MERCATOR
INTERNATIONAL LLC
Logistics & Infrastructure Advisors

AAPA American Association of Port Authorities
Alliance of the Ports of Canada, the Caribbean, Latin America and the United States

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Market-Driven Far-Reaching Scenarios: Impact and Opportunities Resulting from Global Change

Containership Industry Structure

- ***Structure of Liner Industry*** ***--- effectively, this industry is comprised of four tiers of carriers:***
  - **Global Operators**
  - **North-South Specialists and Multi-Trade Operators**
  - **Regional/Country Specialists**
  - **Niche Operators**

Containership Industry– Global Operators

- ***Size Stratification***

RANK	CARRIER	CAPACITY DEPLOYED TOTAL TEUs	CAPACITY DEPLOYED # OF SHIPS	SIZE RATIO TO #1 CARRIER	COUNTRY OF HQ	OWNERSHIP
1	**Maersk Line**	2,633,697	579	**100%**	Denmark	Family/Public
2	**Mediterranean Shipping**	2,376,343	489	**90%**	Switzerland	Family
3	**CMA CGM**	1,506,493	428	**57%**	France	Family
4	**Evergreen**	808,029	199	**31%**	Taiwan	Family/Public
5	**COSCO**	775,342	167	**29%**	China	State/Public
6	**Hapag-Lloyd**	717,383	150	**27%**	Germany	Public
7	**APL**	636,090	121	**24%**	Singapore	State/Public
8	**Hanjin Shipping**	635,522	118	**24%**	South Korea	Family/Public
9	**China Shipping**	603,963	141	**23%**	China	State/Public
10	**MOL**	541,802	113	**21%**	Japan	Public/Keiretsu
11	**OOCL**	466,346	90	**18%**	Hong Kong	Family/Public
12	**NYK**	444,308	100	**17%**	Japan	Public/Keiretsu
13	**Yang Ming**	385,738	89	**15%**	Taiwan	Public/State
14	**K Line**	350,473	67	**13%**	Japan	Public/Keiretsu
15	**Zim**	341,565	87	**13%**	Israel	Family/Public
16	**Hyundai**	330,470	57	**13%**	South Korea	Family/Public

Containership Industry Structural Stability

- *The industry structure outlined in the preceding two pages has been in place since the late 1990s*
- *Moreover, merger/acquisition activity in the industry has been relatively minor during the past seven years*
- *Consequently, the composition of the top tier of the industry of the industry has been relatively stable during this period*
- *Nonetheless, despite this stability in industry structure, volatile and inadequate earnings performance continues to plague the liner shipping business*

Containership Industry
Financial/Economic Framework

- *Key causes of volatility and recurring losses for container shipping lines:*
  - ***Low barriers to entry into markets***
  - ***Vessel assets can be readily shifted between markets***
  - ***Costs for acquiring new vessels are artificially low, given implicit subsidies to shipbuilders***
  - ***Customers have relatively low costs of switching vessel service providers***
  - ***Inability to pass on cost increases in inputs (especially fuel and inland transport charges) to customers***
  - ***Import/export volumes in particular trade lanes can contract or expand more rapidly than vessel capacity can be contracted or expanded***
  - ***Trade volume variability translates into swings in equipment repositioning costs***
  - ***Many (and sometimes most) carriers focus first on market share, rather than earnings***
  - ***State-owned carriers are sometimes charged with keeping transport costs low for their countries' respective exporters***
  - ***High fixed cost structures lead to marginal pricing***
  - ***Over-ordering of new vessels, to maintain unit cost parity for ocean transport***

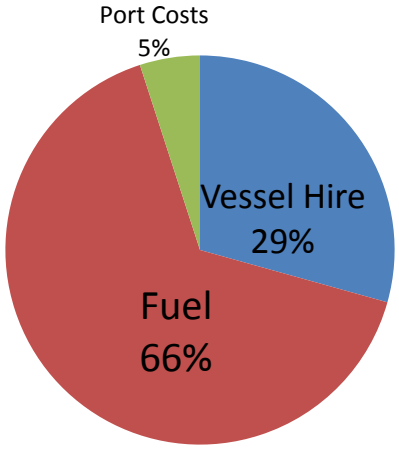
Containership Industry
Financial/Economic Framework

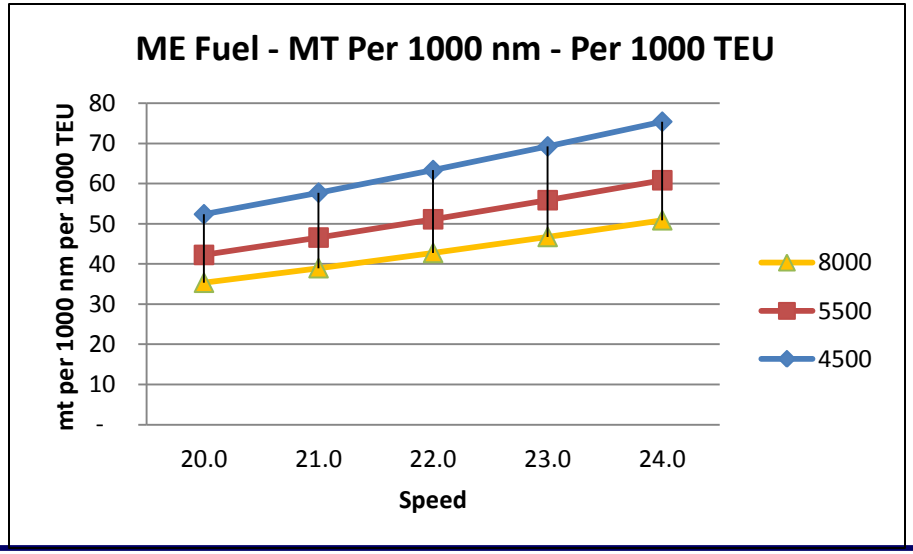
Overseas Landside	Ocean Transport	North American Gateway	N. America Inland Transport
• Terminal Charges	• Vessel Capital • Vessel Operating • Vessel Fuel • Port Call Charges • Canal Fees (opt)	• Terminal Charges • Wharfage • Infrastructure Levies • Other Port Fees • Rail Dray/Gate • On Dock Rail Lift	• Rail – Load Transport • Rail – Mty Repo • Rail – Fuel Surcharges • Rail – Inland Depot • Truck – Drayage

- **The distribution/location of population clusters and manufacturing centers in North America entails major inland transport costs for a significant portion of many trade lanes, especially for Asian cargoes**
- **With FOB terms prevailing in that trade, Asia Landside charges are largely localized to port zones**
- **The Ocean Transport component is the only one of the four that container ship lines can truly control**

Ocean Shipping Overview :
Containership Segment
Financial/Economic Framework

- **Fuel costs have become the largest element of the ocean transport component**
- **The evolution of the global containership fleet is partially due to the increased importance of fuel costs**
  - **Larger ships are more fuel efficient on a TEU-mile basis.**

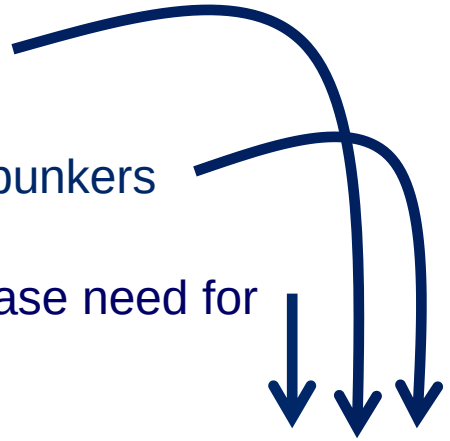




Containership Industry
Financial/Economic Framework

Outlook for bunker costs

- Basic demand projected to grow at about 2.5%/year
- Crude refineries hesitant to invest in more capacity for bunkers
- Establishment of ECAs and other regulations will increase need for higher-cost, low-sulfur bunkers
- These three factors will create further upward pressure on bunker costs
    - *This will increase the use of very large containerships and slow-steaming deployments, where possible*



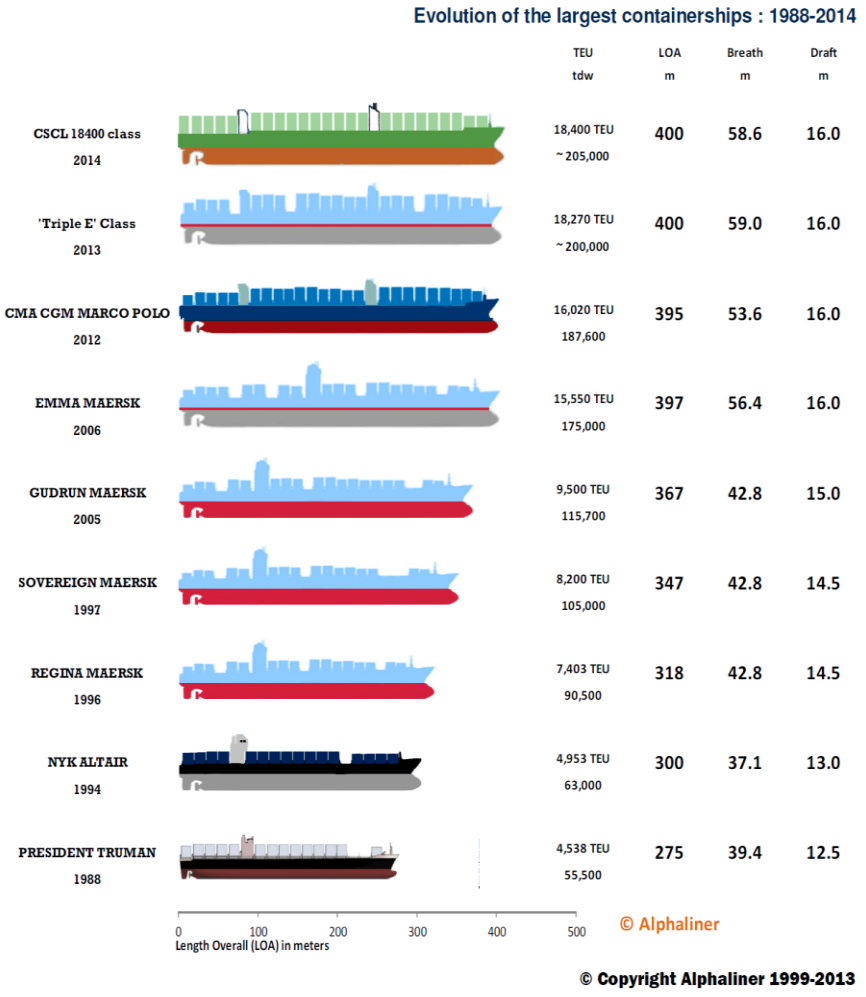
Projected Direction for Liner Shipping
Forces for Industry Consolidation

- Size Stratification
- Economics of Very Large Container Ships
  - Capital Intensity
  - Rising Fuel Costs/Unit Slot Costs
  - Easiest Option for Operators
- Service Requirements
  - Geographic Scope
  - Sailing Frequencies
- Terminal/Landside Considerations
  - Capacity Requirements
  - Rising Cost Trends
  - Buying Power Needs
- Regulatory Framework
  - EU removal of antitrust immunity
  - Impacts on capacity/service planning
  - Impacts on vessel sharing agreements

+ Plus Inadequate Earnings and Return on Capital

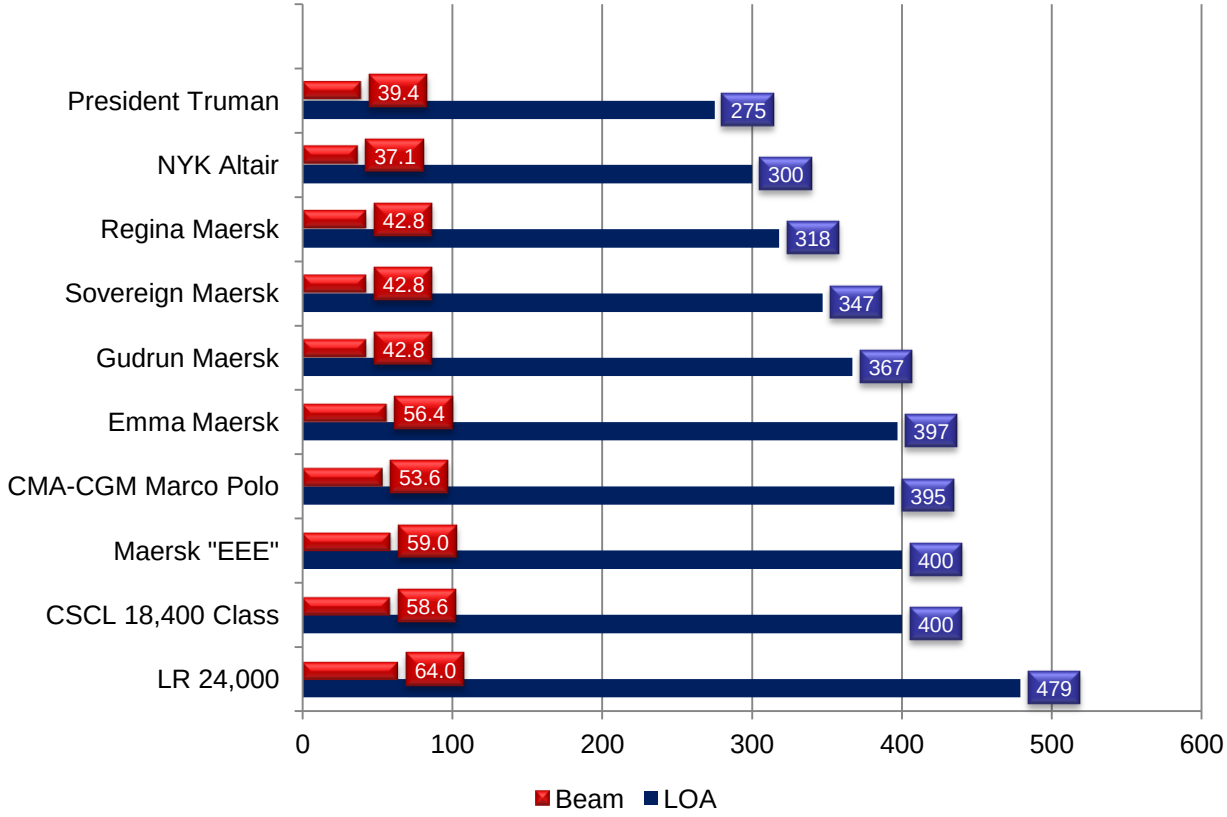
Container Vessel Size Development

- Vessel size has increased substantially with a marked increase from 1996 to 2013
- The TEU increase in vessel size over this period was 148.5%
- The increase in LOA over this period was 45.5% and the beam increased by 49.7%



Future Vessel Size

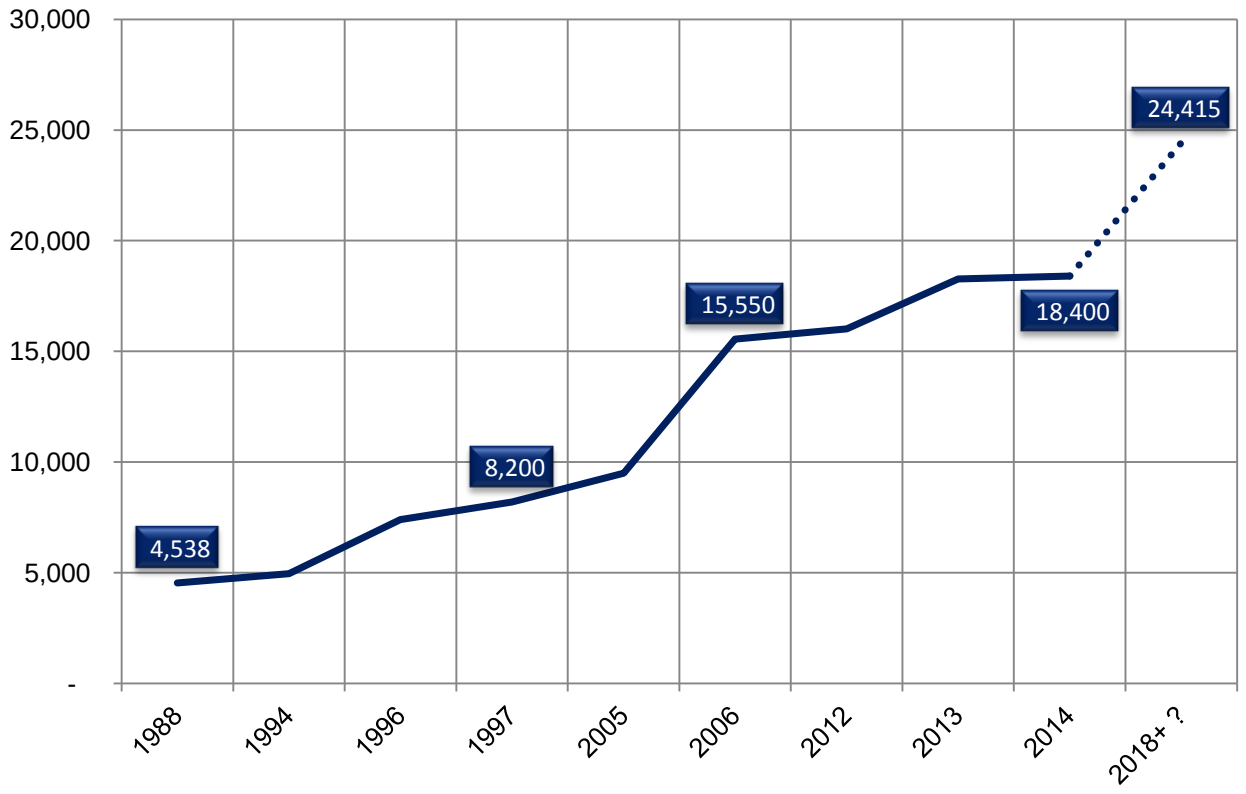
- There is also the prospect of 22-24,000 TEU ships being delivered sooner rather than later
- Industry observers believe 22,000 TEU ships could be in service by 2018
- LR has a design for 24,415 TEU Vessels which would be the current “Malacca-max”



Source: LR, Alphaliner

The development of container ship size

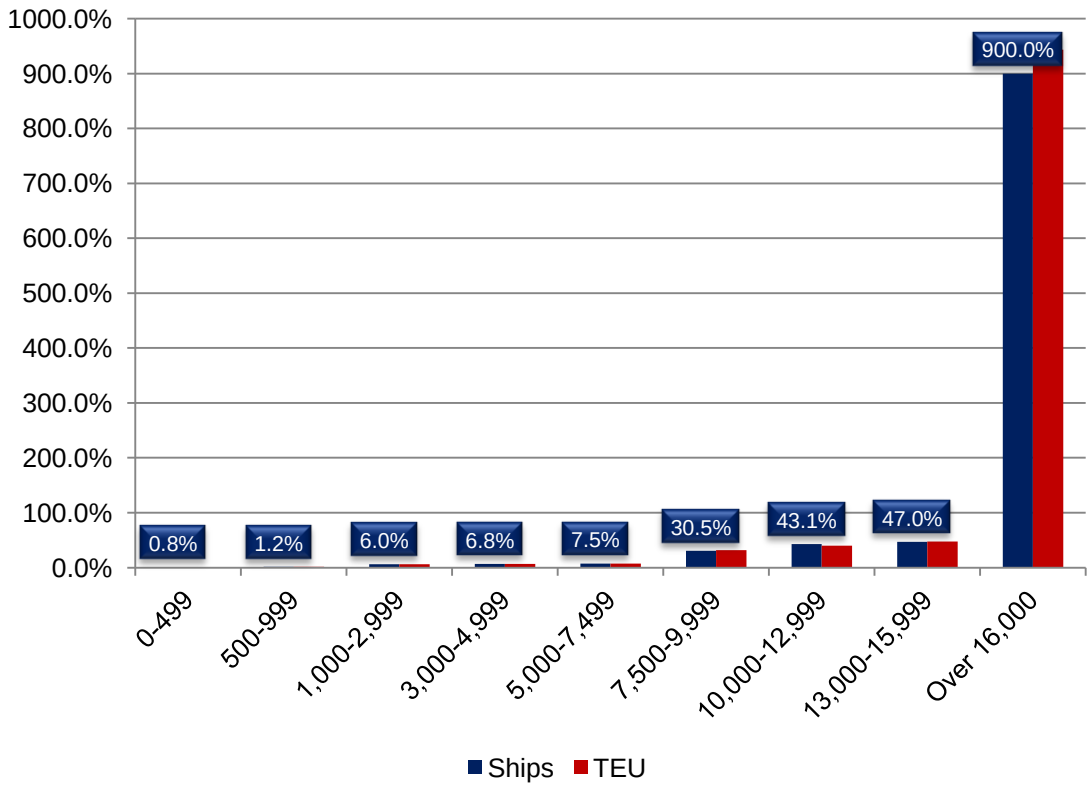
- The increase in vessel size has outpaced many ports
- There was a steep increase in vessel size between 2005 and 2006
- Between 2006 and 2013 the increase has not been so marked



Source: LR, Alphaliner

Percentage increase in container fleet to 2015

- Ships of over 16,000 TEU dominate the percentage of the orderbook albeit from a relatively small base
- Ships over 10,000 TEU will all see 30+ % increase in their sectors

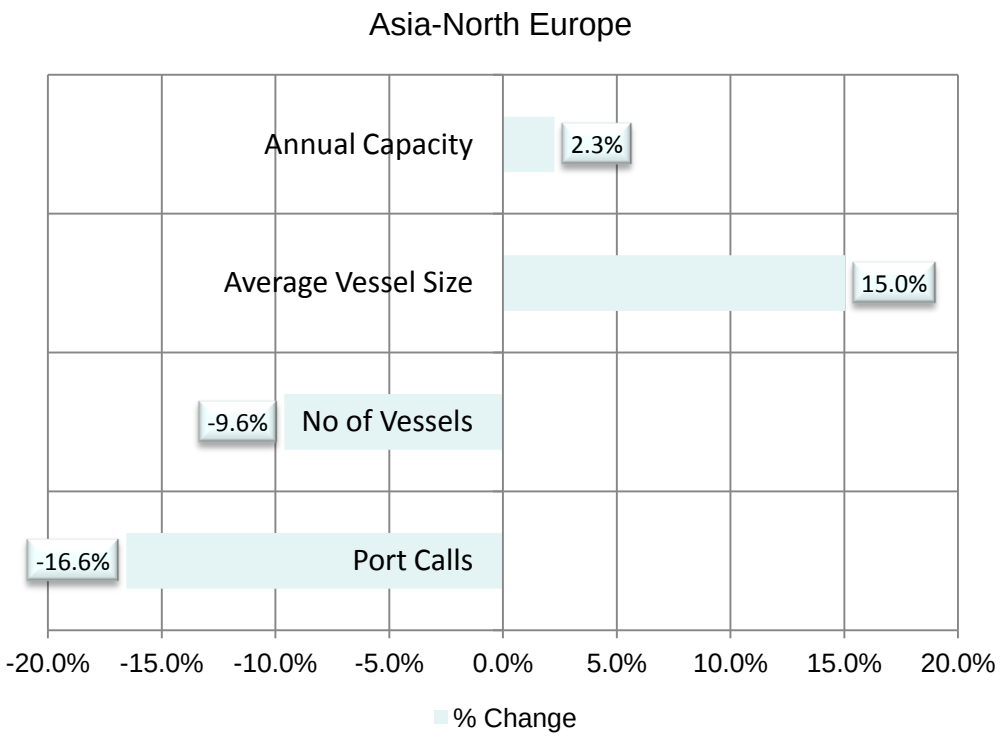


Source: Alphaliner

The impact of larger tonnage and alliances

- The impact of the forming of the P3 Alliance combined with larger tonnage being deployed in the Asia Europe trades has seen capacity more or less stay the same but there will be a 15% increase in the average vessel size, a drop in the number of vessels deployed and less port calls

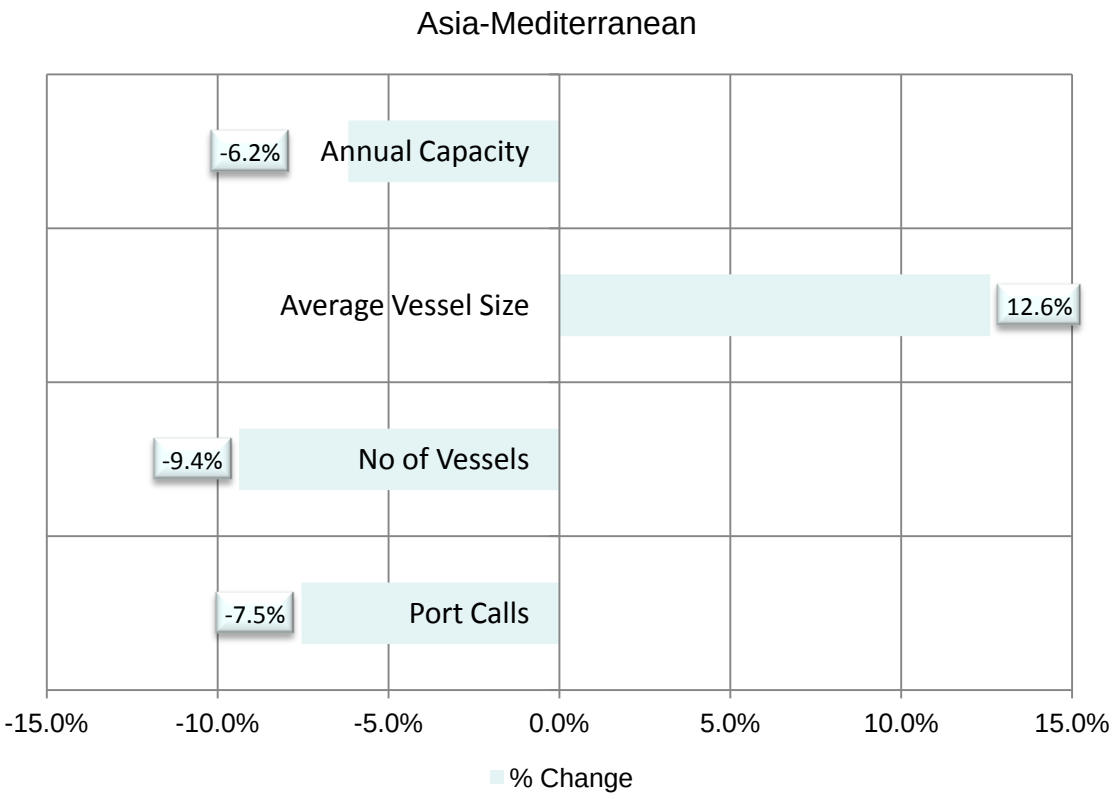
- With the introduction of larger tonnage post Panama expansion and the raising of the Bayonne Bridge in NY, a similar pattern could emerge in the Far East – US East Coast trade



Source: Alphaliner

The impact of larger tonnage and alliances

- A similar picture emerges within the Asia-Mediterranean market.
- The average vessel size increases by 12.6% and the number of vessels is reduced
- The number of port calls is reduced by 7.5%



Source: Alphaliner

The impact of large ships on ports

The areas of impact:

- Access channels width and depth
- Air draft
- Depth alongside
- Quay length
- STS height, outreach and width
- Increased exchanges of containers from each ship
- Landside capacity
- Yard equipment and TOS
- Road, rail and barge access
- Hinterland connections
- Capacity to expand

What do shipping lines want?

- "A quantum leap in productivity at the berth and in handling the vessel from pilot to pilot with the maximum speed, with due regard to safety" – *Maersk Line*

- Berthing on arrival
- Sufficient berthing space
- Ample cranes and other equipment
- Guaranteed berthing slots
- High productivity
- Competitive (low?) tariffs
- ***And above all……lower terminal through-put costs!!***

Are the needs of carriers and port operators compatible?

- The carriers will pursue larger ships
- The development of ships is faster than the development of more efficient terminals at a majority of ports
- Lines will remain focused on costs which will put pressure on port tariffs

- Ports are expected to anticipate and deliver the required service
- Apart from physical and operational issues, major capital expenditures will be required in most port zones

Current Demand/Supply Imbalance: Pacific Northwest

- Ports = Prince Rupert, Vancouver, Seattle, Tacoma, Portland
- Terminals = 17
- Approximate regional capacity = about 11.5 million TEU/year

- Estimated regional throughput (2012) = about 6.9 million TEUs
- Estimated regional capacity utilization = about 60%

Current Demand/Supply Imbalance:
Pacific Southwest

- Ports = Oakland, Los Angeles, Long Beach
- Terminals = 20
- Approximate regional capacity = about 25.0 million TEU/year

- Estimated regional throughput (2012) = about 16.3 million TEUs
- Estimated regional capacity utilization = about 65%

Current Demand/Supply Imbalance: West Gulf

- Ports = Freeport, Houston, New Orleans
- Terminals = 7
- Approximate regional capacity = about 3.7 million TEU/year

- Estimated regional throughput (2012) = about 2.4 million TEUs
- Estimated regional capacity utilization = about 65%

Current Demand/Supply Imbalance: East Gulf

- Ports = Gulfport, Mobile, Tampa
- Terminals = 3
- Approximate regional capacity = about 1.5 million TEU/year

- Estimated regional throughput (2012) = about 0.5 million TEUs
- Estimated regional capacity utilization = about 33%

Current Demand/Supply Imbalance: South Atlantic

- Ports = Miami, Port Everglades, W. Palm Beach, Jacksonville, Savannah, Charleston, Wilmington (NC)
- Terminals = 17
- Approximate regional capacity = about 11.6 million TEU/year

- Estimated regional throughput (2012) = about 7.5 million TEUs
- Estimated regional capacity utilization = about 65%

Current Demand/Supply Imbalance:
US North Atlantic

- Ports = Hampton Roads, Baltimore, Wilmington (DE), Chester, Philadelphia, NY/NJ, Boston
- Terminals = 17
- Approximate regional capacity = about 14.5 million TEU/year

- Estimated regional throughput (2012) = about 9.1 million TEUs
- Estimated regional capacity utilization = about 63%

Current Demand/Supply Imbalance: East Canada

- Ports = Saint John, Halifax, Montreal
- Terminals = 6
- Approximate regional capacity = about 3.4 million TEU/year

- Estimated regional throughput (2010) = about 1.9 million TEUs
- Estimated regional capacity utilization = about 56%

Conclusion
Key Containerport Infrastructure Challenges

- *Dealing with excess capacity and over-investment in container terminals in selected ports*
  - US PNW ports, Oakland, Mobile, others
  - Canadian ports are expected to pay taxes or dividends to Federal Government
  - Allocation of capital costs
- *Securing permits for new terminals and supporting infrastructure in major container ports*
  - Vancouver (BC), Los Angeles, Long Beach, New York
  - South Florida's challenge
- *Obtaining federal/state funds for dredging projects*
  - South Atlantic ports, Delaware River ports, others
  - Montreal's challenge
- *Improving rail connectivity*
  - Seattle, Tacoma, Oakland
  - Boston, Baltimore, Wilmington

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Thank You

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