

Port of Melbourne



*Photo Source: Port of Melbourne website*

## Port of Melbourne Future Containership Fleet Analysis, 2022-2050

TECHNICAL REFERENCE PAPER (Final, 2 September 2022)



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# 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 recent exceptional shipping market developments over the last two years and ongoing (relating to the COVID-19 pandemic, associated overseas port congestion, and abnormally high rates/profits for carriers), the modelling includes two Scenarios (A and B – see Section 4.8 for details) to help ‘book-end’ possible future developments in the shipping markets. 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 FY2021-22 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 (Q1 2022)

**Table 1** Global Containership Fleet – Size class composition & development (Q1 2022)

Start Year	Feeder 100-2,999		Intermediate 3,000-5,999		Intermediate 6,000-7,999		Neo-Panamax 8,000-11,999		Neo-Panamax 12,000-14,999		Post-Panamax 15,000+		Total Fleet	
	No.	,000 TEU	No.	,000 TEU	No.	,000 TEU	No.	,000 TEU	No.	,000 TEU	No.	,000 TEU	No.	,000 TEU
2014	3,036	4,109.8	1,247	5,561.0	274	1,825.8	409	3,690.5	133	1,785.1	18	319.4	5,117	17,291.5
2015	2,971	4,036.4	1,238	5,542.6	279	1,858.6	467	4,237.8	160	2,155.1	34	612.3	5,149	18,442.8
2016	2,963	4,035.8	1,234	5,532.5	282	1,879.1	542	4,942.5	182	2,473.1	57	1,039.1	5,260	19,902.0
2017	2,937	3,964.1	1,140	5,109.7	272	1,815.0	576	5,273.3	199	2,719.2	69	1,268.6	5,193	20,150.0
2018	2,932	3,969.4	1,088	4,868.6	270	1,802.8	603	5,558.6	223	3,064.8	88	1,655.0	5,204	20,919.3
2019	2,974	4,067.7	1,086	4,852.2	270	1,802.8	621	5,755.3	249	3,435.0	114	2,180.6	5,314	22,093.6
2020	3,003	4,128.8	1,076	4,796.3	270	1,802.8	623	5,778.9	274	3,788.2	137	2,681.3	5,383	22,976.4
2021	3,041	4,242.3	1,066	4,739.0	267	1,782.0	623	5,780.3	291	4,018.4	154	3,084.3	5,442	23,646.3
2022	3,127	4,414.7	1,072	4,759.6	267	1,782.0	635	5,919.9	318	4,413.6	168	3,414.0	5,587	24,703.8
2023(f)		4,579.5		4,763.2		1,782.0		6,110.3		4,806.8		3,557.4		25,599.3
2024(f)		4,715.0		4,883.5		1,860.6		6,118.5		5,724.1		4,224.6		27,526.3

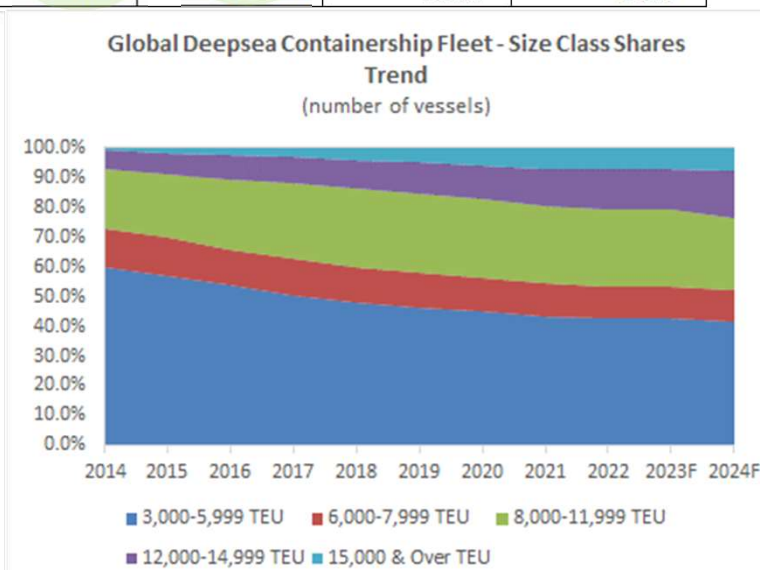
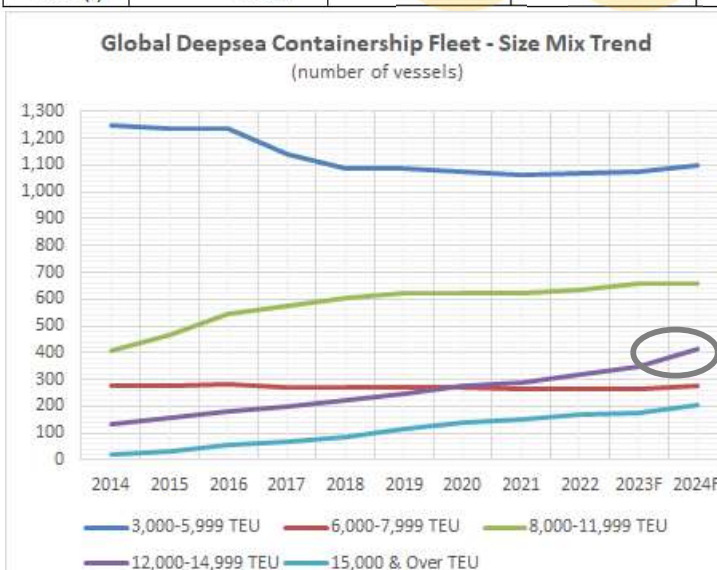
% capacity growth							
2021	4.1%	0.4%	0.0%	2.4%	9.8%	10.7%	4.5%
2022(f)	3.7%	0.1%	0.0%	3.2%	8.9%	4.2%	3.6%
2023(f)	3.0%	2.5%	4.4%	0.1%	19.1%	18.8%	7.5%

#### Outlook Indicators:

- Melbourne historic workhorse size class of **3,000-5,999 TEU has bottomed out\***. Forecast 1,100 vessels by Q4 2024 (= back to 2017).
- Melbourne historic upper size class of **6,000-7,999 TEU has bottomed out\***. Forecast 279 vessels by Q4 2024 (= back to 2016).
- Melbourne relevant Neo-Panamax size class of **8,000-14,999 TEU still rapidly increasing\***. Forecast 1,069 vessels by Q4 2024. Sub-class 12-14,999 TEU driving growth. Sub-class 8-11,999 TEU less growth.

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

Source: GHD analysis of Clarksons  
SIN Quarterly Containership  
Market Review, Q1 2022







## Developments in the Global Containership Fleet

### 2.2a Global Containership Fleet – Vessel Order Book (Q1 2022)

#### Outlook Indicators:

1. Vessel Orderbook for Melbourne **3,000-5,999 TEU size class has turned with 101 vessels, but** likely most for Intra Asia trades with remainder unknown trades.
2. Vessel Orderbook for Melbourne **6,000-7,999 TEU size class has turned with 62** (first orders since 2013/15).
3. Vessel Orderbook for Melbourne Neo-Panamax **8,000-10,999 TEU size class remains at zero** (last ordered 2015/16).
4. Vessel Orderbook for Melbourne Neo-Panamax **11,000-11,999 TEU size class at 17** (declining interest).
5. Vessel Orderbook for Melbourne Neo-Panamax **12,000-12,999 TEU size low at 4** (drying-up).
6. Vessel Orderbook for Melbourne Neo-Panamax **13,000-13,999 TEU size at 45** (still popular).

Table 2 Global Containership Fleet – Orderbook (Q1 2022)

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	
Jan-22	294	538.4	101	397.2	62	428.5	17	199.4	196	2,875.0	52	1,230.7	722	5,669.2
% of Flt	9%	12%	9%	8%	23%	24%	3%	3%	62%	65%	31%	36%	12.9%	22.9%
For delivery in:														
2022	121	211.3	6	21.8	-	-	17	199.4	28	401.1	6	143.5	178	977.1
2023	131	244.2	53	205.1	16	108.3	-	-	68	985.0	32	757.3	300	2,299.9
2024	42	82.9	42	170.2	43	299.2	-	-	82	1,205.1	14	330.0	223	2,087.5
2025+	-	-	-	-	3	21.0	-	-	18	283.7	-	-	21	304.7

Table 3 Global Containership Fleet – Orderbook with further detailing by size class (Q1 2022)

TEU Size up to 14,000 TEU	Number vessels On Order (per Jan. 2022)	Remarks
3,000-5,999	101 (of which only 10 possibly relevant )	61 x 3,000-3,100 TEU & 18 x 4,600 TEU likely for Intra Asia trade; 22 for unknown trades, of which 10 x 5,500 TEU CMA CGM possibly relevant
6,000-7,999	62 (first new orders since 2013/15)	25 x 7,000 TEU Seaspan; 14 x 7,000 TEU Sea Consortium / TS Lines (Intra Asia trade)
8,000-10,999	0 (last ordered 2015/16)	Size range continues to be skipped
11,000-11,999	17 (declining)	11,700-11,900 TEU (Japanese owners / Evergreen / Seaspan)
12,000-12,999	4 (drying-up)	12,100 TEU (MSC / Seaspan)
13,000-13,999	45 (still popular)	12 x 13,000 TEU HMM; 6 x 13,000 TEU CMA CGM

Source: GHD analysis of Clarksons SIN Quarterly Containership Market Review, Q1 2022



## Developments in the Global Containership Fleet

### 2.2b Vessel Order Book (Q1 2022) – Implications for Port of Melbourne Access

Table 4 Vessel Orderbook – Implications for Port of Melbourne Access

TEU Size Class	Port of Melbourne Access*	Number vessels On Order (per Jan. 2022)	Remarks
3,000-5,999	All Docks (Swanson & Webb)	101 (of which only <b>10</b> possibly relevant to PoM )	61 x 3,000-3,100 TEU & 18 x 4,600 TEU likely for Intra Asia trade; 22 for unknown trades, of which 10 x 5,500 TEU CMA CGM possibly relevant
6,000-7,999	All Docks (Swanson & Webb)	<b>62</b> (first new orders since 2013/15)	25 x 7,000 TEU Seaspan; 14 x 7,000 TEU Sea Consortium / TS Lines (Intra Asia trade)
8,000-9,999	All Docks (Swanson & Webb)	<b>0</b> (last ordered 2015/16)	Size range continues to be skipped
10,000-10,999	Webb Dock Only	<b>0</b> (last ordered 2015/16)	Size range continues to be skipped
11,000-11,999	Webb Dock Only	<b>17</b> (declining)	11,700-11,900 TEU (Jap.owners / Evergreen / Seaspan)
12,000-12,999	Webb Dock Only	<b>4</b> (drying-up)	12,100 TEU (MSC / Seaspan)
13,000-13,999	Webb Dock Only	<b>45</b> (still popular)	12 x 13,000 TEU HMM; 6 x 13,000 TEU CMA CGM
14,000-14,999	Heads Constrained**	<b>25</b>	For East-West trades (COSCO, etc.)
15,000-15,999	Heads Constrained**	<b>83</b> (popular)	For East-West trades (Evergreen, CMA, Seaspan, etc.)
16,000-16,999	Heads Constrained**	<b>39</b>	For East-West trades (COSCO, OOCL, etc.)
17,000-22,999	Heads Constrained**	<b>0</b>	Previously for East-West trades
23,000+	Heads Constrained**	<b>52</b> (popular)	For East-West trades (Evergreen, OOCL, Hapag, 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 (2022 vs. 2021)

**Table 5** Global Containership Fleet – Summary of Key Changes since Last Analysis (2022 vs. 2021)

Global Fleet - Key Changes	7/2017	7/2018	10/2019	1/2021	1/2022	Change	% Change	Comment
<b>1. Size-classes (# Vessels)</b>								
- 3,000 to 5,999 TEU	1,140	1,088	1,077	1,066	1,072	6	0.6%	Slight Increase since last 2021 Analysis
- 6,000 to 7,999 TEU	272	270	270	267	267	0	0.0%	Stable since last 2021 Analysis
- 8,000 to 11,999 TEU	576	603	623	623	635	12	1.9%	Small Increase since last 2021 Analysis
- 12,000 to 14,999 TEU	190	210	274	291	318	27	9.3%	Further Rapid Increase since last 2021 Analysis
- 15,000 & Over TEU	78	101	137	154	168	14	9.1%	Further Rapid Increase, but all East-West Trades
<b>Total Fleet &gt;3,000 TEU</b>	<b>2,256</b>	<b>2,272</b>	<b>2,381</b>	<b>2,401</b>	<b>2,460</b>	<b>59</b>	<b>2.5%</b>	<b>Overall Gradual Increase in Vessel Numbers</b>
<b>2. Average Age (Years)</b>								
- 3,000 to 5,999 TEU	10.5	11.2	12.2	13.3	14.2	0.9	6.8%	Further Ageing since last 2021 Analysis
- 6,000 to 7,999 TEU	10.3	11.3	12.6	13.8	14.8	1.0	7.2%	Further Ageing since last 2021 Analysis
- 8,000 to 11,999 TEU	6.5	7.2	8.4	9.6	10.4	0.8	8.3%	Further Ageing since last 2021 Analysis
- 12,000 to 14,999 TEU	4.2	4.8	5.4	6.3	6.5	0.2	3.2%	Minor Ageing on a relatively Young age base
- 15,000 & Over TEU	2.7	2.7	3.3	4.0	4.7	0.7	17.5%	Minor Ageing on a relatively Young age base
Note: Changes in Global Fleet = Net of Demolitions (-), Losses (-) and Newbuild Deliveries (+).								

#### 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 15 years), **BUT recent New Orders for 7,000 TEU vessels (25 Seaspan) show new interest to replace class with a possible future supply source for Melbourne – Recommend monitor this**
3. Confirming Continuing **Lack of Interest for Global Replacements in 8-11,000 TEU size range**
4. Confirming Continuing Global Preference by Carriers for 12-15,000 TEU size vessels

Source: GHD analysis of Clarksons SIN Quarterly Containership Market Review, 1Q 2021 & 2Q 2022.





## Developments in the Global Containership Fleet

### 2.4 Global Containership Fleet – Detailed Size Class & Age Analysis per July 2022

Table 6 Global Containership Fleet – Detailed size class & future age analysis (per July 2022)

GLOBAL CONTAINERSHIP FLEET - TEU Size Class (per 21/07/2022)	Vessels Currently Globally Operating (Number)	% Share* of Current Global Fleet >2,999 TEU	Average Age (Years)	Vessels Currently on PoM Services (Number)	PoM Deployed Fleet as % Current Global Size Class*	Vessels On Order Globally (Number)	Vessels on Order Alternative fuel ready# (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	320	-	16	1	0.3%	2	0	-	50	-	21	2
1,000-1,999 TEU	1,362	-	14	14	1.0%	206	14M & 21L	-	753	-	553	350
2,000-2,999 TEU	763	-	14	25	3.3%	129	1M & 6L	-	401	-	349	225
3,000-3,999 TEU***	259	11.4%	14	28	10.8%	71	4M	27.4%	175	55	112	80
4,000-4,999 TEU	536	23.7%	14	35	6.5%	20	0	3.7%	200	96	29	21
5,000-5,999 TEU	274	12.1%	16	29	10.6%	33	6M	12.0%	92	25	41	35
6,000-6,999 TEU	227	10.0%	15	13	5.7%	19	0	8.4%	81	30	23	19
7,000-7,999 TEU	43	1.9%	16	0	0.0%	95	6A & 2M	220.9%	105	32	95	95
8,000-8,999 TEU	299	13.2%	13	25	8.4%	28	14A	9.4%	186	113	52	28
9,000-9,999 TEU	179	7.9%	11	0	0.0%	0	0	0.0%	113	44	67	0
10,000-10,999 TEU	81	3.6%	9	0	0.0%	0	0	0.0%	67	15	33	0
11,000-11,999 TEU	84	3.7%	7	0	0.0%	20	10A	23.8%	83	33	73	41
12,000-12,999 TEU	31	1.4%	5	0	0.0%	3	0	9.7%	34	13	23	21
13,000-13,999 TEU	145	6.4%	9	0	0.0%	56	10A&M, 12L	38.6%	195	110	82	56
14,000-14,999 TEU	107	4.7%	6	0	0.0%	20	4A	18.7%	127	61	102	35
<b>Total Fleet (&gt;2,999 TEU):</b>	<b>2,265</b>	<b>100.0%</b>	<b>13</b>	<b>130</b>	<b>5.7%</b>	<b>365</b>	<b>68</b>	<b>16.1%</b>	<b>1,458</b>	<b>627</b>	<b>732</b>	<b>431</b>

Notes: (\*) Based on vessel numbers. (\*\*) Based on assumed vessel operational life of 20 years, all current Orders delivered, and no new vessel Orders placed. PoM = Port of Melbourne. Source data is Clarksons SIN (21/07/2022). (\*\*\*) 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 ready refers to ammonia (A), LNG (L) and methanol (M) - there are no vessels currently on order with hydrogen or fully-electric.

#### 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**

Source: GHD analysis of Clarksons SIN Global Containership Fleet Database (delivered & On Order) as of 21/07/2022.

Prepared for the **Port of Melbourne (PoM)** – PoM Future Containership Fleet Analysis (Final Rev.E, 02/09/2022)



## Developments in the Melbourne-Calling Containership Fleet

### 3.1 Current Melbourne International Containership Fleet Deployed on Aus Routes

Analysis for period **1/10-31/12/2021** shows that:

- Melbourne directly called by **25 scheduled container services** covering 8 shipping routes.
- The Melbourne direct calling services require the deployment of a **Containership Fleet of total 143 vessels (105 >3,000 TEU size)**. Average age Melbourne Fleet one year younger than Global.
- Melbourne Containership Fleet now has **25 vessels >8,000 TEU size with maximum size 9,600-10,600 TEU (nominal)**.
- As of 2Q2022, there are **3 new container services planned** (2 E. Asia & 1 NZ) to give **28 total**.

Port of Melbourne International Visits (CY2021)	Arr.	Dep.
Total Containership Visits	912	
Containership Moves > Westgate Bridge Airdraught Limit of 50.1m	70	81
% Visits Unable to Pass under Westgate Bridge	8%	9%

**Table 7** Current Melbourne-calling International Containership Fleet (Scheduled, Jan. 2022)

Shipping Route (Region)	Number Scheduled Vessels Deployed	Average Vessel Size (TEU)	Vessel Size Range (TEU)	Number & Frequency of Services
East Asia	56	5,221	1,740-8,888	9 x Weekly, & 1 x 12 days
SE Asia	42	4,888	1,809-10,622	7 x Weekly (incl. 1 with NZ calls)
N. America EC (Dedicated via Panama)	11	3,365	3,028-3,630	1 x Weekly (incl. NZ calls)
N. America WC	9	4,229	3,765-4,870	1 x Weekly (incl. NZ calls)
Europe (via Suez)	10	8,555	6,572-9,580	1 x Weekly (incl. S/SE Asia & Indian Ocean calls)
Europe (via Panama)	7	2,348	2,200-2,556	1 x 10 days (incl. N.America EC & NZ calls)
New Zealand (Dedicated)	5	1,494	1,102-2,226	2 x Weekly
S. Pacific Islands / PNG (Dedicated)	3	1,301	981-1,617	2 x 20-21 days (= 1 x 10 days)
<b>TOTAL (excl. extra loaders)</b>	<b>143 (avg. age 13 years)</b>	<b>4,798</b>	<b>981-10,622</b>	<b>25 (of which 21 weekly)</b>

**Key observation in CY2021 – Only 82% of scheduled visits actually occurred (incl. extra loaders) compared with typical levels of 95-98% service delivery in CY2018-CY2020. The level for 1H2022 is expected to be 76%. This mirrors known global supply chain issues and port congestion for 01/2021-06/2022.**

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

Sources: GHD analysis of Clarksons ship database (Q1 2022), PoM vessel visit data CY2021 & carrier published sailing schedules..





## Developments in the Melbourne-Calling Containership Fleet

### 3.2 Melbourne-calling Fleet Deployed – Changes since Last Analyses (2015 – 2022)

Table 8 Melbourne-calling International Fleet – Summary of Key Changes since Last Analyses (2015 - 2022)

Melbourne Fleet - Key Changes	2015	2016	2017	2018	2019	1/2021	1/2022*	Comment (Note: Scheduled, excl. extra loaders)
<b>1. Vessels Deployed</b>								
- Total Fleet on services	151	141	148	141	143	134	143	Increased fleet size due to increased services.
- Fleet > 3,000 TEU size	119	112	115	120	115	107	105	Decreased fleet size due to less use of vessels >3,000 TEU.
- % of 3,000+ TEU > 8,000 TEU	-	-	-	8%	22%	23%	24%	Slight increase in share of 8,000+ TEU vessels.
<b>2. Vessel Sizes (TEU)</b>								
- Average	3,871	4,252	4,522	4,792	4,566	5,162	4,798	Reduced average size of vessels due to more Asian & NZ services with smaller vessels by minor carriers (TSL, Zim, BAL)
- Minimum	777	777	777	652	646	907	981	Reflects South Pacific Route needs
- Maximum	5,888	7,455	7,455	8,814	9,472	10,622	10,622	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	SE Asia & Europe (Suez) Routes drivers of Max. Ship Size (9,600 TEU MSC-Europe at Swanson, & 10,622 TEU Maersk-SE Asia at Webb)
<b>3. Fleet Age (Years)</b>								
- Average	10.2	10.4	10.7	10.9	12.7	13.0	13.3	Increasing ageing, slightly less than Global Fleet ageing
<b>4. Services (strings)</b>								
- Total Services	24	24	24	24	23	22	25	Net increase (BAL, TSL & Zim)
- Asia Route Services	14	13	13	14	14	15	17	Net increase (BAL & TSL)
(*) Note: As of 2Q2022, an additional 3 scheduled services are planned (1 x TSL, & 2 x Zim) with total 13 vessels (1,118-3,000 TEU size).								

#### Implications for Future View Since Last Analysis:

1. Confirming Continuing Calling of Large 8,000+TEU Vessels pushing Swanson access
2. Confirming Continuing Ageing of Melbourne-calling Fleet due to size-mix used
3. Increased Number of Services with minor carrier entrants (BAL, TSL, & Zim) on Asia and NZ trade routes leading to market share fragmentation and average vessel TEU size back at 2018 level. This development may dampen vessel size upsizing on Asian trade if demand growth flat / reducing.





## 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. Overall indicative container trade demand forecast, as provided by the PoM (BISOE model, dated 03/05/2022), is used in the modelling.

### 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.

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, an ultimate large ship maximum of **10,000 TEU at Swanson Dock** (Westgate Bridge air-draught constrained at 50.1m) and **14,000 TEU at Webb Dock** (Heads constrained) is assumed. As a starting position (the baseline), the modelling assumes that services will remain at their current respective Port of Melbourne dock precinct until a constraint is hit.

### 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 previous fleet forecasts, 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, the July 2022 detailed analysis of the global fleet (see section 2.4 above) has 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 2022-2050 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 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).

### 4.5 COVID-19 Pandemic and Global Supply-Chain impacts on vessel visits

Analysis of actual versus scheduled annual vessel visits to the Port of Melbourne in CY2021 has shown that carriers have not met their scheduled number of visits per year with around 82% of scheduled visits actually occurring (excl. extra vessel loaders). **Typical levels of service delivery are 95-98% (i.e. before recent global supply chain and port congestion issues).** It is assumed that shipping markets will normalize again taking several years for service delivery to reach an assumed **100% for planning purposes** (see section 4.8 below on the assumptions used in the modelling).



## 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 a large vessel is assumed suddenly deployed with surplus capacity (i.e. in the case when vessel size jumps from 6,000 TEU to 8,000 TEU) then this excess capacity is 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 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 changes are sporadic and hard to predict.

However, the impact of these consolidations has historically been another driver for rapidly introducing larger containerships as shipping line market shares are combined to support the economics of larger vessels.

This general consolidation effect is excluded from the modelling, 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 has recently occurred in Melbourne and is discussed further in section 4.8 below.





## Modelling Assumptions used for Estimating Future Fleet Visits

### 4.8 Modelling using two future fleet scenarios (A and B)

In order to capture potential differences in how the container shipping market may return to normalised operating conditions after the exceptional 2020-2022 period, two Fleet Scenarios (A and B) have been modelled with the differences between the two summarized in the table below. Some factors which are background to the assumptions used in the Scenarios are: recent abnormally high freight and charter rates/profits for carriers sustaining opportunistic small vessel operations; supply-demand expected to rebalance in the next two years with vessels on order being delivered and the demolition of older vessels recommencing as greenhouse gas (GHG) abatement measures accelerate the need for more efficient / alternative-fuelled vessels; and the current overseas port congestion stabilizing / reducing as supply-demand balances.

**Table 9** Overview of Modelled Scenarios A and B

Modelling Assumptions used for Fleet Forecasts (differences between scenarios)	Scenario A	Scenario B
1. Container Demand	PoM Forecast	Same as for A
2. Normalisation of Service Delivery as Supply-Chains recover, % of Scheduled visits performed	100% by 2025 (85% in 2023, 95% in 2024)	100% by 2026 (78% in 2023, 82.5% in 2024, 90% in 2025)
3. Recent Opportunistic Small Vessel Services	3 Cease by 2023 (of which 2 merged with existing larger vessel services)	All remain with market share taken from larger vessel services
4. Vessel Services transferring between PoM Dock Precincts	Swanson Dock vessels generally transfer to Webb Dock when reach 10,000 TEU size; one service assumed to remain by splitting into 2x weekly strings; small vessel size services at Webb Dock assumed to transfer to Swanson Dock if capacity shortfall at Webb Dock / surplus capacity at Swanson Dock	Swanson Dock vessels generally transfer to Webb Dock when reach 10,000 TEU size; small vessel size services at Webb Dock assumed to transfer to Swanson Dock if capacity shortfall at Webb Dock / surplus capacity at Swanson Dock



## Modelling – Services Analysed

### 4.9 Modelled International Containership Services

Table 10 Port of Melbourne Container Services Overview (Projected 2Q 2022)

Service #	Region(s) Served	Scheduled Frequency (days)	PoM Dock Precinct	Number Vessels	Average TEU Size (CY2021)	Min. TEU Size (CY2021)	Max. TEU Size (CY2021)	Average Max. Air Draught, m (CY2021)
1	SE Asia	7.0	ESD	5	4,348	4,250	4,578	45.7
2	SE Asia	7.0	ESD	5	5,143	4,250	5,888	47.7
3	N&E Asia	7.0	WSD	5	5,676	4,253	5,782	47.3
4	N&E Asia	7.0	ESD	5	4,001	2,810	5,060	45.1
5	N&E Asia	7.0	WSD	5	5,730	5,618	5,888	48.1
6	N&E Asia	7.0	VICT	5	5,585	5,023	6,350	47.9
7	N&E Asia	7.0	WSD	6	5,545	5,047	6,039	47.0
8	SE Asia	7.0	VICT	6	8,683	4,250	10,622	52.1
9	SE Asia	7.0	WSD	6	6,015	5,600	6,921	48.3
10	N&E Asia	7.0	ESD	7	6,649	5,301	8,450	46.7
11	N&E Asia	7.0	VICT	5	8,542	8,063	8,888	51.2
12	SE Asia/NZ	7.0	ESD	6	3,370	2,526	5,060	46.1
13	SE Asia	7.0	VICT	7	4,447	4,250	6,921	47.6
14	N&E Asia	7.0	ESD	6	2,909	2,732	4,253	44.3
15	SE Asia	7.0	ESD	7	2,612	1,809	2,824	44.6
16	NAm.-EC	7.0	ESD	11	3,365	3,028	3,630	46.4
17	NAm.-WC	7.0	WSD	9	4,229	3,765	4,870	46.0
18	Europe-Panama	10.0	WSD	7	2,348	2,200	2,556	45.7
19a	Europe-Suez	7.0	ESD	10	8,555	6,572	9,580	47.5
19b	Europe-Suez		VICT	4	8,977	6,350	9,326	53.5
20	NZ only	7.0	WSD	3	1,756	1,740	2,226	40.3
21	Pac.Isl./PNG	20.0	ESD	1	981	981	981	37.4
22	Pac.Isl./PNG	21.0	ESD	2	1,461	1,304	1,617	39.8

WGB limit =  
50.1m

Note: WGB is Westgate Bridge

## Modelling – Services Analysed

### 4.9 Modelled International Containership Services

**Table 10 (cont.)** Port of Melbourne Container Services Overview (Projected 2Q 2022) - continued

								WGB limit = 50.1m
Service #	Region(s) Served	Scheduled Frequency (days)	PoM Dock Precinct	Number Vessels	Average TEU Size (CY2021)	Min. TEU Size (CY2021)	Max. TEU Size (CY2021)	Average Max. Air Draught, m (CY2021)
23-New	N&E Asia	12.0	VICT	3	4,679	4,395	4,963	49.6
24-New	N&E Asia	7.0	ESD	5	2,506	1,740	4,363	42.4
25-New	N&E Asia	7.0	WSD	6	4,478	4,211	4,992	-
26-New	N&E Asia	7.0	VICT	6	1,756	1,708	1,800	-
27-New	NZ only	7.0	VICT	2	1,102	1,102	1,102	38.9
28-New	NZ only	21.0	VICT	1	1,118	1,118	1,118	-
Extra1-SD	All	-	SD	11	3,992	2,546	8,533	45.4
Extra2-WD	All	-	VICT	3	5,003	2,546	9,640	48.9
All	All	-	SD	128	4,421	981	9,580	-
All	All	-	VICT	42	5,540	1,102	10,622	-
All	All	-	PoM	170	4,697	981	10,622	-

Note 1: Services #25, 26 & 28 are only planned to commence in 1Q or 2Q 2022, so vessel sizes are not actuals for CY2021 but are estimates based as public announcements by carriers.

Note 2: Total numbers of vessels for modelling purposes include visits by non-scheduled extra loaders (Extra 1-SD & Extra 2-WD). Scheduled fleet projected for 2Q2022 is 156 vessels.





## Modelling – Services Analysed

### 4.10 Reference Containership Size Class Dimensions

Table 11 Reference Container Vessel Size Class Dimensions

Reference Container Vessel Size Class Dimensions	PoM Dock	Dimensions - LOA x Beam (m)	Vessel Name (& Operator)	TEU	Year of Build	PoM Routes (2022)
<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 Ural (CMA CGM)	10,622	2015	Asia
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	-

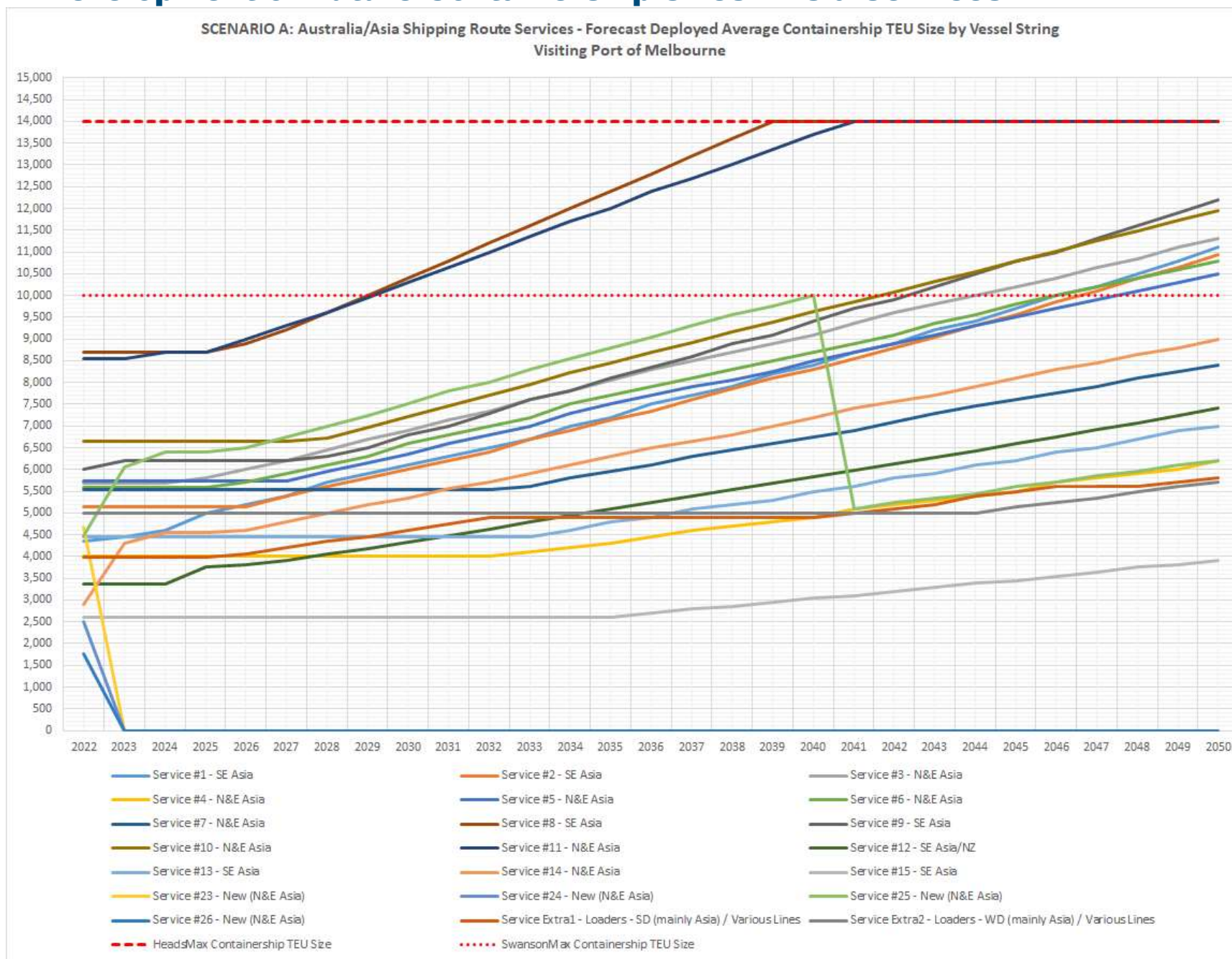
Note: Named Vessels up to 11,000 TEU have called PoM in the recent past (2021).



## Modelling Results – Scenario A

### 5.1 Development of Future Containership Sizes – Asia Services

Figure 1



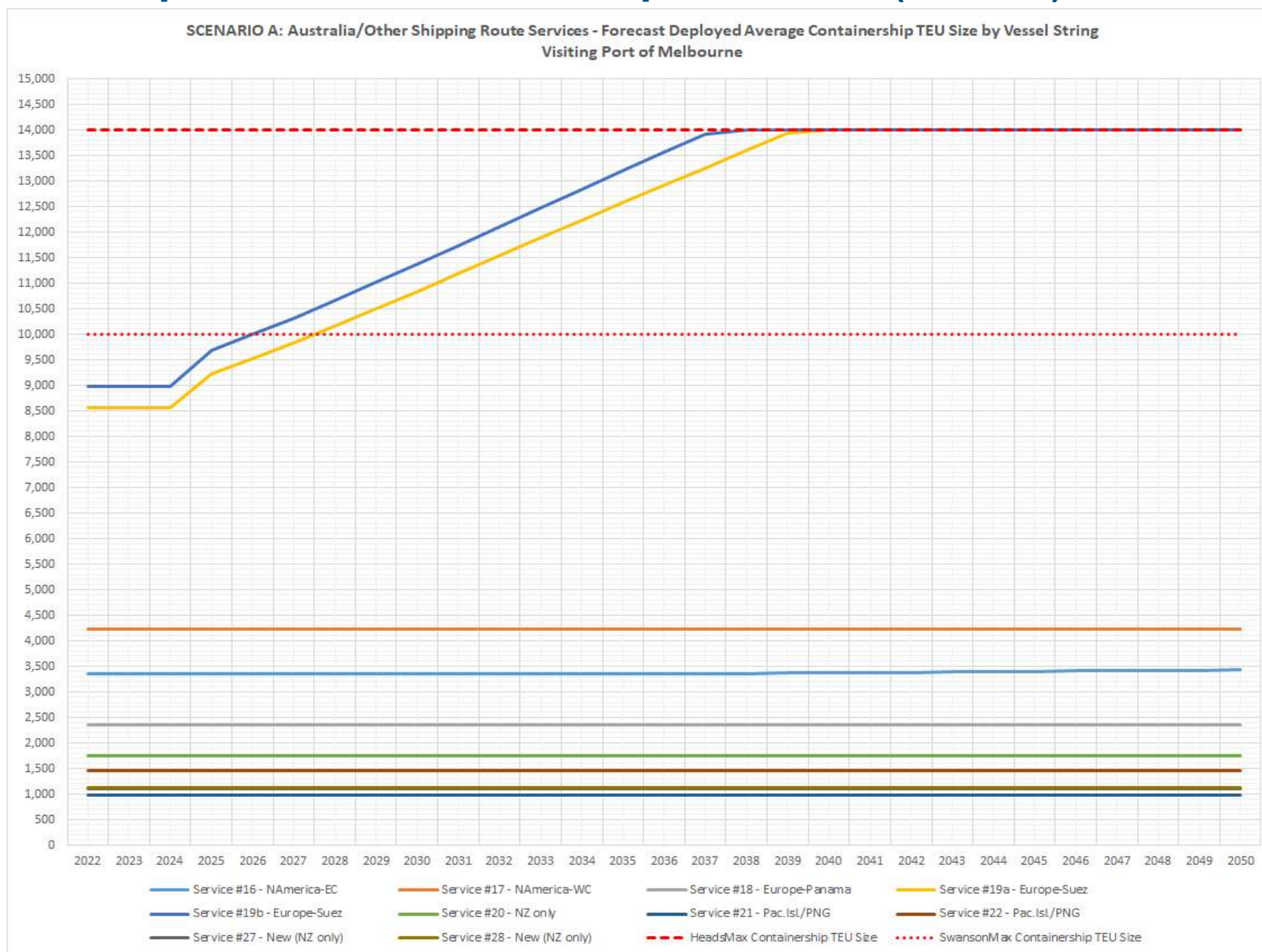




## Modelling Results – Scenario A

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

Figure 2





## Modelling Results – Scenario A

### 5.3 Containership Services at suggested Dock Precinct (2022 to 2030)

Table 12 Containership Services at Port of Melbourne Dock Precincts based on vessel size access

Asia Services - Suggested Dock subject to Capacity & Berth Utilisations	2022	2023	2024	2025	2026	2027	2028	2029	2030
Service #1 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #2 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #3 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #4 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #5 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #6 - N&E Asia	WD	WD	WD	WD	WD	WD	SD	SD	SD
Service #7 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #8 - SE Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #9 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #10 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #11 - N&E Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #12 - SE Asia/NZ	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #13 - SE Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #14 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #15 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #23 - New (N&E Asia)	WD	0	0	0	0	0	0	0	0
Service #24 - New (N&E Asia)	SD	0	0	0	0	0	0	0	0
Service #25 - New (N&E Asia)	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #26 - New (N&E Asia)	WD	0	0	0	0	0	0	0	0
Service Extra1 - Loaders - SD (mainly Asia) / Various Lines	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Extra2 - Loaders - WD (mainly Asia) / Various Lines	WD	WD	WD	WD	WD	WD	WD	WD	WD
Other Services - Suggested Dock subject to Capacity & Berth Utilisations	2022	2023	2024	2025	2026	2027	2028	2029	2030
Service #16 - NAmerica-EC	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #17 - NAmerica-WC	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #18 - Europe-Panama	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #19a - Europe-Suez	SD	SD	SD	SD	SD	SD	WD	WD	WD
Service #19b - Europe-Suez	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #20 - NZ only	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #21 - Pac.Is./PNG	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #22 - Pac.Is./PNG	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #27 - New (NZ only)	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #28 - New (NZ only)	WD	WD	WD	WD	WD	WD	WD	WD	WD





## Modelling Results – Scenario A

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

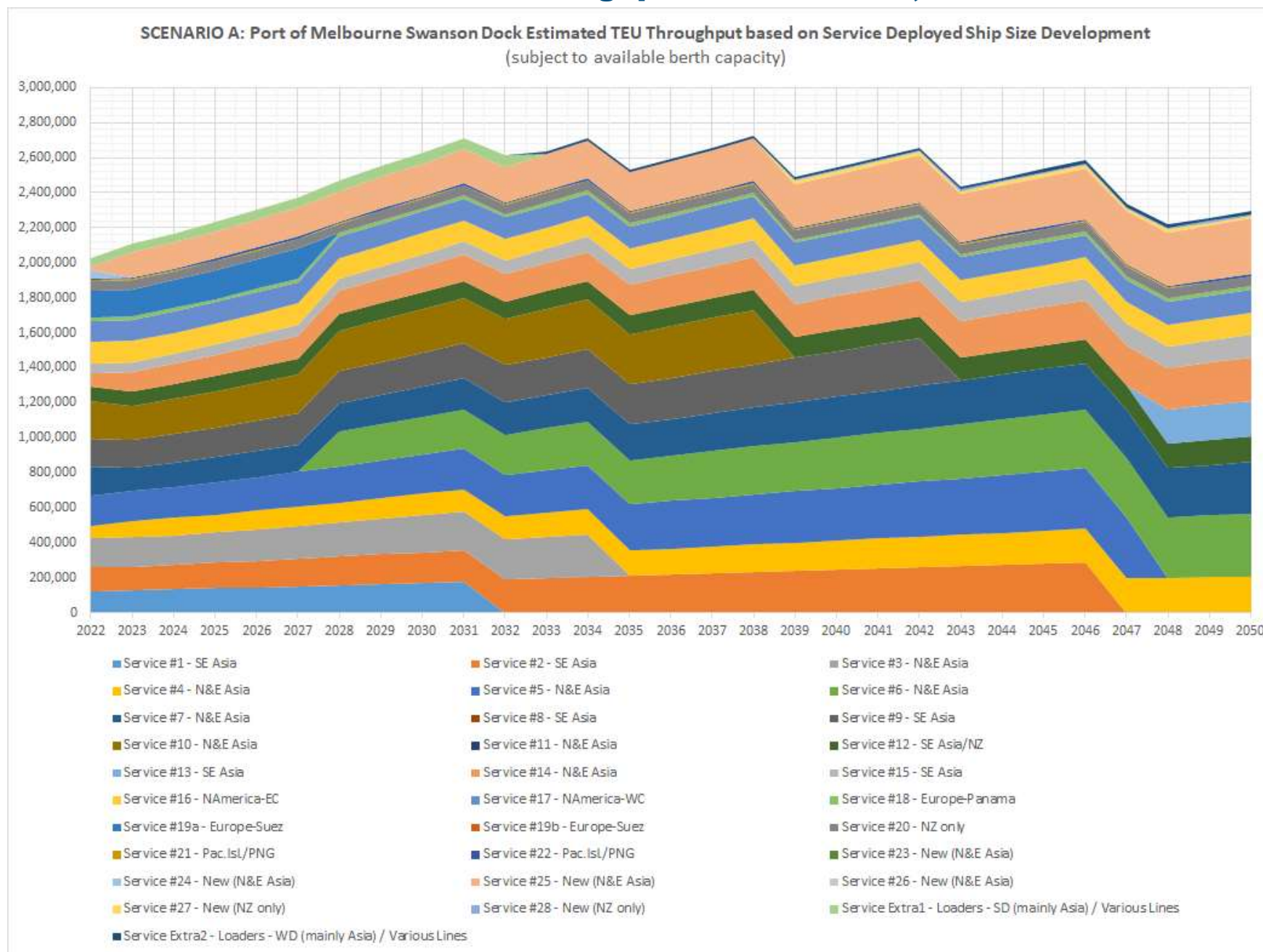
Table 13 Containership Services at Port of Melbourne Dock Precincts based on vessel size access

Asia Services - Suggested Dock subject to Capacity & Berth Utilisations	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Service #1 - SE Asia	SD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #2 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #3 - N&E Asia	SD	SD	SD	SD	WD	WD	WD	WD	WD	WD
Service #4 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #5 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #6 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #7 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #8 - SE Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #9 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #10 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	WD	WD
Service #11 - N&E Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #12 - SE Asia/NZ	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #13 - SE Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #14 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #15 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #23 - New (N&E Asia)	0	0	0	0	0	0	0	0	0	0
Service #24 - New (N&E Asia)	0	0	0	0	0	0	0	0	0	0
Service #25 - New (N&E Asia)	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #26 - New (N&E Asia)	0	0	0	0	0	0	0	0	0	0
Service Extra1 - Loaders - SD (mainly Asia) / Various Lines	SD	SD	WD	WD	WD	WD	WD	WD	WD	WD
Service Extra2 - Loaders - WD (mainly Asia) / Various Lines	WD	WD	SD	SD	SD	SD	SD	SD	SD	SD
<b>Other Services - Suggested Dock subject to Capacity &amp; Berth Utilisations</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>2039</b>	<b>2040</b>
Service #16 - NAmerica-EC	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #17 - NAmerica-WC	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #18 - Europe-Panama	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #19a - Europe-Suez	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #19b - Europe-Suez	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #20 - NZ only	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #21 - Pac.Isl./PNG	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #22 - Pac.Isl./PNG	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #27 - New (NZ only)	WD	WD	WD	WD	WD	WD	WD	WD	SD	SD
Service #28 - New (NZ only)	WD	WD	WD	WD	WD	WD	WD	WD	SD	SD

## Modelling Results – Scenario A

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

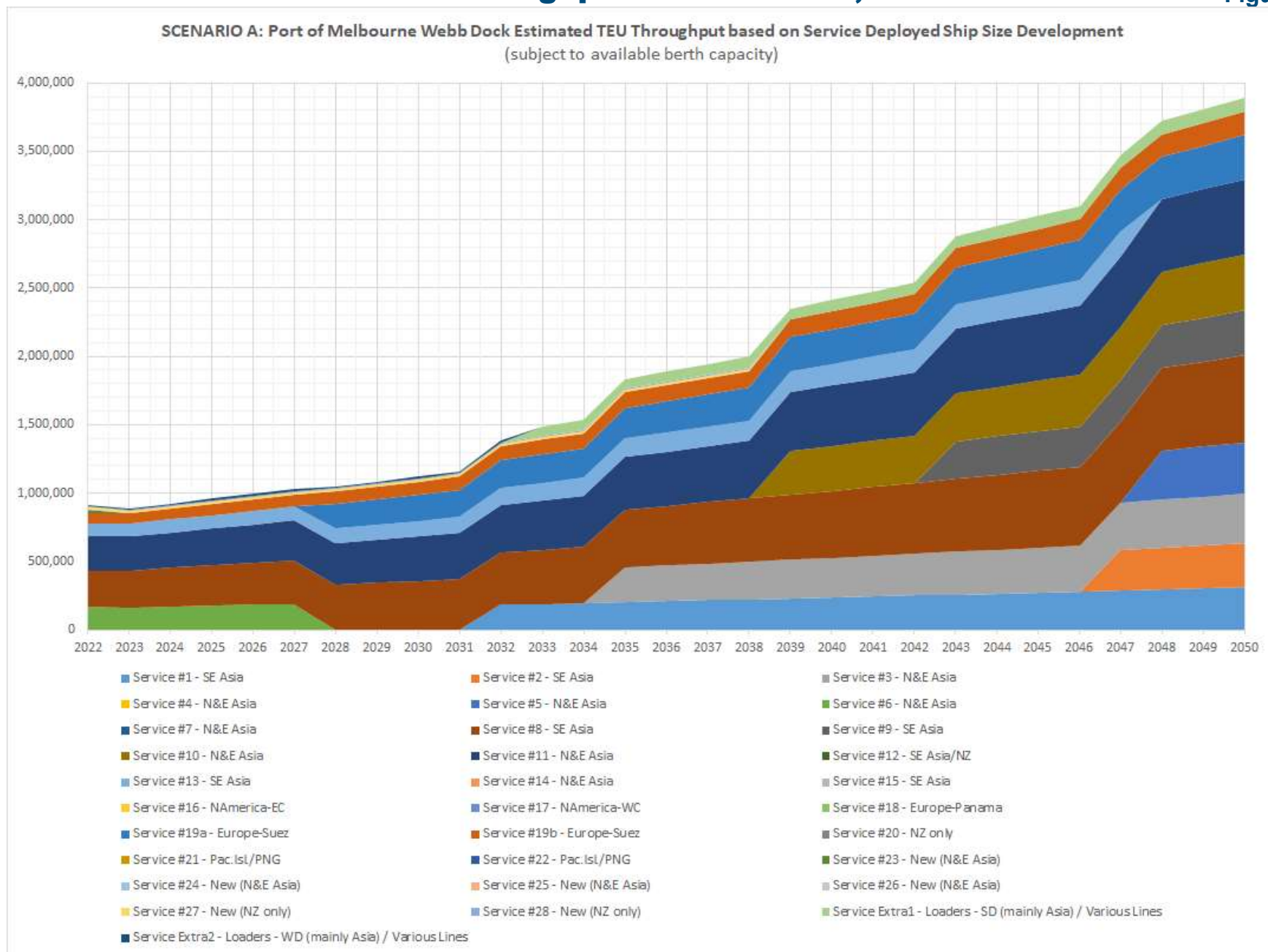
Figure 3



## Modelling Results – Scenario A

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

Figure 4



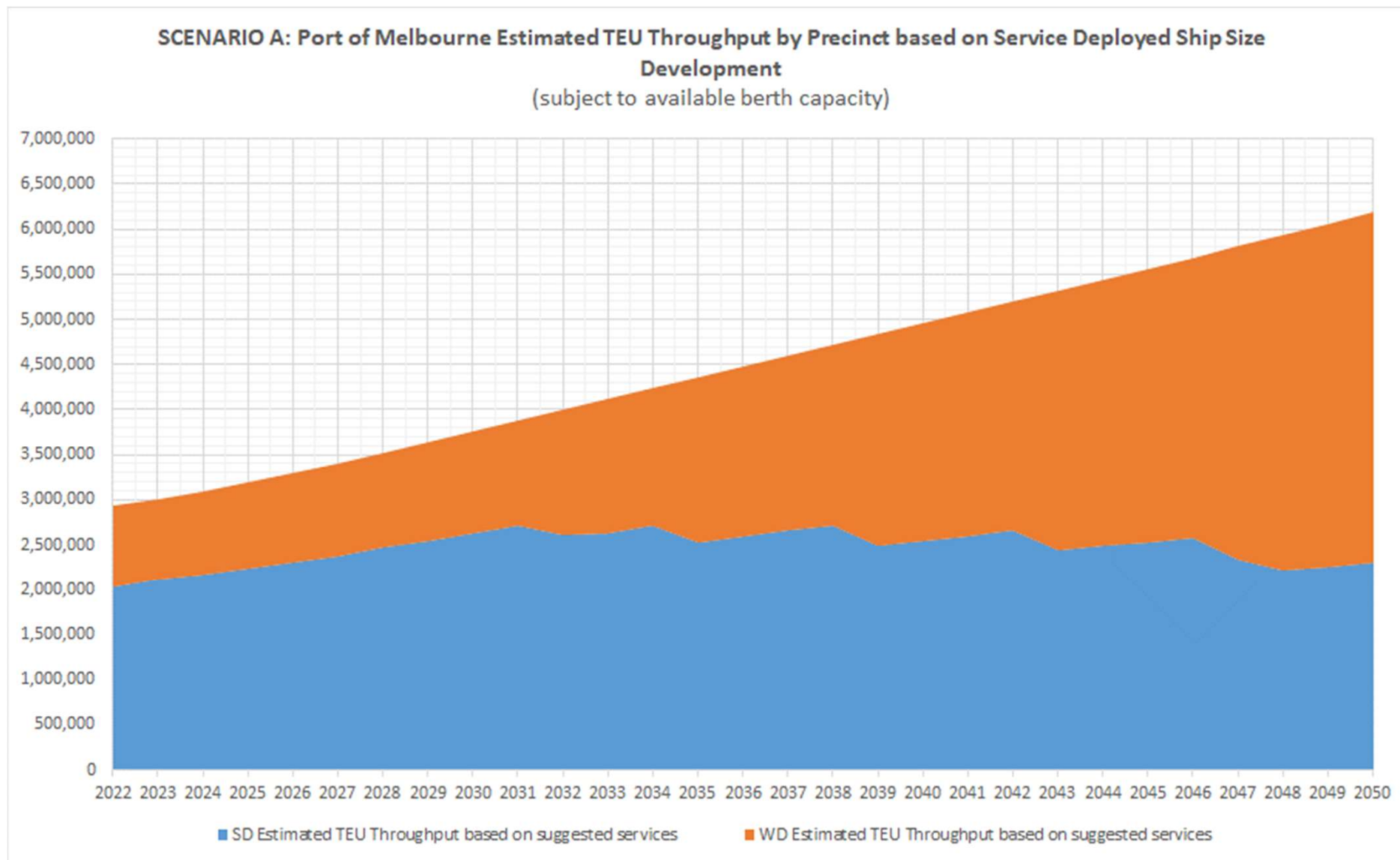




## Modelling Results – Scenario A

### 5.7 Port of Melbourne Throughput by Precinct given ship size development

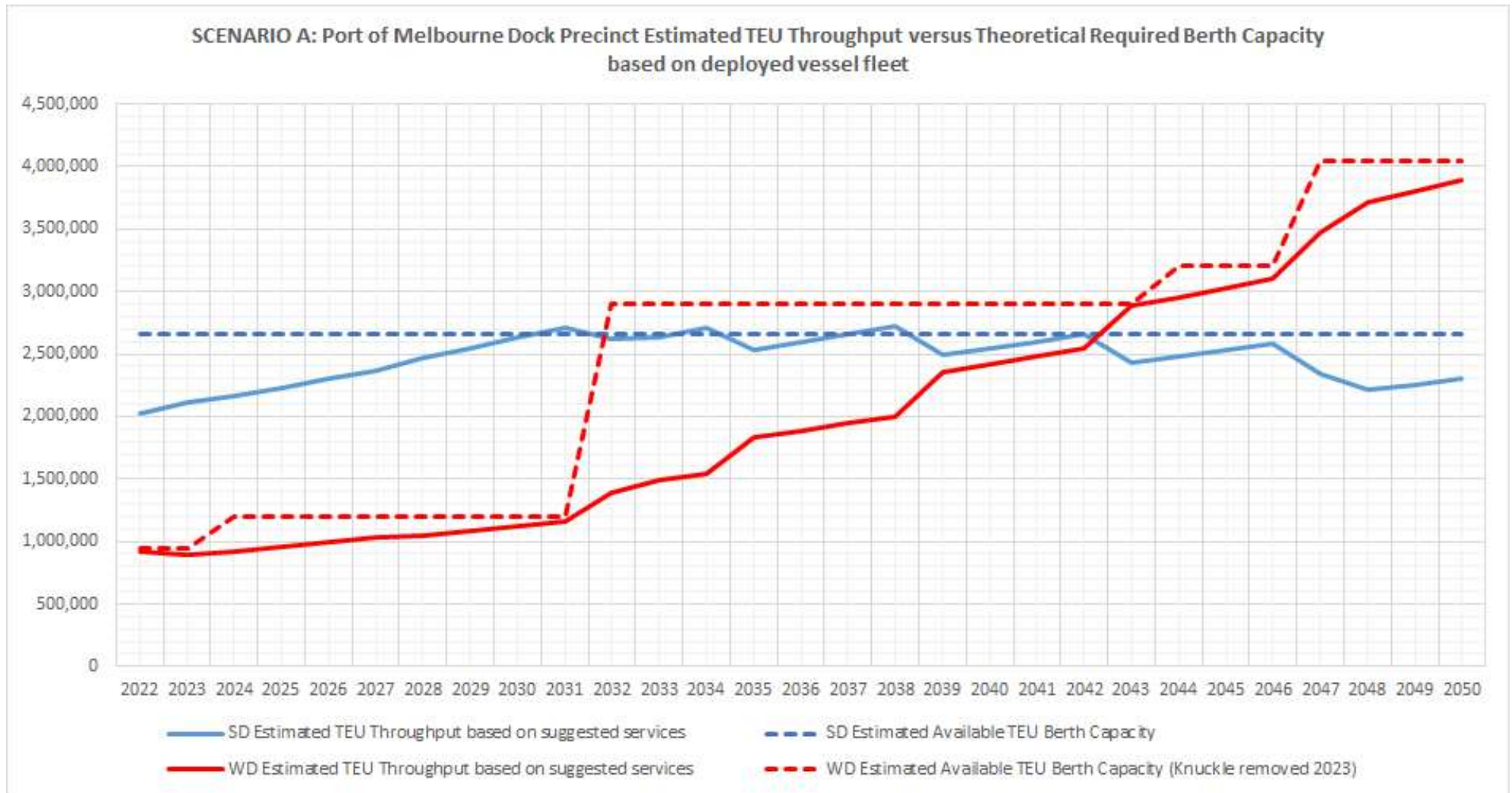
Figure 5



## Modelling Results – Scenario A

### 5.8 Port of Melbourne – Check on Estimated Throughput and Capacity by Precinct

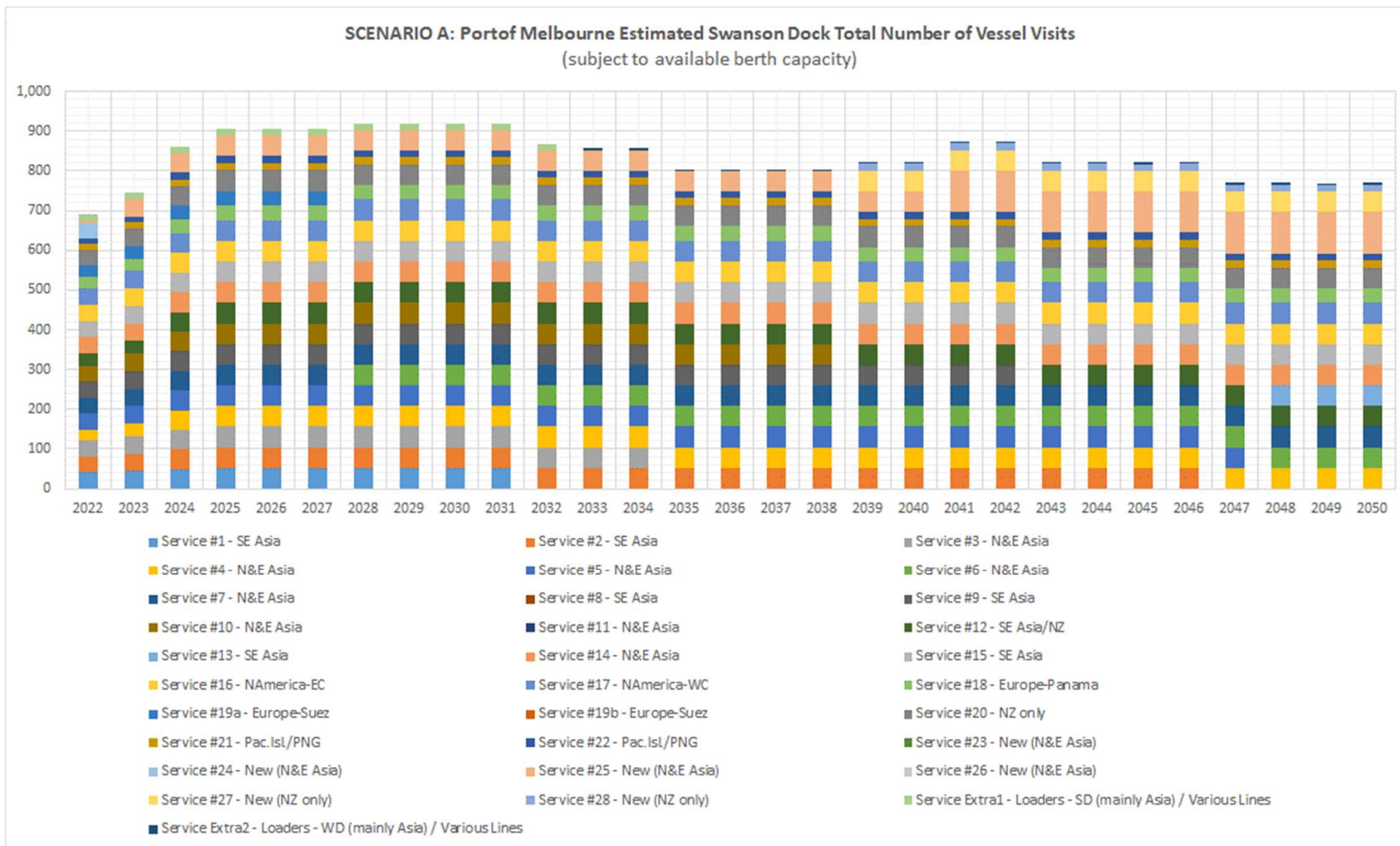
Figure 6



## Modelling Results – Scenario A

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

Figure 7

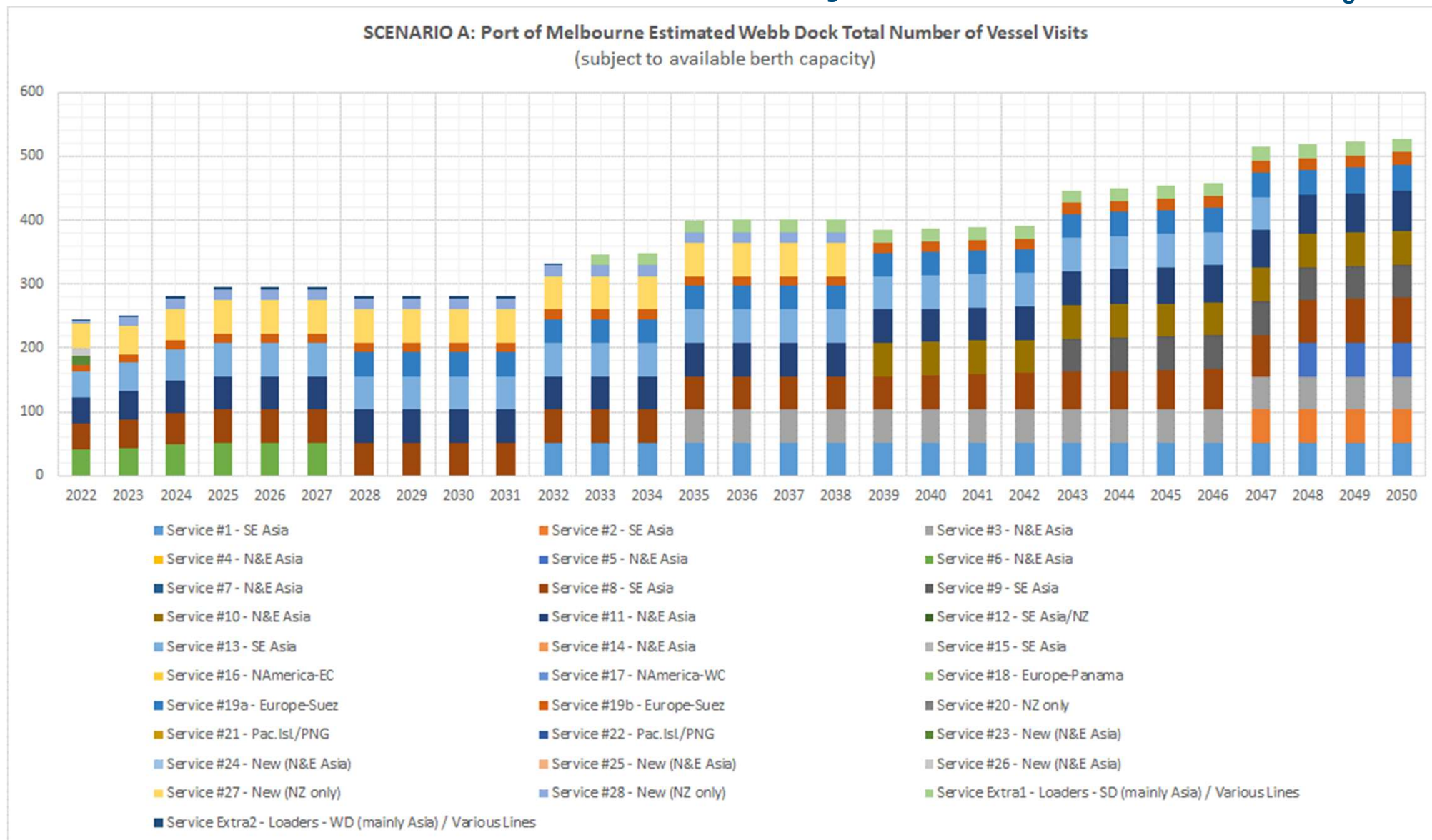




## Modelling Results – Scenario A

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

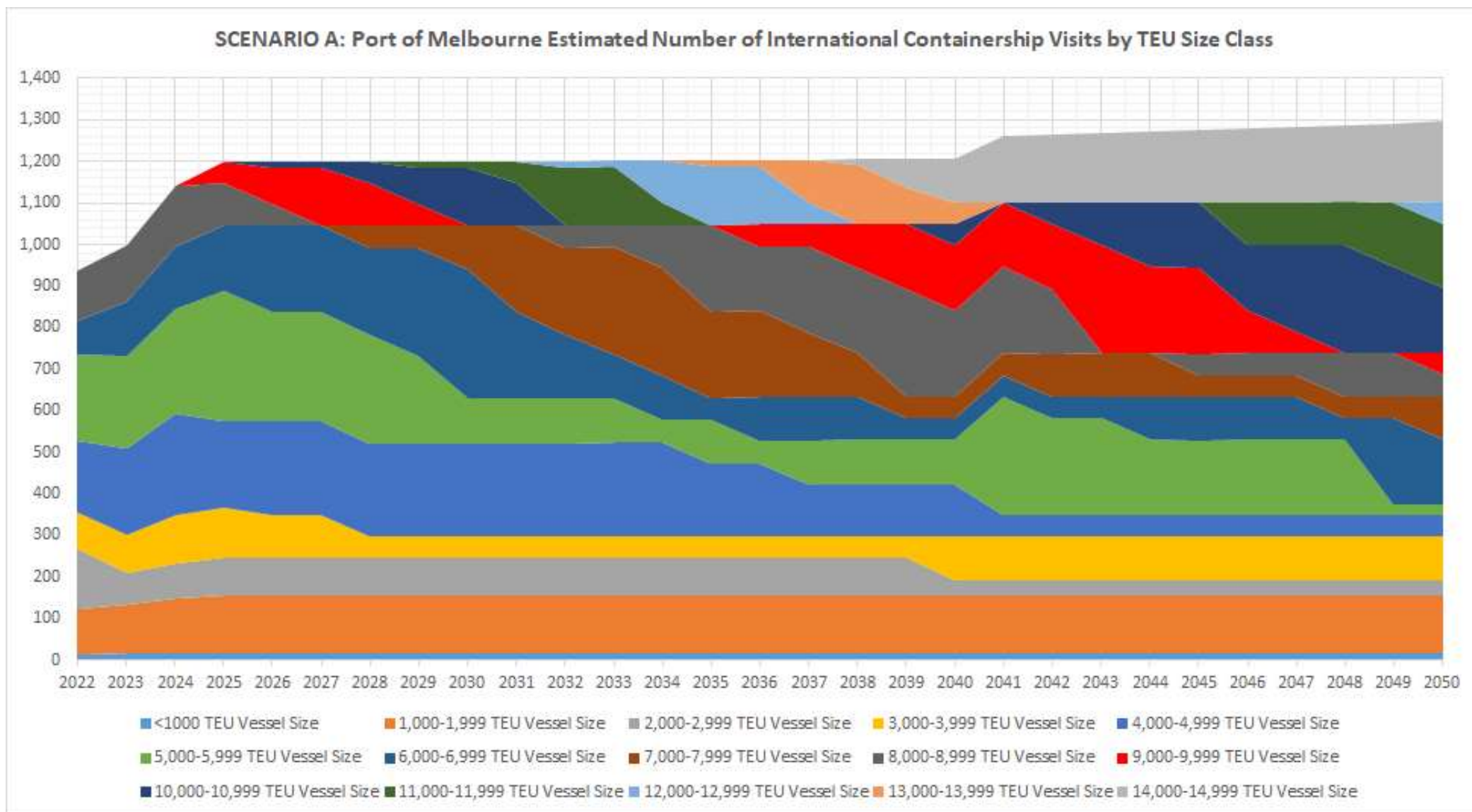
Figure 8



## Modelling Results – Scenario A

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

Figure 9

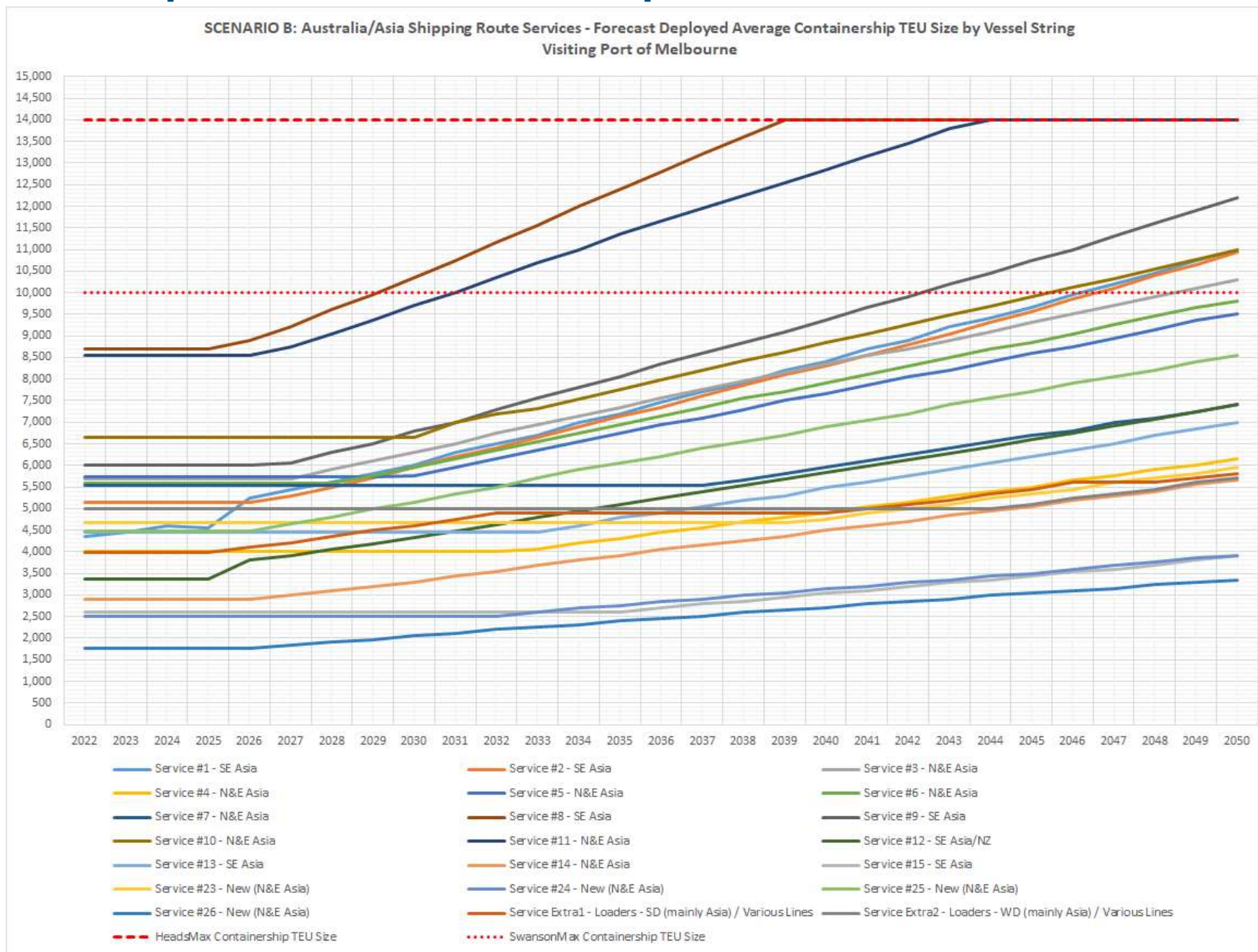




## Modelling Results – Scenario B

### 6.1 Development of Future Containership Sizes – Asia Services

Figure 10

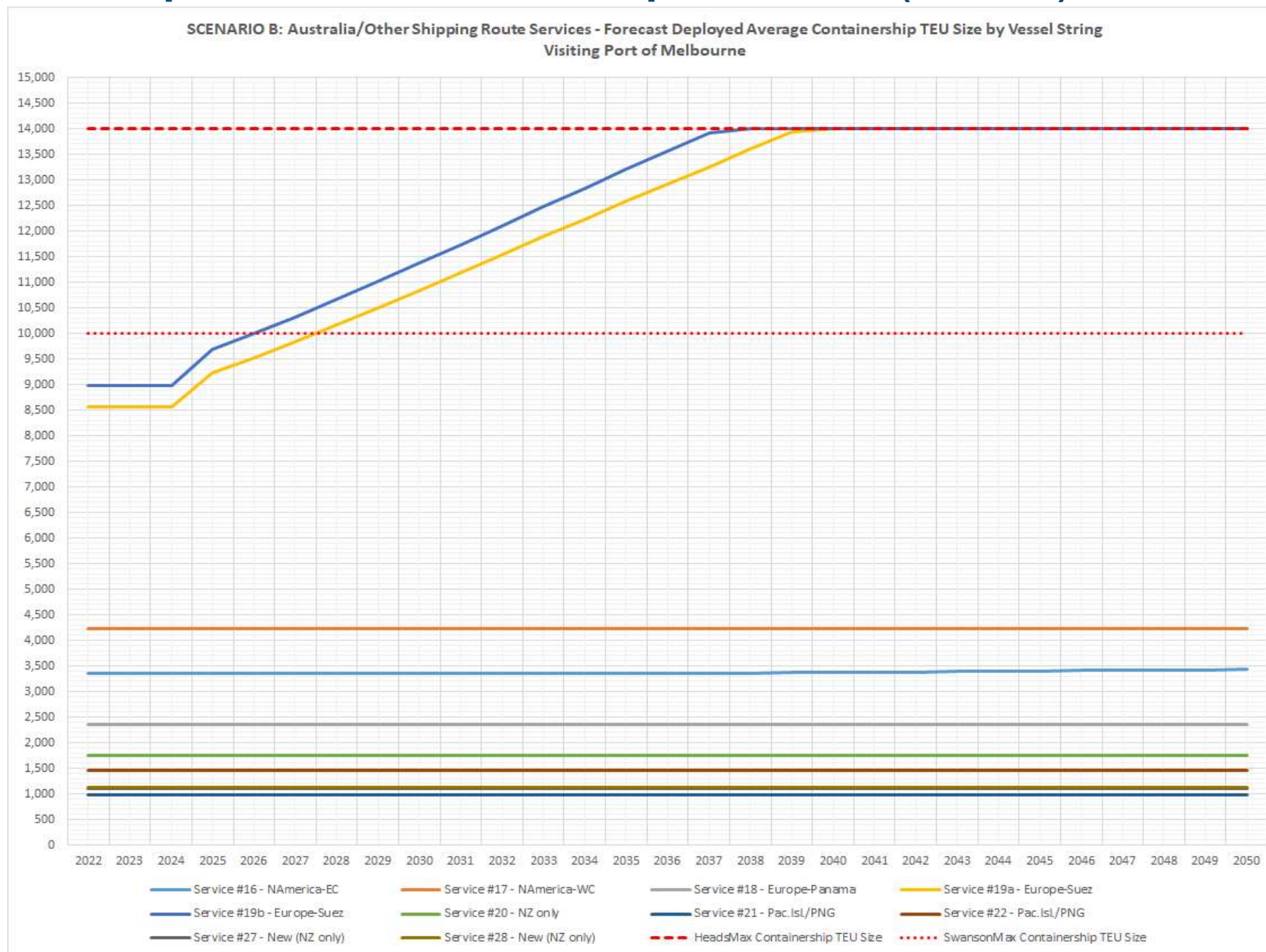




## Modelling Results – Scenario B

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

Figure 11





## Modelling Results – Scenario B

### 6.3 Containership Services at suggested Dock Precinct (2022 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	2022	2023	2024	2025	2026	2027	2028	2029	2030
Service #1 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #2 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #3 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #4 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #5 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #6 - N&E Asia	WD	WD	WD	WD	WD	WD	SD	SD	SD
Service #7 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #8 - SE Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #9 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #10 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #11 - N&E Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #12 - SE Asia/NZ	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #13 - SE Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #14 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #15 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #23 - New (N&E Asia)	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #24 - New (N&E Asia)	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #25 - New (N&E Asia)	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #26 - New (N&E Asia)	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Extra1 - Loaders - SD (mainly Asia) / Various Lines	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service Extra2 - Loaders - WD (mainly Asia) / Various Lines	WD	WD	WD	WD	WD	WD	WD	WD	WD
Other Services - Suggested Dock subject to Capacity & Berth Utilisations	2022	2023	2024	2025	2026	2027	2028	2029	2030
Service #16 - NAmerica-EC	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #17 - NAmerica-WC	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #18 - Europe-Panama	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #19a - Europe-Suez	SD	SD	SD	SD	SD	SD	WD	WD	WD
Service #19b - Europe-Suez	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #20 - NZ only	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #21 - Pac.Isl./PNG	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #22 - Pac.Isl./PNG	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #27 - New (NZ only)	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #28 - New (NZ only)	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 15 Containership Services at Port of Melbourne Dock Precincts based on vessel size access

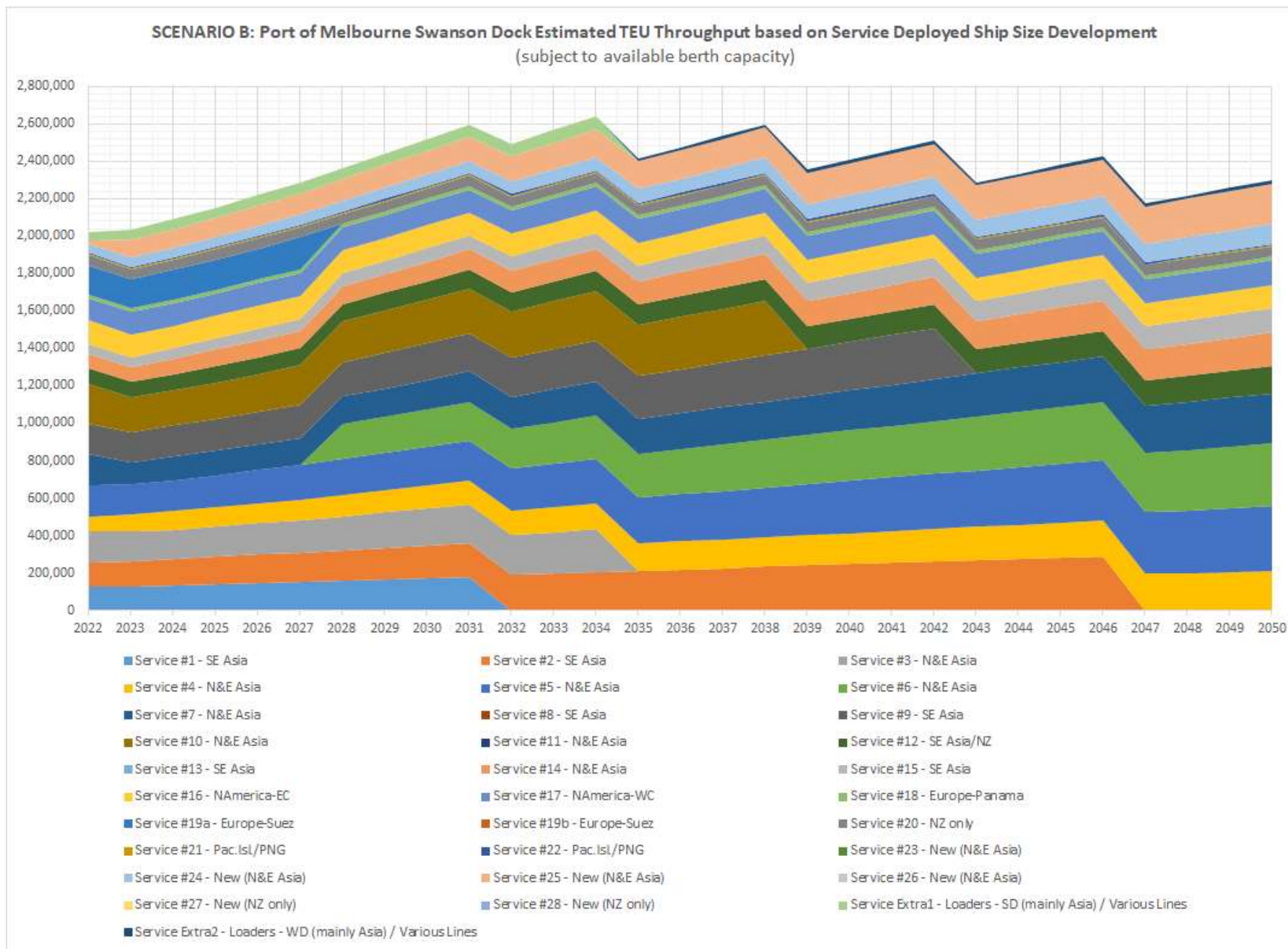
Asia Services - Suggested Dock subject to Capacity & Berth Utilisations	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Service #1 - SE Asia	SD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #2 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #3 - N&E Asia	SD	SD	SD	SD	WD	WD	WD	WD	WD	WD
Service #4 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #5 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #6 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #7 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #8 - SE Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #9 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #10 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	WD	WD
Service #11 - N&E Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #12 - SE Asia/NZ	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #13 - SE Asia	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #14 - N&E Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #15 - SE Asia	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #23 - New (N&E Asia)	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #24 - New (N&E Asia)	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #25 - New (N&E Asia)	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #26 - New (N&E Asia)	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service Extra1 - Loaders - SD (mainly Asia) / Various Lines	SD	SD	SD	SD	WD	WD	WD	WD	WD	WD
Service Extra2 - Loaders - WD (mainly Asia) / Various Lines	WD	WD	WD	WD	SD	SD	SD	SD	SD	SD
Other Services - Suggested Dock subject to Capacity & Berth Utilisations	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Service #16 - NAmerica-EC	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #17 - NAmerica-WC	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #18 - Europe-Panama	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #19a - Europe-Suez	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #19b - Europe-Suez	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #20 - NZ only	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #21 - Pac.Isl./PNG	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #22 - Pac.Isl./PNG	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD
Service #27 - New (NZ only)	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD
Service #28 - New (NZ only)	WD	WD	WD	WD	WD	WD	WD	WD	WD	WD



## Modelling Results – Scenario B

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

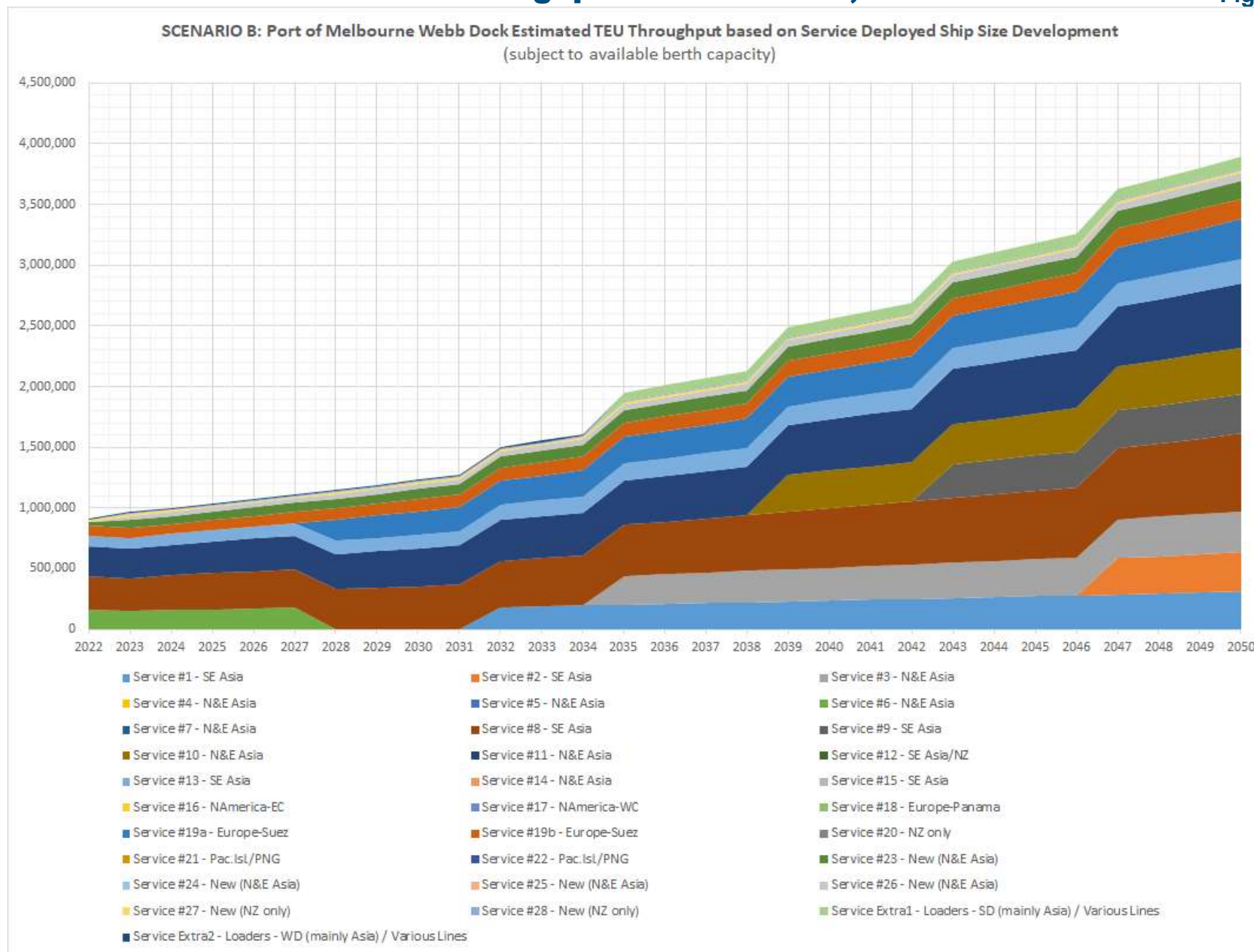
Figure 12



## Modelling Results – Scenario B

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

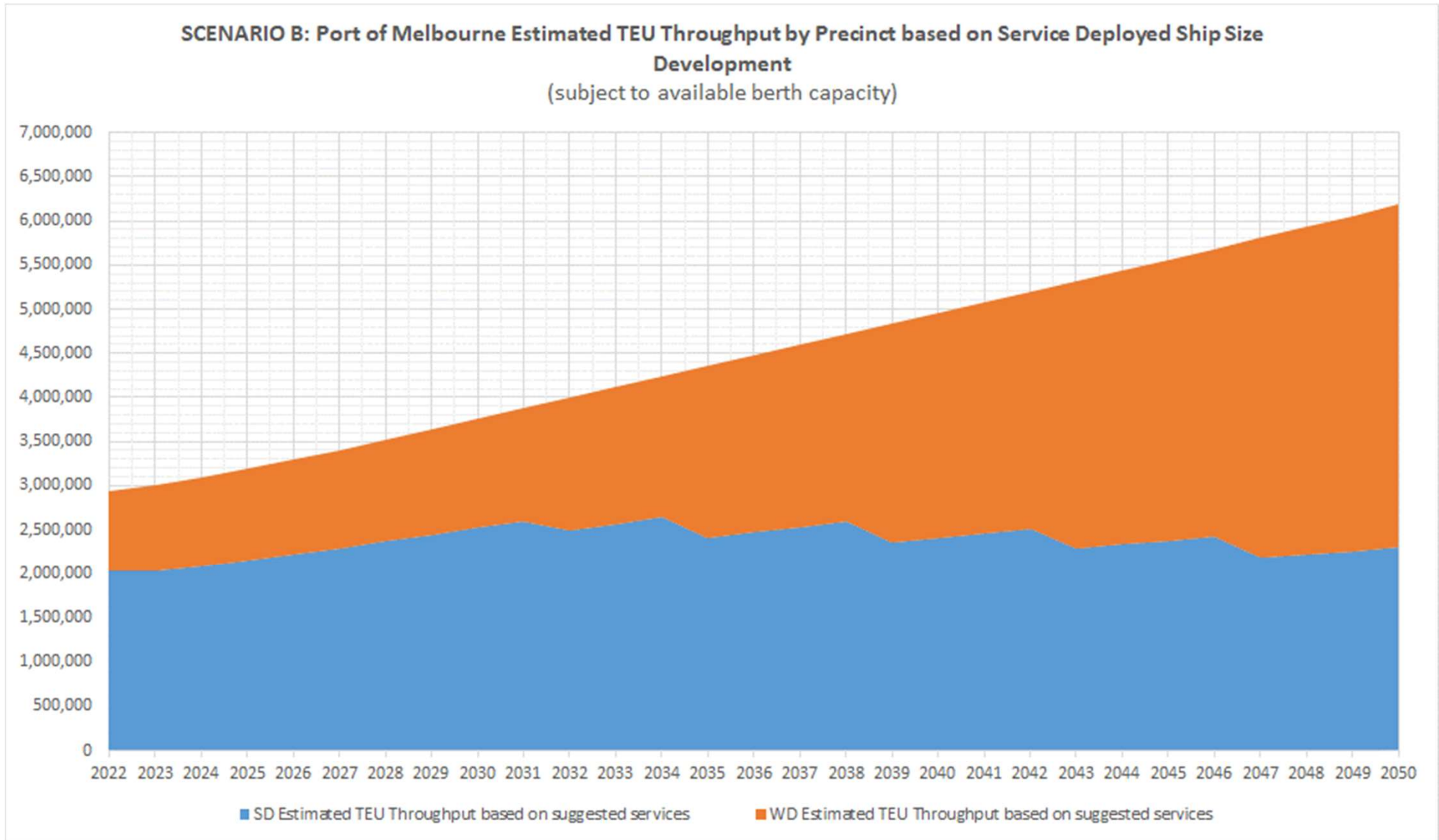
Figure 13



## Modelling Results – Scenario B

### 6.7 Port of Melbourne Throughput by Precinct given ship size development

Figure 14

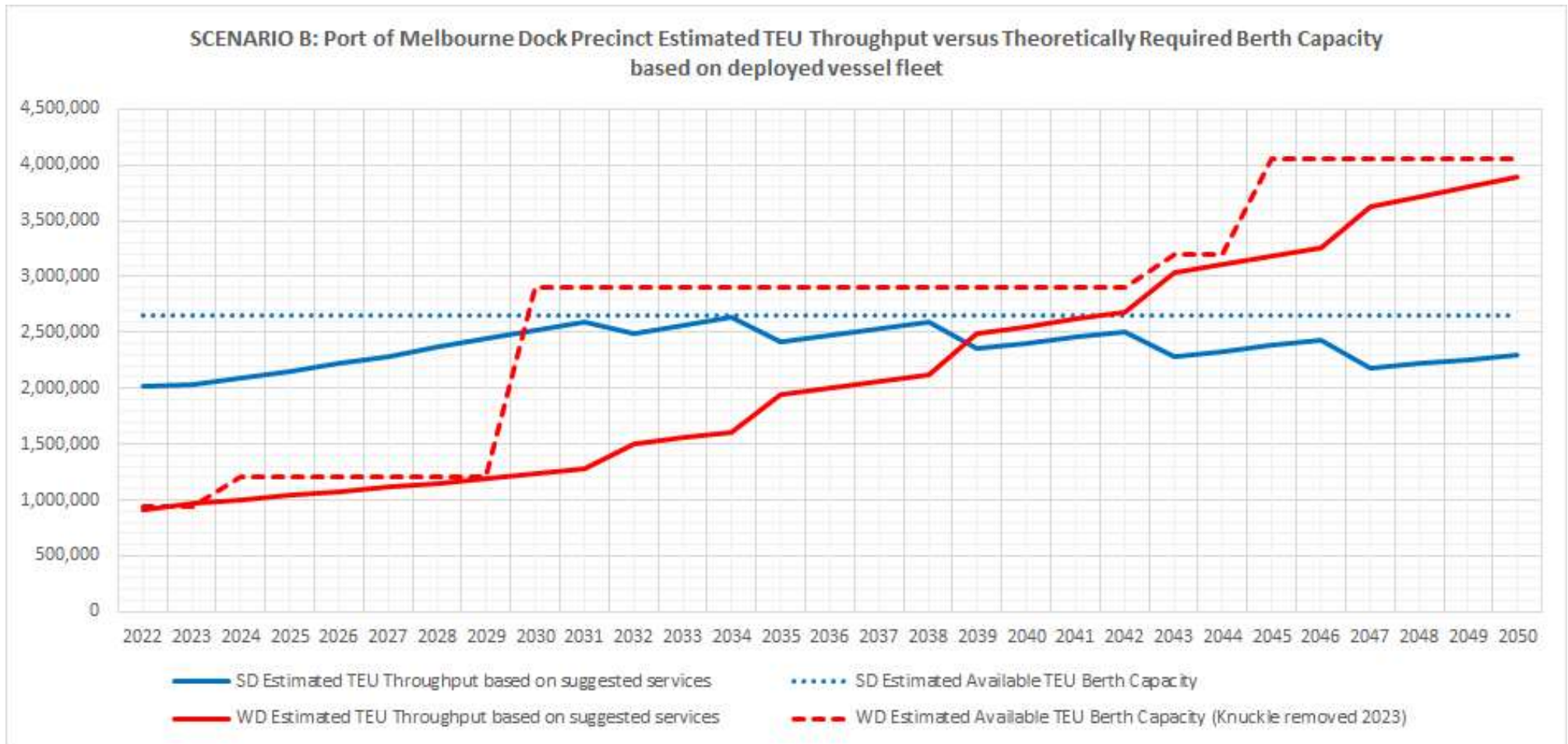




### Modelling Results – Scenario B

#### 6.8 Port of Melbourne – Check on Estimated Throughput and Capacity by Precinct

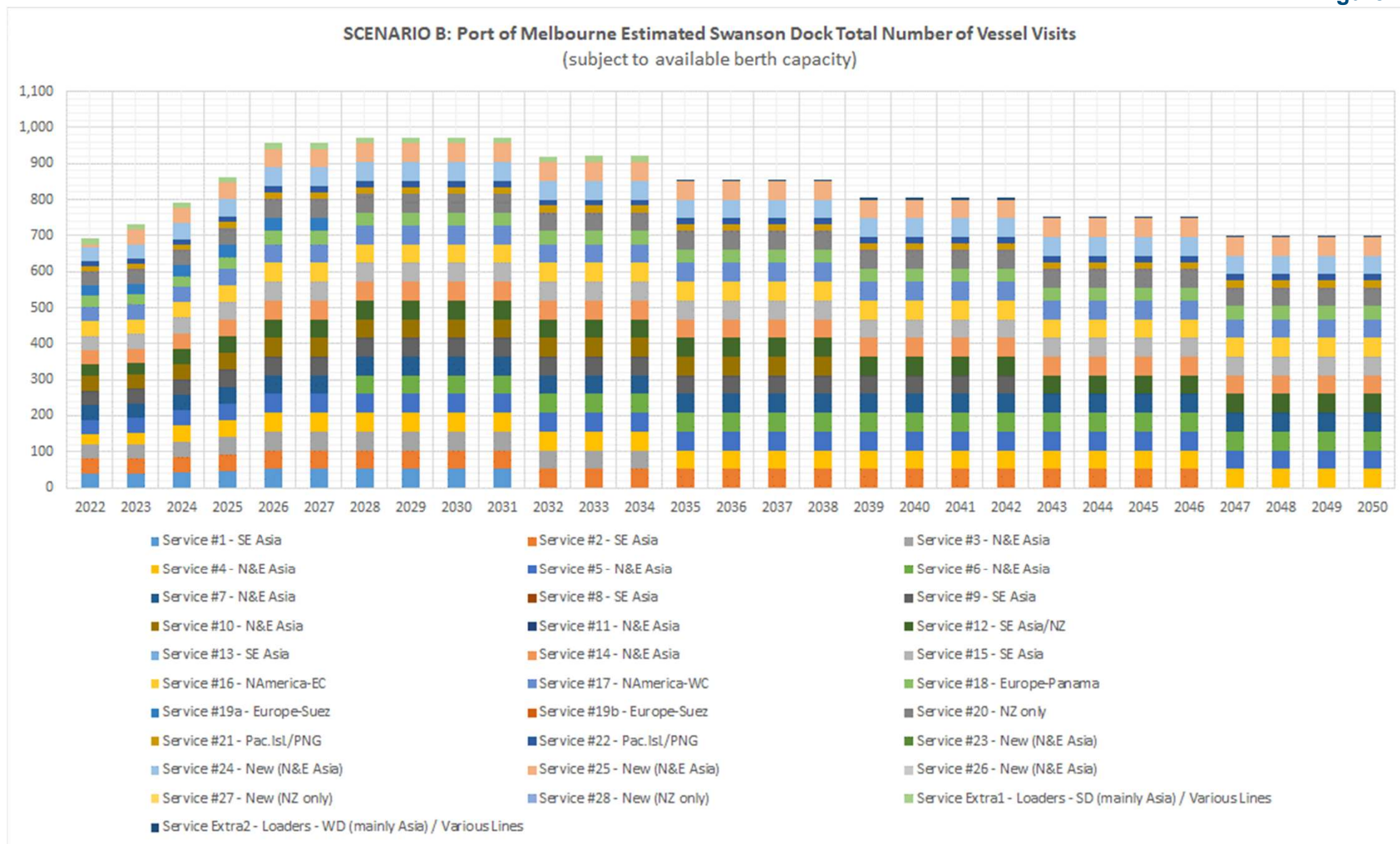
Figure 15



## Modelling Results – Scenario B

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

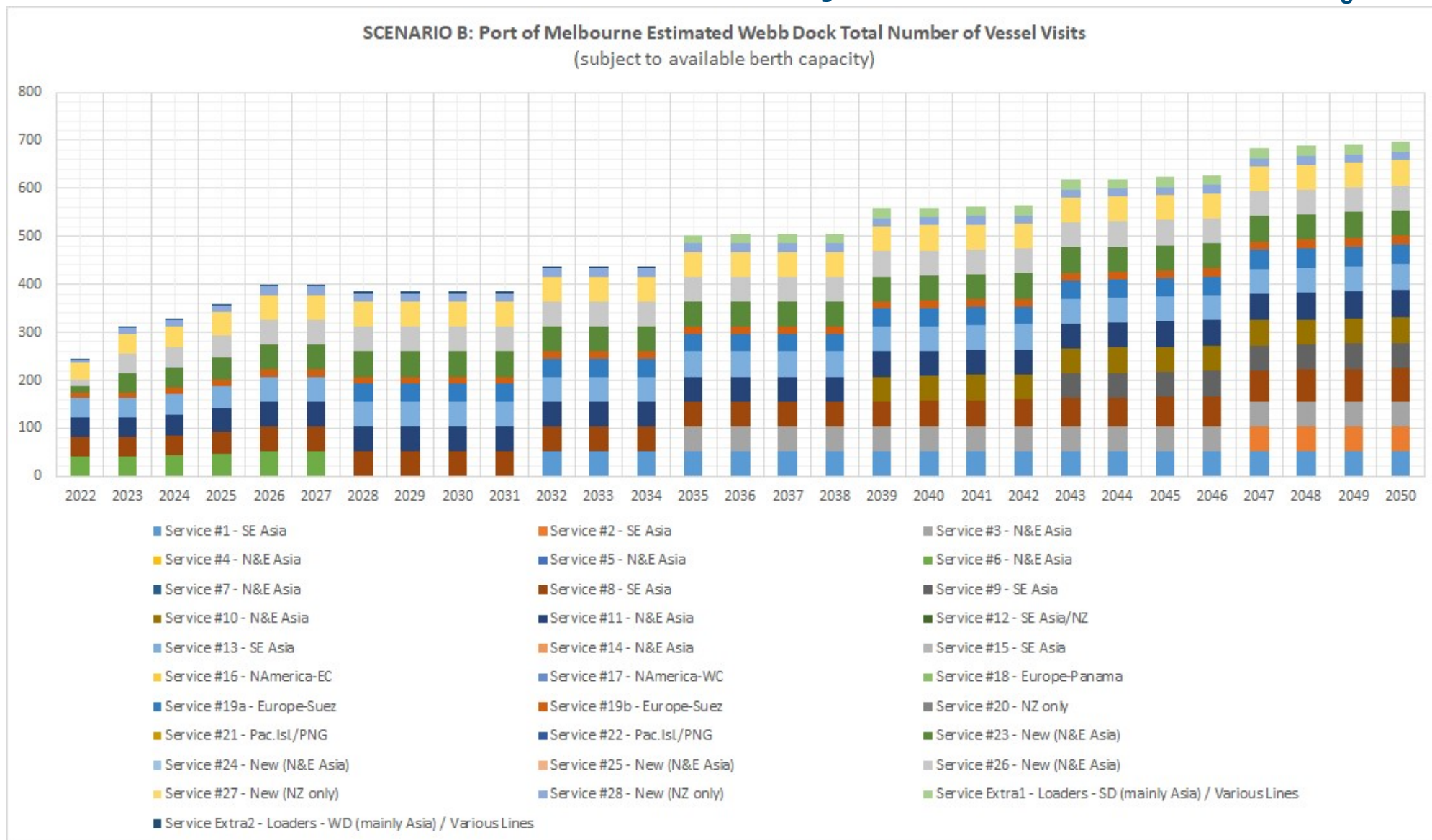
Figure 16



## Modelling Results – Scenario B

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

Figure 17

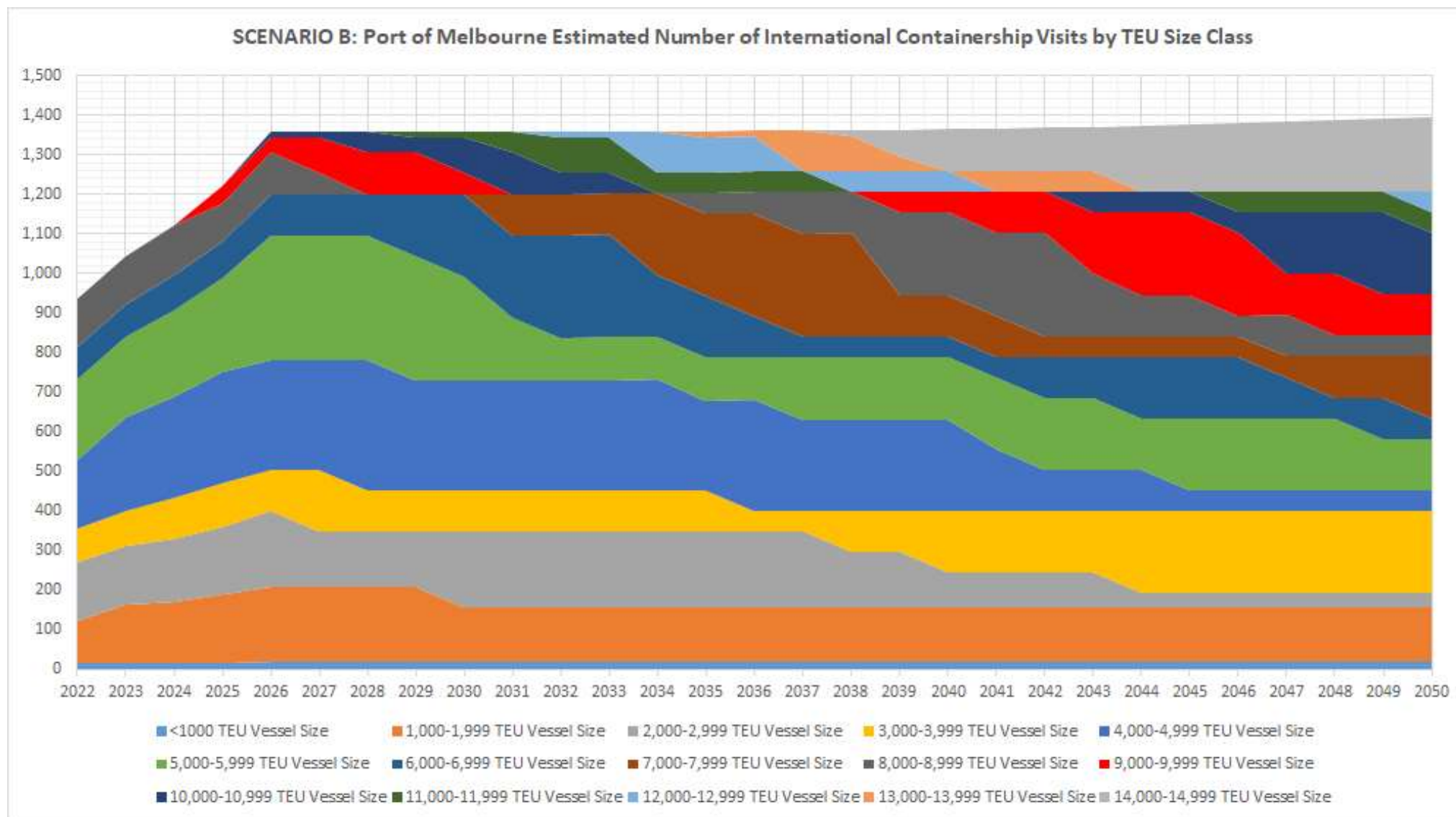




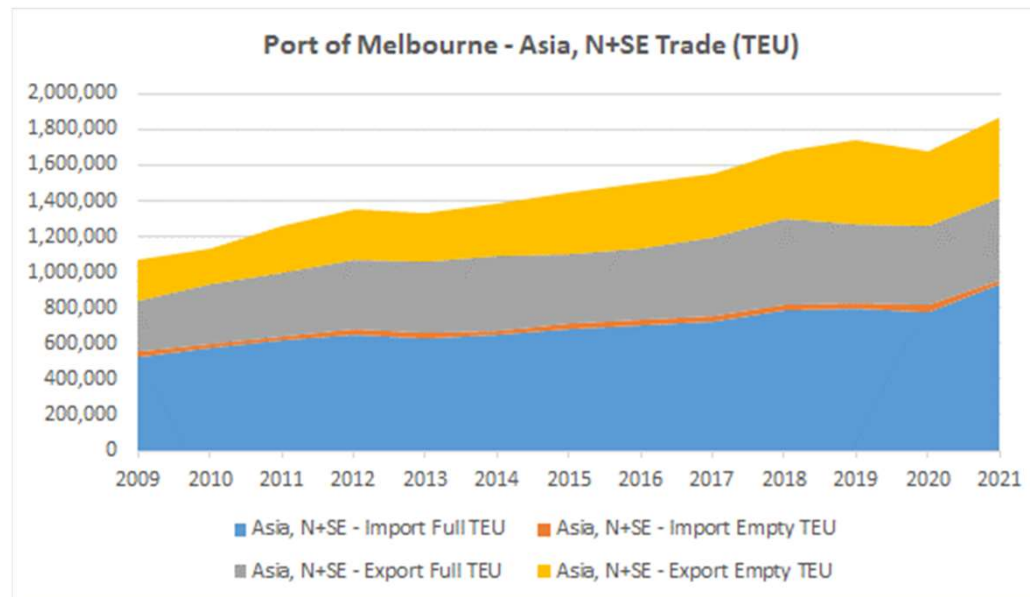
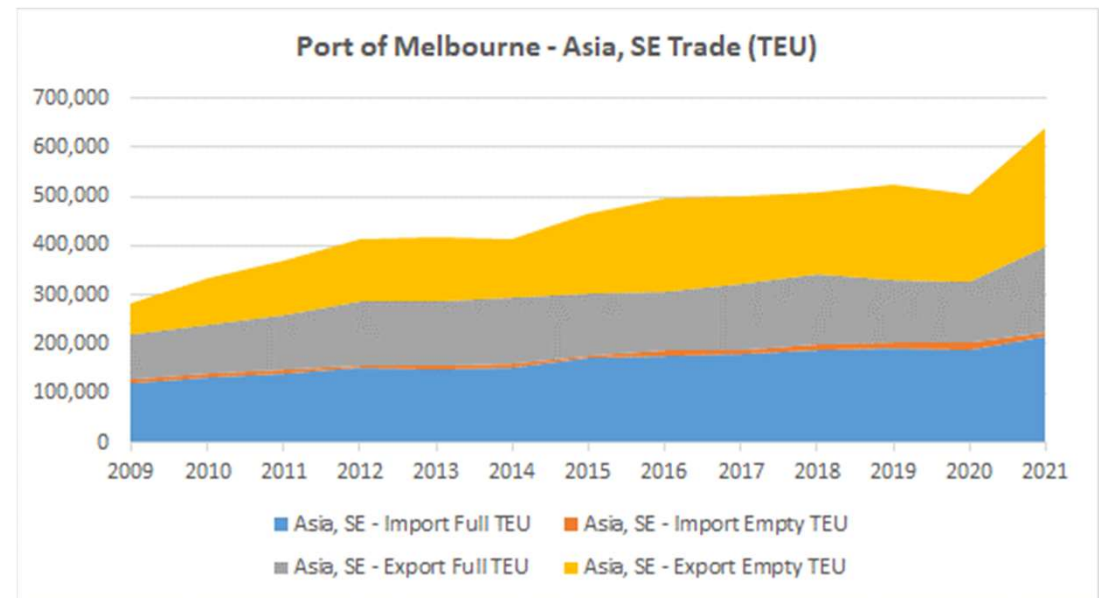
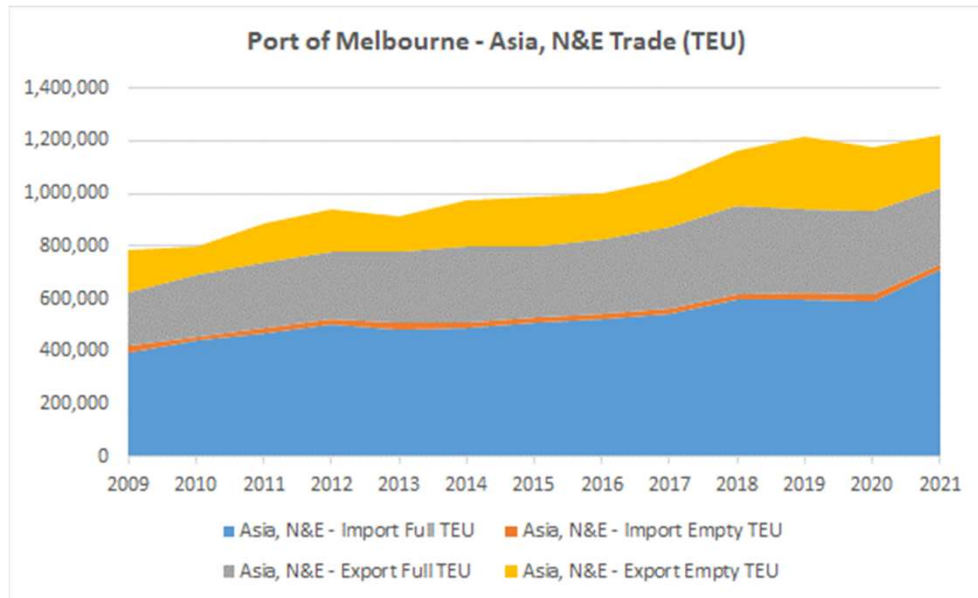
## Modelling Results – Scenario B

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

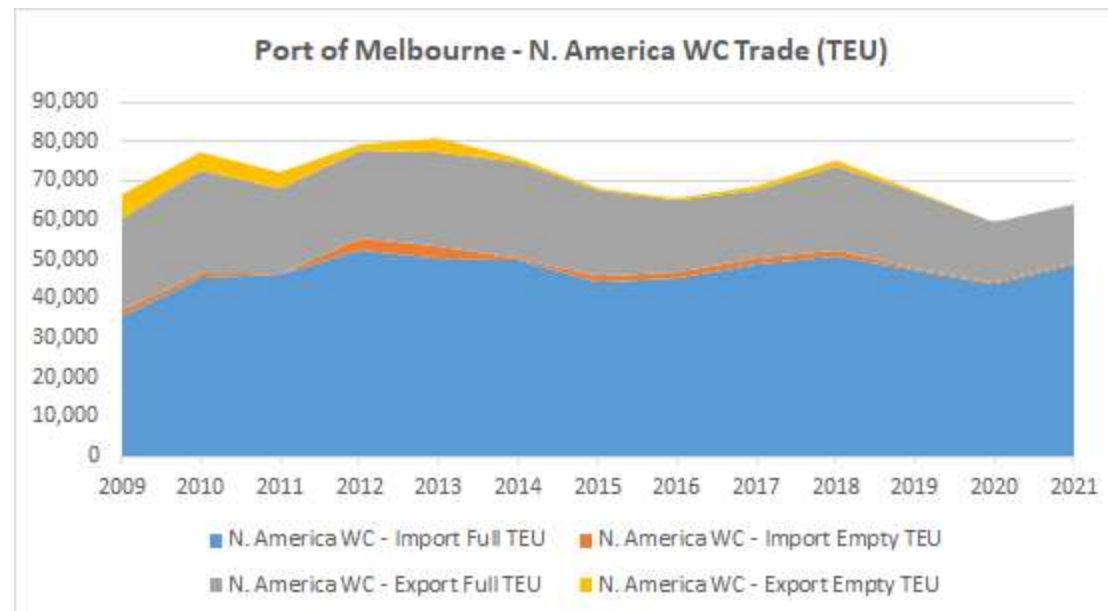
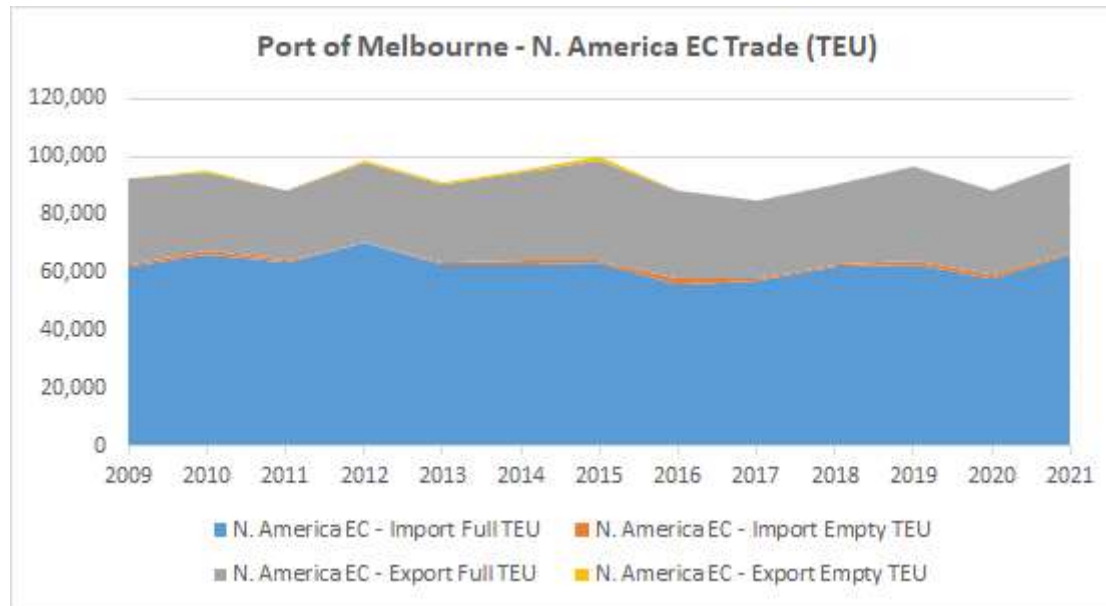
Figure 18



### Port of Melbourne Main Trade Route Developments (last 10 years)

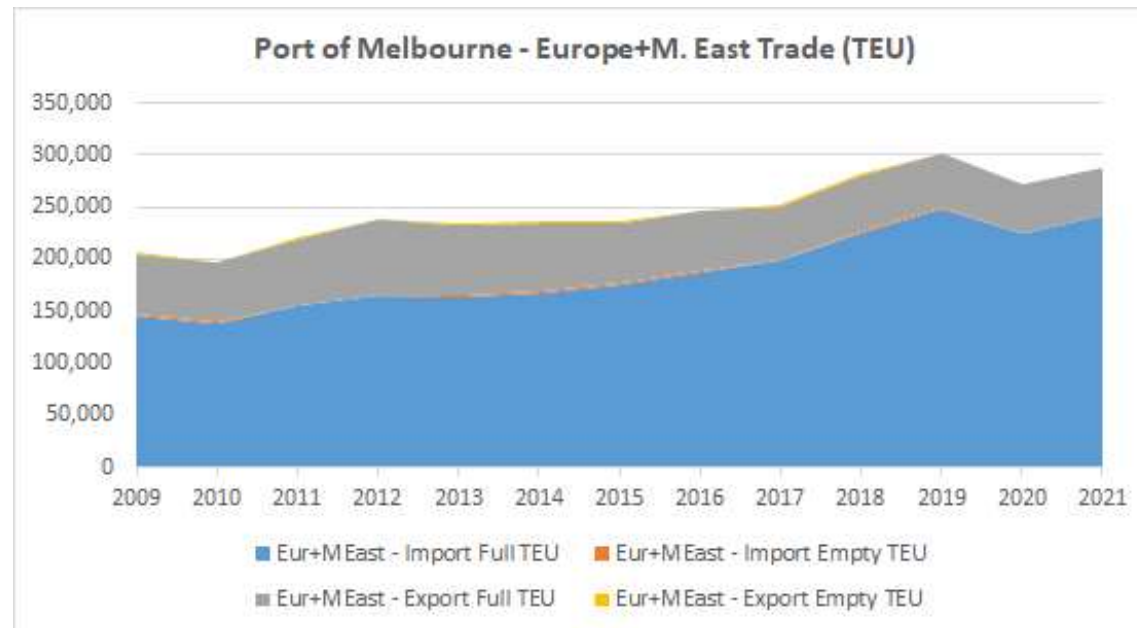
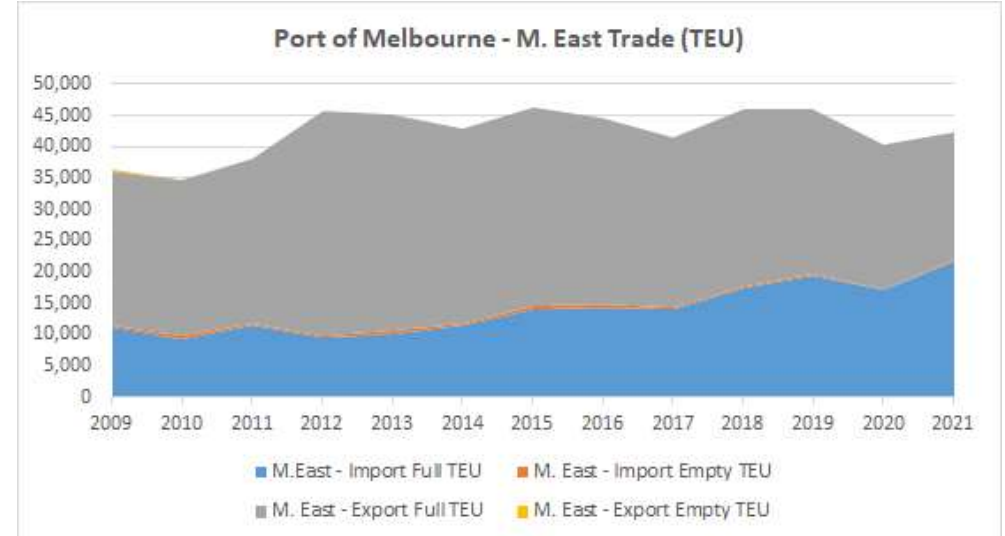
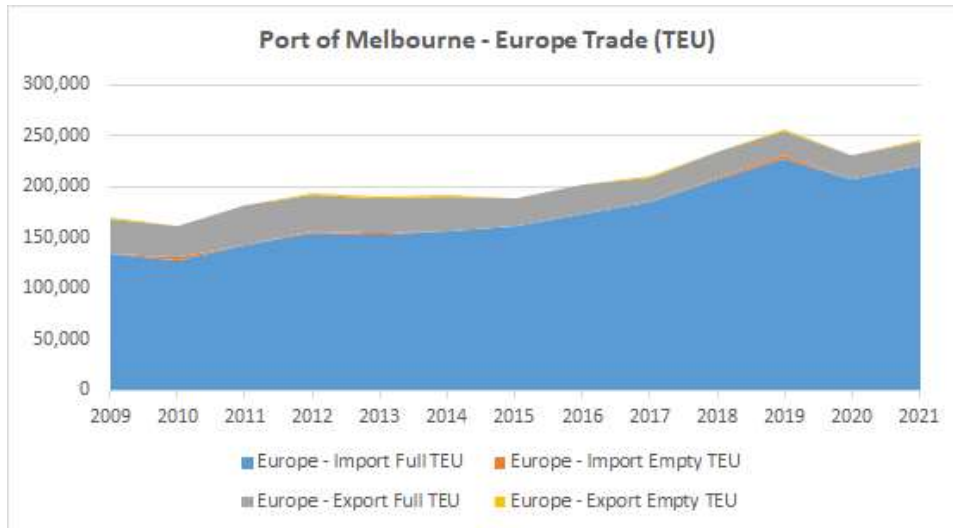


### Port of Melbourne Main Trade Route Developments (last 10 years)

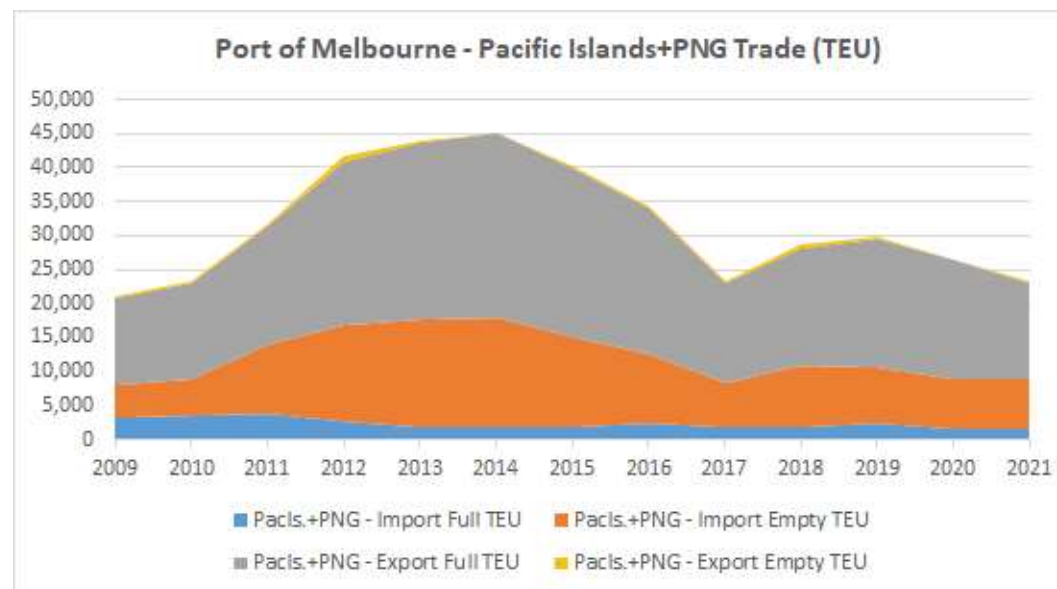
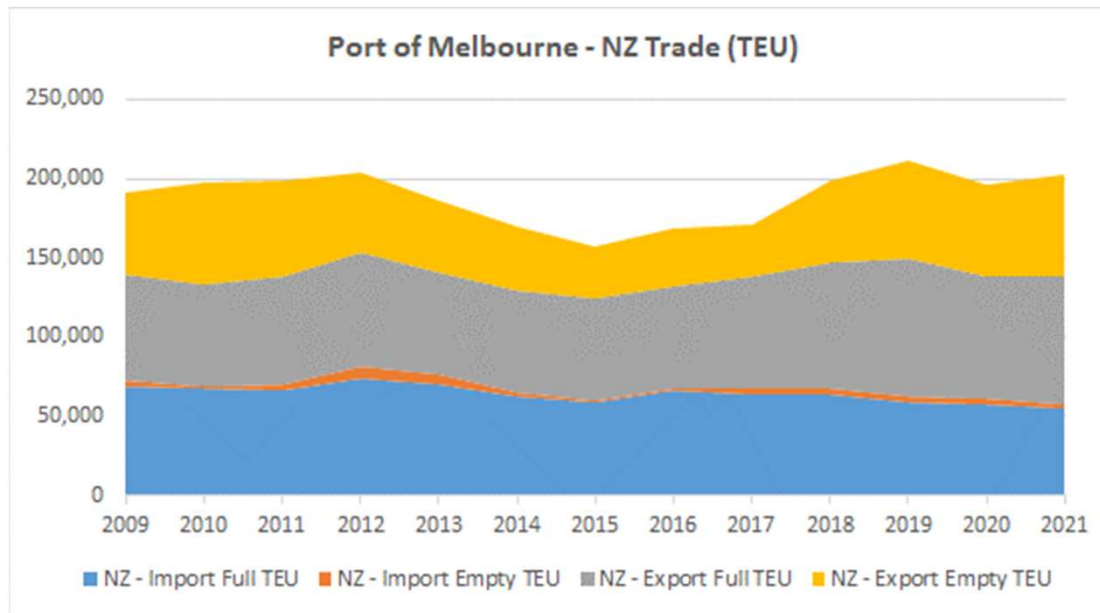




### Port of Melbourne Main Trade Route Developments (last 10 years)



### Port of Melbourne Main Trade Route Developments (last 10 years)





PoM Estimated Number Vessel Visits by TEU Size Class	2022	2023	2024	2025	2026	2027	2028	2029	2030
<1000 TEU Vessel Size	14	16	17	18	18	18	18	18	18
1,000-1,999 TEU Vessel Size	109	118	132	139	139	139	139	139	139
2,000-2,999 TEU Vessel Size	147	75	84	89	89	89	89	89	89
3,000-3,999 TEU Vessel Size	88	91	115	120	104	104	52	52	52
4,000-4,999 TEU Vessel Size	171	208	247	208	224	224	224	224	224
5,000-5,999 TEU Vessel Size	206	224	250	315	263	263	263	211	107
6,000-6,999 TEU Vessel Size	81	133	148	156	208	208	208	260	312
7,000-7,999 TEU Vessel Size	0	0	0	0	0	0	52	52	104
8,000-8,999 TEU Vessel Size	122	133	148	104	52	0	0	0	0
9,000-9,999 TEU Vessel Size	0	0	0	52	89	141	104	52	0
10,000-10,999 TEU Vessel Size	0	0	0	0	15	15	52	89	141
11,000-11,999 TEU Vessel Size	0	0	0	0	0	0	0	15	15
12,000-12,999 TEU Vessel Size	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
14,000-14,999 TEU Vessel Size	0	0	0	0	0	0	0	0	0
<b>PoM: Total Number of International Containership Visits</b>	<b>937</b>	<b>997</b>	<b>1,141</b>	<b>1,201</b>	<b>1,201</b>	<b>1,201</b>	<b>1,201</b>	<b>1,201</b>	<b>1,201</b>





PoM Estimated Number Vessel Visits by TEU Size Class	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
<1000 TEU Vessel Size	18	18	18	18	18	18	18	18	18	18
1,000-1,999 TEU Vessel Size	139	139	139	139	139	139	139	139	139	139
2,000-2,999 TEU Vessel Size	89	89	89	89	89	89	89	89	89	37
3,000-3,999 TEU Vessel Size	52	52	52	52	52	52	52	52	52	104
4,000-4,999 TEU Vessel Size	224	224	225	226	174	175	123	124	124	124
5,000-5,999 TEU Vessel Size	107	107	108	56	108	56	108	108	108	108
6,000-6,999 TEU Vessel Size	208	156	104	104	52	104	104	104	52	52
7,000-7,999 TEU Vessel Size	208	208	260	260	208	208	156	104	52	52
8,000-8,999 TEU Vessel Size	0	52	52	104	208	156	208	208	260	208
9,000-9,999 TEU Vessel Size	0	0	0	0	0	52	52	104	156	156
10,000-10,999 TEU Vessel Size	104	0	0	0	0	0	0	0	0	52
11,000-11,999 TEU Vessel Size	52	141	141	52	0	0	0	0	0	0
12,000-12,999 TEU Vessel Size	0	15	15	104	141	141	52	0	0	0
13,000-13,999 TEU Vessel Size	0	0	0	0	15	15	104	141	89	52
14,000-14,999 TEU Vessel Size	0	0	0	0	0	0	0	15	68	107
<b>PoM: Total Number of International Containership Visits</b>	<b>1,201</b>	<b>1,201</b>	<b>1,203</b>	<b>1,204</b>	<b>1,204</b>	<b>1,205</b>	<b>1,205</b>	<b>1,206</b>	<b>1,206</b>	<b>1,208</b>



PoM Estimated Number Vessel Visits by TEU Size Class	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
<1000 TEU Vessel Size	18	18	18	18	18	18	18	18	18	18
1,000-1,999 TEU Vessel Size	139	139	139	139	139	139	139	139	139	139
2,000-2,999 TEU Vessel Size	37	37	37	37	37	37	37	37	37	37
3,000-3,999 TEU Vessel Size	104	104	104	104	104	104	104	104	104	104
4,000-4,999 TEU Vessel Size	52	52	52	52	52	52	52	52	52	52
5,000-5,999 TEU Vessel Size	284	232	232	180	180	180	181	181	25	25
6,000-6,999 TEU Vessel Size	52	52	52	104	104	104	104	52	208	156
7,000-7,999 TEU Vessel Size	52	104	104	104	52	52	52	52	52	104
8,000-8,999 TEU Vessel Size	208	156	0	0	52	52	52	104	104	52
9,000-9,999 TEU Vessel Size	156	156	260	208	208	104	52	0	0	52
10,000-10,999 TEU Vessel Size	0	52	104	156	156	156	208	260	208	156
11,000-11,999 TEU Vessel Size	0	0	0	0	0	104	104	104	156	156
12,000-12,999 TEU Vessel Size	0	0	0	0	0	0	0	0	0	52
13,000-13,999 TEU Vessel Size	0	0	0	0	0	0	0	0	0	0
14,000-14,999 TEU Vessel Size	161	163	167	170	173	177	181	185	189	194
<b>PoM: Total Number of International Containership Visits</b>	<b>1,262</b>	<b>1,265</b>	<b>1,268</b>	<b>1,272</b>	<b>1,275</b>	<b>1,279</b>	<b>1,283</b>	<b>1,288</b>	<b>1,292</b>	<b>1,296</b>



SCENARIO A: PoM Estimated Total Vessel GT by shipping route	2022	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	37,436,952	41,821,193	48,317,480	51,323,497	52,025,709	53,196,875	54,724,987	56,352,604	58,049,376
Shipping Route: North America (East Coast & West Coast)	3,365,650	3,667,695	4,099,189	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936
Shipping Route: Europe (via Panama & Suez)	4,575,443	4,986,060	5,572,655	6,256,238	6,427,847	6,602,313	6,792,063	6,984,565	7,180,590
Shipping Route: New Zealand & Pacific Islands/PNG	1,653,470	1,962,957	2,193,893	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361
All International Shipping Routes (Regions): Total	47,031,515	52,437,904	60,183,217	64,204,031	65,077,853	66,423,484	68,141,347	69,961,466	71,854,262
SCENARIO A: Average Vessel TEU Size by shipping route:	2022	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	5,064	5,466	5,463	5,519	5,595	5,721	5,885	6,060	6,243
Shipping Route: North America (East Coast & West Coast)	3,797	3,797	3,797	3,797	3,797	3,797	3,797	3,797	3,797
Shipping Route: Europe (via Panama & Suez)	6,066	6,066	6,066	6,469	6,647	6,827	7,024	7,223	7,425
Shipping Route: New Zealand & Pacific Islands/PNG	1,372	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346
All International Shipping Routes: Total	4,593	4,812	4,825	4,894	4,961	5,064	5,195	5,333	5,478
SCENARIO A: Total Number Vessel Visits by shipping route:	2022	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	677	700	809	851	851	851	851	851	851
Shipping Route: North America (East Coast & West Coast)	81	88	99	104	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	69	75	84	89	89	89	89	89	89
Shipping Route: New Zealand & Pacific Islands/PNG	110	133	149	157	157	157	157	157	157
All International Shipping Routes	937	997	1,141	1,201	1,201	1,201	1,201	1,201	1,201
SCENARIO A: Total Vessel Two-way Capacity by shipping route:	2022	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	6,852,201	7,654,662	8,843,698	9,393,898	9,522,426	9,736,788	10,016,483	10,314,391	10,624,956
Shipping Route: North America (East Coast & West Coast)	616,025	671,310	750,287	789,776	789,776	789,776	789,776	789,776	789,776
Shipping Route: Europe (via Panama & Suez)	837,457	912,614	1,019,980	1,145,099	1,176,509	1,208,442	1,243,172	1,278,406	1,314,285
Shipping Route: New Zealand & Pacific Islands/PNG	302,640	359,286	401,555	422,689	422,689	422,689	422,689	422,689	422,689
All International Shipping Routes: Total	8,608,323	9,597,871	11,015,520	11,751,462	11,911,400	12,157,695	12,472,121	12,805,263	13,151,707
SCENARIO A: PoM Trade Share of Vessel Two-way Capacity by shipping route:	2022	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	79.60%	79.75%	80.28%	79.94%	79.94%	80.09%	80.31%	80.55%	80.79%
Shipping Route: North America (East Coast & West Coast)	7.16%	6.99%	6.81%	6.72%	6.63%	6.50%	6.33%	6.17%	6.01%
Shipping Route: Europe (via Panama & Suez)	9.73%	9.51%	9.26%	9.74%	9.88%	9.94%	9.97%	9.98%	9.99%
Shipping Route: New Zealand & Pacific Islands/PNG	3.52%	3.74%	3.65%	3.60%	3.55%	3.48%	3.39%	3.30%	3.21%
All International Shipping Routes: Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%





SCENARIO A: PoM Estimated Total Vessel GT by shipping route	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Shipping Route: Asia (N&E/SE) - incl. extra loaders	59,749,098	61,368,217	63,325,907	65,398,660	67,326,072	69,380,072	71,329,367	73,193,678	75,086,660	77,069,409
Shipping Route: North America (East Coast & West Coast)	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936	4,315,219	4,318,598
Shipping Route: Europe (via Panama & Suez)	7,379,582	7,583,043	7,785,650	7,988,479	8,187,330	8,381,730	8,575,418	8,772,738	8,965,703	9,049,409
Shipping Route: New Zealand & Pacific Islands/PNG	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361
All International Shipping Routes (Regions): Total	73,752,976	75,575,556	77,735,853	80,011,436	82,137,699	84,386,098	86,529,081	88,590,712	90,676,943	92,746,777
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	6,425	6,600	6,794	7,008	7,215	7,426	7,635	7,825	8,028	8,225
Shipping Route: North America (East Coast & West Coast)	3,797	3,797	3,797	3,797	3,797	3,797	3,797	3,797	3,797	3,800
Shipping Route: Europe (via Panama & Suez)	7,631	7,842	8,051	8,261	8,466	8,667	8,868	9,042	9,203	9,250
Shipping Route: New Zealand & Pacific Islands/PNG	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346
All International Shipping Routes: Total	5,622	5,761	5,916	6,084	6,246	6,411	6,574	6,724	6,880	7,026
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	851	851	853	854	854	855	855	856	856	858
Shipping Route: North America (East Coast & West Coast)	104	104	104	104	104	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	89	89	89	89	89	89	89	89	89	90
Shipping Route: New Zealand & Pacific Islands/PNG	157	157	157	157	157	157	157	157	157	157
All International Shipping Routes	1,201	1,201	1,203	1,204	1,204	1,205	1,205	1,206	1,206	1,208
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	10,936,062	11,232,414	11,590,736	11,970,119	12,322,899	12,698,849	13,055,634	13,396,865	13,743,343	14,106,252
Shipping Route: North America (East Coast & West Coast)	789,776	789,776	789,776	789,776	789,776	789,776	789,776	789,776	789,828	790,446
Shipping Route: Europe (via Panama & Suez)	1,350,708	1,387,948	1,425,032	1,462,156	1,498,552	1,534,134	1,569,585	1,605,701	1,641,020	1,656,341
Shipping Route: New Zealand & Pacific Islands/PNG	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689
All International Shipping Routes: Total	13,499,235	13,832,827	14,228,233	14,644,740	15,033,916	15,445,448	15,837,685	16,215,031	16,596,881	16,975,729
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	81.01%	81.20%	81.46%	81.74%	81.97%	82.22%	82.43%	82.62%	82.81%	83.10%
Shipping Route: North America (East Coast & West Coast)	5.85%	5.71%	5.55%	5.39%	5.25%	5.11%	4.99%	4.87%	4.76%	4.66%
Shipping Route: Europe (via Panama & Suez)	10.01%	10.03%	10.02%	9.98%	9.97%	9.93%	9.91%	9.90%	9.89%	9.76%
Shipping Route: New Zealand & Pacific Islands/PNG	3.13%	3.06%	2.97%	2.89%	2.81%	2.74%	2.67%	2.61%	2.55%	2.49%
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: PoM Estimated Total Vessel GT by shipping route	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Shipping Route: Asia (N&E/SE) - incl. extra loaders	79,091,651	81,029,170	83,056,251	85,082,695	87,102,417	89,206,841	91,219,154	93,348,934	95,421,489	97,558,299
Shipping Route: North America (East Coast & West Coast)	4,322,002	4,325,434	4,328,889	4,332,371	4,335,880	4,339,422	4,343,000	4,346,605	4,350,244	4,353,917
Shipping Route: Europe (via Panama & Suez)	9,106,858	9,164,781	9,223,089	9,281,858	9,341,081	9,479,958	9,665,352	9,852,181	10,040,729	10,231,040
Shipping Route: New Zealand & Pacific Islands/PNG	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361
All International Shipping Routes (Regions): Total	94,829,871	96,828,745	98,917,590	101,006,284	103,088,740	105,335,581	107,536,867	109,857,081	112,121,823	114,452,617
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	7,942	8,119	8,293	8,466	8,645	8,822	8,988	9,165	9,343	9,518
Shipping Route: North America (East Coast & West Coast)	3,803	3,806	3,809	3,812	3,815	3,819	3,822	3,825	3,828	3,831
Shipping Route: Europe (via Panama & Suez)	9,270	9,290	9,309	9,329	9,349	9,395	9,454	9,513	9,570	9,627
Shipping Route: New Zealand & Pacific Islands/PNG	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346
All International Shipping Routes: Total	6,875	7,007	7,138	7,268	7,402	7,539	7,668	7,806	7,944	8,080
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	911	913	917	920	922	925	929	932	935	938
Shipping Route: North America (East Coast & West Coast)	104	104	104	104	104	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	90	90	91	91	91	92	94	95	96	97
Shipping Route: New Zealand & Pacific Islands/PNG	157	157	157	157	157	157	157	157	157	157
All International Shipping Routes	1,262	1,265	1,268	1,272	1,275	1,279	1,283	1,288	1,292	1,296
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	14,476,389	14,831,019	15,202,042	15,572,948	15,942,624	16,327,803	16,696,123	17,085,943	17,465,289	17,856,397
Shipping Route: North America (East Coast & West Coast)	791,069	791,697	792,330	792,967	793,609	794,258	794,913	795,573	796,239	796,911
Shipping Route: Europe (via Panama & Suez)	1,666,856	1,677,458	1,688,131	1,698,887	1,709,727	1,735,146	1,769,079	1,803,275	1,837,786	1,872,619
Shipping Route: New Zealand & Pacific Islands/PNG	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689
All International Shipping Routes: Total	17,357,004	17,722,864	18,105,192	18,487,492	18,868,650	19,279,896	19,682,804	20,107,480	20,522,003	20,948,616
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	83.40%	83.68%	83.97%	84.24%	84.49%	84.69%	84.83%	84.97%	85.11%	85.24%
Shipping Route: North America (East Coast & West Coast)	4.56%	4.47%	4.38%	4.29%	4.21%	4.12%	4.04%	3.96%	3.88%	3.80%
Shipping Route: Europe (via Panama & Suez)	9.60%	9.46%	9.32%	9.19%	9.06%	9.00%	8.99%	8.97%	8.96%	8.94%
Shipping Route: New Zealand & Pacific Islands/PNG	2.44%	2.38%	2.33%	2.29%	2.24%	2.19%	2.15%	2.10%	2.06%	2.02%
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%



PoM Estimated Number Vessel Visits by TEU Size Class	2022	2023	2024	2025	2026	2027	2028	2029	2030
<1000 TEU Vessel Size	14	14	15	16	18	18	18	18	18
1,000-1,999 TEU Vessel Size	109	149	157	172	191	191	191	191	139
2,000-2,999 TEU Vessel Size	147	150	159	173	193	141	141	141	193
3,000-3,999 TEU Vessel Size	88	88	102	110	104	156	104	104	104
4,000-4,999 TEU Vessel Size	171	235	257	281	276	276	328	276	276
5,000-5,999 TEU Vessel Size	206	206	218	237	315	315	315	315	263
6,000-6,999 TEU Vessel Size	81	81	86	94	104	104	104	156	208
7,000-7,999 TEU Vessel Size	0	0	0	0	0	0	0	0	0
8,000-8,999 TEU Vessel Size	122	122	129	94	104	52	0	0	0
9,000-9,999 TEU Vessel Size	0	0	0	47	37	89	104	104	52
10,000-10,999 TEU Vessel Size	0	0	0	0	15	15	52	37	89
11,000-11,999 TEU Vessel Size	0	0	0	0	0	0	0	15	15
12,000-12,999 TEU Vessel Size	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
14,000-14,999 TEU Vessel Size	0	0	0	0	0	0	0	0	0
<b>PoM: Total Number of International Containership Visits</b>	<b>937</b>	<b>1,044</b>	<b>1,122</b>	<b>1,223</b>	<b>1,357</b>	<b>1,357</b>	<b>1,357</b>	<b>1,357</b>	<b>1,357</b>





PoM Estimated Number Vessel Visits by TEU Size Class	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
<1000 TEU Vessel Size	18	18	18	18	18	18	18	18	18	18
1,000-1,999 TEU Vessel Size	139	139	139	139	139	139	139	139	139	139
2,000-2,999 TEU Vessel Size	193	193	193	193	193	193	193	141	141	89
3,000-3,999 TEU Vessel Size	104	104	104	104	104	52	52	104	104	156
4,000-4,999 TEU Vessel Size	276	276	277	278	226	279	227	228	228	228
5,000-5,999 TEU Vessel Size	159	107	108	108	108	108	160	160	160	160
6,000-6,999 TEU Vessel Size	208	260	260	156	156	104	52	52	52	52
7,000-7,999 TEU Vessel Size	104	104	104	208	208	260	260	260	104	104
8,000-8,999 TEU Vessel Size	0	0	0	0	52	52	104	104	208	208
9,000-9,999 TEU Vessel Size	0	0	0	0	0	0	0	0	52	52
10,000-10,999 TEU Vessel Size	104	52	52	0	0	0	0	0	0	0
11,000-11,999 TEU Vessel Size	52	89	89	52	52	52	52	0	0	0
12,000-12,999 TEU Vessel Size	0	15	15	104	89	89	0	52	52	52
13,000-13,999 TEU Vessel Size	0	0	0	0	15	15	104	89	37	0
14,000-14,999 TEU Vessel Size	0	0	0	0	0	0	0	15	68	107
<b>PoM: Total Number of International Containership Visits</b>	<b>1,357</b>	<b>1,357</b>	<b>1,359</b>	<b>1,360</b>	<b>1,360</b>	<b>1,361</b>	<b>1,361</b>	<b>1,362</b>	<b>1,362</b>	<b>1,364</b>



PoM Estimated Number Vessel Visits by TEU Size Class	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
<1000 TEU Vessel Size	18	18	18	18	18	18	18	18	18	18
1,000-1,999 TEU Vessel Size	139	139	139	139	139	139	139	139	139	139
2,000-2,999 TEU Vessel Size	89	89	89	37	37	37	37	37	37	37
3,000-3,999 TEU Vessel Size	156	156	156	208	208	208	208	208	208	208
4,000-4,999 TEU Vessel Size	156	104	104	104	52	52	52	52	52	52
5,000-5,999 TEU Vessel Size	180	180	180	128	180	180	181	181	129	129
6,000-6,999 TEU Vessel Size	52	104	104	156	156	156	104	52	104	52
7,000-7,999 TEU Vessel Size	104	52	52	52	52	52	52	104	104	156
8,000-8,999 TEU Vessel Size	208	260	156	104	104	52	104	52	52	52
9,000-9,999 TEU Vessel Size	104	104	156	208	208	208	104	156	104	104
10,000-10,999 TEU Vessel Size	0	0	52	52	52	52	156	156	208	156
11,000-11,999 TEU Vessel Size	0	0	0	0	0	52	52	52	52	52
12,000-12,999 TEU Vessel Size	0	0	0	0	0	0	0	0	0	52
13,000-13,999 TEU Vessel Size	52	52	52	0	0	0	0	0	0	0
14,000-14,999 TEU Vessel Size	109	110	112	167	170	174	178	182	186	190
<b>PoM: Total Number of International Containership Visits</b>	<b>1,366</b>	<b>1,368</b>	<b>1,370</b>	<b>1,372</b>	<b>1,375</b>	<b>1,379</b>	<b>1,384</b>	<b>1,388</b>	<b>1,392</b>	<b>1,397</b>



SCENARIO B: PoM Estimated Total Vessel GT by shipping route	2022	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	37,436,952	41,236,789	44,419,854	48,357,135	54,418,631	55,211,724	56,353,803	57,577,430	58,967,382
Shipping Route: North America (East Coast & West Coast)	3,365,650	3,383,775	3,559,822	3,883,442	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936
Shipping Route: Europe (via Panama & Suez)	4,575,443	4,575,443	4,839,411	5,630,614	6,427,847	6,602,313	6,792,063	6,984,565	7,180,590
Shipping Route: New Zealand & Pacific Islands/PNG	1,653,470	1,801,302	1,905,223	2,078,425	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361
All International Shipping Routes (Regions): Total	47,031,515	50,997,309	54,724,310	59,949,616	67,470,775	68,438,333	69,770,162	71,186,292	72,772,268
SCENARIO B: Average Vessel TEU Size by shipping route:	2022	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	5,064	4,893	4,874	4,873	4,946	5,018	5,121	5,233	5,359
Shipping Route: North America (East Coast & West Coast)	3,797	3,799	3,797	3,797	3,797	3,797	3,797	3,797	3,797
Shipping Route: Europe (via Panama & Suez)	6,066	6,066	6,066	6,469	6,647	6,827	7,024	7,223	7,425
Shipping Route: New Zealand & Pacific Islands/PNG	1,372	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346
All International Shipping Routes: Total	4,593	4,469	4,462	4,487	4,552	4,617	4,707	4,803	4,910
SCENARIO B: Total Number Vessel Visits by shipping route:	2022	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	677	771	834	908	1,007	1,007	1,007	1,007	1,007
Shipping Route: North America (East Coast & West Coast)	81	82	86	94	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	69	69	73	80	89	89	89	89	89
Shipping Route: New Zealand & Pacific Islands/PNG	110	122	130	141	157	157	157	157	157
All International Shipping Routes	937	1,044	1,122	1,223	1,357	1,357	1,357	1,357	1,357
SCENARIO B: Total Vessel Two-way Capacity by shipping route:	2022	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	6,852,201	7,547,697	8,130,303	8,850,956	9,960,410	10,105,572	10,314,610	10,538,575	10,792,982
Shipping Route: North America (East Coast & West Coast)	616,025	619,343	651,565	710,798	789,776	789,776	789,776	789,776	789,776
Shipping Route: Europe (via Panama & Suez)	837,457	837,457	885,772	1,030,589	1,176,509	1,208,442	1,243,172	1,278,406	1,314,285
Shipping Route: New Zealand & Pacific Islands/PNG	302,640	329,698	348,719	380,421	422,689	422,689	422,689	422,689	422,689
All International Shipping Routes: Total	8,608,323	9,334,195	10,016,359	10,972,763	12,349,384	12,526,479	12,770,248	13,029,447	13,319,733
SCENARIO B: PoM Trade Share of Vessel Two-way Capacity by shipping route:	2022	2023	2024	2025	2026	2027	2028	2029	2030
Shipping Route: Asia (N&E/SE) - incl. extra loaders	79.60%	80.86%	81.17%	80.66%	80.66%	80.67%	80.77%	80.88%	81.03%
Shipping Route: North America (East Coast & West Coast)	7.16%	6.64%	6.51%	6.48%	6.40%	6.30%	6.18%	6.06%	5.93%
Shipping Route: Europe (via Panama & Suez)	9.73%	8.97%	8.84%	9.39%	9.53%	9.65%	9.73%	9.81%	9.87%
Shipping Route: New Zealand & Pacific Islands/PNG	3.52%	3.53%	3.48%	3.47%	3.42%	3.37%	3.31%	3.24%	3.17%
All International Shipping Routes: Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%





SCENARIO B: PoM Estimated Total Vessel GT by shipping route	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Shipping Route: Asia (N&E/SE) - incl. extra loaders	60,669,333	62,287,671	64,022,992	65,942,145	67,716,243	69,588,827	71,356,802	73,269,775	75,095,227	77,022,434
Shipping Route: North America (East Coast & West Coast)	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936	4,314,936	4,315,219	4,318,598
Shipping Route: Europe (via Panama & Suez)	7,379,582	7,583,043	7,785,650	7,988,479	8,187,330	8,381,730	8,575,418	8,772,738	8,965,703	9,049,409
Shipping Route: New Zealand & Pacific Islands/PNG	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361
All International Shipping Routes (Regions): Total	74,673,211	76,495,010	78,432,939	80,554,921	82,527,870	84,594,854	86,556,517	88,666,810	90,685,510	92,699,803
SCENARIO B: 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	5,514	5,661	5,807	5,975	6,136	6,299	6,459	6,626	6,791	6,955
Shipping Route: North America (East Coast & West Coast)	3,797	3,797	3,797	3,797	3,797	3,797	3,797	3,797	3,797	3,800
Shipping Route: Europe (via Panama & Suez)	7,631	7,842	8,051	8,261	8,466	8,667	8,868	9,042	9,203	9,250
Shipping Route: New Zealand & Pacific Islands/PNG	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346
All International Shipping Routes: Total	5,038	5,161	5,284	5,423	5,555	5,690	5,822	5,959	6,093	6,219
SCENARIO B: 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	1,007	1,007	1,009	1,010	1,010	1,011	1,011	1,012	1,012	1,014
Shipping Route: North America (East Coast & West Coast)	104	104	104	104	104	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	89	89	89	89	89	89	89	89	89	90
Shipping Route: New Zealand & Pacific Islands/PNG	157	157	157	157	157	157	157	157	157	157
All International Shipping Routes	1,357	1,357	1,359	1,360	1,360	1,361	1,361	1,362	1,362	1,364
SCENARIO B: 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	11,104,495	11,400,705	11,718,326	12,069,594	12,394,313	12,737,058	13,060,656	13,410,793	13,744,911	14,097,654
Shipping Route: North America (East Coast & West Coast)	789,776	789,776	789,776	789,776	789,776	789,776	789,776	789,776	789,828	790,446
Shipping Route: Europe (via Panama & Suez)	1,350,708	1,387,948	1,425,032	1,462,156	1,498,552	1,534,134	1,569,585	1,605,701	1,641,020	1,656,341
Shipping Route: New Zealand & Pacific Islands/PNG	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689
All International Shipping Routes: Total	13,667,668	14,001,118	14,355,823	14,744,216	15,105,331	15,483,657	15,842,706	16,228,960	16,598,449	16,967,131
SCENARIO B: 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	81.25%	81.43%	81.63%	81.86%	82.05%	82.26%	82.44%	82.63%	82.81%	83.09%
Shipping Route: North America (East Coast & West Coast)	5.78%	5.64%	5.50%	5.36%	5.23%	5.10%	4.99%	4.87%	4.76%	4.66%
Shipping Route: Europe (via Panama & Suez)	9.88%	9.91%	9.93%	9.92%	9.92%	9.91%	9.91%	9.89%	9.89%	9.76%
Shipping Route: New Zealand & Pacific Islands/PNG	3.09%	3.02%	2.94%	2.87%	2.80%	2.73%	2.67%	2.60%	2.55%	2.49%
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 B: PoM Estimated Total Vessel GT by shipping route	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Shipping Route: Asia (N&E/SE) - incl. extra loaders	79,049,364	80,967,677	83,060,806	85,031,006	87,005,540	89,102,100	91,209,118	93,288,931	95,428,864	97,488,126
Shipping Route: North America (East Coast & West Coast)	4,322,002	4,325,434	4,328,889	4,332,371	4,335,880	4,339,422	4,343,000	4,346,605	4,350,244	4,353,917
Shipping Route: Europe (via Panama & Suez)	9,106,858	9,164,781	9,223,089	9,281,858	9,341,081	9,479,958	9,665,352	9,852,181	10,040,729	10,231,040
Shipping Route: New Zealand & Pacific Islands/PNG	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361	2,309,361
All International Shipping Routes (Regions): Total	94,787,584	96,767,253	98,922,145	100,954,595	102,991,862	105,230,840	107,526,830	109,797,079	112,129,198	114,382,443
SCENARIO B: 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	7,127	7,288	7,465	7,628	7,784	7,950	8,108	8,269	8,435	8,593
Shipping Route: North America (East Coast & West Coast)	3,803	3,806	3,809	3,812	3,815	3,819	3,822	3,825	3,828	3,831
Shipping Route: Europe (via Panama & Suez)	9,270	9,290	9,309	9,329	9,349	9,395	9,454	9,513	9,570	9,627
Shipping Route: New Zealand & Pacific Islands/PNG	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346	1,346
All International Shipping Routes: Total	6,350	6,474	6,608	6,733	6,853	6,983	7,110	7,238	7,370	7,496
SCENARIO B: 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	1,015	1,017	1,018	1,020	1,023	1,026	1,030	1,032	1,035	1,038
Shipping Route: North America (East Coast & West Coast)	104	104	104	104	104	104	104	104	104	104
Shipping Route: Europe (via Panama & Suez)	90	90	91	91	91	92	94	95	96	97
Shipping Route: New Zealand & Pacific Islands/PNG	157	157	157	157	157	157	157	157	157	157
All International Shipping Routes	1,366	1,368	1,370	1,372	1,375	1,379	1,384	1,388	1,392	1,397
SCENARIO B: 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	14,468,649	14,819,764	15,202,876	15,563,487	15,924,892	16,308,632	16,694,286	17,074,961	17,466,639	17,843,552
Shipping Route: North America (East Coast & West Coast)	791,069	791,697	792,330	792,967	793,609	794,258	794,913	795,573	796,239	796,911
Shipping Route: Europe (via Panama & Suez)	1,666,856	1,677,458	1,688,131	1,698,887	1,709,727	1,735,146	1,769,079	1,803,275	1,837,786	1,872,619
Shipping Route: New Zealand & Pacific Islands/PNG	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689	422,689
All International Shipping Routes: Total	17,349,264	17,711,609	18,106,025	18,478,031	18,850,918	19,260,725	19,680,968	20,096,498	20,523,353	20,935,771
SCENARIO B: 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	83.40%	83.67%	83.97%	84.23%	84.48%	84.67%	84.82%	84.96%	85.11%	85.23%
Shipping Route: North America (East Coast & West Coast)	4.56%	4.47%	4.38%	4.29%	4.21%	4.12%	4.04%	3.96%	3.88%	3.81%
Shipping Route: Europe (via Panama & Suez)	9.61%	9.47%	9.32%	9.19%	9.07%	9.01%	8.99%	8.97%	8.95%	8.94%
Shipping Route: New Zealand & Pacific Islands/PNG	2.44%	2.39%	2.33%	2.29%	2.24%	2.19%	2.15%	2.10%	2.06%	2.02%
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%



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		Name	Signature	Name	Signature	
<b>A (Draft)</b>	G. Reynolds	R. Hill	On file	R. Hill	On file	09/05/2022
<b>B (Draft Final)</b>	G. Reynolds	R. Hill	On file	R. Hill	On file	03/08/2022
<b>C&amp;D (Draft Final)</b>	G. Reynolds	R. Hill	On file	R. Hill	On file	29/08/2022 & 30/08/2022
<b>E (Final)</b>	G. Reynolds	R. Hill	On file	R. Hill	On file	02/09/2022

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