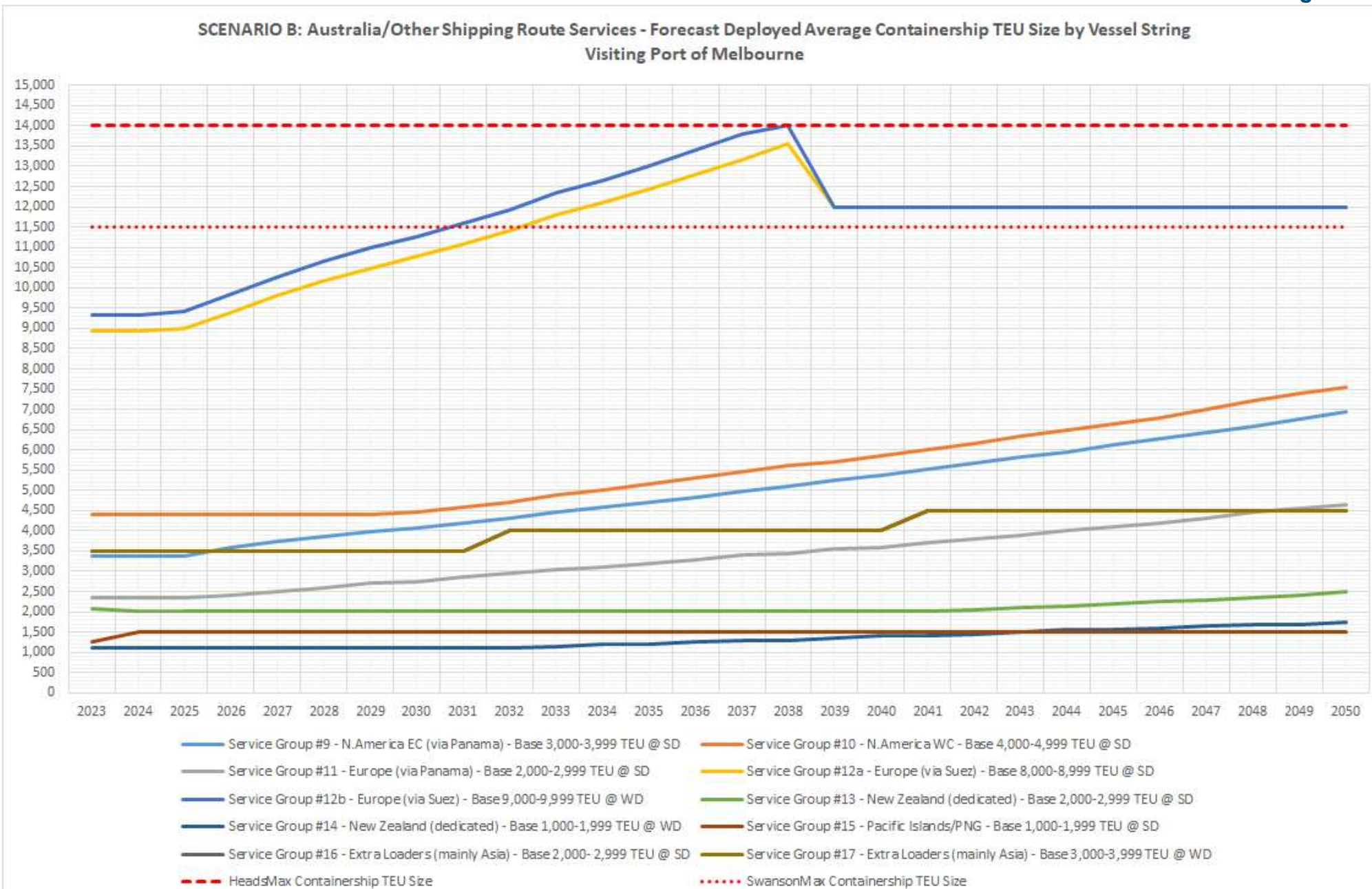




Modelling Results – Scenario B

6.2 Development of Future Containership Sizes – Other (Non-Asia) Services

Figure 12





Modelling Results – Scenario B

6.3 Containership Services at suggested Dock Precinct (2023 to 2030)

Table 17 Containership Services at Port of Melbourne Dock Precincts based on vessel size access

Asia Services - Suggested Dock subject to Capacity & Berth Utilisations	2023	2024	2025	2026	2027	2028	2029	2030
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Other Services - Suggested Dock subject to Capacity & Berth Utilisations	2023	2024	2025	2026	2027	2028	2029	2030
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD



Modelling Results – Scenario B

6.4 Containership Services at suggested Dock Precinct (2031 to 2040)

Table 18 Containership Services at Port of Melbourne Dock Precincts based on vessel size access

Asia Services - Suggested Dock subject to Capacity & Berth Utilisations	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Other Services - Suggested Dock subject to Capacity & Berth Utilisations	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	SD	SD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD



Modelling Results – Scenario B

6.4 Containership Services at suggested Dock Precinct (2041 to 2050)

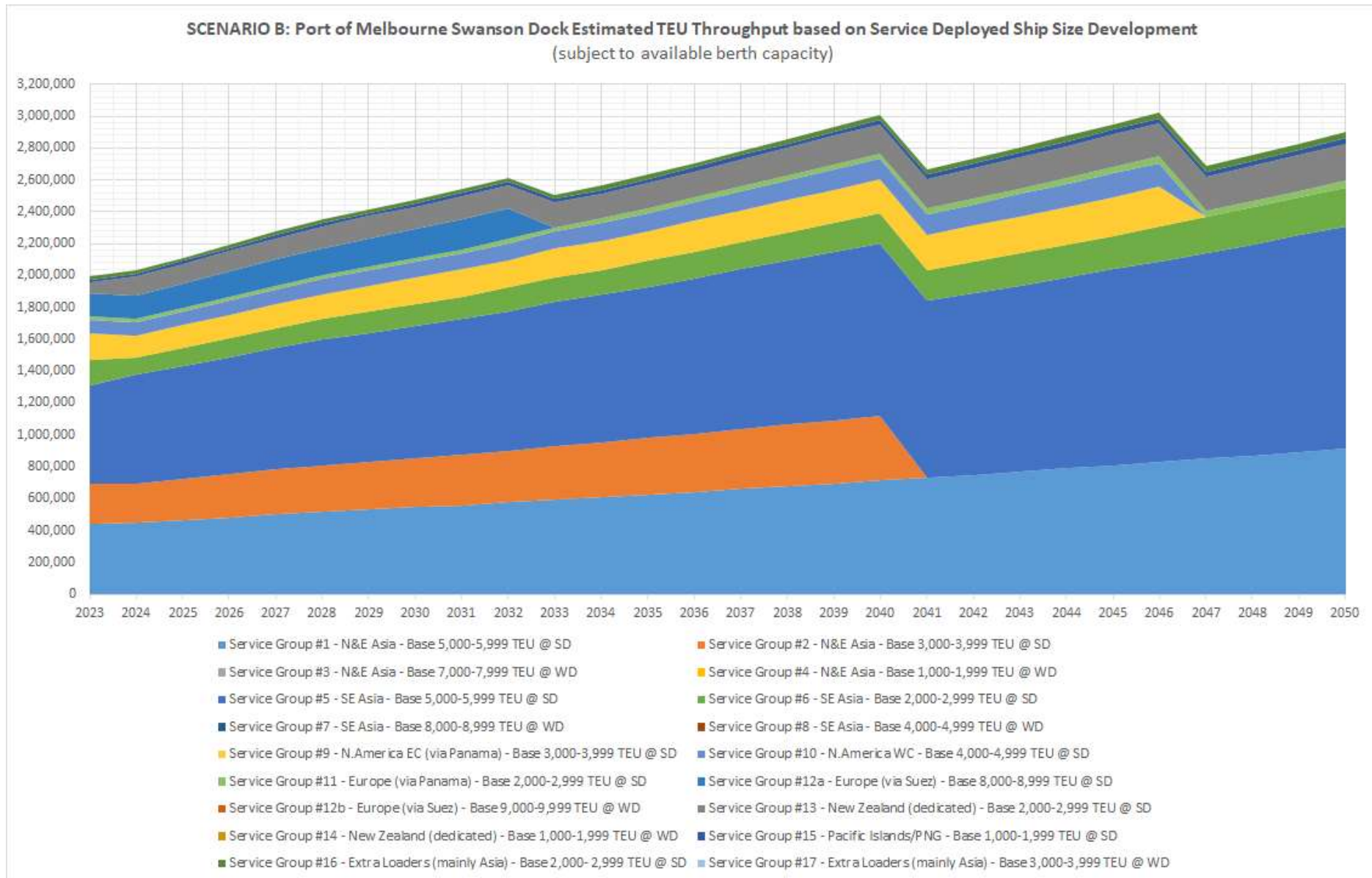
Table 19 Containership Services at Port of Melbourne Dock Precincts based on vessel size access

Asia Services - Suggested Dock subject to Capacity & Berth Utilisations	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Other Services - Suggested Dock subject to Capacity & Berth Utilisations	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	SD	SD	SD	SD	SD	SD	WD	WD	WD	WD
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	SD	SD	SD	SD	SD	SD	WD	WD	WD	WD
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD

Modelling Results – Scenario B

6.5 Swanson Dock Est. Future Throughput with max. 11,500 TEU access

Figure 13

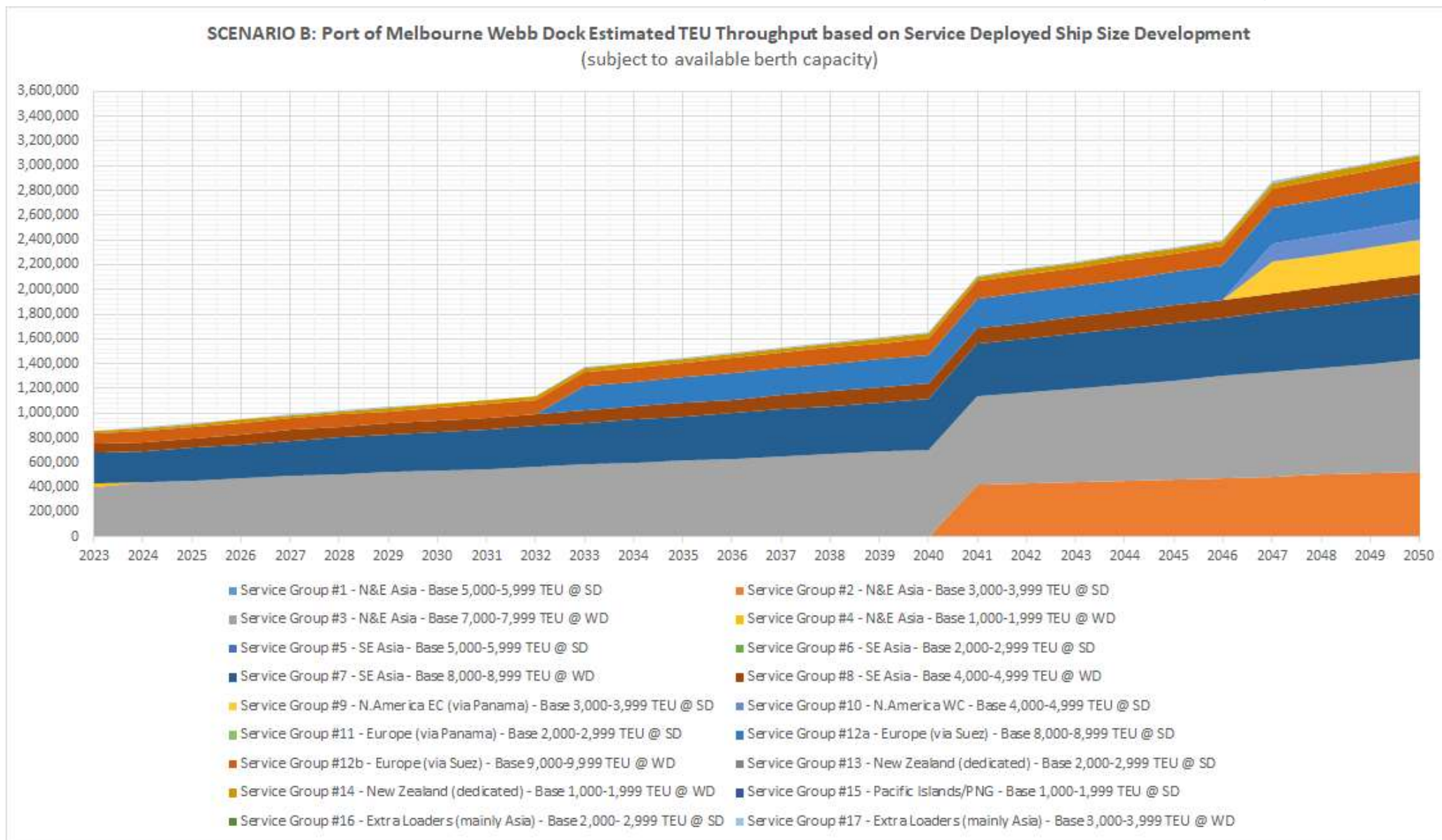




Modelling Results – Scenario B

6.6 Webb Dock Est. Future Throughput with max. 14,000 TEU access

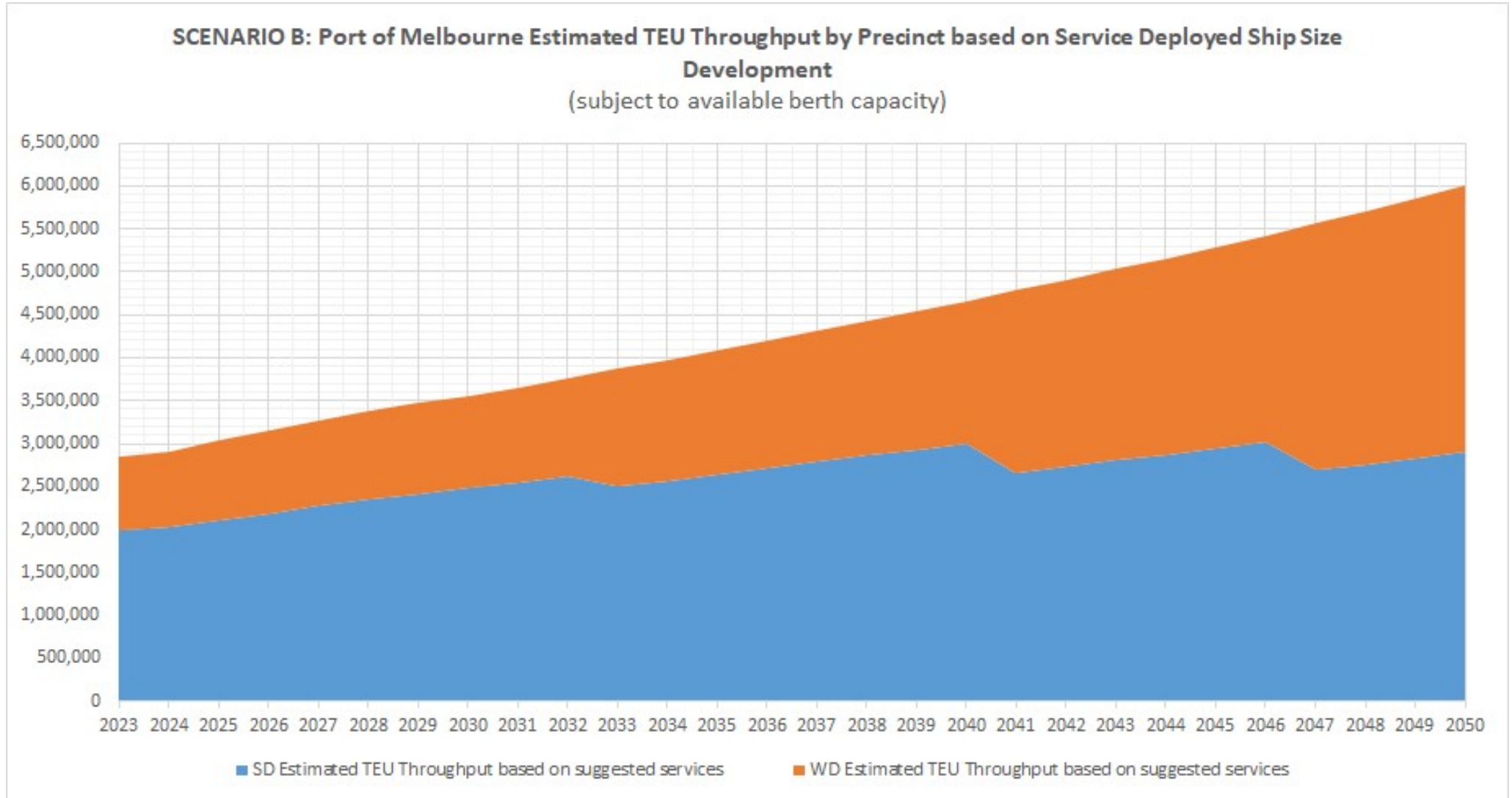
Figure 14



Modelling Results – Scenario B

6.7 Port of Melbourne Throughput by Precinct given ship size development

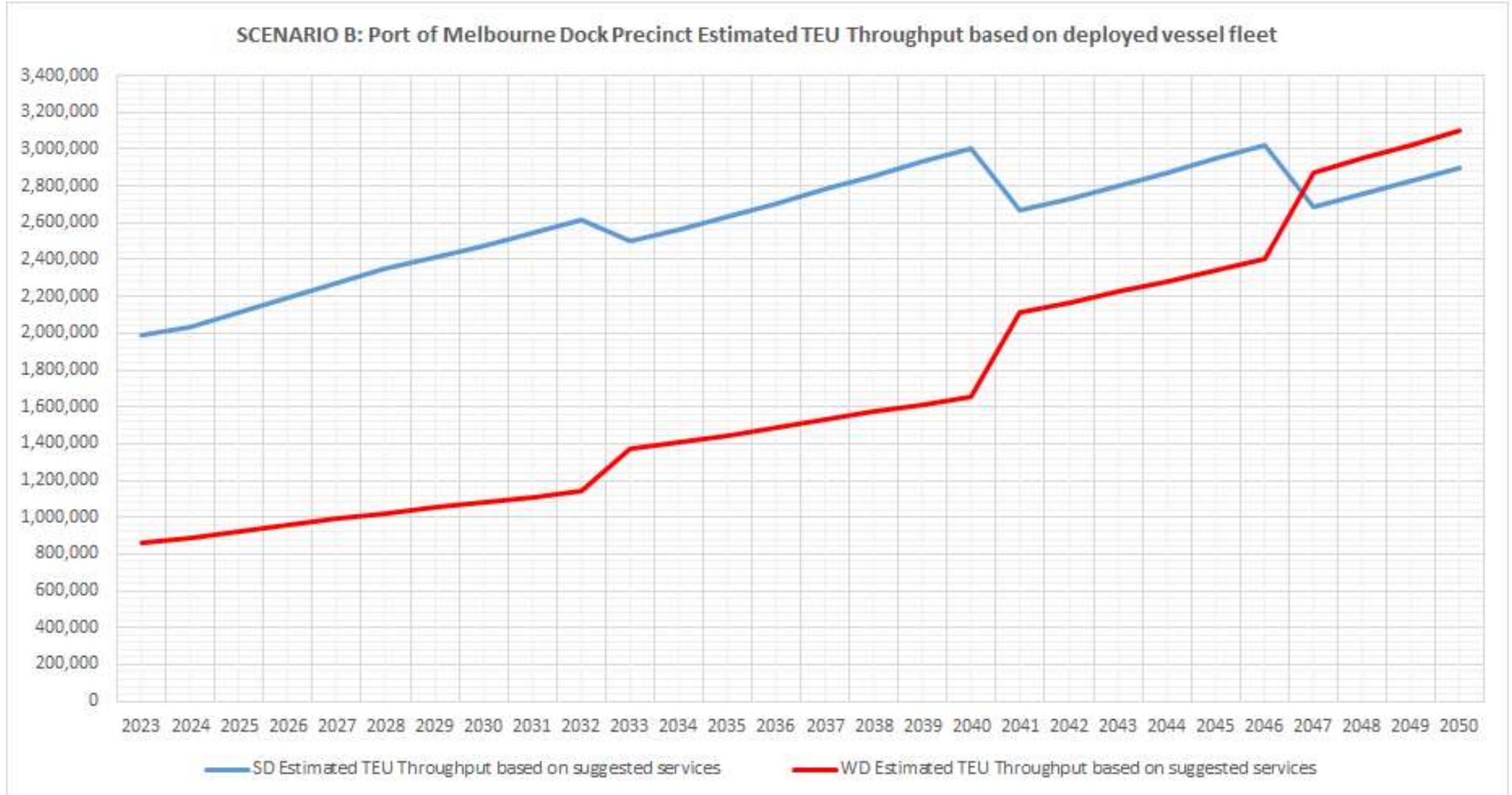
Figure 15



Modelling Results – Scenario B

6.8 Port of Melbourne – Estimated Throughput by Precinct

Figure 16

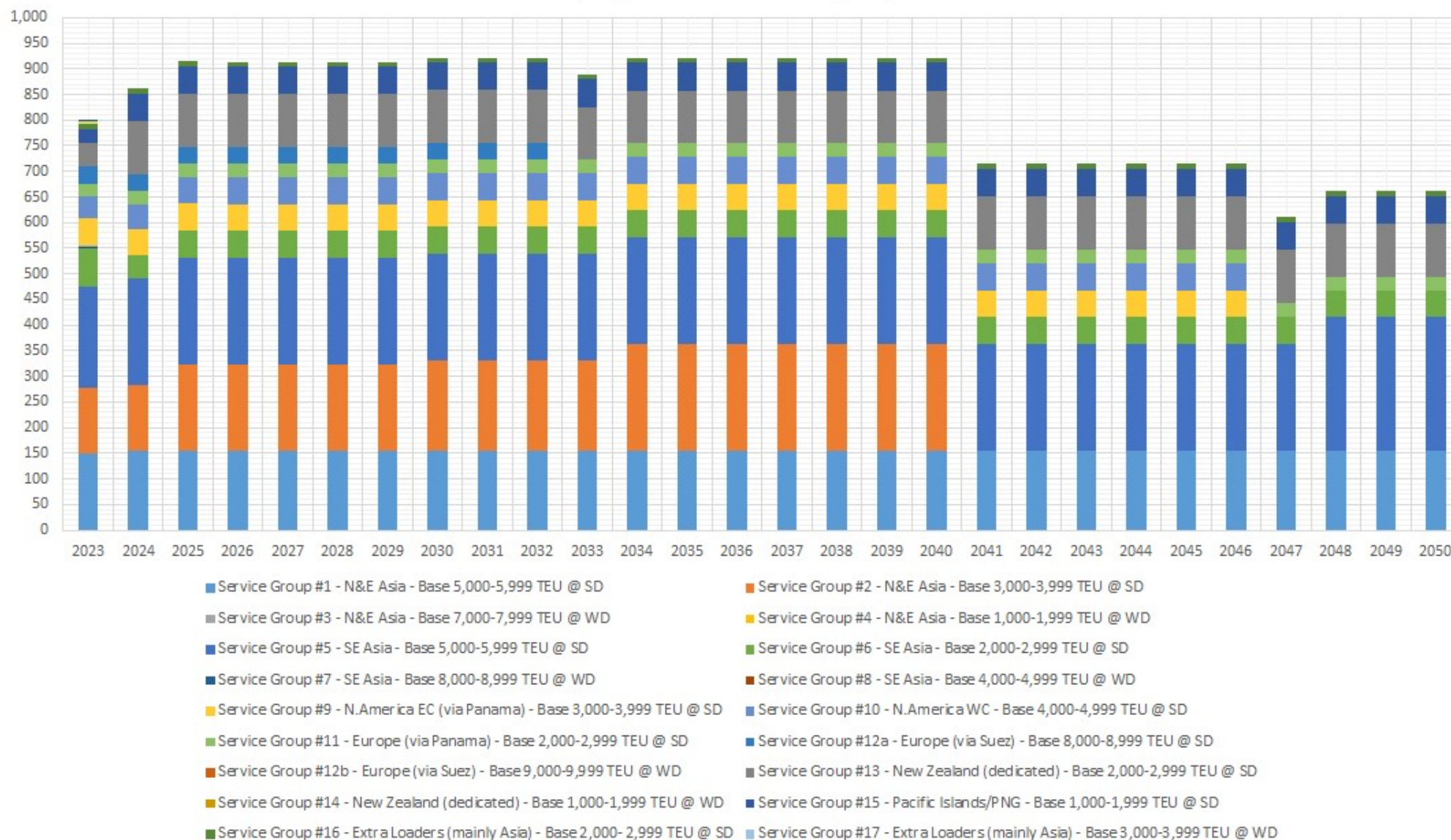


Modelling Results – Scenario B

6.9 Estimated Number of Future Vessel Visits by Service – Swanson Dock

Figure 17

SCENARIO B: Port of Melbourne Estimated Swanson Dock Total Number of Vessel Visits
(subject to available berth capacity)

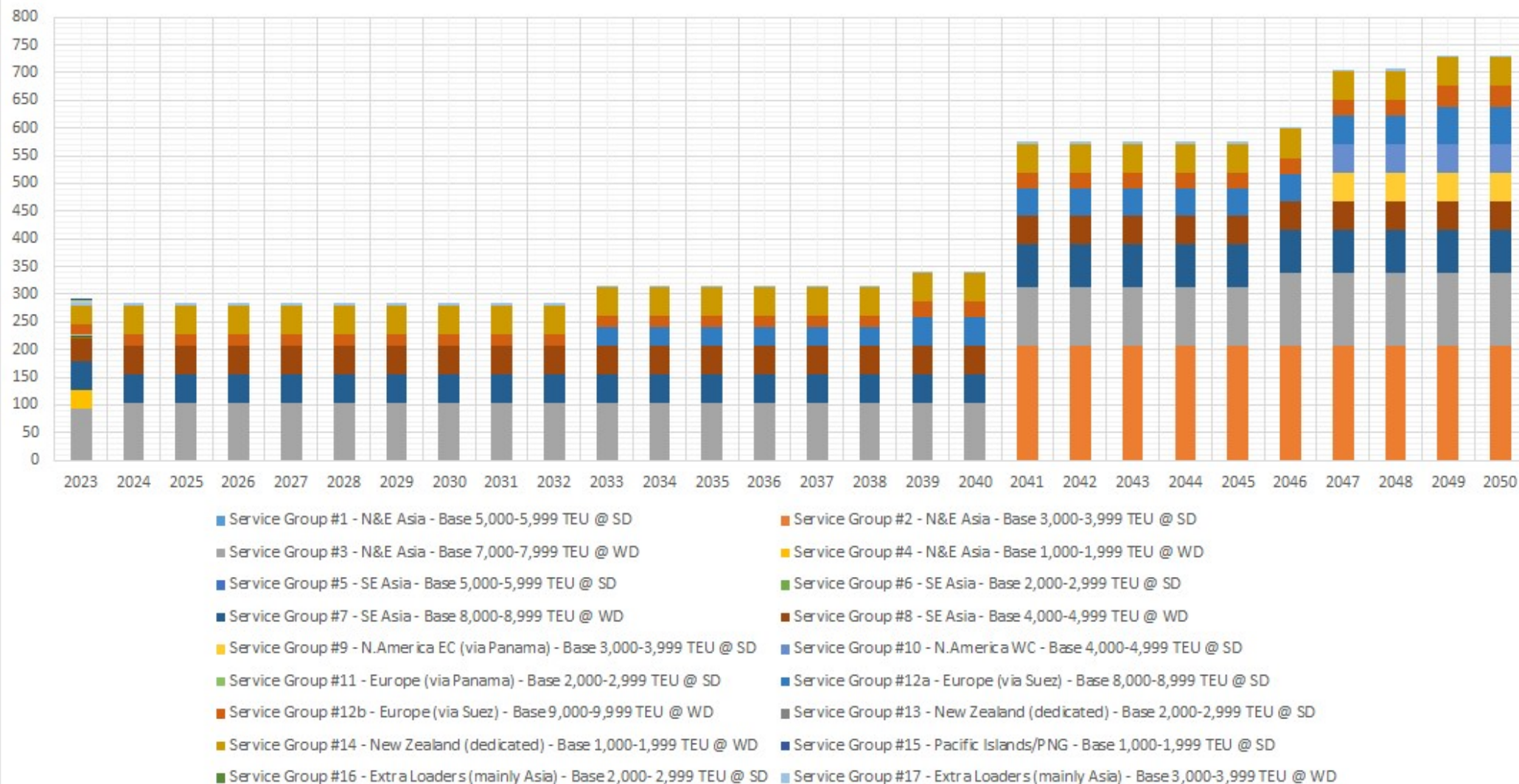


Modelling Results – Scenario B

6.10 Estimated Number of Future Vessel Visits by Service – Webb Dock

Figure 18

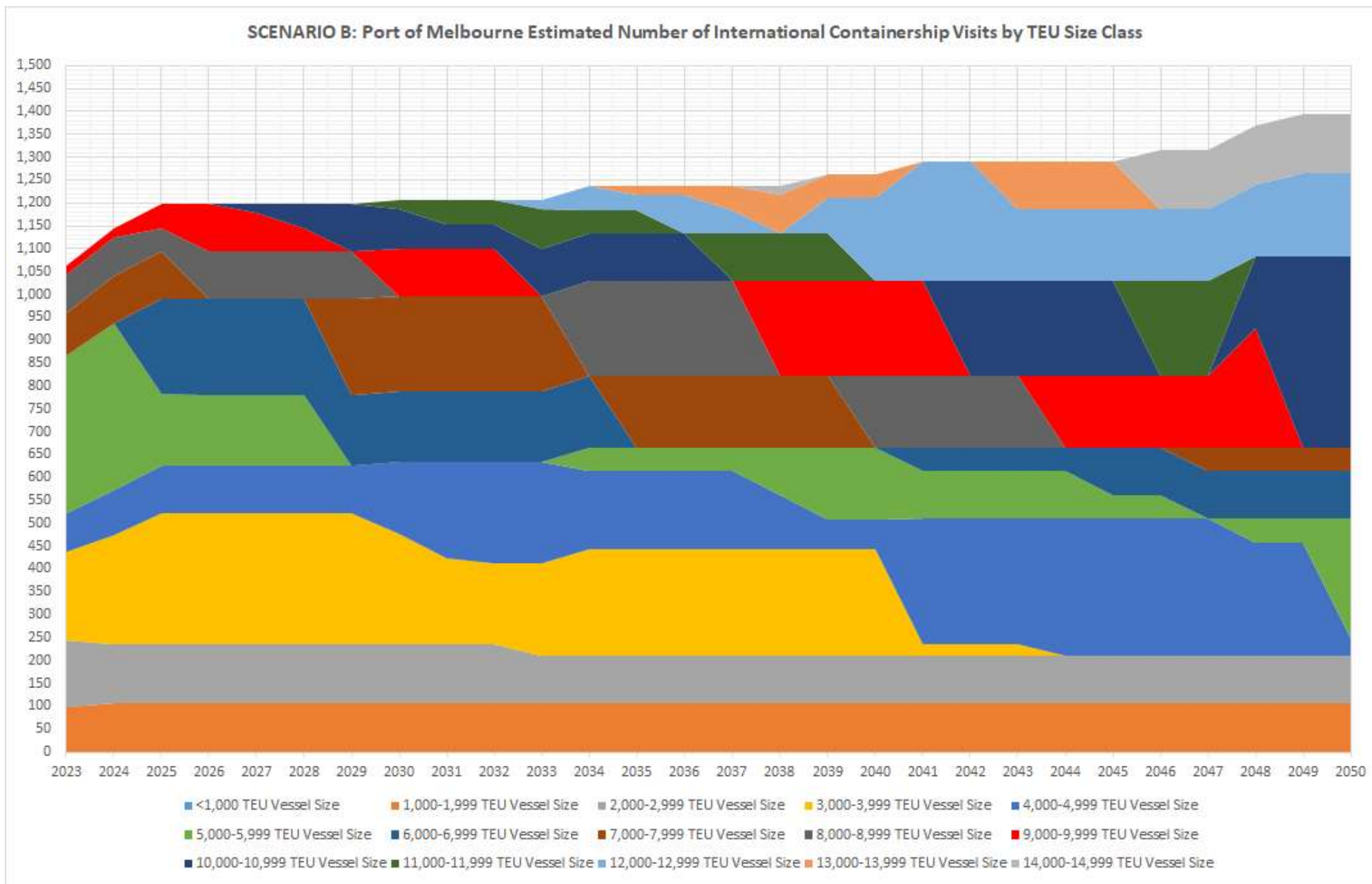
SCENARIO B: Port of Melbourne Estimated Webb Dock Total Number of Vessel Visits
(subject to available berth capacity)



Modelling Results – Scenario B

6.11 Port of Melbourne Future Vessel Visits by Vessel TEU Size Class

Figure 19





Key Conclusions

7.1 Modelling of the future Melbourne visiting containership fleet to 2050

7.1.1 Shipping routes and trade-lanes

The modelling shows that the **services on the N&E Asia, SE Asia and Europe/M.East (via. Suez) shipping routes will drive the growth both in the international container throughput** at the Port of Melbourne (total trade assumed to increase from around a current 2.9 million TEU per year to around 3.6 million TEU per year in 2030, around 4.7 million TEU per year in 2040, and reaching around 6.0 million TEU per year by 2050), **as well as ship size increases.**

7.1.2 Port access constraints

At the assumed general maximum of 10,000 TEU for Swanson Dock (SD) access and using the various modelling assumptions, **Asian services with current 5,000-5,999 TEU vessels visiting SD would reach this 10,000 TEU size threshold in the period 2041-2048. At 11,500 TEU access, this threshold only starts to be met in 2047.** The assumed Heads/Webb Dock (WD) vessel size constraint of 14,000 TEU is met in the period 2040-2046 for the **Asian services with current 7,000-8,999 TEU vessels.** The Europe/M.East (via Suez) service(s) may meet this 14,000 TEU threshold before 2040, and the SD 10,000 TEU threshold within a few years extended by 5 years at 11,500 TEU threshold.

7.1.3 Port precincts

Under **Scenario A** assumptions on port precinct capacity, trade and ship size growth, and vessel access limits, **the Swanson Dock precinct may have modelled vessel visits generating from over 2 million TEU per year up to a peak of 3 million TEU per year in 2040, and then operating at 2.0-2.5 million TEU per year for the period 2041-2050.**

Under **Scenario B** assumptions, the **Swanson Dock precinct could operate at 2.6-3.0 million TEU per year for the period 2041-2050.**

The Webb Dock precinct is assumed to receive the SD part of the Europe/M.East service by 2027 under Scenario A, and by 2032 under Scenario B, which releases capacity at SD.

Webb Dock capacity is assumed to be expanded based on a combination of Swanson Dock reaching capacity from container trade demand growth and transferred services no-longer able to access Swanson Dock.



Key Conclusions

7.2 Sensitivity to different shipping line approaches and trade growth rates

7.2.1 Some lines maintaining vessel sizes at 7,000-10,000 TEU for some Asia services

The impact of this approach would be to increase vessel visits as additional services are added. This could represent a minimum of an extra 26 visits per year (a fortnightly service), or multiples of 52 visits per year (one or more weekly services) depending on the number of lines adopting this approach and available port capacity. Initially a line may split a constrained access service into two with the average size of vessels for the split services reducing but then increasing again as trade growth increases. This would benefit the Swanson Dock precinct in terms of long-term utilisation.

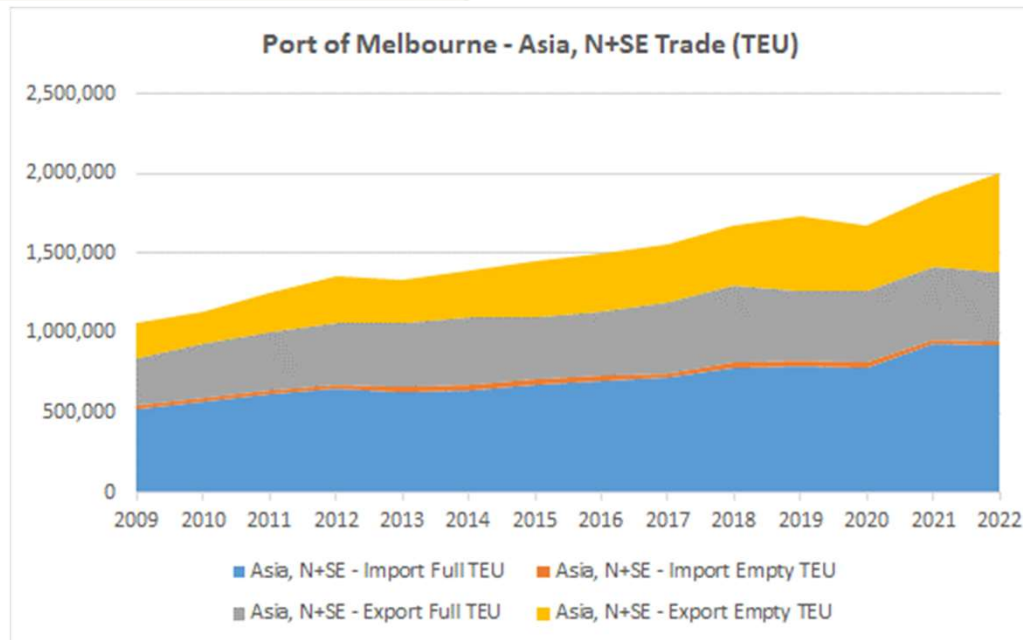
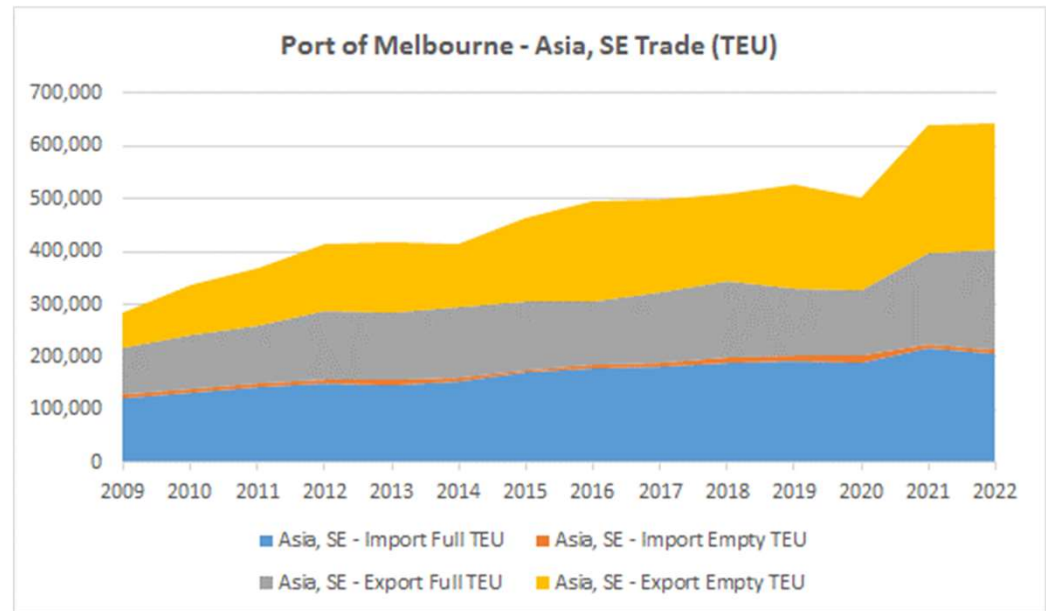
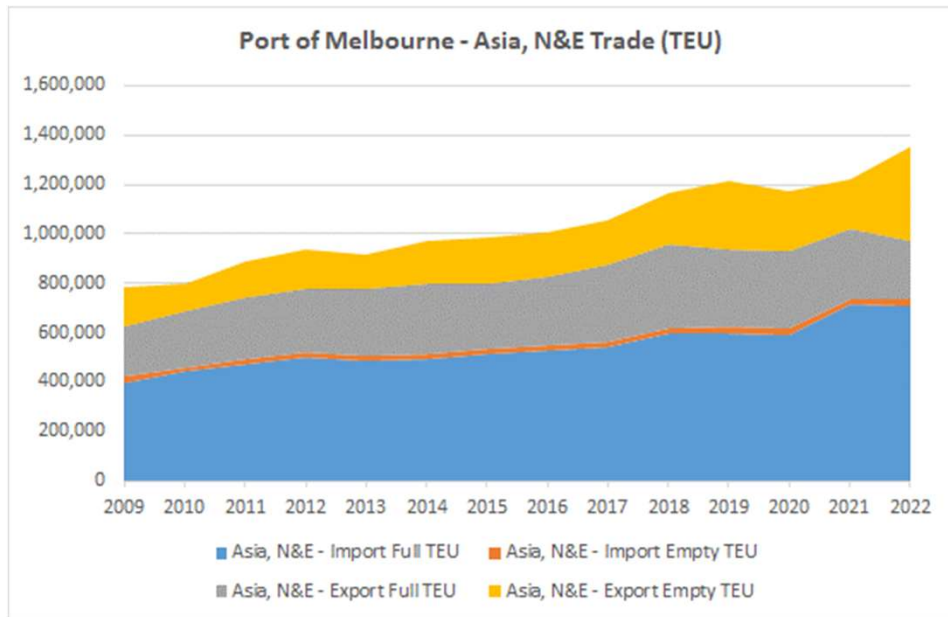
7.2.2 Some lines decide to consolidate some Asia services as a response to IMO new regulations in 2023

The impact of this approach would be to reduce vessel visits (52 to several hundred visits per year) as services are consolidated and a potential doubling of vessel size on the remaining services (i.e. from say 5,000 TEU to 9-10,000 TEU size). This would mean Swanson Dock access is faster a constraint and the resulting larger vessels would need to use Webb Dock earlier.

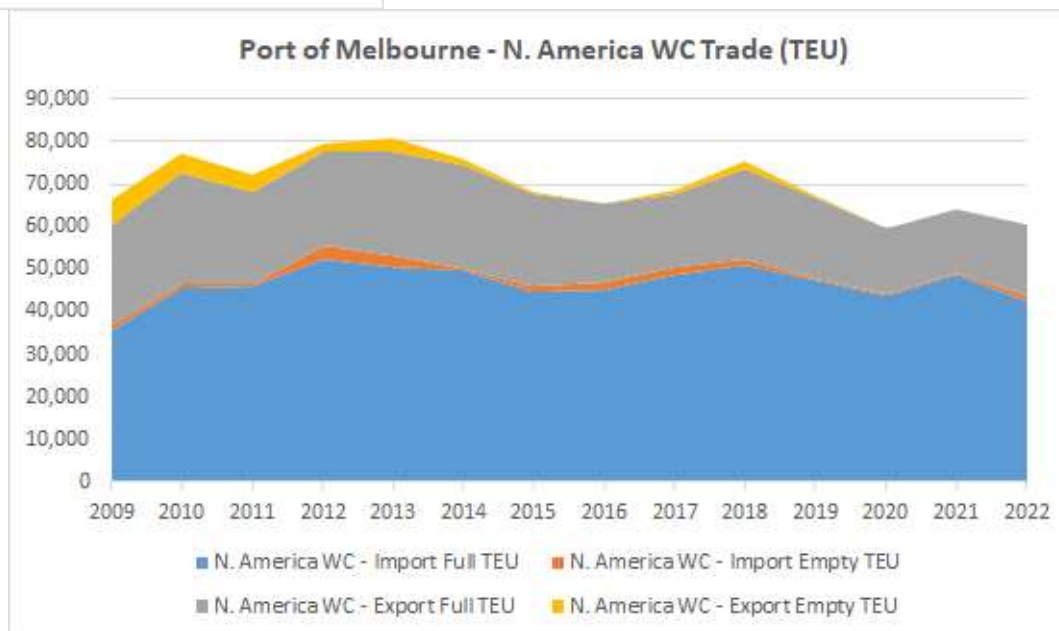
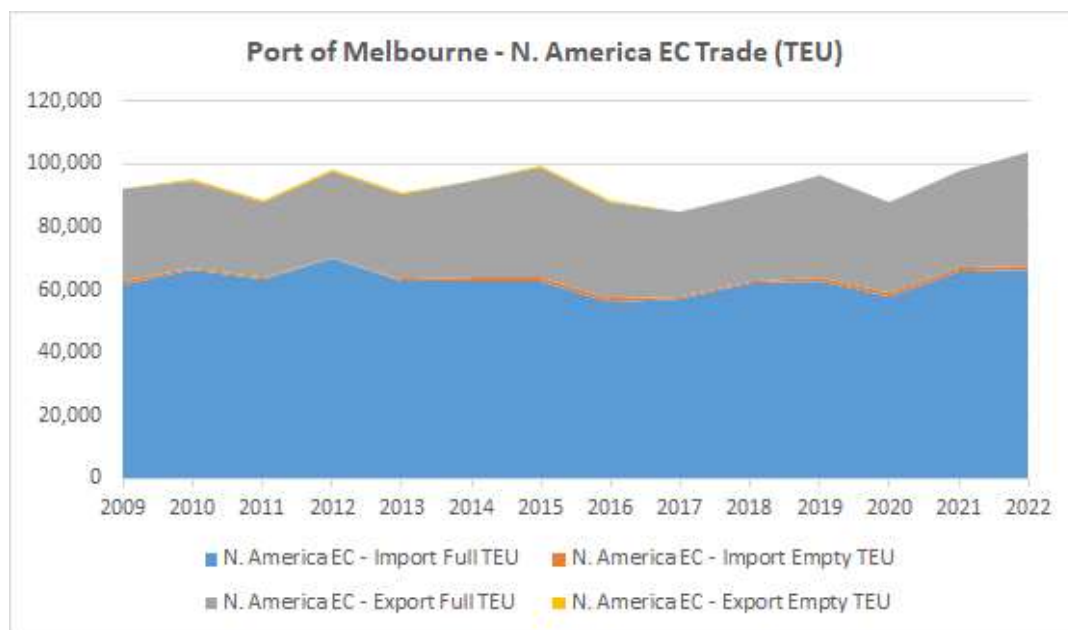
7.2.3 Lower or higher trade growth rates than those modelled

The modelling results are based upon the PoM's medium growth container trade forecast. Given the linkage of the results to trade growth, the timing of when both port precinct container capacity and vessel size access constraints kick-in are therefore on a sliding-scale. Lower container trade growth rates would push the timing of both port capacity and vessel access constraints further back into the future. Whilst a higher container trade growth rate would bring the timing of both port capacity and vessel access constraints forward in the future.

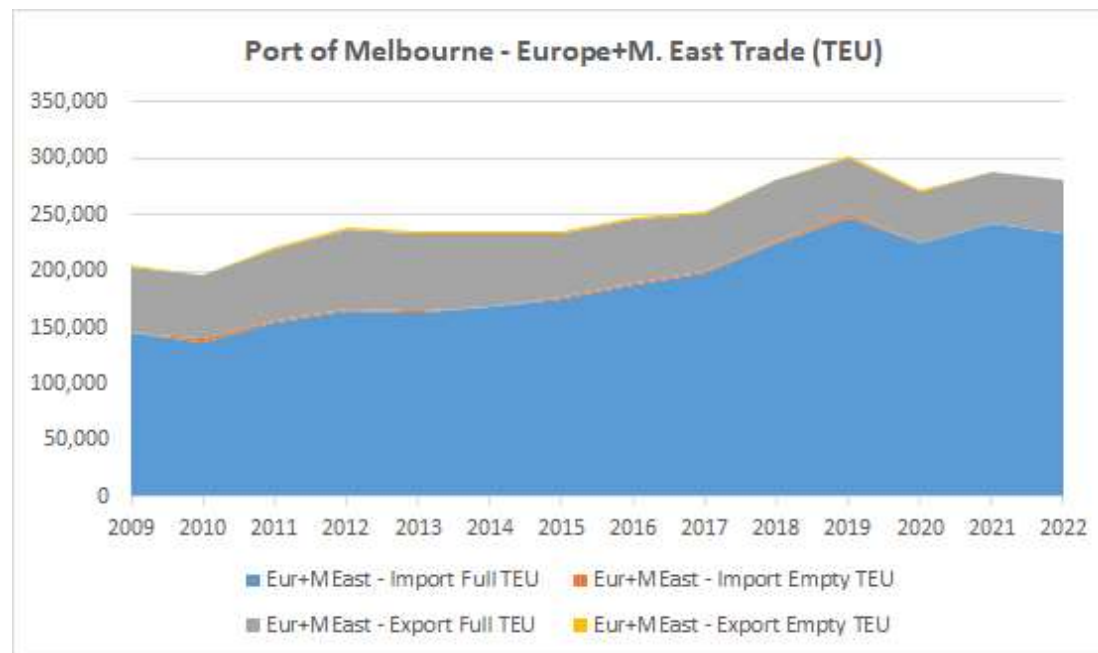
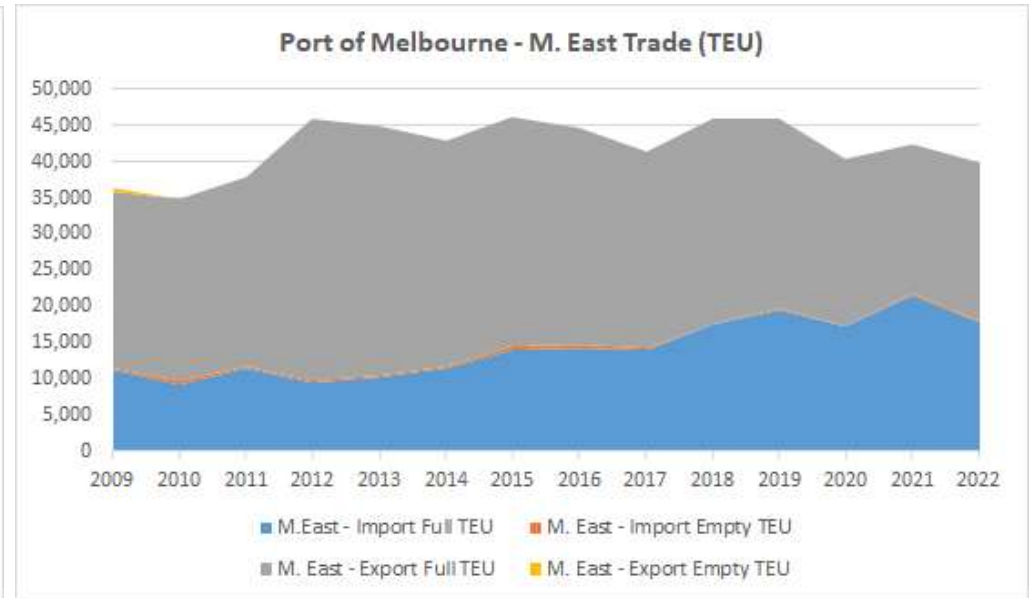
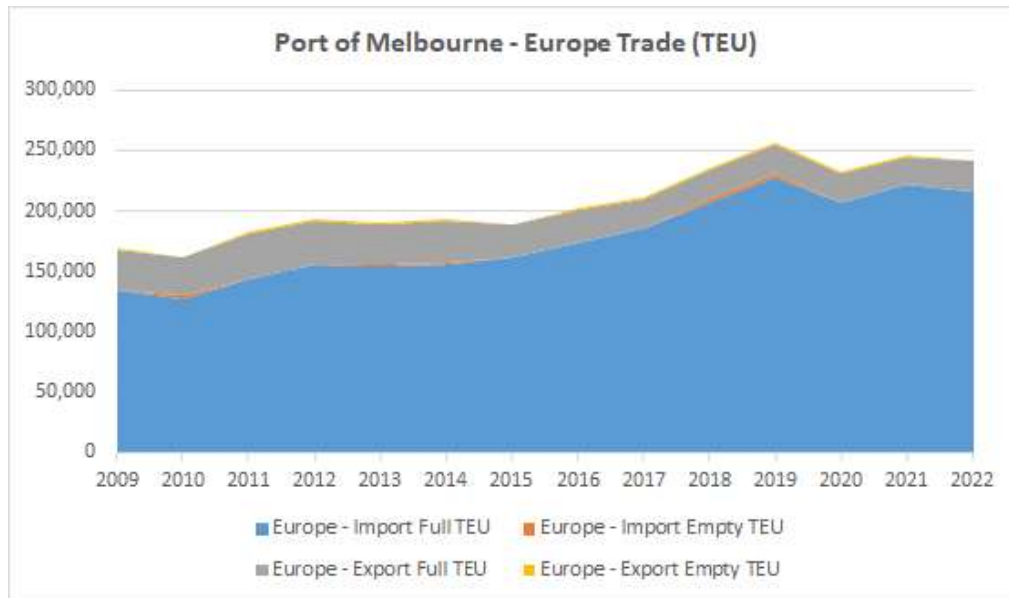
Port of Melbourne Main Trade Route Developments (Actuals)



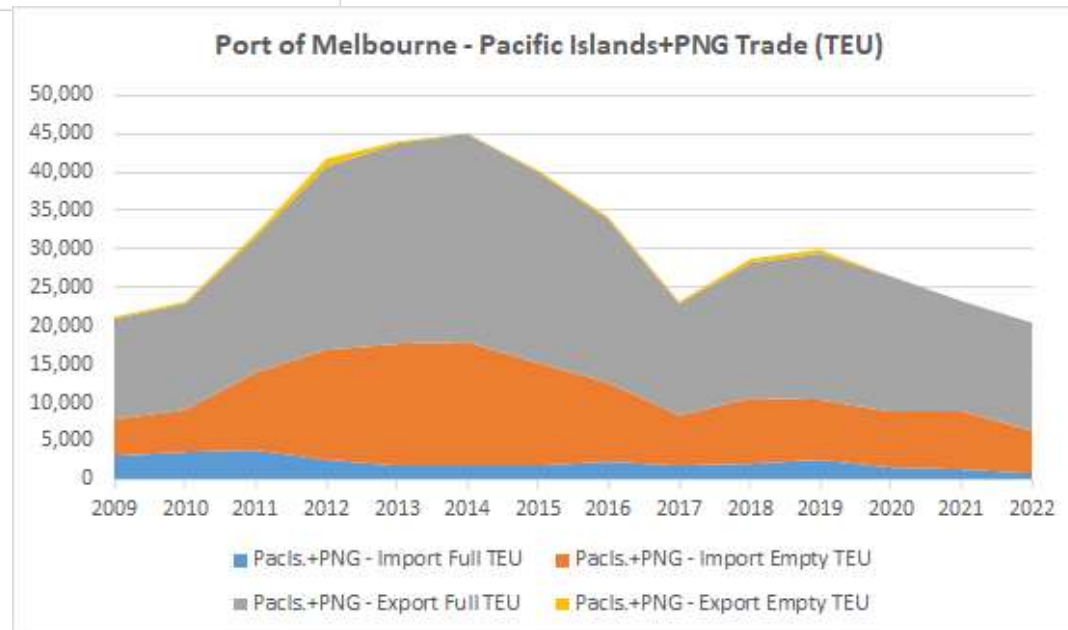
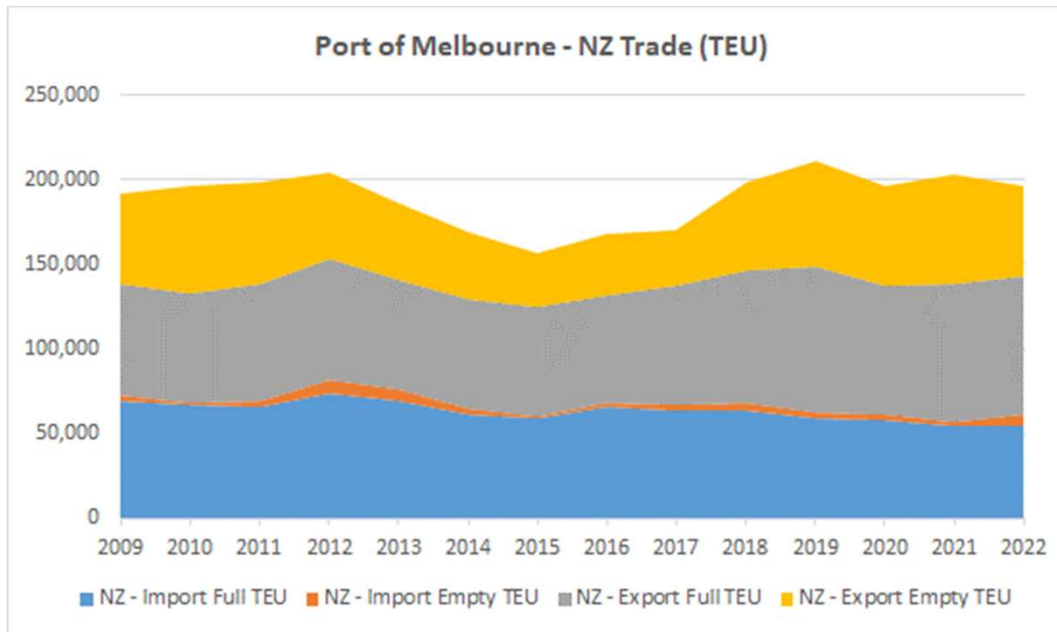
Port of Melbourne Main Trade Route Developments (Actuals)



Port of Melbourne Main Trade Route Developments (Actuals)



Port of Melbourne Main Trade Route Developments (Actuals)



Port of Melbourne International Containership Visits (Actuals)

Development of Port of Melbourne Vessel Visits by Nominal TEU Size Class											
Nominal TEU Size Class	FY2011-12	FY2012-13	FY2013-14	FY2014-15	FY2015-16	FY2016-17	FY2017-18	FY2018-19	FY2019-20	FY2020-21	FY2021-22
<1,000 TEU Vessel Size	70	74	50	55	57	64	77	43	59	18	7
1,000-1,999 TEU Vessel Size	109	42	45	38	106	126	144	71	73	77	117
2,000-2,999 TEU Vessel Size	347	220	132	125	99	71	80	60	47	96	145
3,000-3,999 TEU Vessel Size	179	161	131	118	126	150	126	118	106	84	75
4,000-4,999 TEU Vessel Size	443	531	497	556	502	347	223	317	272	179	152
5,000-5,999 TEU Vessel Size	44	36	159	145	189	285	341	310	239	234	211
6,000-6,999 TEU Vessel Size	0	0	2	11	16	55	100	99	44	71	75
7,000-7,999 TEU Vessel Size	0	0	0	0	1	9	11	11	6	5	0
8,000-8,999 TEU Vessel Size	0	0	0	0	0	0	0	35	76	103	74
9,000-9,999 TEU Vessel Size	0	0	0	0	0	0	0	0	27	39	58
10,000-10,999 TEU Vessel Size	0	0	0	0	0	0	0	0	1	8	0
11,000-11,999 TEU Vessel Size	0	0	0	0	0	0	0	0	0	0	0
12,000-12,999 TEU Vessel Size	0	0	0	0	0	0	0	0	0	0	0
13,000-13,999 TEU Vessel Size	0	0	0	0	0	0	0	0	0	0	0
14,000-14,999 TEU Vessel Size	0	0	0	0	0	0	0	0	0	0	0
Total Number Visits	1,192	1,064	1,016	1,048	1,096	1,107	1,102	1,064	950	914	914

Source: GHD analysis of PoM Actual Vessel Visit Records, 2011-2022



Port of Melbourne International Containership Visits (Actuals)

Share of Port of Melbourne Vessel Visits by Nominal TEU Size Class											
Nominal TEU Size Class	FY2011-12	FY2012-13	FY2013-14	FY2014-15	FY2015-16	FY2016-17	FY2017-18	FY2018-19	FY2019-20	FY2020-21	FY2021-22
<1,000 TEU Vessel Size	6%	7%	5%	5%	5%	6%	7%	4%	6%	2%	1%
1,000-1,999 TEU Vessel Size	9%	4%	4%	4%	10%	11%	13%	7%	8%	8%	13%
2,000-2,999 TEU Vessel Size	29%	21%	13%	12%	9%	6%	7%	6%	5%	11%	16%
3,000-3,999 TEU Vessel Size	15%	15%	13%	11%	11%	14%	11%	11%	11%	9%	8%
4,000-4,999 TEU Vessel Size	37%	50%	49%	53%	46%	31%	20%	30%	29%	20%	17%
5,000-5,999 TEU Vessel Size	4%	3%	16%	14%	17%	26%	31%	29%	25%	26%	23%
6,000-6,999 TEU Vessel Size	0%	0%	0%	1%	1%	5%	9%	9%	5%	8%	8%
7,000-7,999 TEU Vessel Size	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	0%
8,000-8,999 TEU Vessel Size	0%	0%	0%	0%	0%	0%	0%	3%	8%	11%	8%
9,000-9,999 TEU Vessel Size	0%	0%	0%	0%	0%	0%	0%	0%	3%	4%	6%
10,000-10,999 TEU Vessel Size	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
11,000-11,999 TEU Vessel Size	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12,000-12,999 TEU Vessel Size	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13,000-13,999 TEU Vessel Size	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14,000-14,999 TEU Vessel Size	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<5,000 TEU Vessel Visits Share:	96%	97%	84%	85%	81%	68%	59%	57%	59%	50%	54%
=>5,000 TEU Vessel Visits Share:	4%	3%	16%	15%	19%	32%	41%	43%	41%	50%	46%

Source: GHD analysis of PoM Actual Vessel Visit Records, 2011-2022



Modelling Results Detail for Fleet Scenario A

PoM Estimated Number of Vessel Visits by Service	2023	2024	2025	2026	2027	2028	2029	2030
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	150	156	156	156	156	156	156	156
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	128	128	168	168	168	168	168	176
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	92	104	104	104	104	104	104	104
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	36	0	0	0	0	0	0	0
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	196	208	208	208	208	208	208	208
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	75	44	52	52	52	52	52	52
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	50	52	52	52	52	52	52	52
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	42	52	52	52	52	52	52	52
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	52	52	53	52	52	52	52	52
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	42	47	52	52	52	52	52	52
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	26	26	26	26	26	26	26	26
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	33	33	33	33	33	33	33	33
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	19	19	19	19	19	19	19	19
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	46	104	104	104	104	104	104	104
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	34	52	52	52	52	52	52	52
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	28	54	54	54	54	54	54	54
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	9	9	9	9	9	9	9	9
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	4	4	4	4	4	4	4	4
PoM Estimated Total Number of International Containership Visits	1,062	1,144	1,198	1,197	1,197	1,197	1,197	1,205



Modelling Results Detail for Fleet Scenario A

PoM Estimated Number of Vessel Visits by Service	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	156	156	156	156	156	156	156	156	156	156
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	176	176	176	208	208	208	208	208	208	208
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	104	104	104	104	104	104	104	104	104	104
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	0	0	0	0	0	0	0	0	0	0
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	208	208	208	208	208	208	208	208	208	208
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	52	52	52	52	52	52	52	52	52	52
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	52	52	52	52	52	52	52	52	52	52
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	26	26	26	26	26	26	26	26	26	26
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	33	33	33	33	33	33	33	33	50	50
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	19	19	19	19	19	19	19	19	29	29
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	104	104	104	104	104	104	104	104	104	104
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	52	52	52	52	52	52	52	52	52	52
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	54	54	54	54	54	54	54	54	54	54
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	9	9	9	9	9	9	9	9	9	9
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	4	4	4	4	4	4	4	4	4	4
PoM Estimated Total Number of International Containership Visits	1,205	1,205	1,205	1,237	1,237	1,237	1,237	1,237	1,263	1,263



Modelling Results Detail for Fleet Scenario A

PoM Estimated Number of Vessel Visits by Service	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	156	156	156	156	156	156	156	156	182	182
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	208	208	208	208	208	208	208	208	208	208
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	104	104	104	104	104	130	130	130	130	130
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	0	0	0	0	0	0	0	0	0	0
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	208	208	208	208	208	208	208	208	208	208
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	78	78	78	78	78	78	78	78	78	78
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	52	52	52	52	52	52	52	52	52	52
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	26	26	26	26	26	26	26	26	26	26
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	50	50	50	50	50	50	50	50	66	66
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	29	29	29	29	29	29	29	29	38	38
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	104	104	104	104	104	104	104	104	104	104
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	52	52	52	52	52	52	52	52	52	52
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	54	54	54	54	54	54	54	54	54	54
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	10	10	10	10	10	10	10	10	10	10
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	4	4	4	4	4	4	4	4	4	4
PoM Estimated Total Number of International Containership Visits	1,290	1,290	1,290	1,290	1,290	1,316	1,316	1,317	1,368	1,368



SCENARIO A: Average Vessel TEU Size by shipping route:	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	5,008	5,449	5,435	5,576	5,758	5,957	6,128	6,230
Shipping Route: North America (East Coast & West Coast)	3,828	3,857	3,880	3,994	4,067	4,134	4,191	4,268
Shipping Route: Europe (via Panama & Suez)	6,834	6,834	6,888	7,175	7,487	7,769	8,012	8,221
Shipping Route: New Zealand & Pacific Islands/PNG	1,565	1,653	1,653	1,653	1,653	1,653	1,653	1,653
All International Shipping Routes: Total	4,687	4,709	4,731	4,854	5,004	5,162	5,297	5,392
SCENARIO A: Total Number Vessel Visits by shipping route:	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	782	757	805	805	805	805	805	813
Shipping Route: North America (East Coast & West Coast)	94	99	105	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	78	78	78	78	78	78	78	78
Shipping Route: New Zealand & Pacific Islands/PNG	108	210	210	210	210	210	210	210
All International Shipping Routes	1,062	1,144	1,198	1,197	1,197	1,197	1,197	1,205
SCENARIO A: Total Vessel Two-way Capacity by shipping route:	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	7,831,810	8,250,316	8,750,793	8,976,818	9,270,509	9,591,182	9,865,390	10,129,354
Shipping Route: North America (East Coast & West Coast)	719,624	763,644	812,177	830,697	846,038	859,845	871,744	887,826
Shipping Route: Europe (via Panama & Suez)	1,066,052	1,066,052	1,074,491	1,119,274	1,168,041	1,211,986	1,249,909	1,282,400
Shipping Route: New Zealand & Pacific Islands/PNG	337,972	694,444	694,444	694,444	694,444	694,444	694,444	694,444
All International Shipping Routes: Total	9,955,458	10,774,456	11,331,906	11,621,234	11,979,032	12,357,457	12,681,487	12,994,024
SCENARIO A: PoM Trade Share of Vessel Two-way Capacity by shipping route:	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	78.67%	76.57%	77.22%	77.24%	77.39%	77.61%	77.79%	77.95%
Shipping Route: North America (East Coast & West Coast)	7.23%	7.09%	7.17%	7.15%	7.06%	6.96%	6.87%	6.83%
Shipping Route: Europe (via Panama & Suez)	10.71%	9.89%	9.48%	9.63%	9.75%	9.81%	9.86%	9.87%
Shipping Route: New Zealand & Pacific Islands/PNG	3.39%	6.45%	6.13%	5.98%	5.80%	5.62%	5.48%	5.34%
All International Shipping Routes: Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



SCENARIO A: Average Vessel TEU Size by shipping route:	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Shipping Route: Asia (N&E/SE) - incl. extra loaders	6,374	6,558	6,784	6,803	6,961	7,120	7,287	7,448	7,610	7,784
Shipping Route: North America (East Coast & West Coast)	4,400	4,513	4,685	4,791	4,928	5,069	5,215	5,357	5,474	5,617
Shipping Route: Europe (via Panama & Suez)	8,459	8,718	9,019	9,235	9,497	9,776	10,069	10,290	9,888	9,900
Shipping Route: New Zealand & Pacific Islands/PNG	1,653	1,653	1,662	1,674	1,674	1,687	1,699	1,699	1,712	1,724
All International Shipping Routes: Total	5,516	5,666	5,855	5,917	6,052	6,193	6,340	6,475	6,641	6,772
SCENARIO A: Total Number Vessel Visits by shipping route:	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Shipping Route: Asia (N&E/SE) - incl. extra loaders	813	813	813	845	845	845	845	845	845	845
Shipping Route: North America (East Coast & West Coast)	104	104	104	104	104	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	78	78	78	78	78	78	78	78	104	104
Shipping Route: New Zealand & Pacific Islands/PNG	210	210	210	210	210	210	210	210	210	210
All International Shipping Routes	1,205	1,205	1,205	1,237	1,237	1,237	1,237	1,237	1,263	1,263
SCENARIO A: Total Vessel Two-way Capacity by shipping route:	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Shipping Route: Asia (N&E/SE) - incl. extra loaders	10,363,903	10,663,048	11,030,130	11,497,239	11,763,379	12,032,952	12,315,146	12,586,280	12,861,354	13,154,801
Shipping Route: North America (East Coast & West Coast)	915,273	938,637	974,564	996,465	1,025,003	1,054,440	1,084,621	1,114,226	1,138,493	1,168,241
Shipping Route: Europe (via Panama & Suez)	1,319,632	1,360,075	1,406,935	1,440,654	1,481,579	1,525,075	1,570,763	1,605,314	2,056,600	2,059,200
Shipping Route: New Zealand & Pacific Islands/PNG	694,444	694,444	698,084	703,284	703,284	708,484	713,684	713,684	718,884	724,084
All International Shipping Routes: Total	13,293,251	13,656,205	14,109,714	14,637,643	14,973,246	15,320,952	15,684,214	16,019,504	16,775,330	17,106,326
SCENARIO A: PoM Trade Share of Vessel Two-way Capacity by shipping route:	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Shipping Route: Asia (N&E/SE) - incl. extra loaders	77.96%	78.08%	78.17%	78.55%	78.56%	78.54%	78.52%	78.57%	76.67%	76.90%
Shipping Route: North America (East Coast & West Coast)	6.89%	6.87%	6.91%	6.81%	6.85%	6.88%	6.92%	6.96%	6.79%	6.83%
Shipping Route: Europe (via Panama & Suez)	9.93%	9.96%	9.97%	9.84%	9.89%	9.95%	10.01%	10.02%	12.26%	12.04%
Shipping Route: New Zealand & Pacific Islands/PNG	5.22%	5.09%	4.95%	4.80%	4.70%	4.62%	4.55%	4.46%	4.29%	4.23%
All International Shipping Routes: Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



SCENARIO A: Average Vessel TEU Size by shipping route:	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Shipping Route: Asia (N&E/SE) - incl. extra loaders	7,983	8,154	8,340	8,529	8,707	9,037	9,184	9,350	9,235	9,394
Shipping Route: North America (East Coast & West Coast)	5,761	5,907	6,080	6,229	6,380	6,533	6,713	6,894	7,078	7,238
Shipping Route: Europe (via Panama & Suez)	9,925	9,950	9,975	10,000	10,025	10,050	10,075	10,126	10,510	10,530
Shipping Route: New Zealand & Pacific Islands/PNG	1,724	1,758	1,795	1,832	1,857	1,894	1,931	1,968	1,993	2,055
All International Shipping Routes: Total	6,942	7,076	7,224	7,372	7,510	7,779	7,902	8,040	8,081	8,211
SCENARIO A: Total Number Vessel Visits by shipping route:	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Shipping Route: Asia (N&E/SE) - incl. extra loaders	872	872	872	872	872	898	898	898	924	924
Shipping Route: North America (East Coast & West Coast)	104	104	104	104	104	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	104	104	104	104	104	104	104	105	130	130
Shipping Route: New Zealand & Pacific Islands/PNG	210	210	210	210	210	210	210	210	210	210
All International Shipping Routes	1,290	1,290	1,290	1,290	1,290	1,316	1,316	1,317	1,368	1,368
SCENARIO A: Total Vessel Two-way Capacity by shipping route:	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Shipping Route: Asia (N&E/SE) - incl. extra loaders	13,922,933	14,220,816	14,545,272	14,874,075	15,184,527	16,230,771	16,494,524	16,792,263	17,066,878	17,360,041
Shipping Route: North America (East Coast & West Coast)	1,198,318	1,228,709	1,264,625	1,295,701	1,327,123	1,358,909	1,396,272	1,434,025	1,472,181	1,505,549
Shipping Route: Europe (via Panama & Suez)	2,064,400	2,069,600	2,074,800	2,080,000	2,085,200	2,090,400	2,095,600	2,120,993	2,732,600	2,737,800
Shipping Route: New Zealand & Pacific Islands/PNG	724,084	738,228	753,828	769,428	779,828	795,428	811,028	826,628	837,028	863,028
All International Shipping Routes: Total	17,909,734	18,257,353	18,638,525	19,019,204	19,376,678	20,475,508	20,797,424	21,173,909	22,108,686	22,466,418
SCENARIO A: PoM Trade Share of Vessel Two-way Capacity by shipping route:	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Shipping Route: Asia (N&E/SE) - incl. extra loaders	77.74%	77.89%	78.04%	78.21%	78.36%	79.27%	79.31%	79.31%	77.20%	77.27%
Shipping Route: North America (East Coast & West Coast)	6.69%	6.73%	6.79%	6.81%	6.85%	6.64%	6.71%	6.77%	6.66%	6.70%
Shipping Route: Europe (via Panama & Suez)	11.53%	11.34%	11.13%	10.94%	10.76%	10.21%	10.08%	10.02%	12.36%	12.19%
Shipping Route: New Zealand & Pacific Islands/PNG	4.04%	4.04%	4.04%	4.05%	4.02%	3.88%	3.90%	3.90%	3.79%	3.84%
All International Shipping Routes: Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



Modelling Results Detail for Fleet Scenario B

PoM Estimated Number of Vessel Visits by Service	2023	2024	2025	2026	2027	2028	2029	2030
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	150	156	156	156	156	156	156	156
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	128	128	168	168	168	168	168	176
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	92	104	104	104	104	104	104	104
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	36	0	0	0	0	0	0	0
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	196	208	208	208	208	208	208	208
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	75	44	52	52	52	52	52	52
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	50	52	52	52	52	52	52	52
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	42	52	52	52	52	52	52	52
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	52	52	53	52	52	52	52	52
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	42	47	52	52	52	52	52	52
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	26	26	26	26	26	26	26	26
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	33	33	33	33	33	33	33	33
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	19	19	19	19	19	19	19	19
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	46	104	104	104	104	104	104	104
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	34	52	52	52	52	52	52	52
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	28	54	54	54	54	54	54	54
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	9	9	9	9	9	9	9	9
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	4	4	4	4	4	4	4	4
PoM Estimated Total Number of International Containership Visits	1,062	1,144	1,198	1,197	1,197	1,197	1,197	1,205



Modelling Results Detail for Fleet Scenario B

PoM Estimated Number of Vessel Visits by Service	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	156	156	156	156	156	156	156	156	156	156
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	176	176	176	208	208	208	208	208	208	208
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	104	104	104	104	104	104	104	104	104	104
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	0	0	0	0	0	0	0	0	0	0
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	208	208	208	208	208	208	208	208	208	208
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	52	52	52	52	52	52	52	52	52	52
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	52	52	52	52	52	52	52	52	52	52
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	26	26	26	26	26	26	26	26	26	26
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	33	33	33	33	33	33	33	33	50	50
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	19	19	19	19	19	19	19	19	29	29
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	104	104	104	104	104	104	104	104	104	104
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	52	52	52	52	52	52	52	52	52	52
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	54	54	54	54	54	54	54	54	54	54
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	9	9	9	9	9	9	9	9	9	9
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	4	4	4	4	4	4	4	4	4	4
PoM Estimated Total Number of International Containership Visits	1,205	1,205	1,205	1,237	1,237	1,237	1,237	1,237	1,263	1,263



Modelling Results Detail for Fleet Scenario B

PoM Estimated Number of Vessel Visits by Service	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Service Group #1 - N&E Asia - Base 5,000-5,999 TEU @ SD	156	156	156	156	156	156	156	156	156	156
Service Group #2 - N&E Asia - Base 3,000-3,999 TEU @ SD	208	208	208	208	208	208	208	208	208	208
Service Group #3 - N&E Asia - Base 7,000-7,999 TEU @ WD	104	104	104	104	104	130	130	130	130	130
Service Group #4 - N&E Asia - Base 1,000-1,999 TEU @ WD	0	0	0	0	0	0	0	0	0	0
Service Group #5 - SE Asia - Base 5,000-5,999 TEU @ SD	208	208	208	208	208	208	208	260	260	260
Service Group #6 - SE Asia - Base 2,000-2,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #7 - SE Asia - Base 8,000-8,999 TEU @ WD	78	78	78	78	78	78	78	78	78	78
Service Group #8 - SE Asia - Base 4,000-4,999 TEU @ WD	52	52	52	52	52	52	52	52	52	52
Service Group #9 - N.America EC (via Panama) - Base 3,000-3,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #10 - N.America WC - Base 4,000-4,999 TEU @ SD	52	52	52	52	52	52	52	52	52	52
Service Group #11 - Europe (via Panama) - Base 2,000-2,999 TEU @ SD	26	26	26	26	26	26	26	26	26	26
Service Group #12a - Europe (via Suez) - Base 8,000-8,999 TEU @ SD	50	50	50	50	50	50	50	50	66	66
Service Group #12b - Europe (via Suez) - Base 9,000-9,999 TEU @ WD	29	29	29	29	29	29	29	29	38	38
Service Group #13 - New Zealand (dedicated) - Base 2,000-2,999 TEU @ SD	104	104	104	104	104	104	104	104	104	104
Service Group #14 - New Zealand (dedicated) - Base 1,000-1,999 TEU @ WD	52	52	52	52	52	52	52	52	52	52
Service Group #15 - Pacific Islands/PNG - Base 1,000-1,999 TEU @ SD	54	54	54	54	54	54	54	54	54	54
Service Group #16 - Extra Loaders (mainly Asia) - Base 2,000- 2,999 TEU @ SD	10	10	10	10	10	10	10	10	10	10
Service Group #17 - Extra Loaders (mainly Asia) - Base 3,000-3,999 TEU @ WD	4	4	4	4	4	4	4	4	4	4
PoM Estimated Total Number of International Containership Visits	1,290	1,290	1,290	1,290	1,290	1,316	1,316	1,369	1,394	1,394



SCENARIO A: Average Vessel TEU Size by shipping route:	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	5,008	5,449	5,435	5,576	5,758	5,957	6,128	6,230
Shipping Route: North America (East Coast & West Coast)	3,828	3,857	3,880	3,994	4,067	4,134	4,191	4,268
Shipping Route: Europe (via Panama & Suez)	6,834	6,834	6,888	7,175	7,487	7,769	8,012	8,221
Shipping Route: New Zealand & Pacific Islands/PNG	1,565	1,653	1,653	1,653	1,653	1,653	1,653	1,653
All International Shipping Routes: Total	4,687	4,709	4,731	4,854	5,004	5,162	5,297	5,392
SCENARIO A: Total Number Vessel Visits by shipping route:	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	782	757	805	805	805	805	805	813
Shipping Route: North America (East Coast & West Coast)	94	99	105	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	78	78	78	78	78	78	78	78
Shipping Route: New Zealand & Pacific Islands/PNG	108	210	210	210	210	210	210	210
All International Shipping Routes	1,062	1,144	1,198	1,197	1,197	1,197	1,197	1,205
SCENARIO A: Total Vessel Two-way Capacity by shipping route:	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	7,831,810	8,250,316	8,750,793	8,976,818	9,270,509	9,591,182	9,865,390	10,129,354
Shipping Route: North America (East Coast & West Coast)	719,624	763,644	812,177	830,697	846,038	859,845	871,744	887,826
Shipping Route: Europe (via Panama & Suez)	1,066,052	1,066,052	1,074,491	1,119,274	1,168,041	1,211,986	1,249,909	1,282,400
Shipping Route: New Zealand & Pacific Islands/PNG	337,972	694,444	694,444	694,444	694,444	694,444	694,444	694,444
All International Shipping Routes: Total	9,955,458	10,774,456	11,331,906	11,621,234	11,979,032	12,357,457	12,681,487	12,994,024
SCENARIO A: PoM Trade Share of Vessel Two-way Capacity by shipping route:	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	78.67%	76.57%	77.22%	77.24%	77.39%	77.61%	77.79%	77.95%
Shipping Route: North America (East Coast & West Coast)	7.23%	7.09%	7.17%	7.15%	7.06%	6.96%	6.87%	6.83%
Shipping Route: Europe (via Panama & Suez)	10.71%	9.89%	9.48%	9.63%	9.75%	9.81%	9.86%	9.87%
Shipping Route: New Zealand & Pacific Islands/PNG	3.39%	6.45%	6.13%	5.98%	5.80%	5.62%	5.48%	5.34%
All International Shipping Routes: Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



SCENARIO A: Average Vessel TEU Size by shipping route:	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Shipping Route: Asia (N&E/SE) - incl. extra loaders	6,374	6,558	6,784	6,803	6,961	7,120	7,287	7,448	7,610	7,784
Shipping Route: North America (East Coast & West Coast)	4,400	4,513	4,685	4,791	4,928	5,069	5,215	5,357	5,474	5,617
Shipping Route: Europe (via Panama & Suez)	8,459	8,718	9,019	9,235	9,497	9,776	10,069	10,290	9,888	9,900
Shipping Route: New Zealand & Pacific Islands/PNG	1,653	1,653	1,662	1,674	1,674	1,687	1,699	1,699	1,712	1,724
All International Shipping Routes: Total	5,516	5,666	5,855	5,917	6,052	6,193	6,340	6,475	6,641	6,772
SCENARIO A: Total Number Vessel Visits by shipping route:	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Shipping Route: Asia (N&E/SE) - incl. extra loaders	813	813	813	845	845	845	845	845	845	845
Shipping Route: North America (East Coast & West Coast)	104	104	104	104	104	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	78	78	78	78	78	78	78	78	104	104
Shipping Route: New Zealand & Pacific Islands/PNG	210	210	210	210	210	210	210	210	210	210
All International Shipping Routes	1,205	1,205	1,205	1,237	1,237	1,237	1,237	1,237	1,263	1,263
SCENARIO A: Total Vessel Two-way Capacity by shipping route:	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Shipping Route: Asia (N&E/SE) - incl. extra loaders	10,363,903	10,663,048	11,030,130	11,497,239	11,763,379	12,032,952	12,315,146	12,586,280	12,861,354	13,154,801
Shipping Route: North America (East Coast & West Coast)	915,273	938,637	974,564	996,465	1,025,003	1,054,440	1,084,621	1,114,226	1,138,493	1,168,241
Shipping Route: Europe (via Panama & Suez)	1,319,632	1,360,075	1,406,935	1,440,654	1,481,579	1,525,075	1,570,763	1,605,314	2,056,600	2,059,200
Shipping Route: New Zealand & Pacific Islands/PNG	694,444	694,444	698,084	703,284	703,284	708,484	713,684	713,684	718,884	724,084
All International Shipping Routes: Total	13,293,251	13,656,205	14,109,714	14,637,643	14,973,246	15,320,952	15,684,214	16,019,504	16,775,330	17,106,326
SCENARIO A: PoM Trade Share of Vessel Two-way Capacity by shipping route:	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Shipping Route: Asia (N&E/SE) - incl. extra loaders	77.96%	78.08%	78.17%	78.55%	78.56%	78.54%	78.52%	78.57%	76.67%	76.90%
Shipping Route: North America (East Coast & West Coast)	6.89%	6.87%	6.91%	6.81%	6.85%	6.88%	6.92%	6.96%	6.79%	6.83%
Shipping Route: Europe (via Panama & Suez)	9.93%	9.96%	9.97%	9.84%	9.89%	9.95%	10.01%	10.02%	12.26%	12.04%
Shipping Route: New Zealand & Pacific Islands/PNG	5.22%	5.09%	4.95%	4.80%	4.70%	4.62%	4.55%	4.46%	4.29%	4.23%
All International Shipping Routes: Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



SCENARIO A: Average Vessel TEU Size by shipping route:	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Shipping Route: Asia (N&E/SE) - incl. extra loaders	7,983	8,154	8,340	8,529	8,707	9,037	9,184	8,977	9,123	9,281
Shipping Route: North America (East Coast & West Coast)	5,761	5,907	6,080	6,229	6,380	6,533	6,713	6,894	7,078	7,238
Shipping Route: Europe (via Panama & Suez)	9,925	9,950	9,975	10,000	10,025	10,050	10,075	10,126	10,510	10,530
Shipping Route: New Zealand & Pacific Islands/PNG	1,724	1,758	1,795	1,832	1,857	1,894	1,931	1,968	1,993	2,055
All International Shipping Routes: Total	6,942	7,076	7,224	7,372	7,510	7,779	7,902	7,832	8,025	8,157
SCENARIO A: Total Number Vessel Visits by shipping route:	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Shipping Route: Asia (N&E/SE) - incl. extra loaders	872	872	872	872	872	898	898	950	950	950
Shipping Route: North America (East Coast & West Coast)	104	104	104	104	104	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	104	104	104	104	104	104	104	105	130	130
Shipping Route: New Zealand & Pacific Islands/PNG	210	210	210	210	210	210	210	210	210	210
All International Shipping Routes	1,290	1,290	1,290	1,290	1,290	1,316	1,316	1,369	1,394	1,394
SCENARIO A: Total Vessel Two-way Capacity by shipping route:	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Shipping Route: Asia (N&E/SE) - incl. extra loaders	13,922,933	14,220,816	14,545,272	14,874,075	15,184,527	16,230,771	16,494,524	17,057,200	17,332,800	17,634,400
Shipping Route: North America (East Coast & West Coast)	1,198,318	1,228,709	1,264,625	1,295,701	1,327,123	1,358,909	1,396,272	1,434,025	1,472,181	1,505,549
Shipping Route: Europe (via Panama & Suez)	2,064,400	2,069,600	2,074,800	2,080,000	2,085,200	2,090,400	2,095,600	2,120,993	2,732,600	2,737,800
Shipping Route: New Zealand & Pacific Islands/PNG	724,084	738,228	753,828	769,428	779,828	795,428	811,028	826,628	837,028	863,028
All International Shipping Routes: Total	17,909,734	18,257,353	18,638,525	19,019,204	19,376,678	20,475,508	20,797,424	21,438,846	22,374,609	22,740,777
SCENARIO A: PoM Trade Share of Vessel Two-way Capacity by shipping route:	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Shipping Route: Asia (N&E/SE) - incl. extra loaders	77.74%	77.89%	78.04%	78.21%	78.36%	79.27%	79.31%	79.56%	77.47%	77.55%
Shipping Route: North America (East Coast & West Coast)	6.69%	6.73%	6.79%	6.81%	6.85%	6.64%	6.71%	6.69%	6.58%	6.62%
Shipping Route: Europe (via Panama & Suez)	11.53%	11.34%	11.13%	10.94%	10.76%	10.21%	10.08%	9.89%	12.21%	12.04%
Shipping Route: New Zealand & Pacific Islands/PNG	4.04%	4.04%	4.04%	4.05%	4.02%	3.88%	3.90%	3.86%	3.74%	3.80%
All International Shipping Routes: Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



Rev No.	Author	Reviewer		Approved for Issue		Date
		Name	Signature	Name	Signature	
A	G. Reynolds	R. Hill	On file	R. Hill	On file	29/06/2023
B	G. Reynolds	R. Hill	On file	R. Hill	On file	05/07/2023
C	G. Reynolds	R. Hill	On file	P. Templer	On file	06/07/2023

DISCLAIMER:

This Document has been prepared by GHD Pty Ltd (GHD) for the Port of Melbourne (PoM) and may only be used by PoM for the purposes contracted between GHD and PoM. While reasonable efforts have been made to ensure that the contents of this publication are factually correct, GHD does not accept responsibility for the accuracy or completeness of the contents, and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this publication.

In the preparation of this document, and noting the nature of the assignment is strategic and involves analysis of market information, GHD will assume:

All documents and records examined by GHD are genuine, complete and up to date

The information provided to GHD is true and accurate in all respects and contains no material errors or omissions

All factual matters stated in any document are true and correct.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out. The opinions and conclusions in this report are based on conditions encountered and information reviewed at the date of preparation of the report.

GHD disclaims liability arising from any of the assumptions being incorrect. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared. GHD has prepared this report on the basis of information provided by PoM, information in the public domain, and others who provided information to GHD, which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

www.ghd.com

