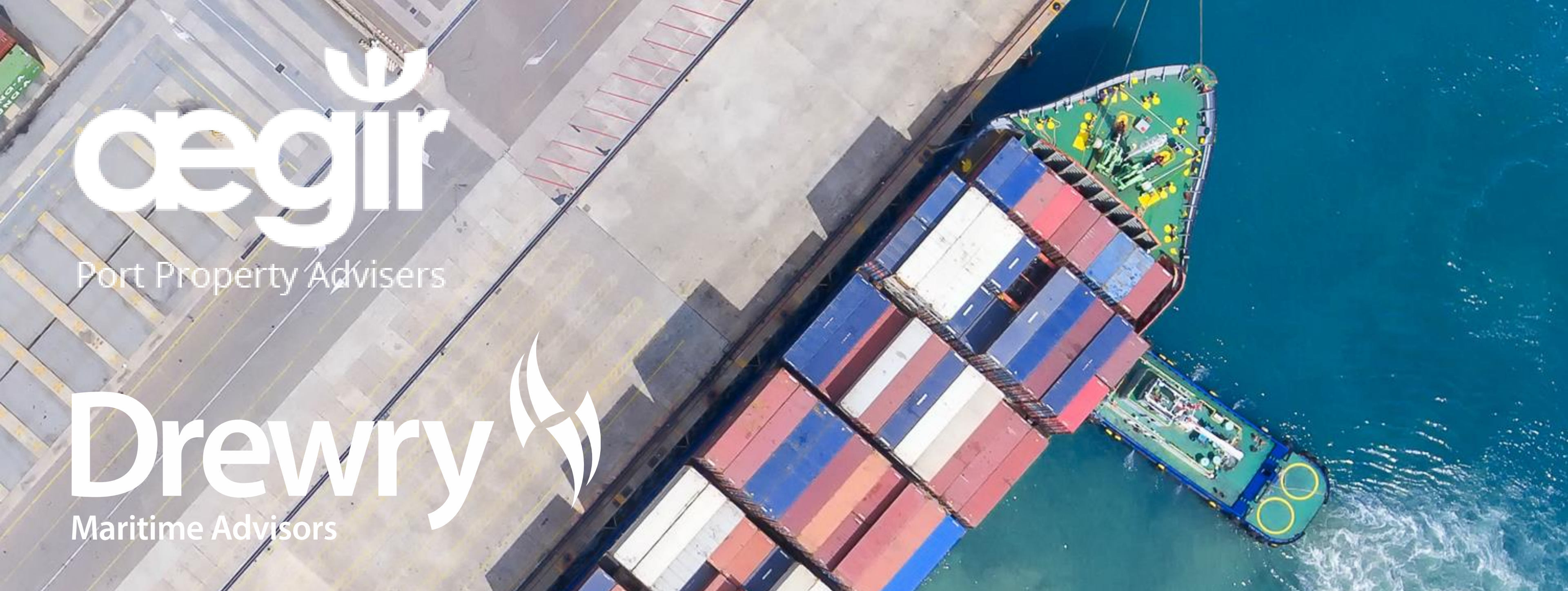

AAPA Executive Management Conference: Enhancing maritime economic development in and around ports ©

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www.aegirports.com

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Franc J Pigna CRE FRICS CMC, Managing Director, Aegir Port Property Advisers

9 May 2019

Maritime Advisors

Port Property Advisers

From our origins in 1970 London to a 21st century maritime and shipping consultancy, Drewry has established itself as one of the most widely used and respected sources of impartial market insight, industry analysis and advice. This in-depth understanding and objectivity provides our clients with the actionable advice and recommendations they need to achieve their ambitions and stay ahead of the market.

- Last 10 years: 400+ assignments in 50 countries.
- Since 2010: $20bn value in commercial & due diligence advice in port M&A and financing.
- Last 5 years: vessel valuations on more than $180bn in combined asset value.
- Last five years: advised container shipping industry on investments totalling $6bn.

Since 2003, Aegir Port Property Advisers are the pioneer consultancy engineered to meet the unique property challenges faced by the ports and maritime industries. Aegir's focus is to enhance a port's competitive position and financial value through the more strategic use of its largest asset - property.

In the last decade Aegir has undertaken complex port property lease, asset management, valuation, development feasibility, management consultancy and strategy instructions in Europe, the Middle East, Africa, the Americas and Asia with port asset values in the billions of US dollars.

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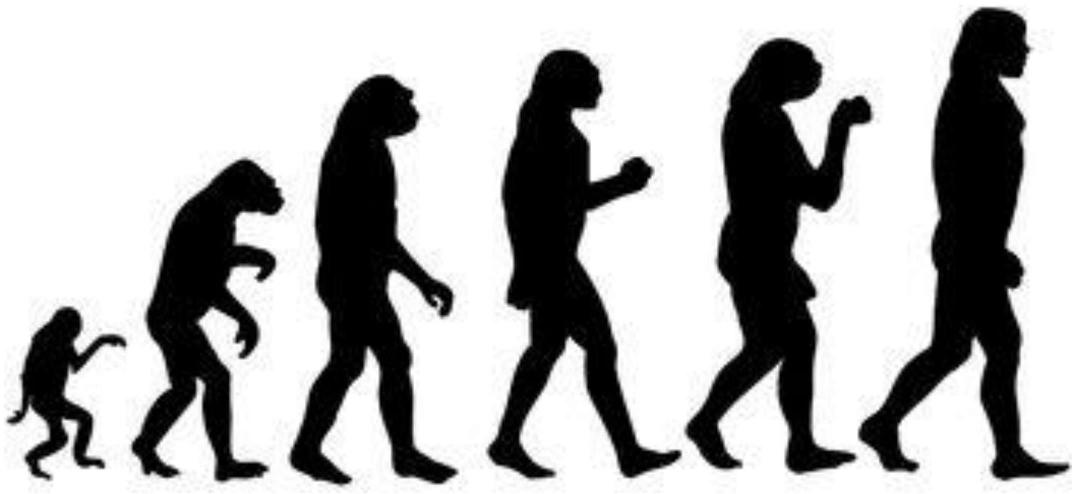
Let's get started…

Is the industry in a state of evolution…



… or revolution?

To be explored in the next hour.

Agenda

- ✓ About Aegir & Drewry
- ✓ Port Authority (PA) evolving role
- ✓ The ‘business’ of a PA
- ✓ Market environment challenges
- ✓ Port infrastructure challenges
- ✓ Economic Development
- ✓ Off port economic development example
- ✓ Conclusions

Q&A throughout

Port Authorities' evolving role

Port Authorities' evolution

Specialisation	➡	Regionalisation
Transport node	➡	Transport nexus
Port operator	➡	***Asset manager (key change)***
Service provider	➡	Services regulator

PA's – don't forget to mind your key business!

Port Authority's emerging role

- Now operate as 'for profit' entities, responsible for raising their capital needs

- From operator to asset manager - property their main asset

- PA's address four main functions* :

  - Traffic
  - Customer
  - Area
  - Stakeholders

- What about 'profit'?

PA’s evolution

- PA’s must now look beyond being an asset manager within the port confines

- Must actively look where it can promote their respective supply chains/logistics corridors through facilitating them, directing infrastructure investment*

- Such investment in time, knowledge and capital leads to **growth in two main revenue drivers:**
  - Land rent/values **- Throughput**

Both are intrinsically intertwined

* de Langen, 2008

PAs’ hinterland challenges

- In the ‘Sea – Land’ equation land now key to compressing supply chains – why?
- Expanded hinterland coverage = ports being more competitive, less oligopolistic*
- Competition now between supply chains/logistics corridors – not ports
- More cargo through fewer ports & ports competing for hinterlands
- Ports need to increase throughput/capacity on same footprint by moving non operational activities inland
- Challenges – yes; but opportunities as well!

* Notteboom, 2008

PA's – the natural transport leaders?

- Why PA's are natural transport leaders for logistics chains*:
  - Investments in logistics poles benefits all users, regardless of who invests (resulting in freeloaders).
  - PA's through throughput charges can more equitably invest in infrastructure
  - PA's can manage port communities and clusters to create more efficient, broader, competitive regional load centres
  - PA's can better manage environmental constraints
  - A better managed logistics pole and inland facilities guarantee PA's maintain their competitive advantages as well as competition within supply chains
- But all will require even more land…

* Notteboom, 2008

Ports as hinterland nexus leaders - examples

Source: PA's websites, trade journals

Port Authority	Project	Objective
Los Angeles/Long Beach	Alameda Corridor	Decongestion at terminal
Barcelona	Rail, Terminal Maritima	Deeper access; inland terminals to capture mkt share
Rotterdam	Transferium	Barge intermodal 40 kms away from port
Antwerp	Trilogiport	100 ha logistics platform
Marseilles	Lyon inland port	Develop Lyon as Marseille's multimodal satellite
Lisbon	Puerta del Atlantico	Logistics platform outside Madrid

The business of a port authority

Why PA's need an asset management approach

- More effectively access private capital to release tied up equity in largest asset – property
- Increasing ability to borrow beyond enterprise value
- Increase competitive advantages
- Increase property revenue streams
- Maximise overall port value
- Extend port 'life cycle' to circumvent economic/functional obsolescence

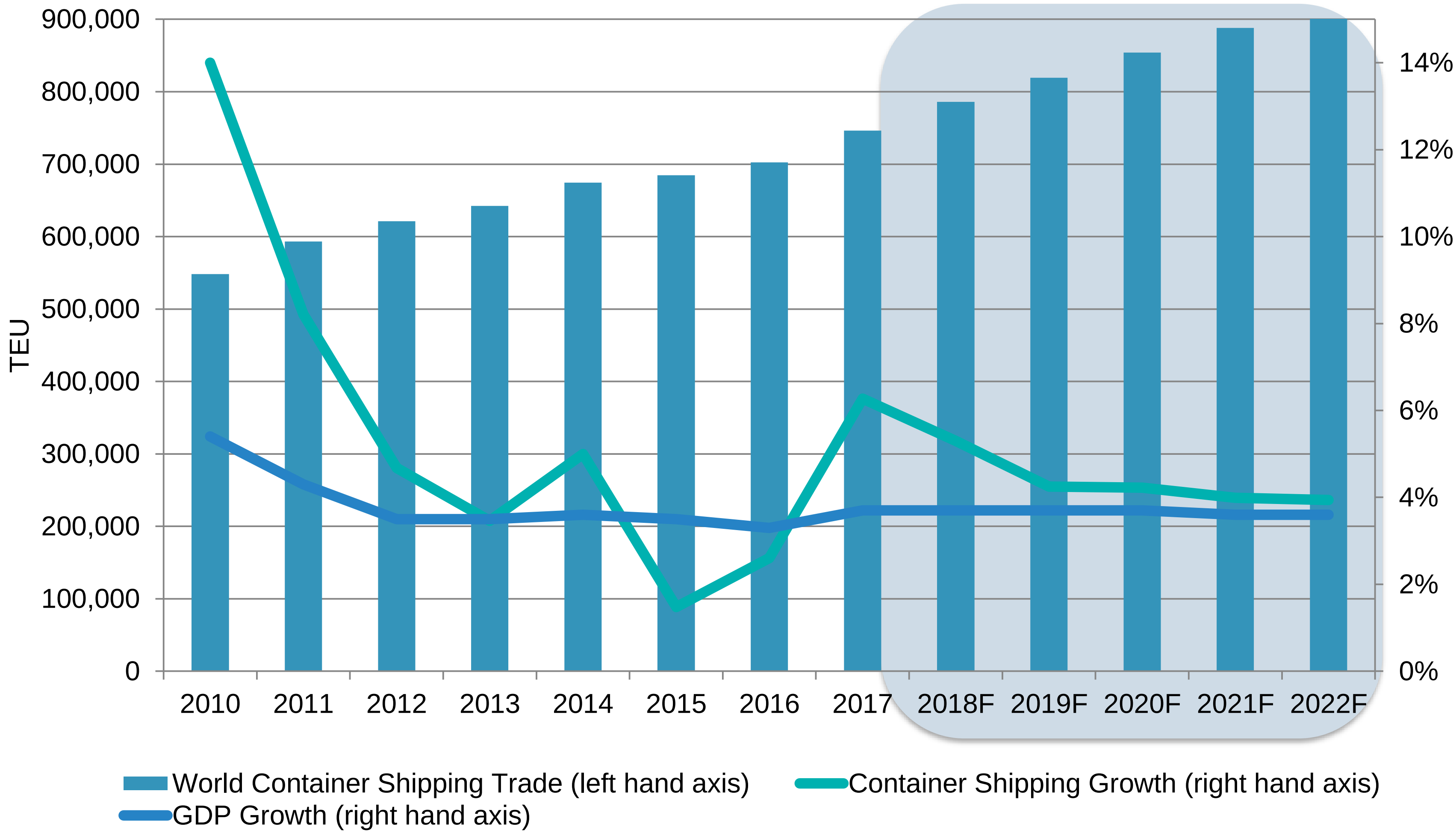
Lease issues

- Realistic capital basis (land value) – the starting point
- Balance between property based rent and throughput based rent MAG (rating agencies?)
- Terms & conditions, adequate and proper rent reviews
- Meaningful lease rates; 'financiable' leases
- Impact of capitalised leases (elimination of FAS 13) on tenants (lease versus buy issues by corporations)

Market environment challenges

World trade flagging

Trade & GDP growth are converging

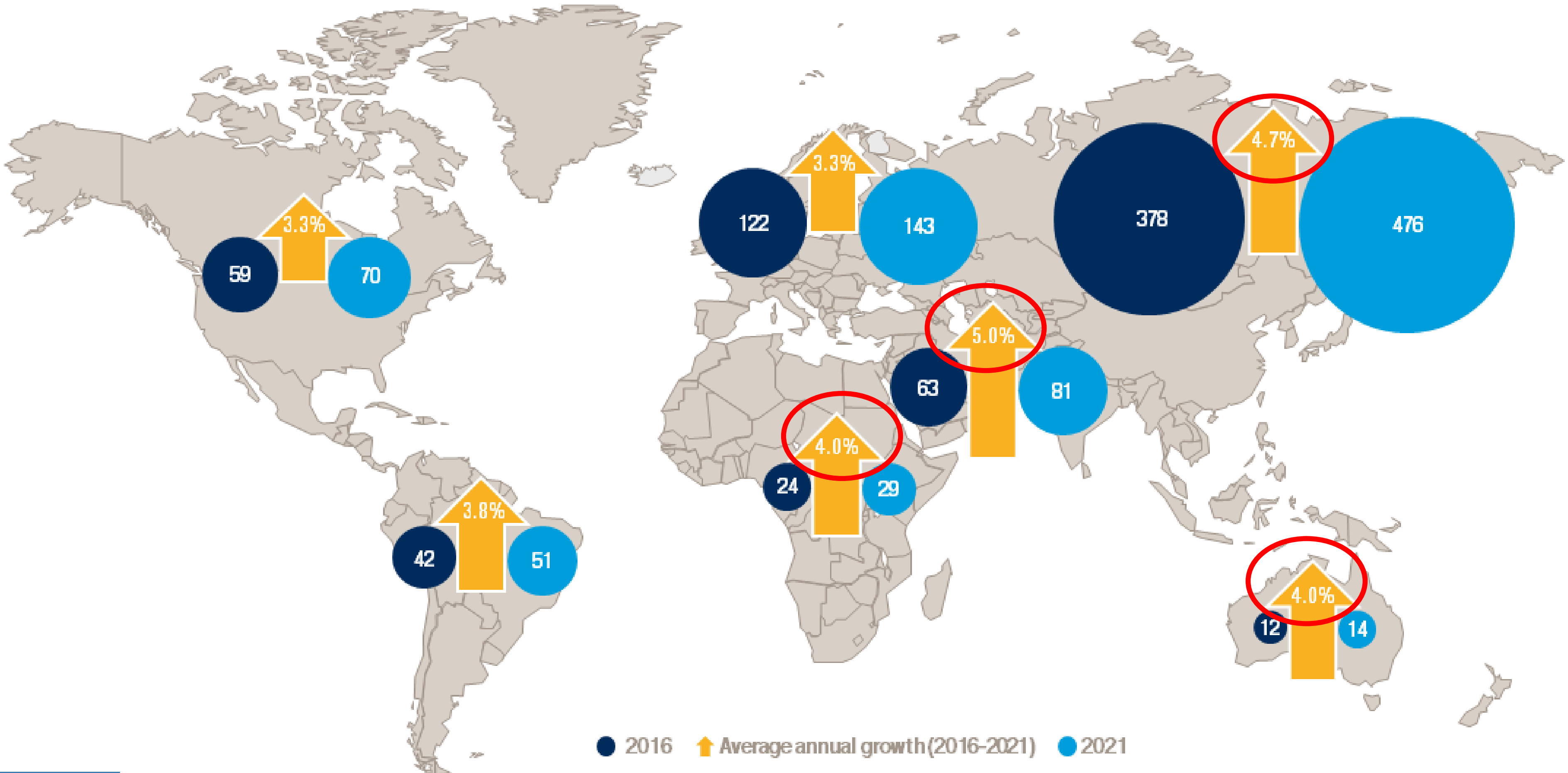


Source: Drewry's Container Forecaster (www.drewry.co.uk/research)

Five-year regional container port demand forecasts

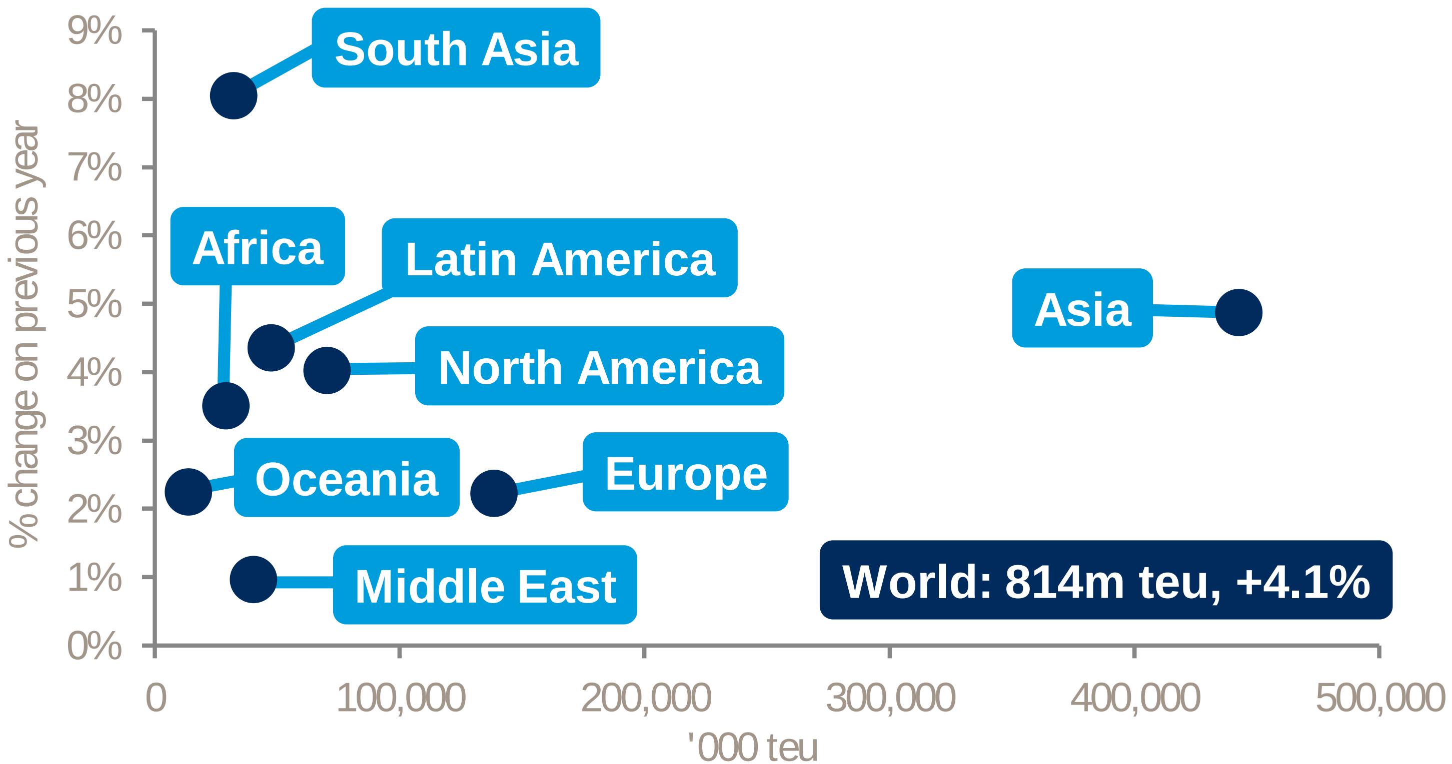
Pre recession, 11% average growth; average growth now: just over 4% per annum

Projected Container Port Volumes by World Region (million teu) and Average Annual Growth (%), 2016-2021



Container shipping demand outlook
Mixed-bag at regional level

Drewry Container Forecast 2019: Port throughput, % change on previous year (000 teu)



Source: Drewry's *Container Forecaster*

Liner shipping: Rapid consolidation reshaping the industry

8 of top 20 global carriers acquired or merged in past 2 years

CMA CGM (8.1%, May 17)	+			**NOL** (2.2%, May 17)	=	**CMA CGM** (10.3%, May 17)
COSCO (4.9%, Aug 16)	+			**CSCL** (4.1%, Aug 16)	=	**COSCO** (9.0%, Aug 16)
Hapag-Lloyd (4.3%, May 17)	+			**UASC** (2.5%, May 17)	=	**Hapag-Lloyd** (6.8%, May 17)
Maersk Line (16.9%, Sep 17)	+			**Hamburg Sud** (2.4%, Sep 17)	=	**Maersk Line** (19.3%, Sep 17)
COSCO (9.2%, May 17)	+			**OOCL** (3.3%, May 17)	=	**COSCO** (12.5%, May 17)
MOL (2.6%, May 17)	+	**NYK** (2.9%, May 17)	+	**K Line** (1.9%, May 17)	=	**Ocean Network Express (ONE)** (7.5%, May 17)
	−			**Hanjin Shipping** (2.6%, Aug 16)		

Note - Percentages within brackets represent capacity market share around the time of transaction

Alliances Consolidating…

2015

2M

Ocean 3

CKYHE

G6

Source: Drewry Maritime Research

Alliances Consolidating…

2017

2M
MÆRSK
MSC

Ocean Alliance
CMA CGM
EVERGREEN
UASC
COSCO
CS

HANJIN
YANG MING
"K" LINE
KAWASAKI KISEN KAISHA, LTD.

THE Alliance
Hapag-Lloyd
APL
OOCL
MOL
NYK LINE
HMM

…with consolidation of power, stronger negotiating position with ports

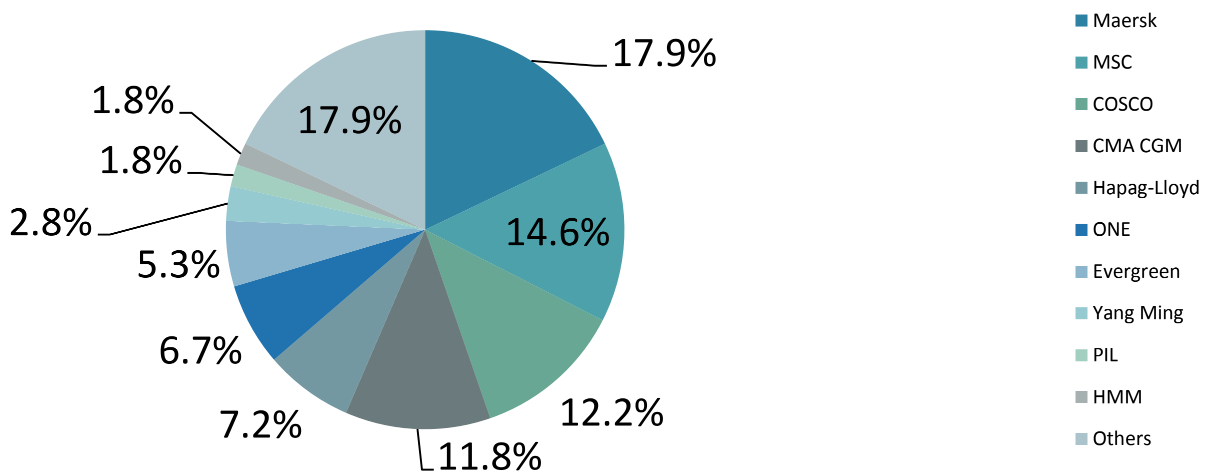
Source: Drewry Maritime Research

Container shipping

Will there be more consolidation?

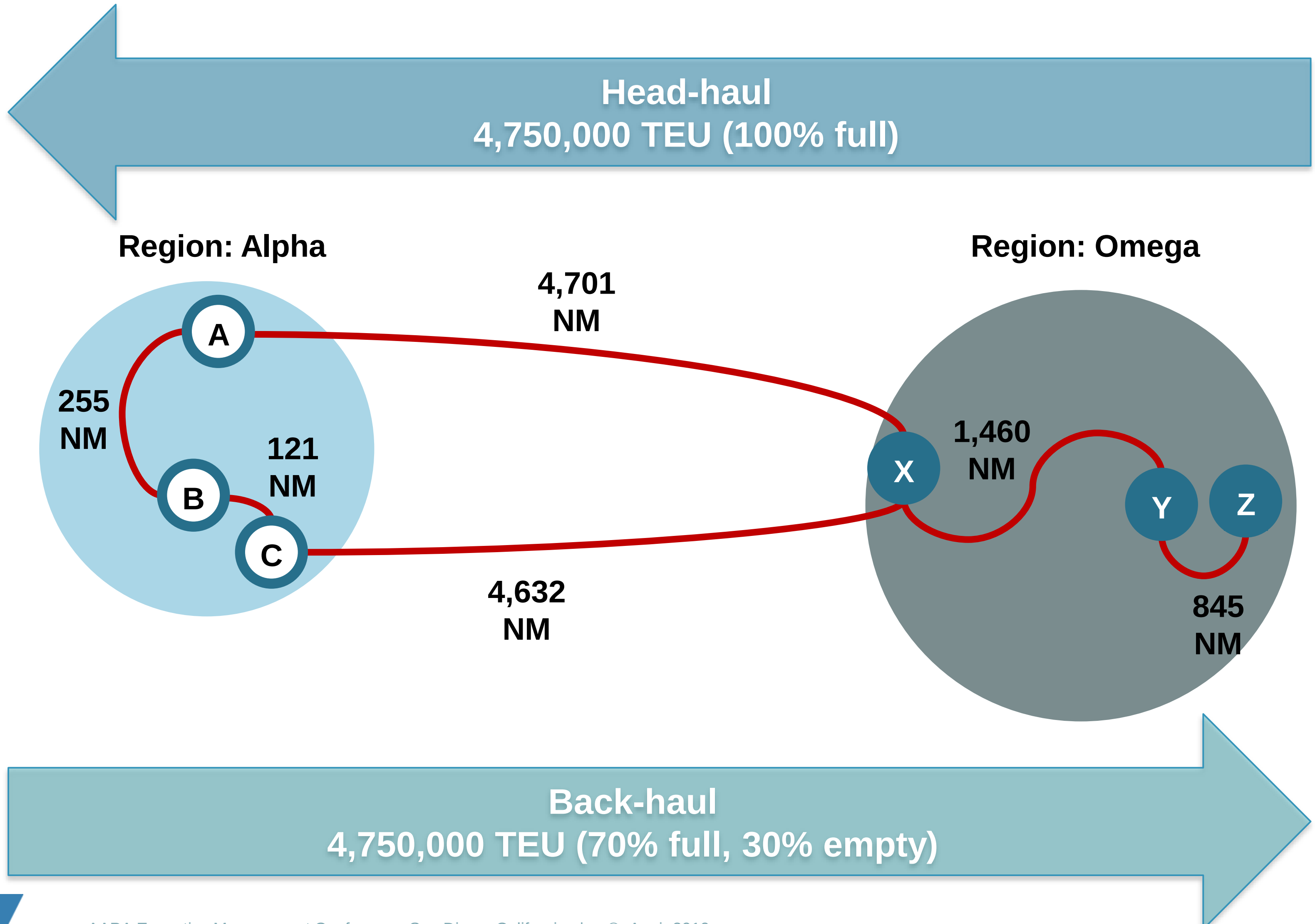
- 5 or 6 global ‘mega-carriers’ are emerging – with real scale
- Lines with <5% capacity share look vulnerable – will alliance membership be enough to save them?
- No line is ‘too big to fail’
- Smaller carriers could group into viable single operators - but Hanjin failed to do so

Active fleet capacity shares, January 2019



Will container ships keep getting bigger?

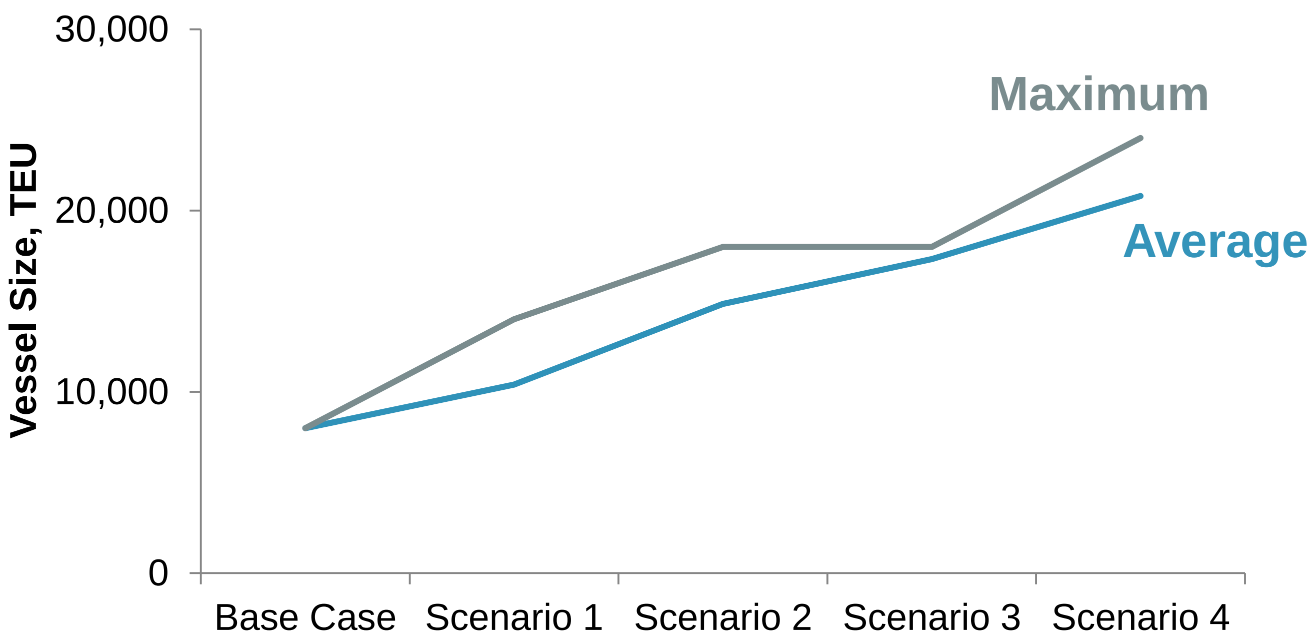
Drewry Simulation Model



Drewry Simulation Model

Vessel sizes increase; fewer weekly strings

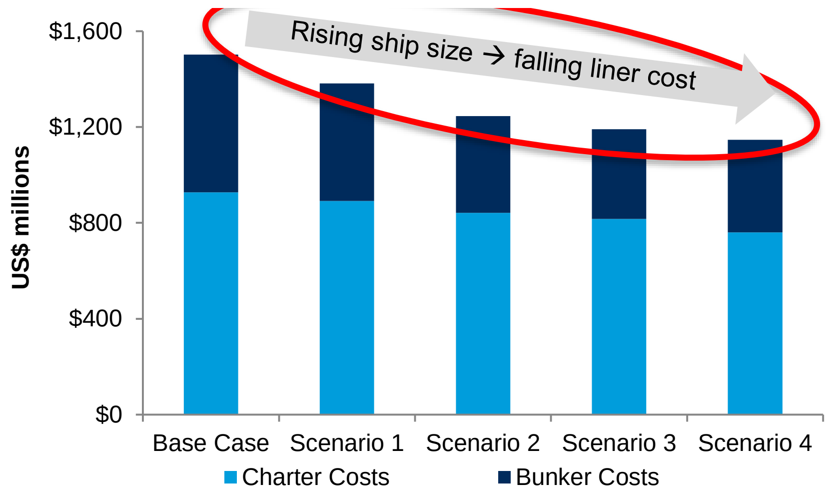
	Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Number of Weekly Strings	*13*	*10*	*7*	*6*	*5*
Average vessel size (TEU)	*8,000*	*10,400*	*14,857*	*17,333*	*20,800*
Maximum vessel size (TEU)	8,000	14,000	18,000	18,000	24,000



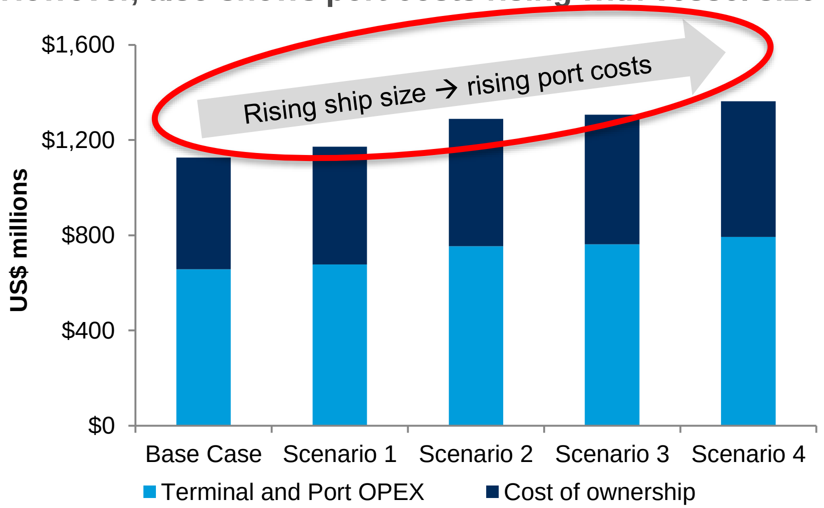
Container shipping - Findings from the Drewry study

Diminishing economies of scale from megaships?

Simulation shows liner costs fall as ships get bigger



However, also shows port costs rising with vessel size



- As vessel sizes increase:

Shipping lines' network costs fall…….

…….but the costs incurred by ports and terminals rise

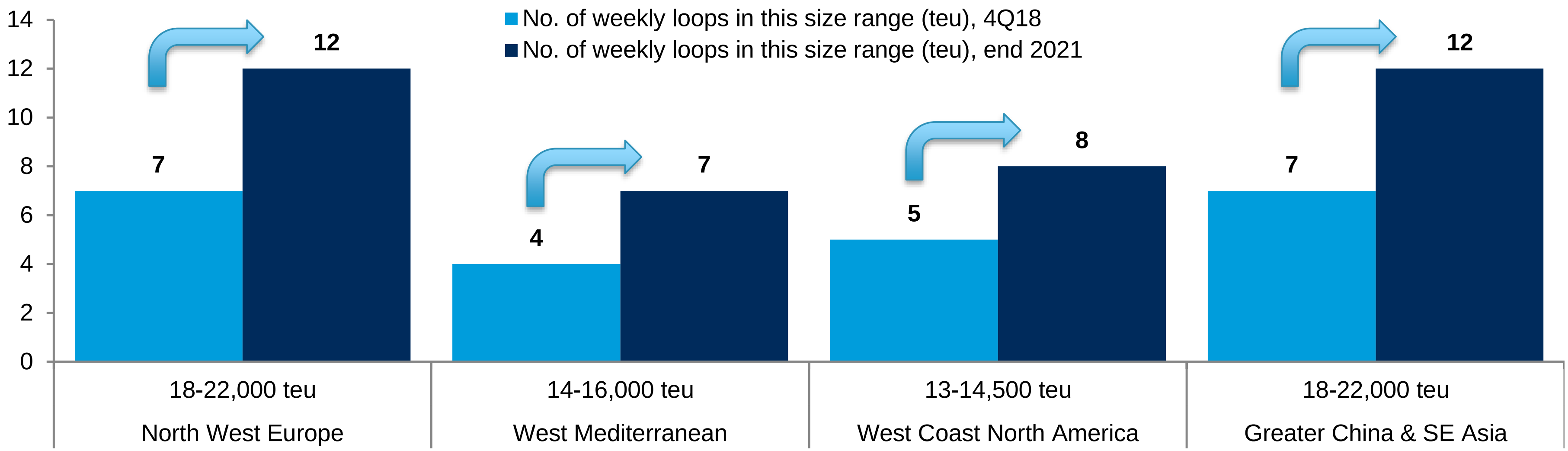
….so overall system costs increase

- **Drewry believes optimum vessel size reached for foreseeable future (and may already been exceeded)**
- **Aegir believes ports not charging enough to cover true costs and profit on asset values ie, PROPERTY!**

Cascading loops

Ports will have to cope with significantly more weekly loops of largest vessels

Projected Impact of Cascading on Key Port Ranges, 2018-21 (No. of weekly loops)



Golden age of liner shipping profitability just around the corner?

Economies of scale in ship size run out

Industry consolidation continues

Hyundai order for 12 x 23,000 teu vessels for delivery in 2020

New entrants

Political motivations

Excess shipbuilding capacity

Golden age of liner shipping profitability just around the corner?

Economies of scale in ship size run out

Industry consolidation continues

Port infrastructure challenges

The infrastructure challenge – why things will change, quickly

- $57 trillion in global infrastructure required in 2013 - 2030 just to keep up with projected GDP growth
(McKinsey Global Institute)
- This is exceeds the value of global infrastructure today (MGI)
- US requires $1.6T next five years (double current outlay) just to bring infrastructure to acceptable levels (ASCE)
- US port infrastructure underinvestment: a few years ago, USDOT invested $357m in 25 port projects; $40m less than Port of New Orleans did in its own port (The Economist)
-

Infrastructure challenge

- US port infrastructure: ranked 22nd globally, behind Iceland and Estonia (World Economic Forum)
- US national debt: now at $20 trillion
- How many believe infrastructure can/will continue to be funded the way it has been?
- The time has arrived where infrastructure capital requirements have outpaced most governments ability to fund it
- Ports will need to become self-funding for their infrastructure needs

Vessel cascading will continue for a while yet…

	2011	2013	2015	2017
Asia-North Europe	16,000	16,000	19,000	21,000
Asia-Med	14,000	14,000	16,000	16,000
Transpacific	10,000	13,000	14,000	14,000
Transatlantic	7,000	8,000	9,000	9,000
Asia-South America	9,000	10,000	11,000	13,000
Asia-W Africa	4,000	4,000	8,000	13,000

Impact of bigger ships on port infrastructure?

Larger ships, major peak periods changing demand for ports/terminals…

…requiring more infrastructure, longer periods of underutilisation, lower revenues AND fewer, but larger terminals – MAJOR port challenge!

Shipping lines obtaining <u>cost savings</u> with bigger ships…

Before

3,000 boxes

MONDAY

3,000 boxes

THURSDAY

After

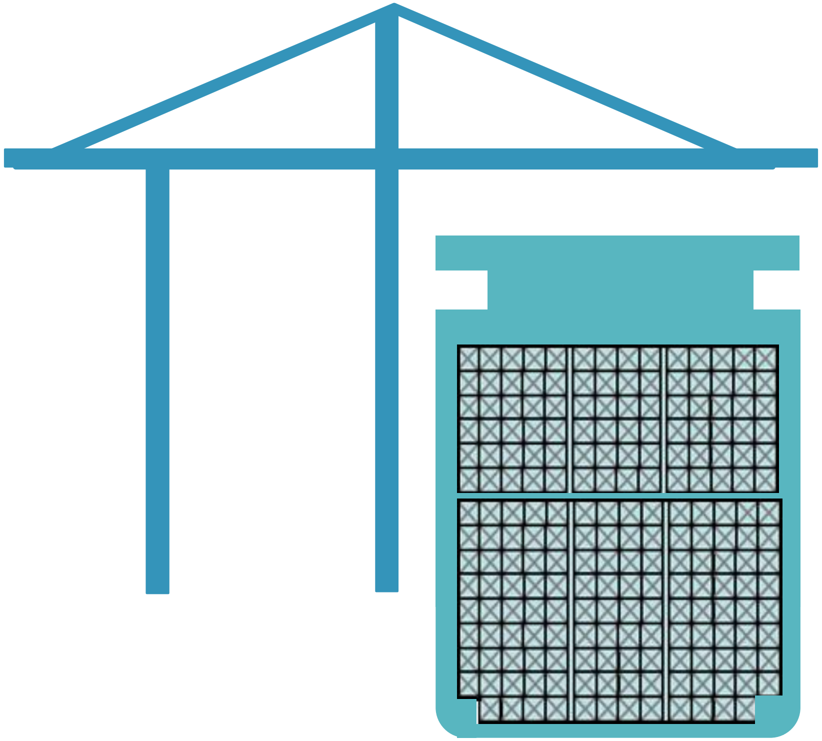
6,000 boxes

MONDAY

Are shipping lines prepared to pay for these enhanced requirements?

… but generating <u>higher investment needs</u> through supply chain infrastructure

Terminal operator pressures are rising

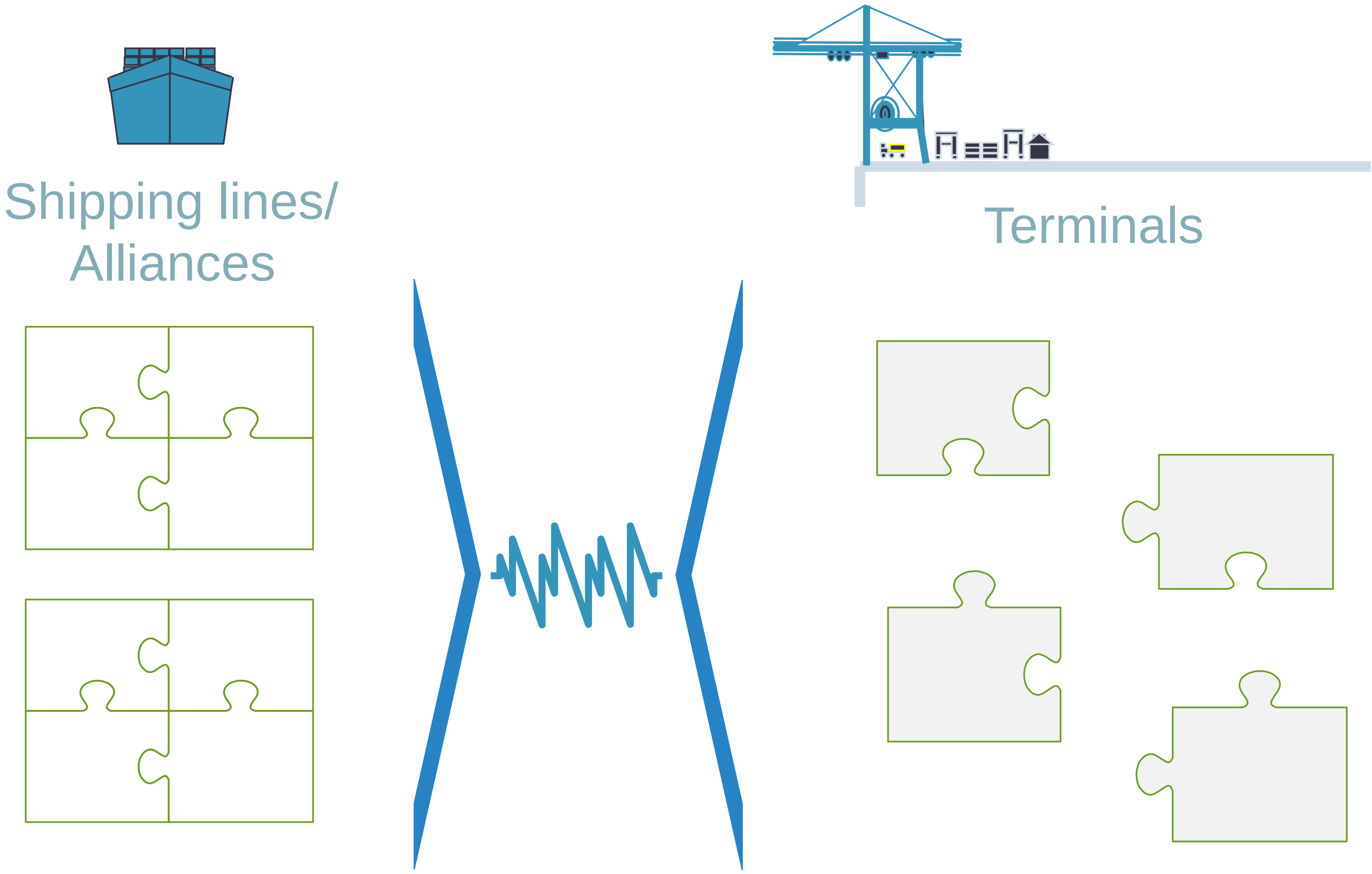


- Larger cranes (outreach and height)
- More cranes
- Longer and deeper berths
- Deeper approach channels
- Greater air draft
- Larger or more densely stacked yard

- Higher crane and berth productivity demands
- Greater peaks

Nature of demand for ports/terminals is changing

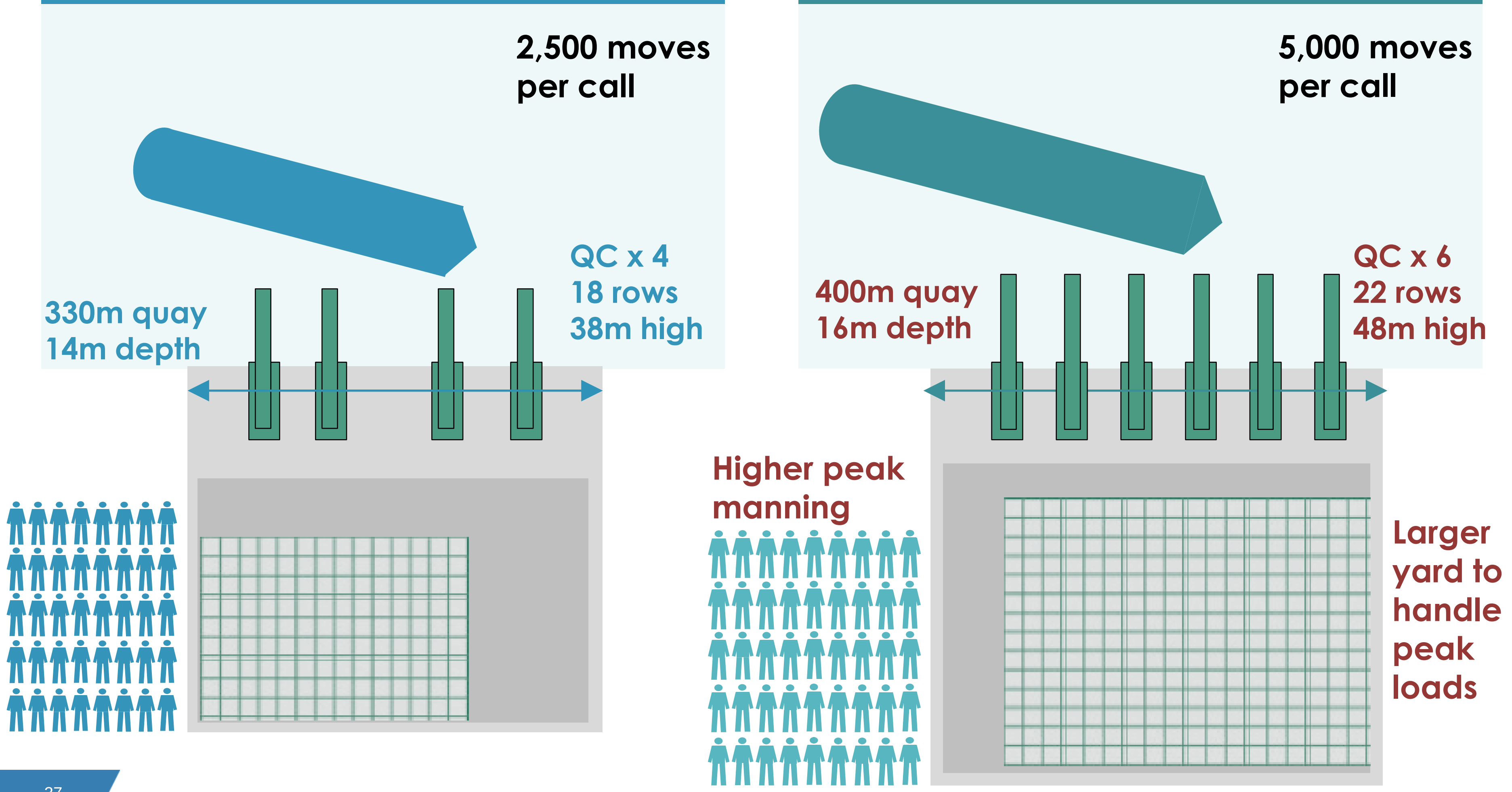
Demand for fewer, larger terminals in each port



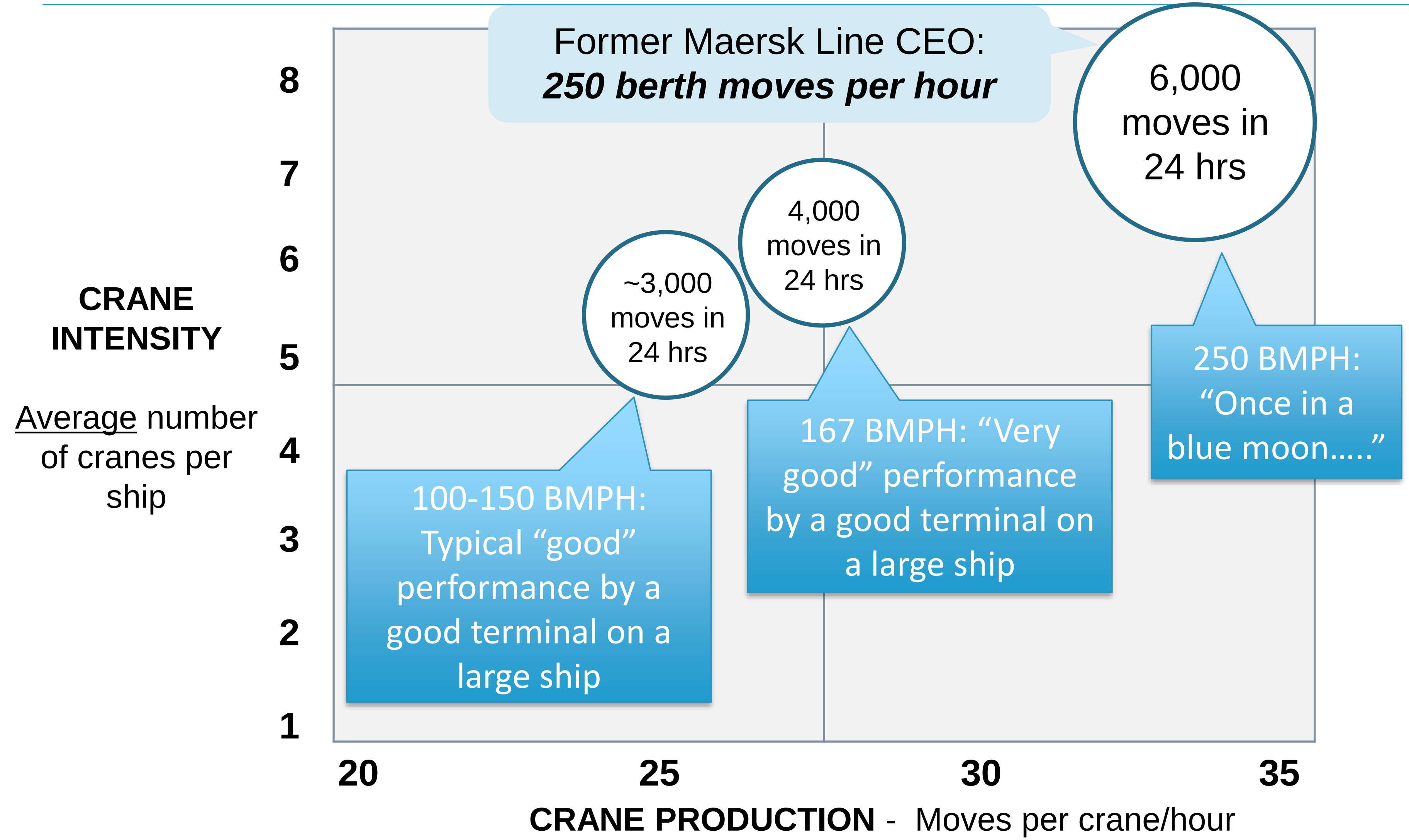
Why are costs under pressure?

Reduced service frequency and bigger ships = greater peaks

10,000 moves per week 4 x 7,500 TEU vessel calls	10,000 moves per week 2 x 15,000 TEU vessel calls



Unrealistic pressure for higher berth productivity?



Is the terminal industry surviving the "perfect storm"?

The news is good….revenue per teu being maintained

	Average revenue per teu ($)		
	2015	2016	2017
Cosco Shipping Ports[1]	47.3	35.4	53.2
China Merchants Port Holdings[1]	75.8	71.2	71.1
DP World[2]	94.3	97.5	90.7
Hamburger Hafen[2]	111.6	108.9	123.3
HPH Trust	77.1	76.5	71.0
ICTSI	135.2	129.9	136.0
Santos Brasil[1]	115.1	127.9	119.2
Tianjin Port[2]	37.4	35.4	35.2
Westports[2]	33.6	34.4	39.6
Average	**80.8**	**79.7**	**82.1**
Change		-1.4%	3.1%

(1) Consolidated Port operations only
(2) Container operations only

Prices holding firm for several reasons:

i) Bigger ships and bigger alliances have less choice of ports and terminals

ii) Available terminal capacity is shrunk by peaks and by premature obsolescence, meaning little evidence of over-capacity

iii) Transhipment incidence is levelling off meaning the proportion of higher paying gateway cargo is increasing in the industry

On the downside, liner alliances mean that the lowest common denominator in terms of price has to be accepted by terminals for the whole alliance.

This is a one-off negative effect though.

Is the terminal industry surviving the "perfect storm"?

The news is good….tight control of opex

Company	Average opex cost per teu				
	2013	2014	2015	2016	2017
DP World	78.8	79.2	86.6	83.6	78.9
ICTSI	91.1	99.5	93.6	86.4	91.8
HHLA *	105.4	95.5	94.0	91.3	106.1
HPH Trust	46.5	47.6	47.1	48.0	45.7
Average	**80.5**	**80.4**	**80.3**	**77.3**	**80.6**

* Container operations only

Is the terminal industry surviving the “perfect storm”?

The news is good….as far as EBITDA margins are concerned

	Hutchison Ports	DP World	APMT	ICTSI	Eurogate	HHLA	Cosco Shipping Ports	CM Ports	Average
2013	33.2%	42.5%	20.6%	44.3%	23.9%	23.9%	39.5%	48.9%	**34.6%**
2014	34.1%	41.9%	22.7%	41.7%	23.6%	25.3%	41.0%	51.2%	**35.2%**
2015	35.1%	45.3%	19.9%	42.8%	25.0%	24.6%	43.7%	49.4%	**35.7%**
2016	36.2%	48.9%	18.3%	46.5%	24.0%	25.6%	41.7%	47.1%	**36.0%**
2017	36.8%	49.3%	17.0%	46.4%	24.1%	25.6%	39.1%	47.3%	**35.7%**

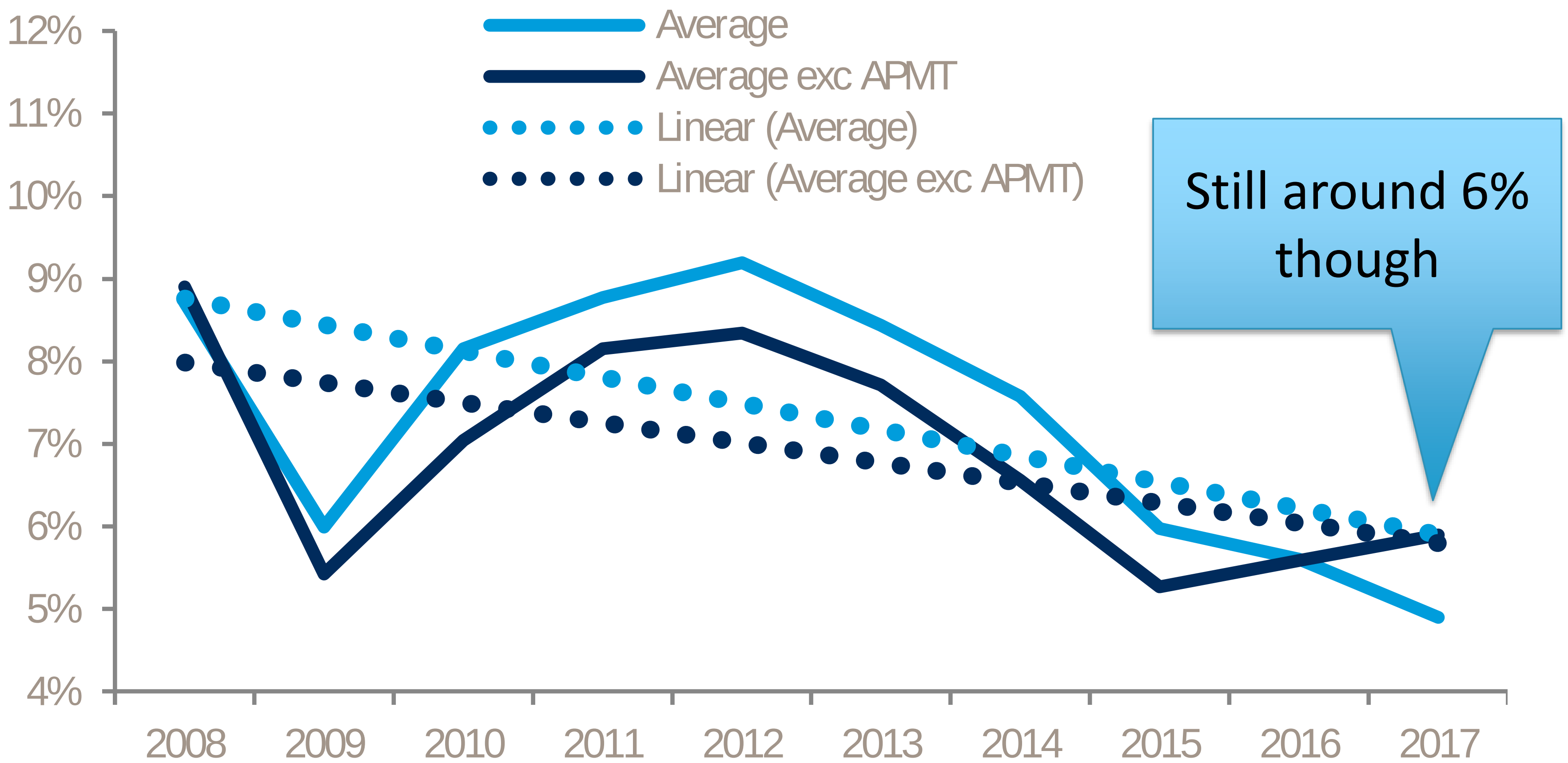
Notes:

Hutchison Ports includes HPH Trust
Cosco figures are for Terminals and Related Business only
CM Ports is Port Operations only (including Joint ventures and Associates)

Is the terminal industry surviving the “perfect storm”?

The performance: Returns going down

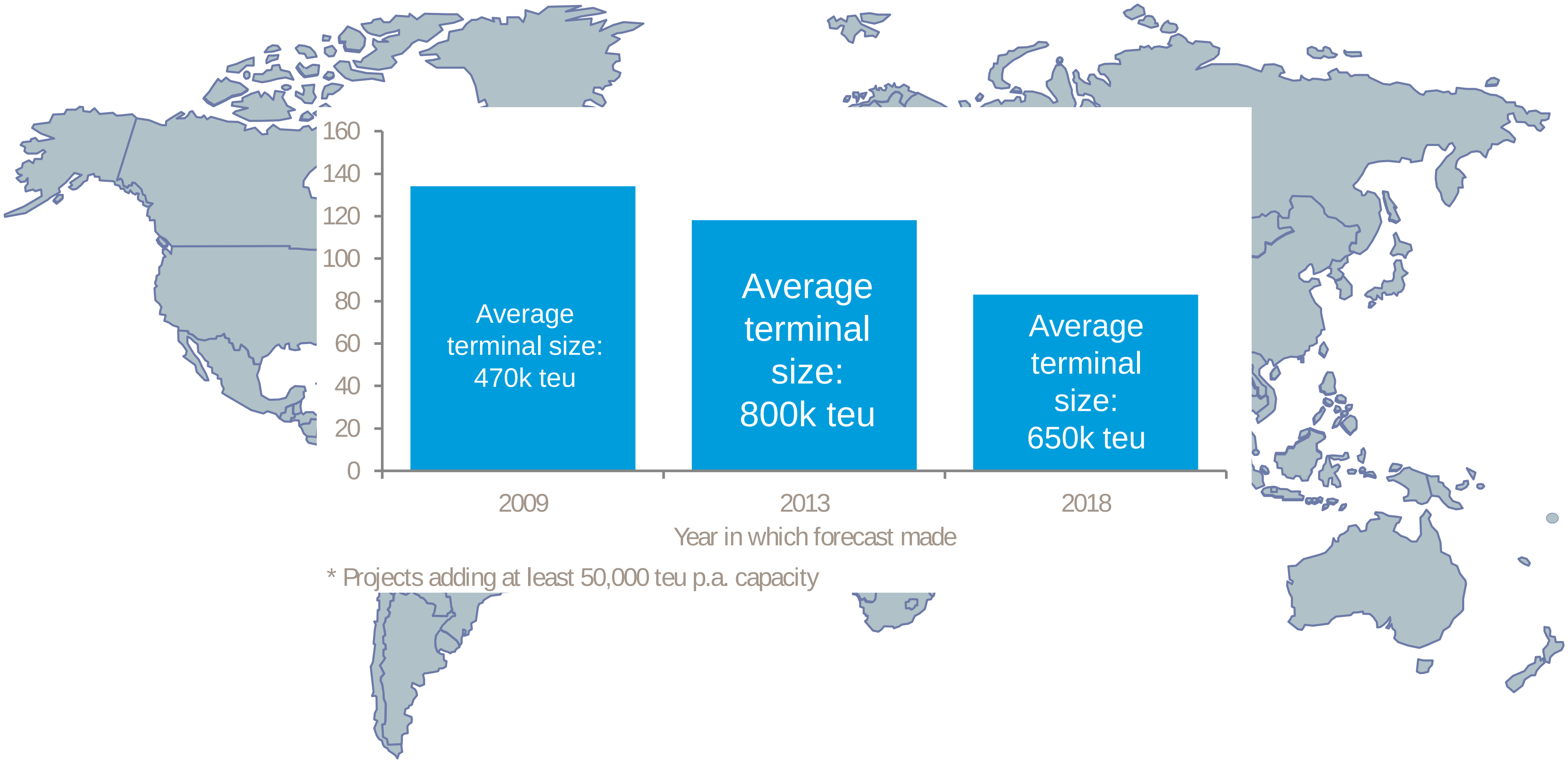
Sample Port Operators: Return On Invested Capital (ROIC), 2008-17



Where have all the greenfields gone?

Only ~80 greenfield projects in the pipeline, compared to over 130 in the past

Number of greenfield projects in pipeline (adding new capacity in 5-year outlook) *

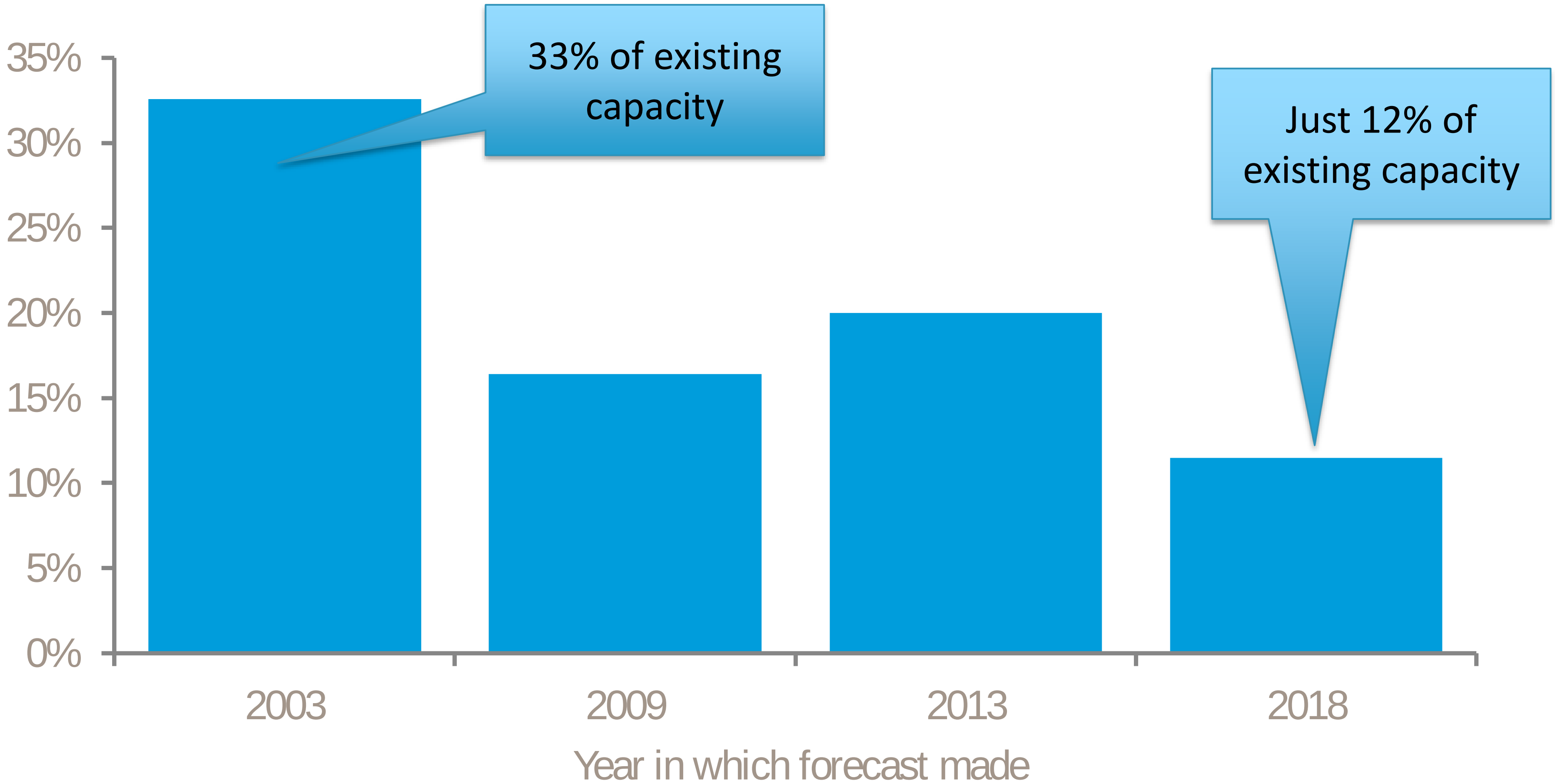


* Projects adding at least 50,000 teu p.a. capacity

Where have all the greenfields gone?

Forecast capacity increase at lowest proportion ever

Forecast global capacity increase as a percentage of existing capacity (2003-2018)



Implications of liner industry development

Terminal costs now the largest spend item for carriers

% split of costs (AP Moller Maersk) 2012 and 2015

Costs	2012	2015
Vessel	26%	28%
Bunker	25%	13%
Terminal	24%	32%
Other	25%	27%

Pressure to reduce terminal handling costs (impact on port fees?)

Question of joint contracting by alliances (impact on port concession, rents?

Source: AP Moller Maersk Annual Reports

Port property – port's new strategic asset

- 8,000 TEU ship requires 99 acres to keep container flow inbound smooth; most large ports are land constrained
- Throughput per acre key to making customers money and satisfied eg, in US about 4,000 – 5,000 TEU/acre yet in Europe and Asia 10,000 TEU/acre and higher is not unusual
- Every factor indicates the need for more on and off port land
- Therefore: PA's will need to acquire/control land banks inland to facilitate processing, throughput and addressing value added functions increasingly required y clients
- Automation will be key

Net results of market and infrastructure challenges…

- Ports will need to invest in more infrastructure, process more cargo on same footprint and increase cargo velocity to service increasing ship sizes.
- Fewer but larger alliances will force rationalization of terminal and berth assets.
- Market growth will stabilize, increased capacity will add more pressure on shipping lines to squeeze costs.
- But, ports will make less marine revenues from fewer calls (but hopefully more throughput revenues).
- This will also result in tougher negotiations with larger and fewer major clients and increasing pressure to squeeze concession fees.
- This will translate into a heightened competitive operating environment for ports.

Economic Development: challenges, opportunities & solutions

The road to hell is paved with good intentions…

- Economic Development:
  - ‘Economic development is the process by which a nation improves the economic, political, and social well-being of its people.’ The term has been used frequently by economists, politicians, and others in the 20th and 21st centuries.
  - This is one of the main objectives of most public ports.
  - While 30 years ago, in a more static environment where public funding was plentiful, this was possible as it was and continues to be done, today the delivery of this goal needs to be rethought.
- Today’s realities:
  - Ports are capital intensive. Today their need for capital has outstripped government’s ability to properly fund them; existing ‘revenue bond’ financing models are not enough.
  - Private capital needs to be sourced.
  - This requires transparency to gauge economic and financial perfromance of the port authority.
  - Stripping funding between top and bottom lines of ports’ financials is counterproductive. Need to act like ‘shareholders’.
  - Privatisation of PA’s will continue (like in Australia) to met this challenge.
  - PA’s need to act lie for profit businesses. Increasingly, this will become imperative.

Strategies of terminal operators

Diversification by port and terminal operators beyond the port gate

….and now shipping lines
(DP World acquisition of Unifeeder)

Trucking and rail services

Warehousing and distribution

Supply chain management; blockchain; digitisation

Industrial and free zones

Port-Park-City concept

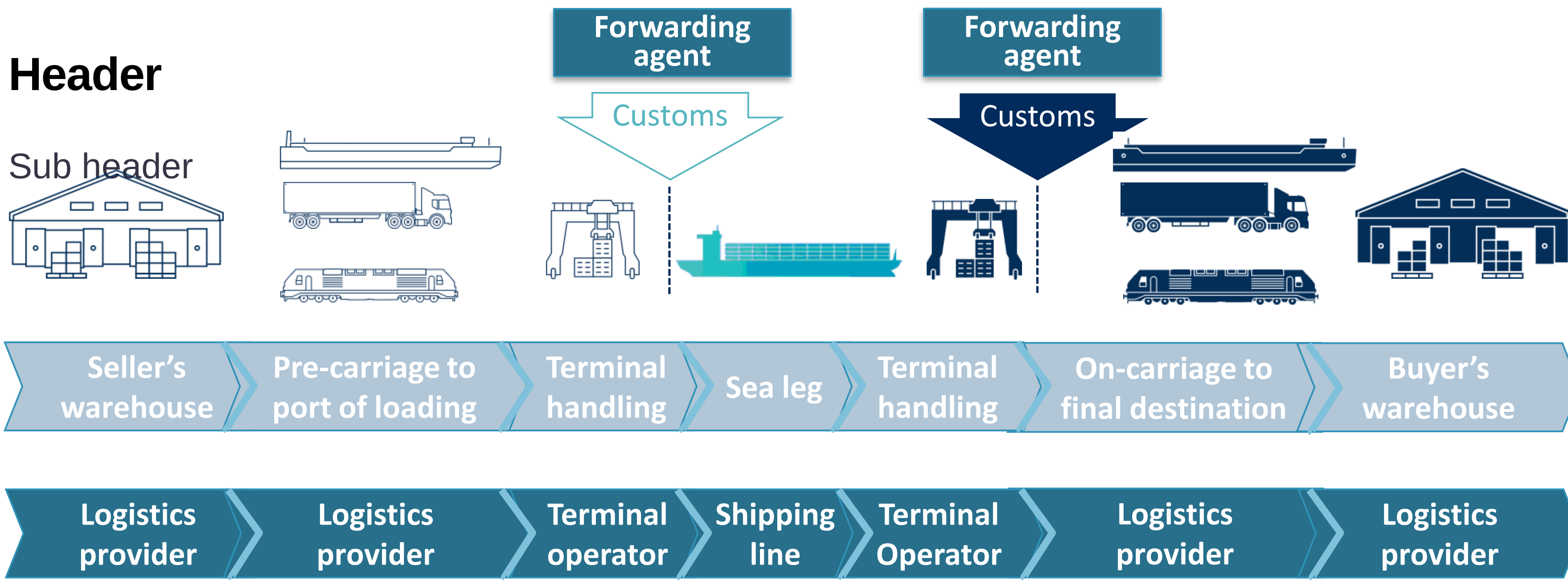
Increasing diversification

Intermodal Supply Chain Players

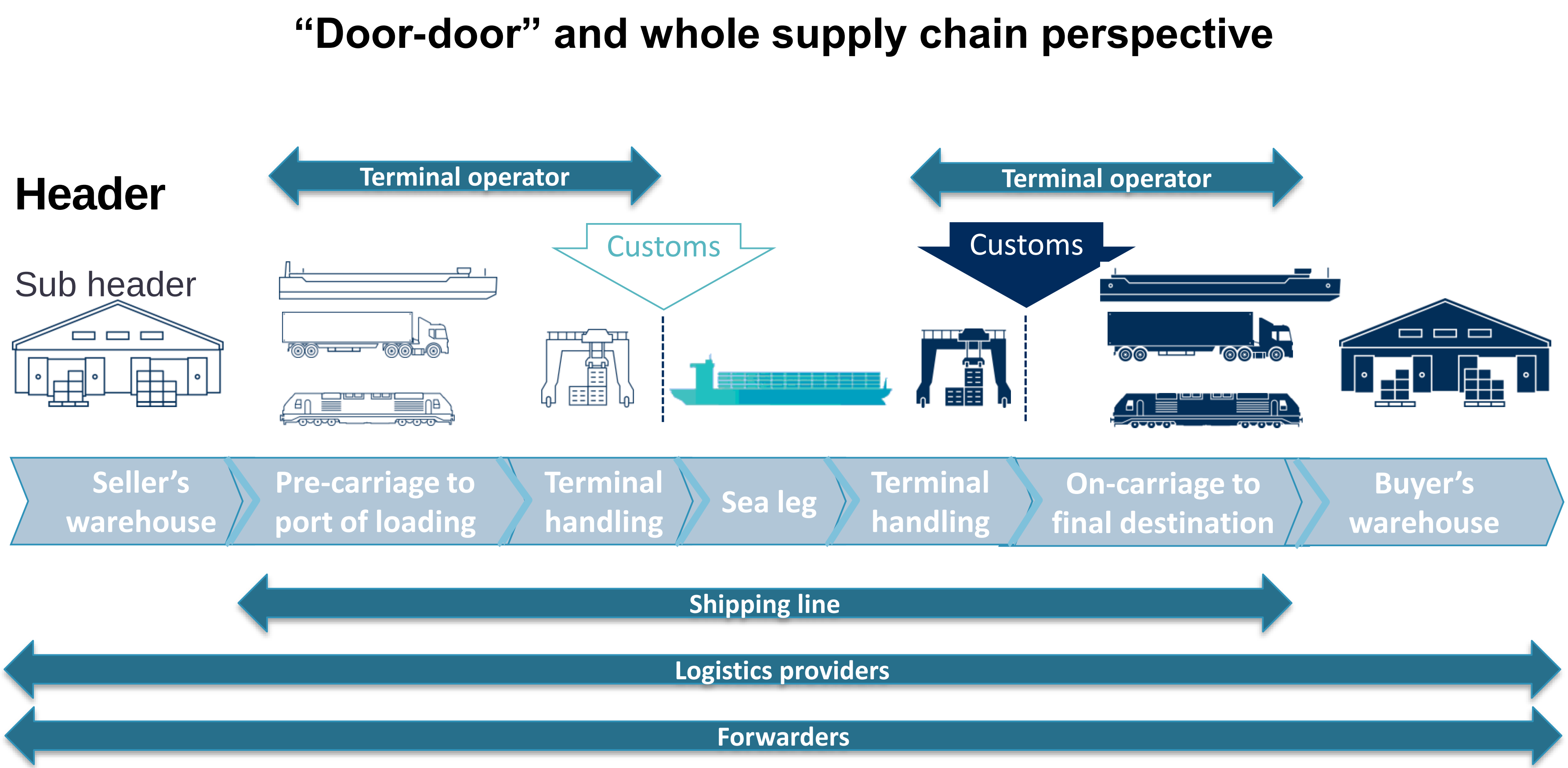
Multiple parties, each has a core (or original) role…….

Header

Sub header

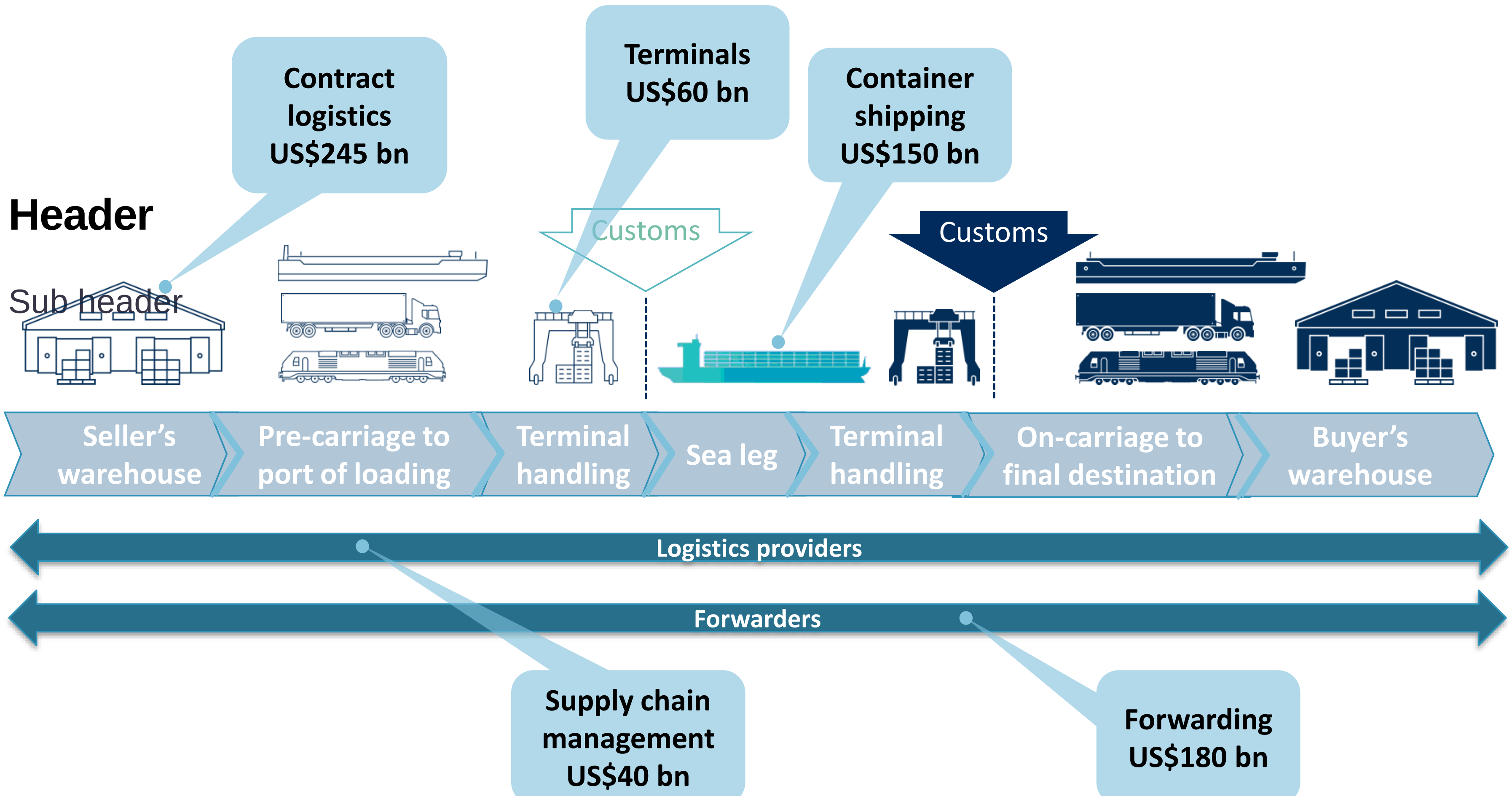


Intermodal Supply Chain Players
…….but tries to expand outside it



Where is the money?

…to secure new sources of revenue and profit, to improve competitiveness…



Everyone wants to get closer to the cargo owner

…….and to get closer to the end customer

Forwarders

Sub header

Ports

Shipping lines

Terminals

Vertical integration - Risks

- Competition with your customers
- Loss of management focus on core business key success factors
- Failure to manage expanded scope
- Internal conflict

Off port economic development example

Port Hueneme – the little port that can and does!

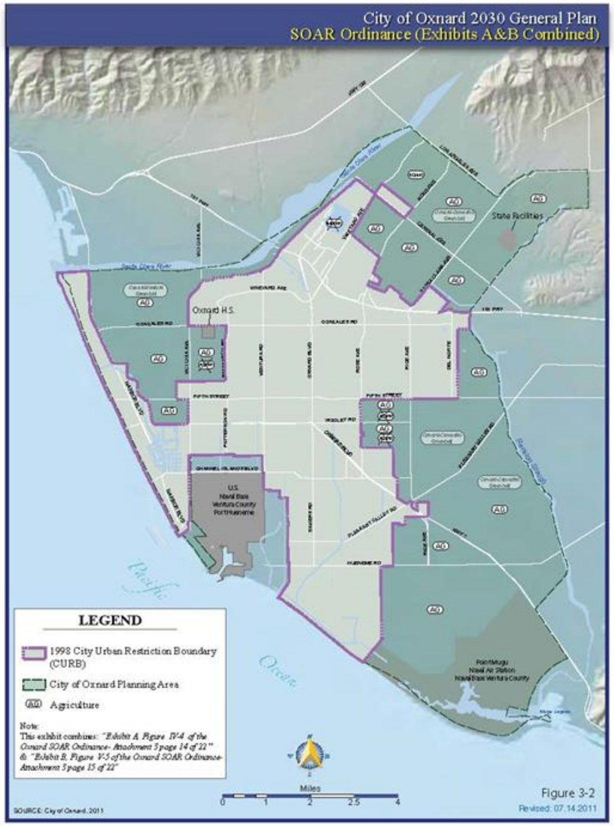
- Very successful niche port with visionary leadership and very effective senior management
- Deepest natural harbour between Los Angeles and San Francisco
- Specialises in autos, perishables and bulk cargoes
- Land constrained in a land constrained County

Off port expansion strategy

- Maximum radius, based on physical limitations - approximately ten miles
- POH client requirements - outermost radius from port of six miles (outermost ring)
- Red border is area within the City Urban Restriction Lines (CURB), only viable location for port related properties
- SOAR also establishes CURB lines in various cities and their urban areas. Land lying outside CURB lines are protected by SOAR.

Many challenges and the alignment of planets…

- Area for off-port expansion is severely limited
- Challenge - have county, city officials embrace port expansion
- Convergence of circumstances facilitates this
- Port management vision, delivers this

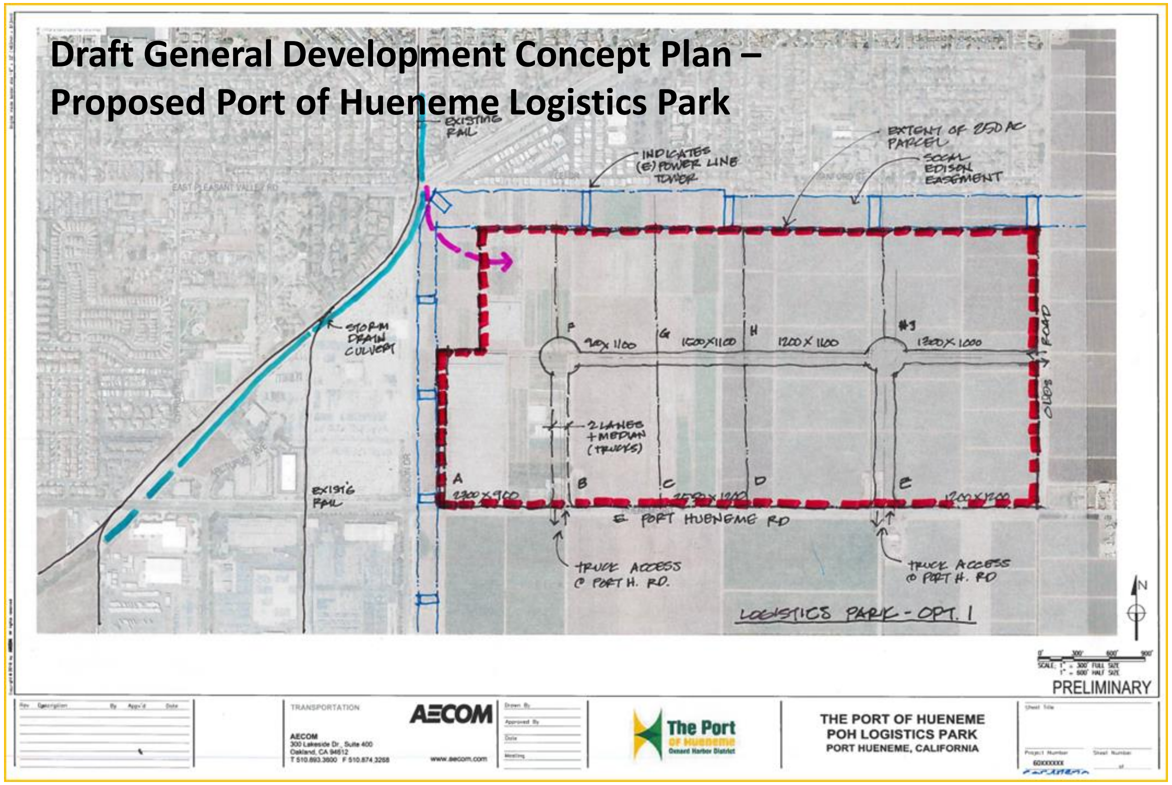


Significant progress made …

- Issues faced:
  - Outside of its immediate environs, port was not as well known as it should have been
  - Perception of ‘ports’ in the area was dated and conjured up images of container ports of decades ago
  - Port and its clients operating at over 130% capacity for existing land banks – not sustainable, will impact growth, economic viability
- Challenges:
  - Change perceptions of port
  - Establish port as a ‘county’ economic engine, not just city, local one
  - Need city and county officials to buy in, become effective port supporters
  - Fast track off port expansion strategy
- Results so far:
  - Numerous meetings held with government, community, positively received
  - Case made that port is an environmental leader, its off port expansion would be ‘biggest positive environmental impact’ for the county by greatly reducing truck traffic, more use of rail assets
  - Case made that port will be major generator of ‘family sustaining jobs’
  - Based on thorough, measured consideration by port management of every community concern and need, city, county governments now major port supporters and of its expansion plan

Proposed 250 acre logistics park development

- The following are port objectives:
  - Addressing immediate and near term port client land needs
  - Continuing the port’s long history of following the highest environmental standards
  - Obtaining highest possible LEED standards for like-kind facilites (eg, all vertical planes to be solar panels; advanced water storm drainage system
  - Community sports park to be included
  - Designed to be a port facility - off port
  - Located less than 2.5 miles from port central gate



Conclusions

The future of this industry promises to evolve at exponentially faster rates than in recent history – and that was fast.

Regardless of size, all ports are grappling with where and how to finance expansion and modernisation and increase profits.

Property is the ports' sector's next frontier and the path to success in meeting the unique challenges ports will face.

Navigating the World of Port Properties – To Maximise the Value of Your Ports

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