Port of Melbourne Fleet Forecasts - Channels

Container and Non-Container Vessel Visits, 2023-2028

Port of Melbourne (PoM)

29 May 2023

→ The Power of Commitment

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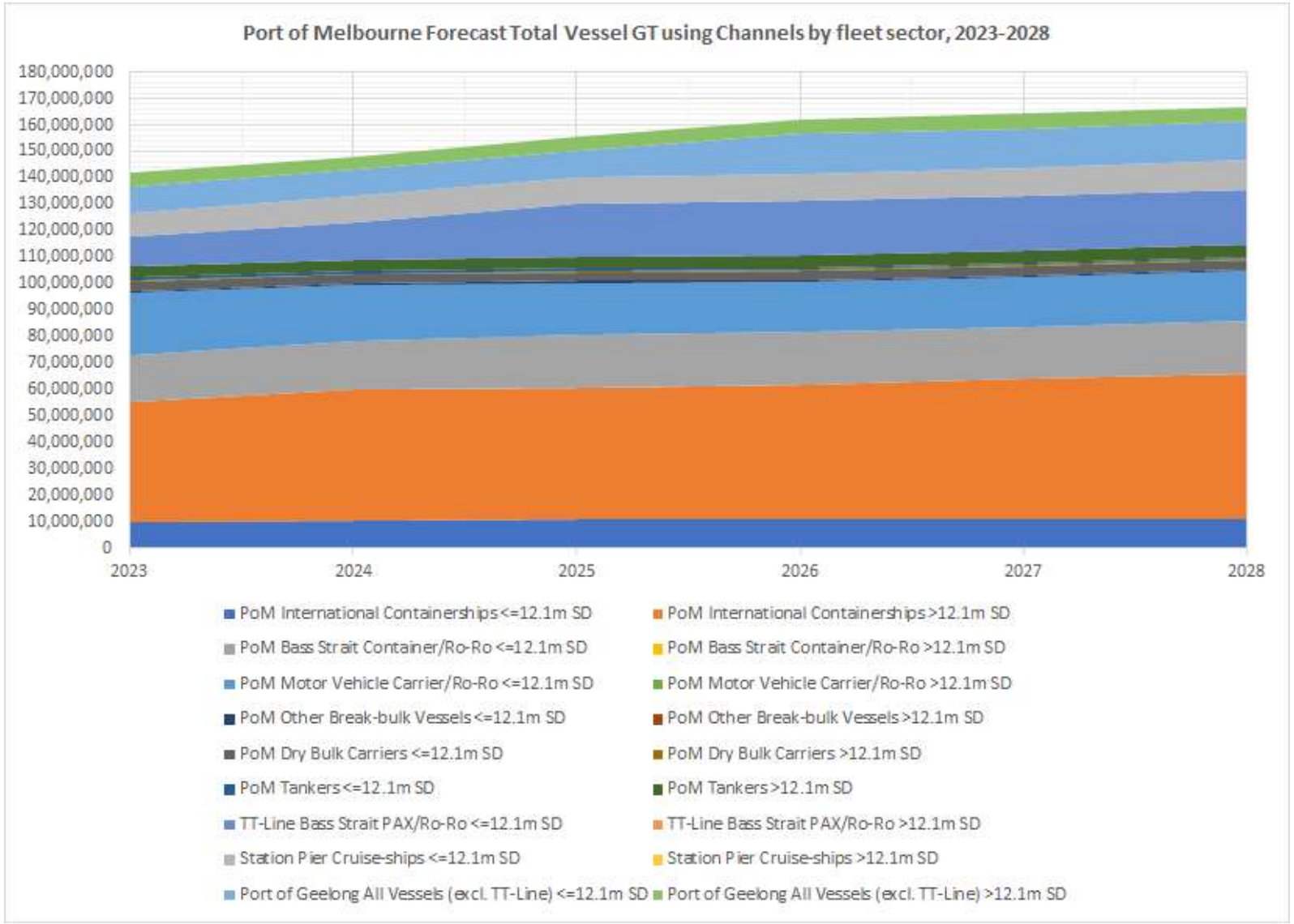
Executive summary

GHD has undertaken the modelling of Vessel Fleet Forecasts - Channels using a combination of Port of Melbourne (Deloitte Access Economics, DAE) base cargo trade forecasts and sets of technical/operational assumptions relating to the various vessel fleet sectors.

The modelling of Container and Non-Container Vessel Fleet forecasts for the Port of Melbourne Channels indicates that total vessel GT using the Channels is estimated to grow from 141.8 million GT in FY2022/23 to 167.1 million GT in FY2027/28. In terms of vessel maximum summer draughts, it is estimated that by FY2027/28 vessels with a maximum summer draught <=12.1m may represent 61% share of the total vessel GT using the Port of Melbourne Channels. These overall modelling results are summarised in Figure 1 below.

Figure 1 *Port of Melbourne Forecast Total Vessel GT using Channels by fleet sector, 2023-2028*



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1. Introduction

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 Fleets as well as the provision of Vessel Fleet Visits Forecasts which model the possible use of Port of Melbourne channels and facilities.

This Final report (dated 29th May, 2023) is a Technical Reference Paper with a focus on assessing the future use of Port of Melbourne shipping channels by a fleet of container and non-container vessels. The approach used is a scenario-basis linked to a base cargo-demand forecast provided by the Port of Melbourne and sets of technical and operational modelling assumptions for determining a possible future fleet situation.

The estimated future fleet visits and vessel size (Gross Tonnage, and Registered Summer Draught) 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 other considerations.

GHD is of the view that this report is in compliance with Pricing Order clause 8.2.2. in that the methodology and assumptions used are reasonable and consistent with standard industry practice. Fleet data is baselined with Port of Melbourne supplied actuals. The approach used for this report has been used by GHD, and the GHD team, for other port parties in Australia and New Zealand regarding port master planning assignments.

1.2 Scope

The Scope of the analysis (modelling of the possible future fleet using Port of Melbourne channels) covers two parts:

- PART A: Container Vessel Fleet – assessment of the number, Gross Tonnage (GT) and Registered Summer Draught (SD) of International Containerships visiting berths at the Port of Melbourne (Swanson Dock and Webb Dock precincts) on a regular, scheduled service basis
- PART B: Non-Container Vessel Fleet - assessment of the number and Gross Tonnage (GT) and SD of Non-Container vessel visiting berths at the Port of Melbourne, and all other vessels using Port of Melbourne channels consisting of visits to Station Pier (cruise-ships), and the Port of Geelong.

The Future period is FY2022-23 to FY2027-28 inclusive. Each of these future years works with a base cargo demand forecast as provided by Deloitte Access Economics (DAE) (dated 9th May, 2023) for the Port of Melbourne, and a set of specified assumptions used in the modelling.

1.3 Disclaimers

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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.

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1.4 Assumptions

The modelling work is based on an approach and linked set of assumptions which are listed in Sections 2 and 3 of the report.

2. Container Vessel Fleet Forecasts (2022-2028)

2.1 Modelling approach used

2.1.1 Container trade demand on container vessels

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. Overall indicative Port of Melbourne container trade demand is assessed for each of the main shipping routes directly linked to the Port of Melbourne, i.e. all containers to/from overseas regions not directly connected with the Port of Melbourne as assumed to be transhipped overseas (primarily at SE Asia).

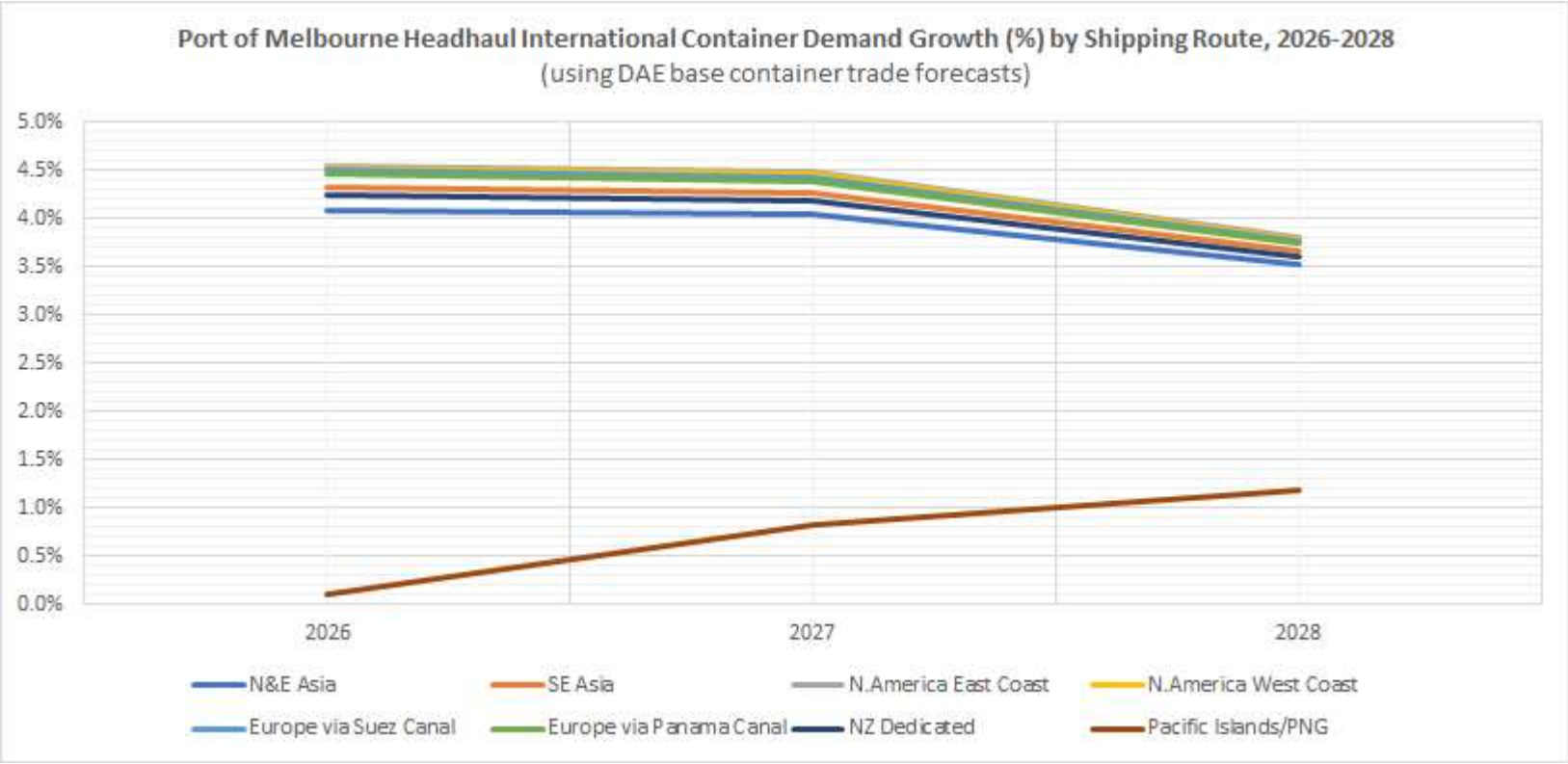
These main Port of Melbourne shipping routes (eight in total), with estimated container trade demand, comprise: Asia-North/East, Asia-South East, North America-East Coast, North America-West Coast, Europe via the Suez Canal, Europe via the Panama Canal, NZ dedicated, and the Pacific Islands/PNG.

In general, the Port of Melbourne direct calling services involve connections with one trade region such that the growth for that trade region is the most relevant for ship sizing. 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. In the case of the two Asia shipping routes, these have been divided into services using small 'niche' sized vessels (i.e. max. summer draught <= 12.1m), and standard sized medium/large vessels (i.e. max. summer draught >12.1m).

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. This demand growth is the applied to the average vessel size subject to an assessment of average vessel utilisations (i.e. when a maximum utilisation is achieved, then supplied capacity is forced to increase). The modelling works with a baseline of actual average vessel sizes visiting the Port of Melbourne for each of the shipping routes. In the first forecast year (FY2022/23), adjustments are made for any planned new or recently ceased container services.

Base container trade demand forecasts by overseas trade regions, as provided by the PoM (DAE data, dated 09/05/2023), are used in the modelling. The head-haul medium to long-term growth rates (from FY2025/26 onwards) for the various shipping routes (and services) are assumed to drop from around 4-4.5% per year for all non-Pacific Island/PNG routes to 3.6% per year by FY2027/28 (see Figure 2 below).

Figure 2 *Port of Melbourne Head-haul Container Demand Growth rates by Shipping Route (using DAE base forecasts)*



2.1.2 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. There are also instances of opportunistic niche vessel services (visits), but these are extremely difficult to predict due to their inherent nature.

2.1.3 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 11,000 TEU at Swanson Dock 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.

Since, the **Channel Forecasts analysis** is independent of which Port of Melbourne precinct the containerships will visit, it is assumed that long-term 50% of visits will be access capped at 11,000 TEU, and 50% at 14,000 TEU with an average of around 12,500 TEU. This means that demand growth is assumed to be accommodated by increase visits (services).

None of the access constraints discussed above are hit over the forecast time horizon (i.e. FY2022/23 to FY2027/28).

2.1.4 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.

2.1.5 Allocation of Overseas Region Volumes to Direct Shipping Routes

The allocation of overseas region volumes to direct shipping routes connecting the Port of Melbourne is assumed according to Table 1 below. These allocations (informed by baseline Port of Melbourne statistics) are assumed to be held constant over future years.

Table 1 Assumed Allocations of Overseas Region Volumes to Direct Shipping Routes

2a. PoM International Trade Region Shares on Shipping Routes	Direct Shipping Routes->	1. N&E Asia Route	2. SE Asia Route**	3. N.Am.EC Panama Route	4. N.Am.WC Route	5. Europe Suez Route	6. Europe Panama Route*	7. NZ Dedicated Route	8. Pac.Isl. & PNG Route	Total
(*) incl. N. America East Coast as part of the route. (**) covers all Asia services	*Units*									
Asia, North & East - Full Imports	%	85.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
Asia, North & East - Full Exports	%	85.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
Asia, South East - Full Imports	%	0.0%	95.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	**100.0%**
Asia, South East - Full Exports	%	0.0%	95.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	**100.0%**
Asia, South - Full Imports	%	0.0%	95.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	**100.0%**
Asia, South - Full Exports	%	0.0%	95.0%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	**100.0%**
North America, East Coast - Full Imports	%	0.0%	0.0%	97.5%	0.0%	0.0%	2.5%	0.0%	0.0%	**100.0%**
North America, East Coast - Full Exports	%	0.0%	0.0%	97.5%	0.0%	0.0%	2.5%	0.0%	0.0%	**100.0%**
North America, West Coast - Full Imports	%	10.0%	0.0%	0.0%	90.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
North America, West Coast - Full Exports	%	10.0%	0.0%	0.0%	90.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
Europe, M.East, Africa & Indian Ocean Isl. - Full Imports	%	0.0%	22.5%	0.0%	0.0%	75.0%	2.5%	0.0%	0.0%	**100.0%**
Europe, M.East, Africa & Indian Ocean Isl. - Full Exports	%	0.0%	22.5%	0.0%	0.0%	75.0%	2.5%	0.0%	0.0%	**100.0%**
New Zealand - Full Imports	%	0.0%	0.0%	25.0%	5.0%	0.0%	2.5%	67.5%	0.0%	**100.0%**
New Zealand - Full Exports	%	0.0%	0.0%	25.0%	5.0%	0.0%	2.5%	67.5%	0.0%	**100.0%**
Pacific Islands & PNG - Full Imports	%	0.0%	5.0%	0.0%	5.0%	0.0%	5.0%	5.0%	80.0%	**100.0%**
Pacific Islands & PNG - Full Exports	%	0.0%	5.0%	0.0%	5.0%	0.0%	5.0%	5.0%	80.0%	**100.0%**
Caribbean, C. America & S. America - Full Imports	%	0.0%	0.0%	95.0%	0.0%	0.0%	5.0%	0.0%	0.0%	**100.0%**
Caribbean, C. America & S. America - Full Exports	%	0.0%	0.0%	95.0%	0.0%	0.0%	5.0%	0.0%	0.0%	**100.0%**

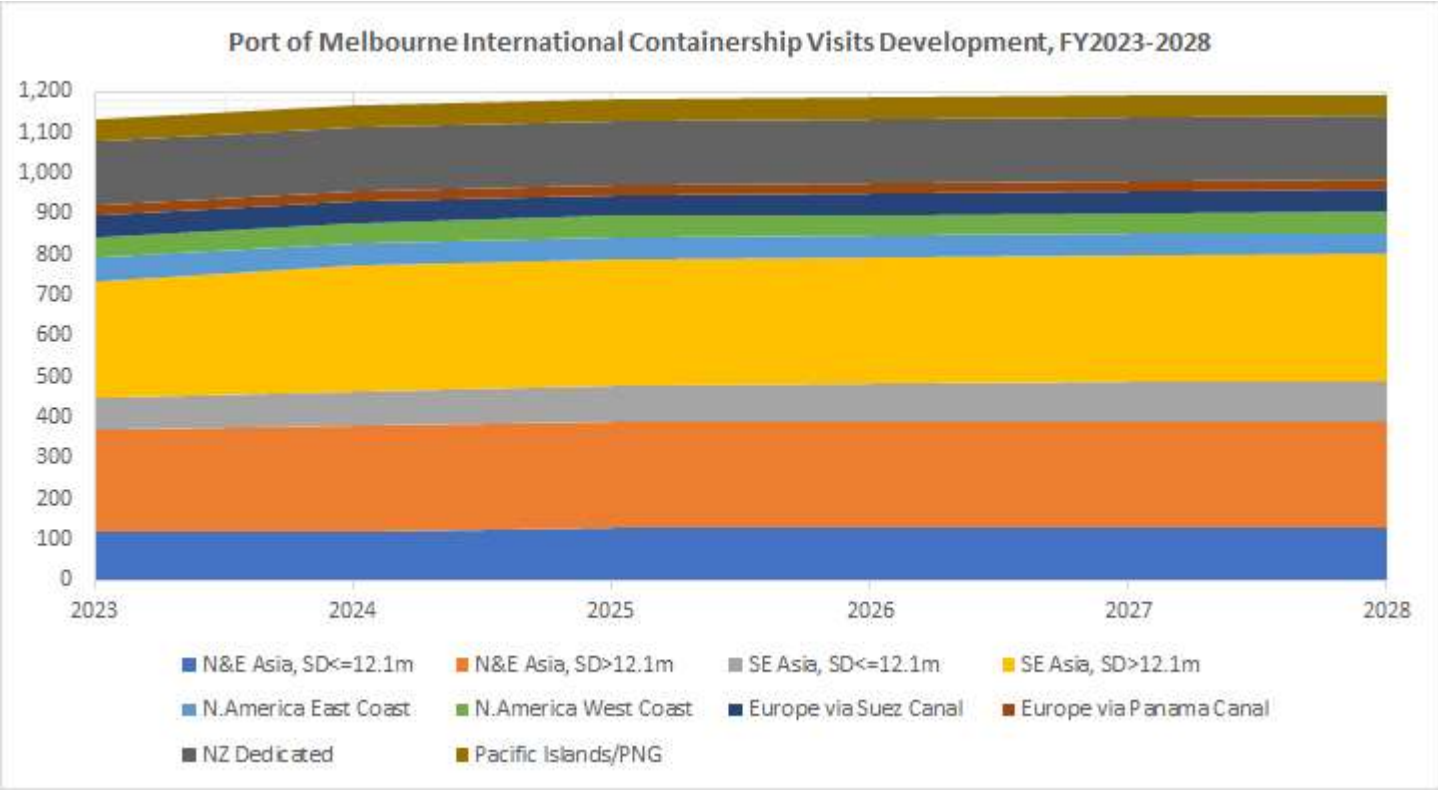
Source: GHD analysis using Port of Melbourne actual statistics as a basis.

2.2 Results of modelling

2.2.1 Container Vessel Visits Development, 2023-2028

Given the assumptions used, the modelling shows that the number of visits by international containerships to the Port of Melbourne may increase from 1,130 in FY2022/23 to a total of 1,193 by FY2027/28 (see Figure 3 below).

Figure 3 Port of Melbourne International Containership Visits by Shipping Route, FY2023-2028

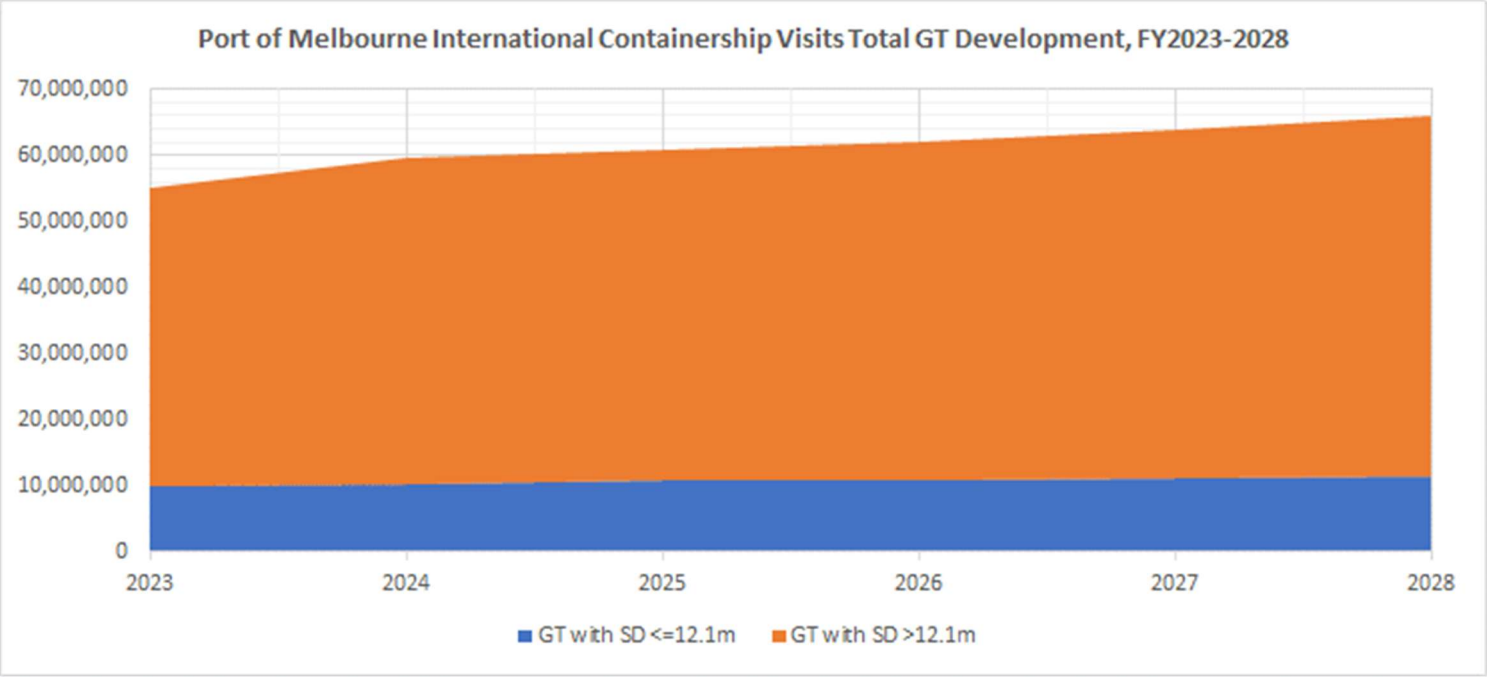


2.2.2 Container Vessel GT Forecasts by Summer Draught group, 2023-2028

The calculation of the future Vessel GT uses an assumption of a conversion factor of between 10-11 GT per nominal vessel TEU depending on the shipping route, which reflects the mix of fleet deployed by shipping lines (carriers) on the Port of Melbourne shipping routes from the global fleet.

Given the assumptions used, the modelling shows that the total GT of international containerships visiting the Port of Melbourne may increase from 55.2 million GT in FY2022/23 to a total of 66.1 million GT by FY2027/28 (see Figure 4 below). As of FY2027/28, the GT share of vessels visiting with a maximum summer draught (SD) of >12.1m may be 83%.

Figure 4 *Port of Melbourne International Containership Visits Total GT Development by maximum summer draught group, FY2023-2028*



3. Non-Container Vessel Fleet Forecasts (2023-2028)

3.1 Modelling approach used

3.1.1 Vessel fleet type and channel sectors

The modelling approach used for the Non-Container Vessel Fleet Forecasts is a combination of grouping vessels by Vessel Fleet Type with their cargo demand assessed, and the Port of Melbourne Channel sectors used (i.e. Port of Melbourne berths, Station Pier Cruise-ships and Port of Geelong vessels). The breakdown of the forecasts, with sets of relevant assumptions applied in the modelling, comprises: Bass Strait Container/Ro-Ro, Motor Vehicle Carrier/Ro-Ro, Other break-bulk – general cargo/multi-purpose (Lo-Lo), Dry Bulk Carriers, Liquid Bulk Tankers (fuel and other oils, chemicals & gases), TT-Line Passenger Ferries (PAX/Ro-Ro), Cruise-ships (at Station Pier), and Vessels visiting the Port of Geelong (Tankers, Dry Bulk Carriers, Break-bulk Vessels, Offshore Supply Vessels, and Cruise-ships).

3.1.2 Trade Demand

The trade demand is based, where relevant, on the Port of Melbourne DAE base trade forecasts for the commodity groups carried on the vessel types. Where a non-container vessel type carries both import and export cargoes, then the head-haul trade direction growth forecasts are used to determine the required number of vessel visits for a given shipment size and the corresponding vessel size (DWT, GT and maximum summer draught). Where vessels carry different trade forecast commodities in different trade directions (i.e. vessel back-hauling occurs), then an average vessel backhaul factor is applied to the required number of unique vessel visits to reduce the nominal number of vessel visits.

DAE base trade forecasts are only for the Port of Melbourne trades. For Cruise-ships visiting Station Pier, public-domain forward bookings, as published by Victoria Ports, and long-term cruise industry assessments (including vessel size increases), have been used (2023 and 2024 cruise seasons). For the Port of Geelong, where common commodity trades exist with the Port of Melbourne, then the DAE base trade forecast growth rates have been used. There are also some specific assumptions relating to the Geelong trades (i.e. wood-chips, fertilisers and prospective LNG) which are discussed in the later report sections.

3.2 Port of Melbourne Bass Strait Container/Ro-Ro fleet sector

3.2.1 Specific modelling assumptions

The forecast head-haul (export) trade demand of containers (per DAE base trade forecasts) is used in the modelling. The Bass Strait fleet is assumed to be stable as of FY2024/25 once the new vessel for Searoad is delivered (replacing a smaller chartered vessel). The two operators are assumed to have constant market shares. Average vessel utilisation of the Bass Strait fleet (four vessels), comparing head-haul container demand with nominal TEU capacity, is estimated at 38% in FY2022/23 increasing to 40% by FY2027/28. If Bass Strait breakbulk cargoes are also included (i.e. motor vehicles, trailers, etc.), then these assumed vessel utilisations will be higher and may influence the timing of increased vessel capacity on the route.

3.2.2 Results of Modelling – Vessel Fleet Sector Development, 2023-2028

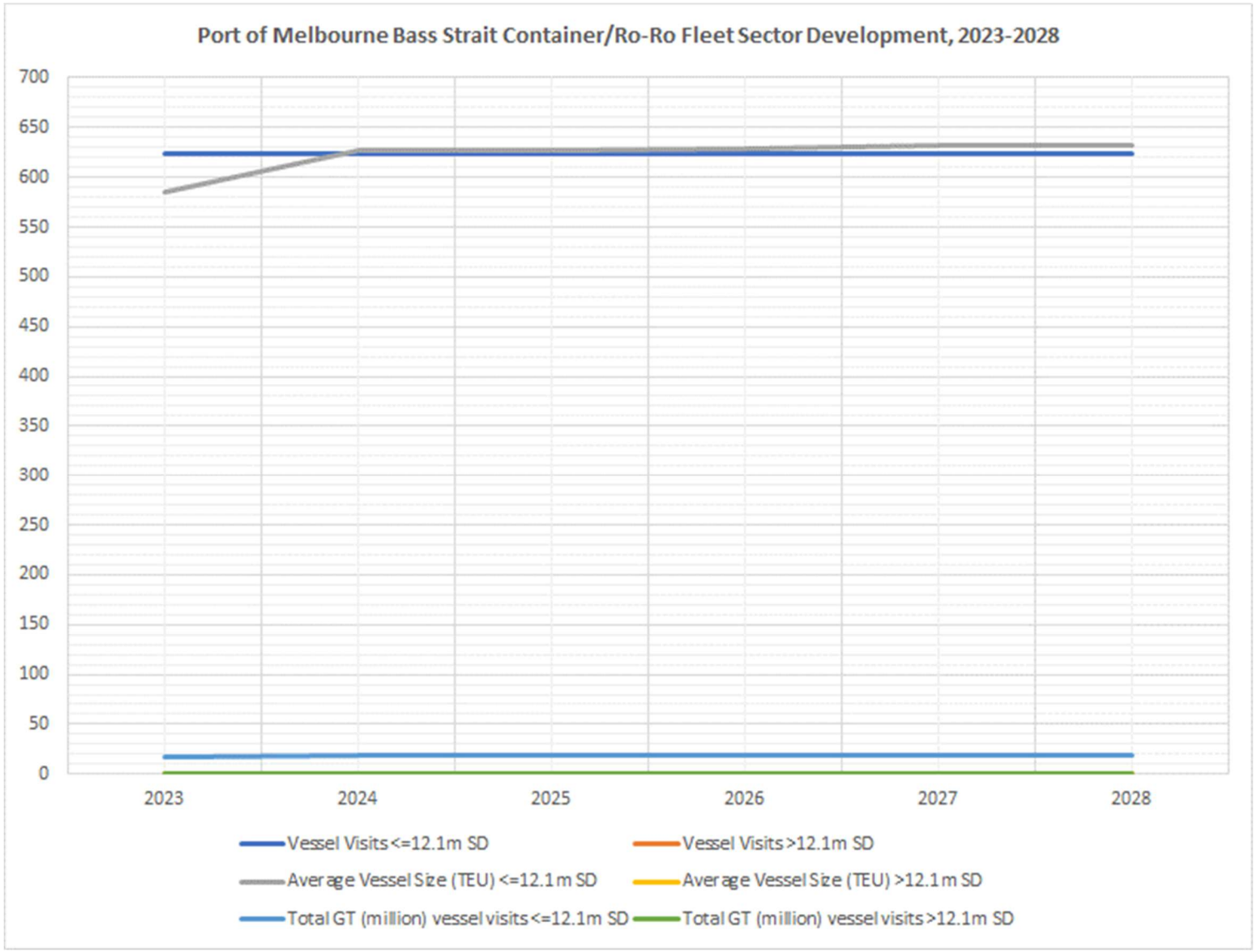
As of FY2024/25, the average vessel sizes are assumed to remain constant through to FY 2027/28 due to estimated available vessel capacity (based on estimated utilisation).

As of FY2022/23, the total vessel visits of 624 per year (6 sailings per week per operator) are assumed to remain constant through to FY 2027/28 due to estimated available vessel capacity (based on estimated utilisation). If utilisation becomes an issue in the future, then it is likely that the sailings will be first increased to daily before increasing the size of the vessels.

As of FY2024/25, the total vessel visits GT is estimated to remain constant at 19.6 million GT (all with maximum summer draught <12.1m) through to FY 2027/28.

The results are summarised in Figure 5 below.

Figure 5 *Port of Melbourne Bass Strait Container/Ro-Ro Fleet Sector Development, 2023-2028*



3.3 Port of Melbourne Motor Vehicle Carrier/Ro-Ro fleet sector

3.3.1 Specific modelling assumptions

The forecast head-haul (import) trade demand of motor vehicles (per DAE base trade forecasts) is used in the modelling. Based on historical fleet developments, it is assumed that 50% of the head-haul demand growth is met by increased vessel size, and the remaining 50% by an increased number of vessel visits.

3.3.2 Results of Modelling – Vessel Fleet Sector Development, 2023-2028

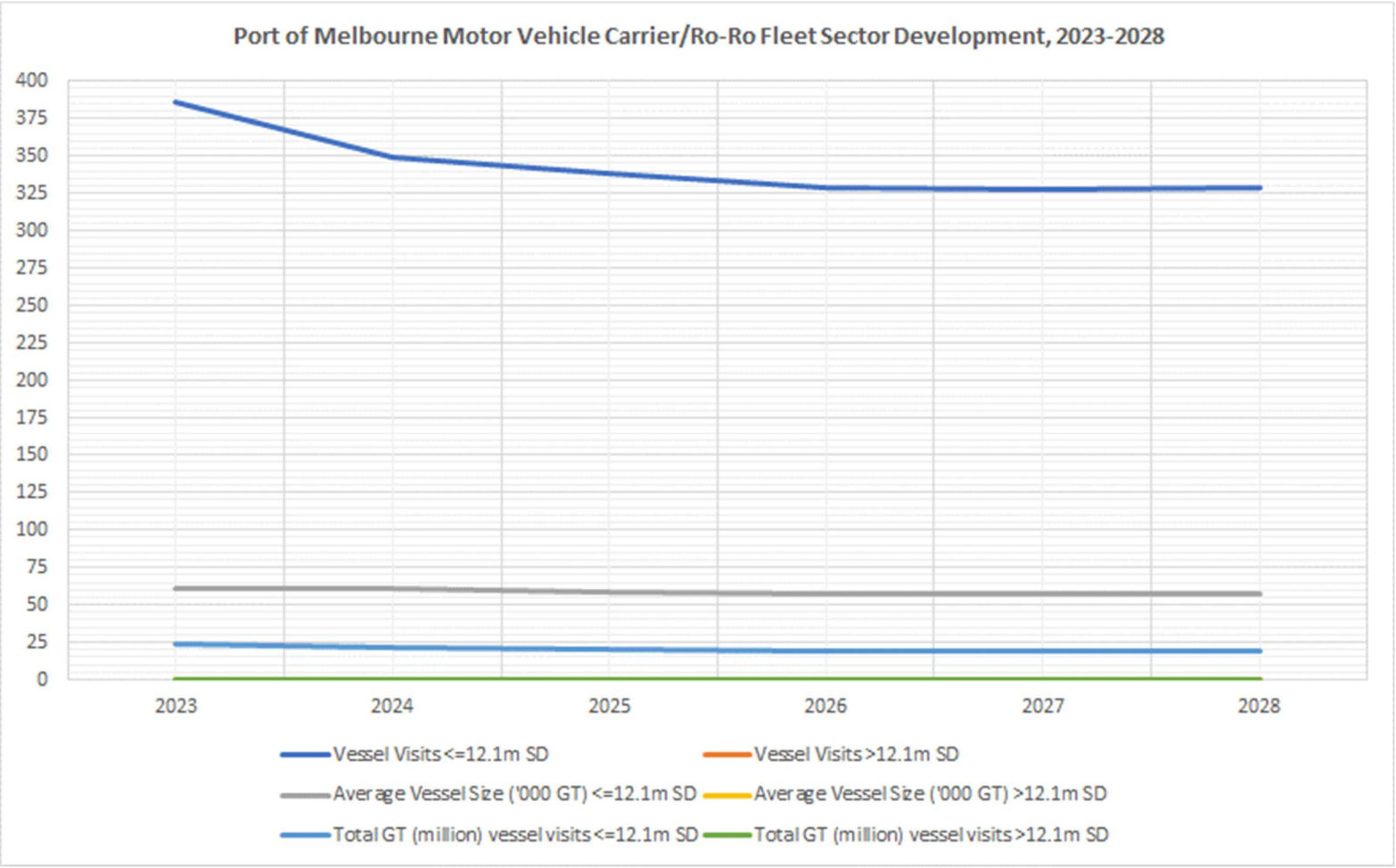
The average vessel sizes are estimated to increase from 60,600 GT in FY2023/23 to 57,262 GT in FY2027/28.

The total vessel visits are estimated to increase from 386 in FY2022/23 to 329 in FY2027/28.

The total vessel visits GT are estimated to increase from 23.4 million GT in FY2022/23 to 18.8 million GT in FY2027/28. The share of total vessel GT by vessels with maximum summer draughts <=12.1m is estimated at 100% in FY2027/28.

The results are summarised in Figure 6 below.

Figure 6 *Port of Melbourne Motor Vehicle/Ro-Ro Fleet Sector Development, 2023-2028*



3.4 Port of Melbourne Other Break-bulk (general cargo/multi-purpose Lo-Lo) fleet sector

3.4.1 Specific modelling assumptions

The forecast head-haul (import) trade demand of other breakbulk (per DAE base trade forecasts) is used in the modelling. Based on historical fleet developments, it is assumed that average shipment sizes remain constant such that any forecast growth in head-haul demand is met by an increased number of vessel visits of the same average size.

3.4.2 Results of Modelling – Vessel Fleet Sector Development, 2023-2028

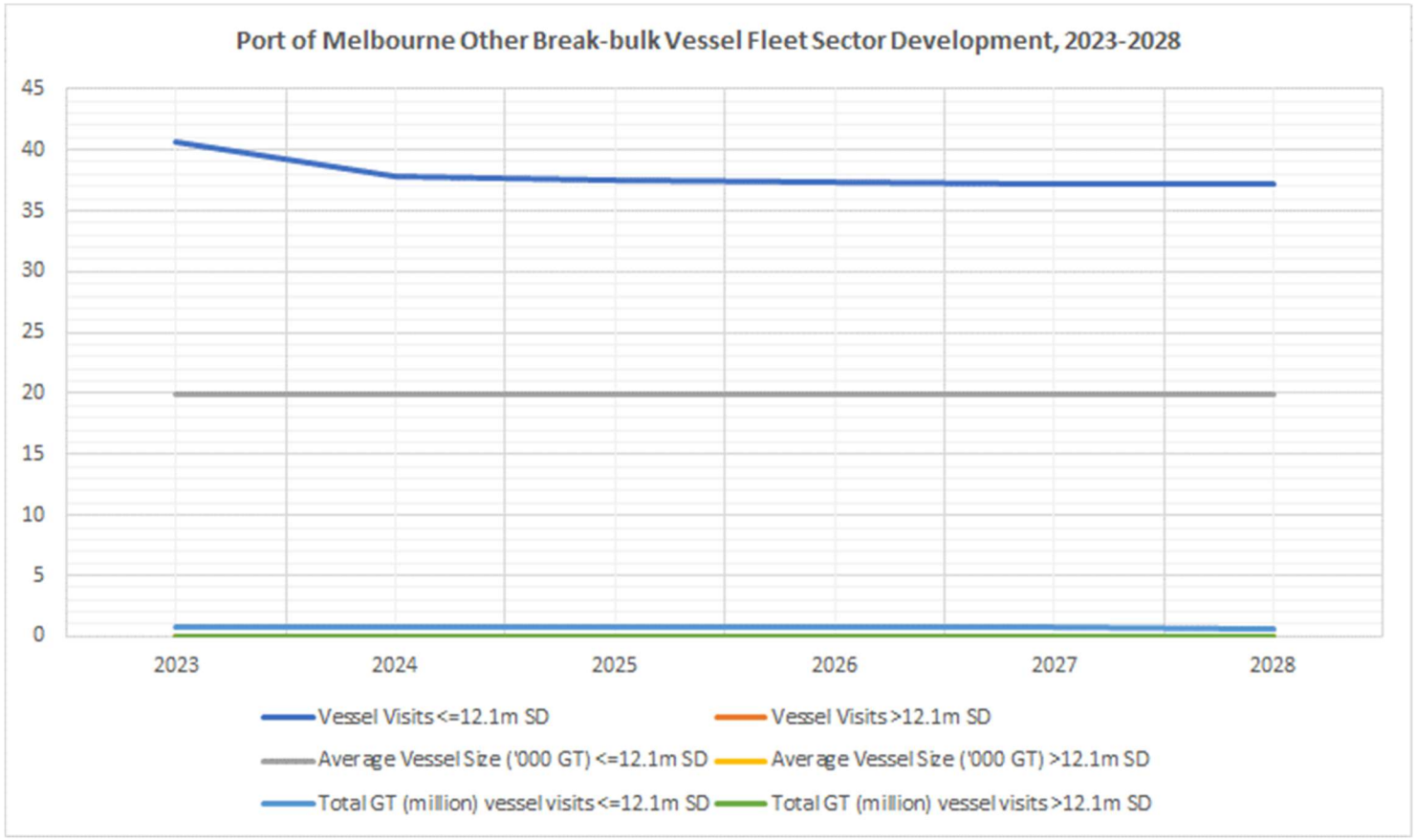
The average vessel sizes are estimated to remain constant at 19,940 GT.

The total vessel visits are estimated to decrease from 41 in FY2022/23 to 37 in FY2027/28.

The total vessel visits GT are estimated to decrease from 0.8 million GT in FY2022/23 to 0.7 million GT in FY2027/28. The share of total vessel GT by vessels with maximum summer draughts <=12.1m is estimated at 100% throughout the period.

The results are summarised in Figure 7 below.

Figure 7 *Port of Melbourne Other Break-bulk Vessel (General Cargo/Multi-purpose LoLo) Fleet Sector Development, 2023-2028*



3.5 Port of Melbourne Dry Bulk Carrier fleet sector

3.5.1 Specific modelling assumptions

The forecasting of the Port of Melbourne Dry Bulk Carrier fleet sector is divided into three dry bulk trades: cement/fly-ash/clinker imports at SW 26 & 27, sugar and gypsum imports at YVL 5 & 6, and grain exports using Handysize and Panamax size vessels at APPF. The share of Handysize and Panamax size vessels exporting grain is assumed to be constant. Based on historical fleet developments, it is assumed that average shipment sizes remain constant such that any forecast growth in head-haul demand is met by an increased number of vessel visits of the same average size.

3.5.2 Results of Modelling – Vessel Fleet Sector Development, 2023-2028

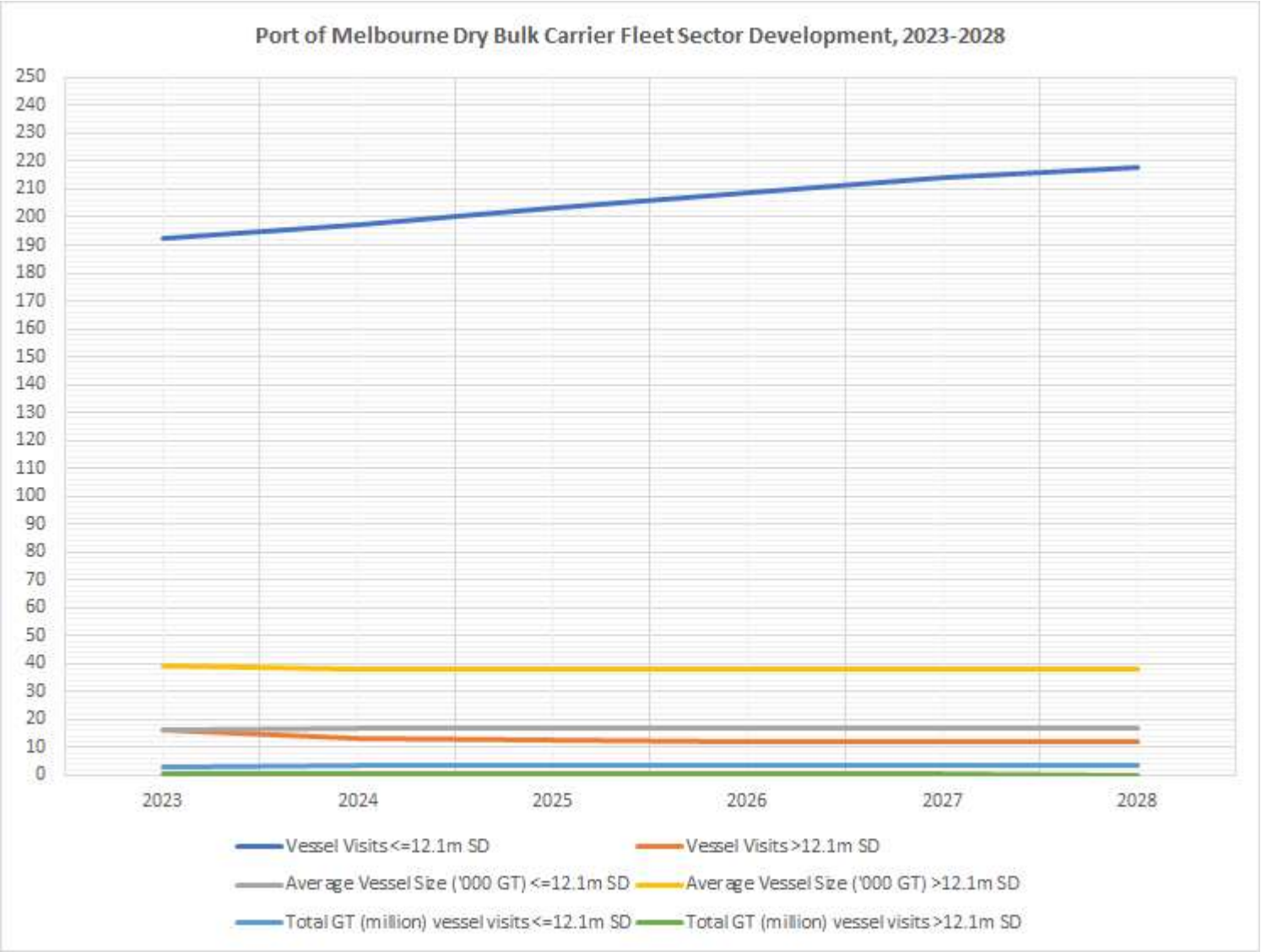
The average vessel sizes are estimated to remain constant and vary between 15,060 and 38,000 GT.

The total vessel visits are estimated to increase from 209 in FY2022/23 to 230 in FY2027/28.

The total vessel visits GT are estimated to increase from 3.8 million GT in FY2022/23 to 4.1 million GT in FY2027/28. The share of total vessel GT by vessels with maximum summer draughts <=12.1m is estimated at 89% in FY2027/28.

The results are summarised in Figure 8 below.

Figure 8 *Port of Melbourne Dry Bulk Carrier Fleet Sector Development, 2023-2028*



3.6 Port of Melbourne Tanker fleet sector

3.6.1 Specific modelling assumptions

The forecasting of the Port of Melbourne Liquid Bulk Tanker fleet sector is divided into five liquid bulk trades: fuel imports at GELI, fuel imports at HOLD, other liquid bulk imports at HOLD, other liquid bulk imports at MRY1, and other liquid bulk exports at MRY1. The share of fuel imports at GELI and HOLD is assumed to be constant. Based on historical fleet developments, it is assumed that average shipment sizes remain constant such that any forecast growth in head-haul demand is met by an increased number of vessel visits of the same average size.

3.6.2 Results of Modelling – Vessel Fleet Sector Development, 2023-2028

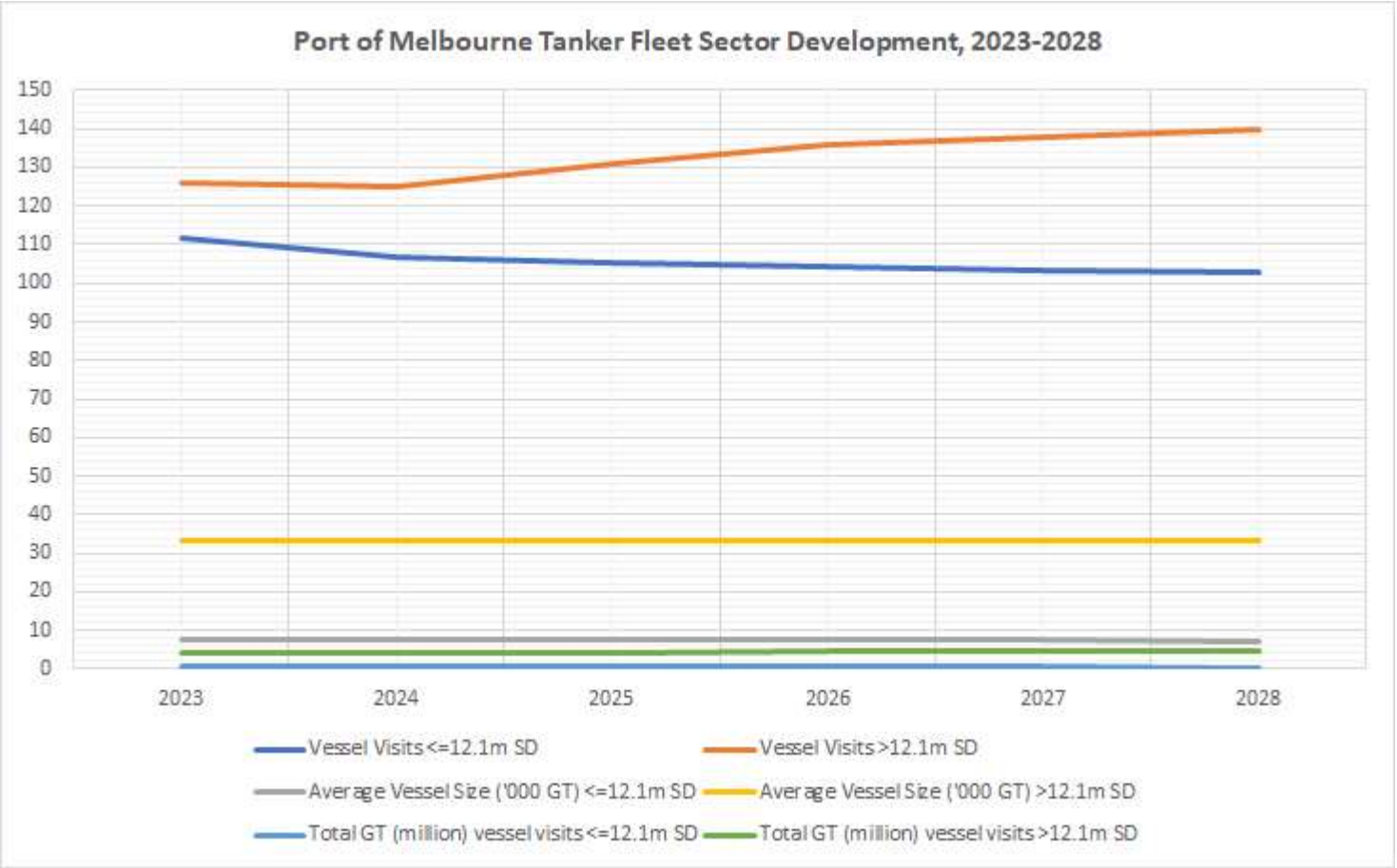
The average vessel sizes are estimated to remain constant and vary between 7,864 and 44,613 GT.

The total vessel visits are estimated to increase from 238 in FY2022/23 to 242 in FY2027/28.

The total vessel visits GT are estimated to increase from 5.1 million GT in FY2022/23 to 5.5 million GT in FY2027/28. The share of total vessel GT by vessels with maximum summer draughts <=12.1m is estimated at 16% in FY2027/28.

The results are summarised in Figure 9 below.

Figure 9 *Port of Melbourne Tanker Fleet Sector Development, 2023-2028*



3.7 TT-Line Bass Strait PAX/Ro-Ro fleet sector

3.7.1 Specific modelling assumptions

The TT-Line Bass Strait PAX/Ro-Ro fleet of two vessels (average 27,169 GT) is assumed to be replaced with larger newbuilds (average 48,000 GT) in FY2024/25. These new vessels (and future replacements) are assumed to operate unchanged through to FY2027/28. The TT-Line fleet is using the Port of Geelong as of October 2022 after moving from Station Pier.

3.7.2 Results of Modelling – Vessel Fleet Sector Development, 2023-2028

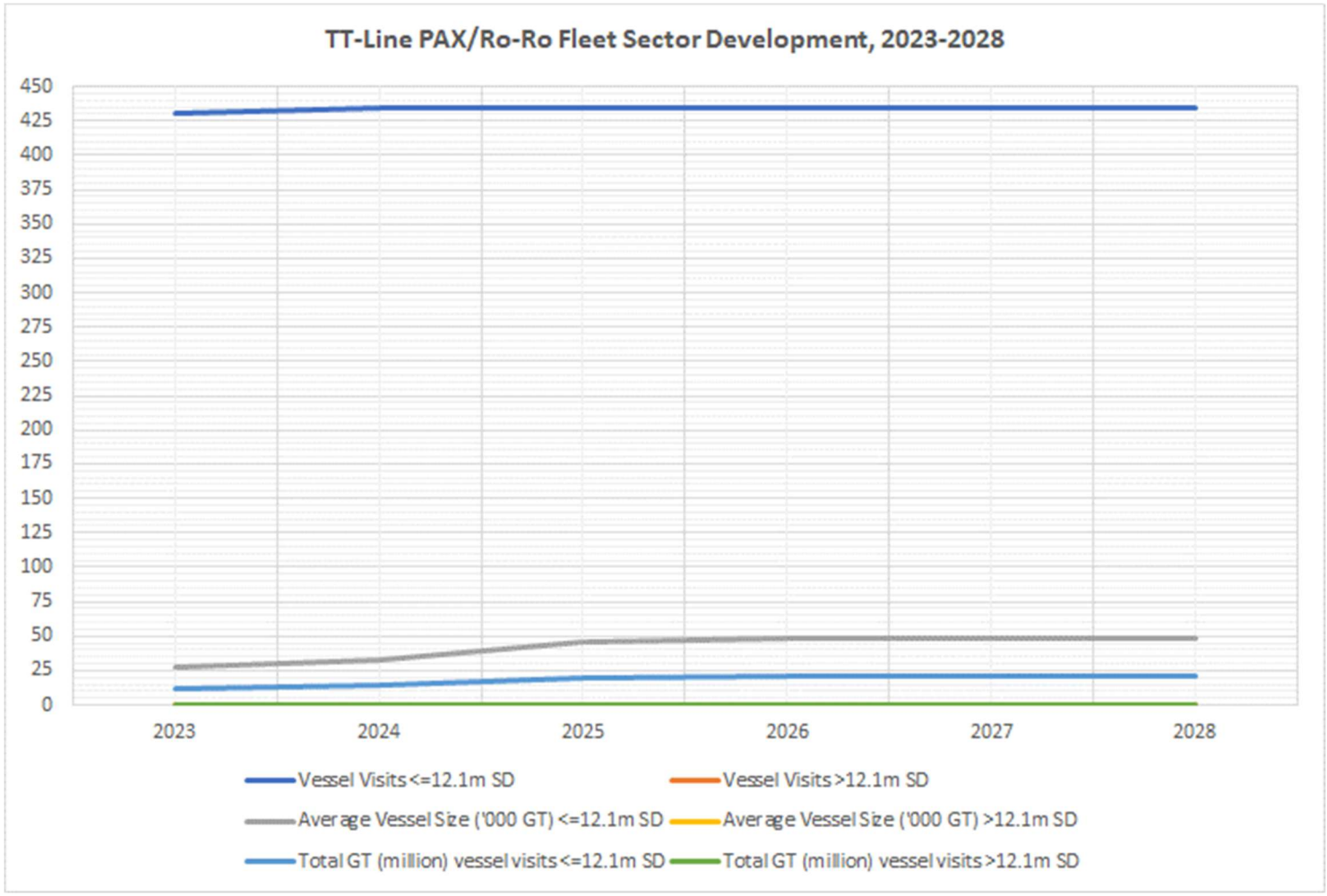
As of FY2024/25, the average vessel size of 48,000 GT is assumed to remain constant through to FY 2027/28 due to estimated available vessel capacity.

As of FY2024/25, the total vessel visits of 434 per year are assumed to remain constant through to FY 2027/28 due to estimated available vessel capacity. If utilisation becomes an issue in the future, then it is likely that the sailings will be first increased before increasing the size of the vessels.

As of FY2024/25, the total vessel visits GT is estimated to remain constant at 20.8 million GT (all with maximum summer draught <12.1m) through to FY 2027/28.

The results are summarised in Figure 10 below.

Figure 10 *TT-Line PAX/Ro-Ro Fleet Sector Development, 2023-2028*



3.8 Station Pier Cruise-ship fleet sector

3.8.1 Specific modelling assumptions

After a cessation of cruise-shipping at Station Pier (and nationally) due to the COVID-19 pandemic, cruise-shipping has resumed in FY2022-23. The forecasts use the forward bookings with Victoria Ports for 2023-2025 noting that the cruise season (5 months duration) typically runs from start of November through to end of March for each FY. Based on industry information, it is assumed that cruise demand will increase at around 2.5% per year until FY2027/28. The shifting of TT-Line to Geelong in October 2022 means that four berths are now available at Station Pier for cruise-shipping. The maximum cruise-ship size is limited to a maximum summer draught of 10.3m due to channel/berth-pocket depths. Based on historical developments, it is assumed that 50% of cruise demand is met by increasing vessel size and the remainder of growth by increasing the number of vessel visits.

3.8.2 Results of Modelling – Vessel Fleet Sector Development, 2023-2028

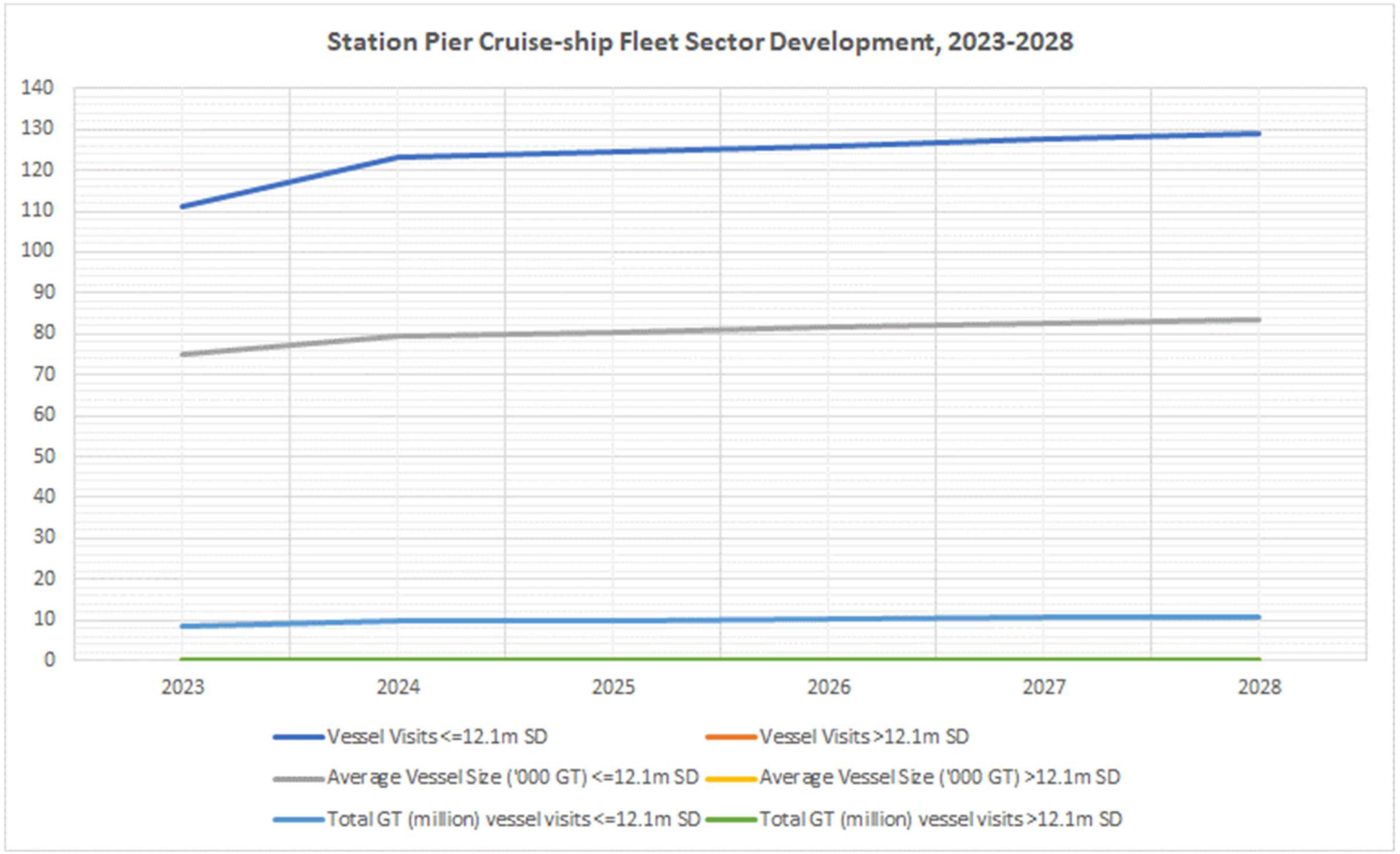
The average vessel sizes are estimated to increase from 74,859 GT (1,738 PAX berths) in FY2022/23 to 83,562 GT (1,944 PAX berths) in FY2027/28.

The total vessel visits are estimated to increase from 111 in FY2022/23 to 129 in FY2027/28.

The total vessel visits GT are estimated to increase from 8.3 million GT in FY2022/23 to 10.8 million GT in FY2027/28. The share of total vessel GT by vessels with maximum summer draughts <=12.1m is estimated at 100% in FY2027/28.

The results are summarised in Figure 11 below.

Figure 11 *Station Pier Cruise-ship Fleet Sector Development, 2023-2028*



3.9 Port of Geelong Vessel fleet sector (excl. TT-Line)

3.9.1 Specific modelling assumptions

The Port of Geelong vessel fleet forecasts are based on multiple distinct trades: dry bulk exports – woodchips, dry bulk exports – grain, dry bulk exports – fertilisers, dry bulk exports – other commodities, dry bulk imports – fertilisers, dry bulk imports – cement products, dry bulk imports – soy/grain, dry bulk imports – other commodities, liquid bulk imports – crude oil for the refinery, liquid bulk imports – fuel, liquid bulk imports – chemicals, liquid bulk imports – LNG (firm prospect), liquid bulk exports – fuel to Melbourne and inter-state, break-bulk imports and exports (various commodities), offshore supply vessels, and cruise-ships (limited to at anchor visits).

The forecasts relating to each of the trades are based on:

- DAE base Port of Melbourne forecasts for similar import and export commodities (i.e. dry bulk exports, cement imports, fuel imports, other liquid bulk imports, and break-bulk imports)
- Geelong forestry and agricultural trades not covered by DAE base forecasts assumed to remain constant due to harvest variability, and plantation size/re-planting factors
- LNG imports of 2.7 million tonnes per year starting in FY2025/26 and continuing through FY2027/28 as per the information in the proponent's public Feasibility Study / EIS
- Other minor Geelong trades (cruise-ship, offshore supply etc.) remain constant.

Based on historical developments, it is assumed that average shipment sizes for the Port of Geelong remain constant and that any trade growth is met by increasing the number of vessel visits.

3.9.2 Results of Modelling – Vessel Fleet Sector Development, 2023-2028

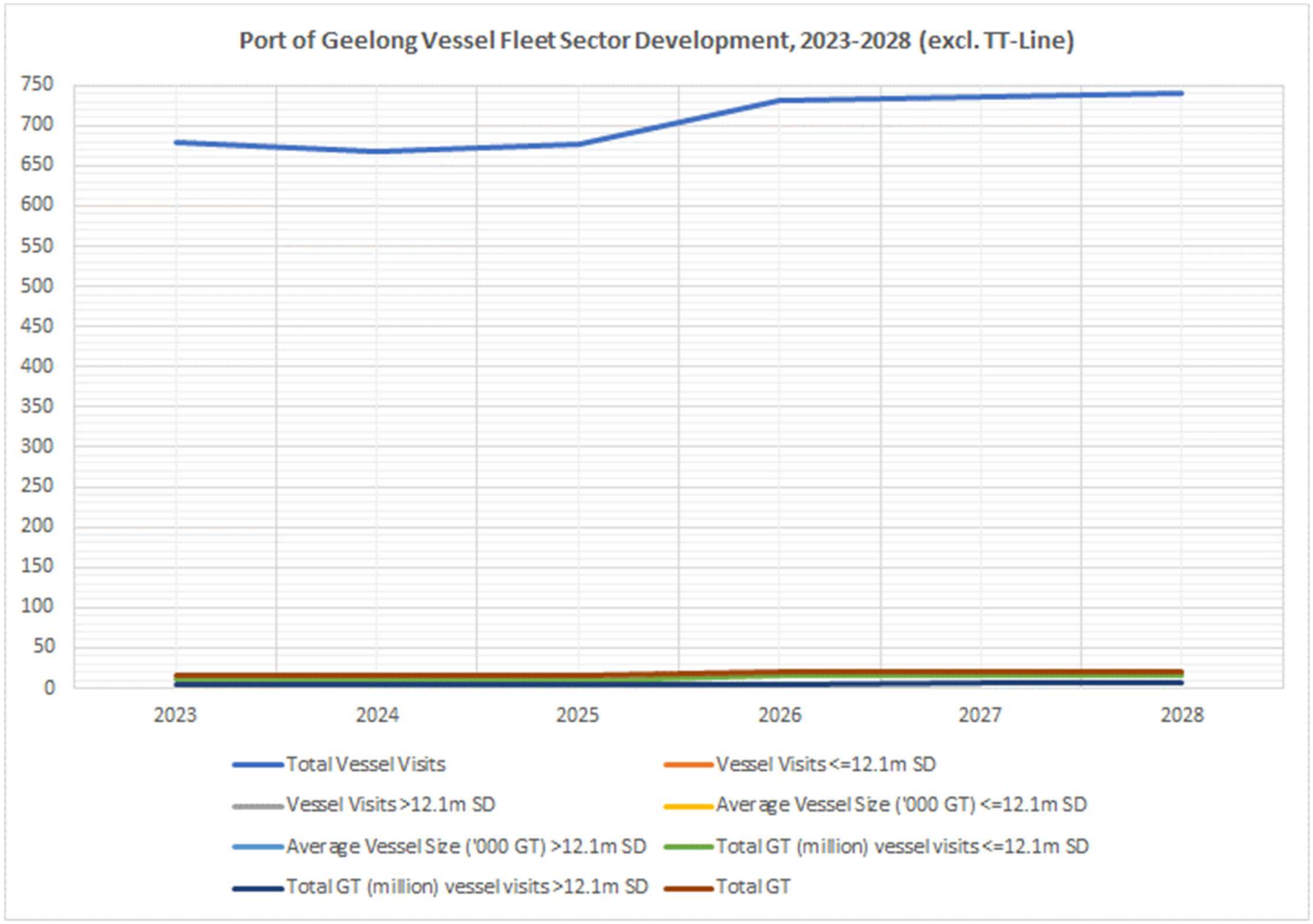
The average vessel sizes are estimated to range from 6,317 GT (offshore supply vessels) to 104,000 GT (prospective LNG tankers).

The total vessel visits are estimated to increase from 678 in FY2022/23 to 741 in FY2027/28.

The total vessel visits GT are estimated to slightly decline from 15.4 million GT in FY2022/23 to 14.9 million GT in FY2027/28. The share of total vessel GT by vessels with maximum summer draughts <=12.1m is estimated at 72% in FY2027/28.

The results are summarised in Figure 12 below.

Figure 12 *Port of Geelong Vessel Fleet Sector Development, 2023-2028 (excl. TT-Line)*



3.10 All Vessel Fleet Sectors for Port of Melbourne Channels, 2023-2028

The modelling of Container and Non-Container Vessel Fleet forecasts for the Port of Melbourne Channels indicates that total vessel GT using the Channels is estimated to grow from 141.8 million GT in FY2022/23 to 167.1 million GT in FY2027/28. In terms of vessel maximum summer draughts, it is estimated that by FY2027/28 vessels with a maximum summer draught <=12.1m may represent 61% share of the total vessel GT using the Port of Melbourne Channels. These overall modelling results are summarised in Figures 13 and 14 below.

Figure 13 Total GT for Port of Melbourne Channels by Vessel Fleet Sector, 2023-2028

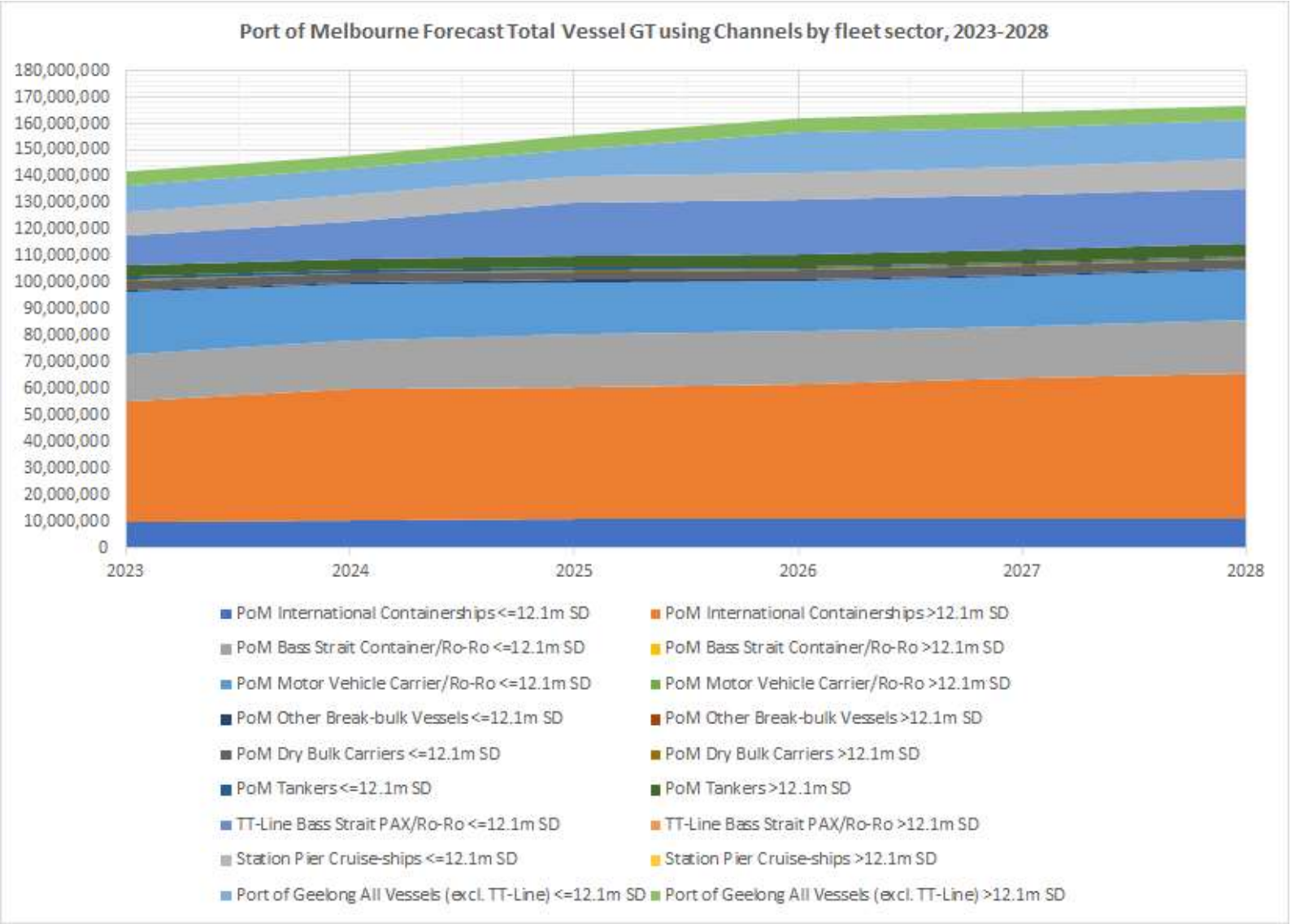
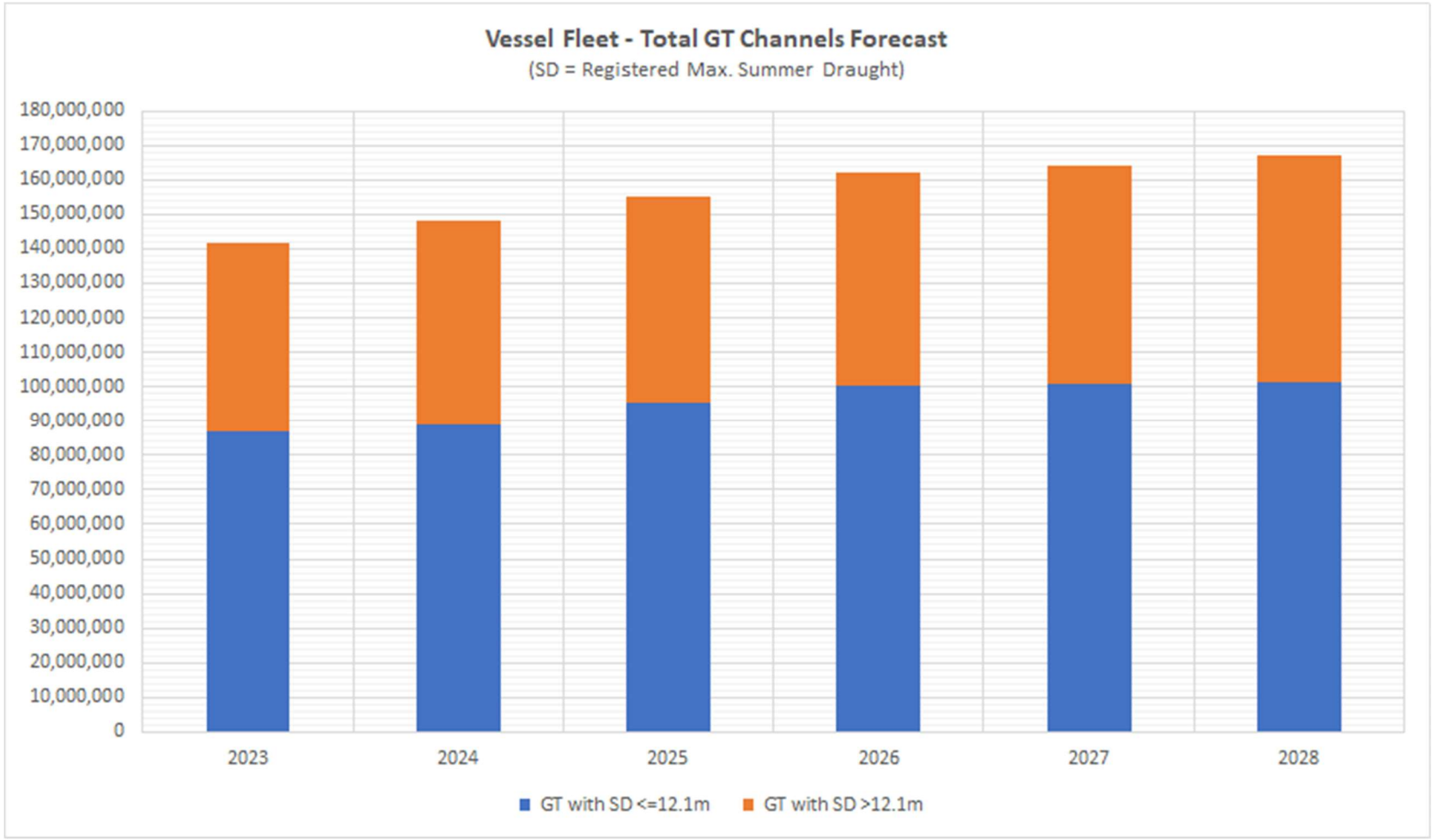


Figure 14 *Vessel Fleet Total GT for Port of Melbourne Channels by Summer Draught Group, 2023-2028*



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