Market dynamics impacting the demand and financing of port infrastructure and emerging alternative funding options ©
To be determined?

• The environment, market, competition and technologies related to ports are rapidly changing.

What will be the impact on port infrastructure and its financing?

• Challenges port authorities face are changing and increasing.

How will this impact their ability to fund their infrastructure needs?

• Increasingly, traditional funding sources and structures for ports are failing to meet the need for capital.

How will these evolve and what changes are on the horizon?
Subjects to be covered:

- Another ‘New Normal’ underway - again
- Port challenges – changing and increasing
- Alternative and evolving funding structures
- Conclusions/takeaways
Another ‘New Normal’ underway – again!
Are we entering a new period where port and terminal profitability is markedly less than in the recent past?

- Container terminal investments and operations:
  - historically highly profitable and resilient
  - with high barriers to entry and limited competition.

- Although not immune to market volatility and global economic shifts, ports’ sector proved its resiliency – even in 2009.

- Typical EBITDA margins for global container terminal operators remained in 20-45% range a year.

- But, container port industry entering new, ‘mature phase’, resulting in lower profitability and a more challenging environment.

### Changing environment for port and terminal operators

<table>
<thead>
<tr>
<th></th>
<th>Container port demand</th>
<th>Containership sizes</th>
<th>Shipping lines</th>
<th>Competition</th>
<th>Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10-15 years ago</strong></td>
<td>Strong demand growth</td>
<td>Limited growth in ship size</td>
<td>Smaller shipping lines and alliances</td>
<td>Competition for acquiring port assets</td>
<td>Generally high returns</td>
</tr>
<tr>
<td><strong>Today</strong></td>
<td>Weaker demand growth</td>
<td>Huge growth in ship size (raising terminal opex and capex)</td>
<td>Much bigger shipping lines and alliances</td>
<td>Greater international competition for acquiring port assets</td>
<td>Lower returns?</td>
</tr>
</tbody>
</table>

Source: Drewry Maritime Research
Demand growth

Double digit growth (11%pa) before Great Recession (2008/09); since then, single digit (5%pa) – lowest growth rates ever in the industry (apart from 2009). But there is the China Factor.

Source: Drewry Maritime Research/Aegir Port Property Advisers
Ship sizes

Average and largest ship sizes exponentially increasing…what will be the be the impact?

Average vessel size in global fleet

CAGR +1.9%

CAGR +15.3%

Source: Drewry Maritime Research
Impact on ports of major peaks
Requirement for more infrastructure; longer periods of underutilisation

Before

<table>
<thead>
<tr>
<th>Day</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>3,000 boxes</td>
</tr>
<tr>
<td>Thursday</td>
<td>3,000 boxes</td>
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</table>

After

<table>
<thead>
<tr>
<th>Day</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>6,000 boxes</td>
</tr>
</tbody>
</table>

...and what if the ships are off-schedule too?
• Larger carrier alliances = larger, more complex port clients

• Less fragmented terminal capacity

• This will lead to further consolidation

Major shipping lines and their respective alliance – musical chairs

Source: Drewry Maritime Research
M&A multiples creeping up again

Source: Drewry Maritime Equity Research
Entering a market of lower returns

Drewry Port Index: Return on Equity

Drewry Port Index: EBITDA growth estimates

Source: Bloomberg, Drewry Maritime Equity Research. Note: Drewry Port Index is a market-weighted index, comprising 11 listed terminal operators Drewry Maritime Research covers globally. The ROE estimates of respective companies are weighted accordingly.

Source: Bloomberg, Drewry Maritime Equity Research
Port challenges – changing and increasing
The infrastructure challenge – why things are changing, quickly

- US$57 trillion in global infrastructure required from 2013 to 2030 just to keep up with projected GDP growth
- This exceeds the value of global infrastructure to date
- US requires about $1.6T next five years (double current outlay) - just to get to acceptable levels (ASCE)
- 2013 US port infrastructure underinvestment: past 4 years USDOT invested $357m in 25 port projects - $40m less than Port of New Orleans did in its own port (The Economist)

Exhibit E7
The United States must raise infrastructure spending by 1 percentage point of GDP to meet future needs
Gap between historical spend and estimated future spending need
% of GDP

<table>
<thead>
<tr>
<th>United States</th>
<th>United Kingdom</th>
<th>Germany</th>
<th>Canada</th>
<th>France</th>
<th>Sweden</th>
<th>Australia</th>
<th>Japan</th>
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<tr>
<td>3.6</td>
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<td>3.3</td>
<td>4.4</td>
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<tr>
<td>-1.0</td>
<td>-0.9</td>
<td>-0.6</td>
<td>-0.7</td>
<td>-0.6</td>
<td>-0.7</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>2.6</td>
<td>2.4</td>
<td>2.2</td>
<td>2.7</td>
<td>2.3</td>
<td>2.6</td>
<td>2.6</td>
<td>2.6</td>
</tr>
</tbody>
</table>

SOURCE: McKinsey Global Institute analysis
Investment challenges – implications for ports and terminals

Enhanced equipment and infrastructure required

More rapid obsolescence of existing terminal capacity
Vessel call volumes and handling speeds: the increasing disconnect (size of exchanges per vessel call get very large, very quickly)

What level of productivity does the shipping line want (they may not want the fastest) and are they prepared to pay for it?

* i.e. 20% of vessel discharged and 20% loaded per port call
** JOC Port Productivity Data (2013, 8,000teu+ sized ships)

Former Maersk Line CEO: 6,000 moves in 24 hours = 250 berth moves per hour

Best performing terminal in the world
Annual average 179 berth moves per hour **
Investment implications – for a wider supply chain…

Shipping lines obtaining sea transport cost savings for themselves (and cargo owners) with bigger ships…

...but generating higher investment needs in other parts of the supply chain (for other service providers) eg, infrastructure
State of port property (AAPA’s Research Paper: overview on how port’s manage their largest asset – property, challenges faced and key issues for further research’, April 2013)

• International survey conducted of six ports:
  – US Gateway
  – US Inland
  – US Gulf
  – European gateway
  – Asian transhipment
  – Latin American regional
State of port property

- Port’s surveyed represented:
  - 34,176 acres/13,831 hectares
  - $6.835 billion in land value (at $200k/acre or $495k/ha)
  - 2,145,000 teu’s
  - 750,000,000 MT
Aegir survey results – Port Authorities know the issues

- Ports need to act like a business and not constrained by economic development issues

- Have reached serious point of being capital constrained; past financing methods do not work

- Need to better understand private sector capital markets

- Believe solutions will come from private sector
Aegir survey results

- Shift to property rent revenue from MAG’s and throughput charges

- **Property side** of business needs to be **better understood**

- Terminal concessions **underlying land do not take into account**

- **No starting basis of value for property portfolio**

- Leases do not reflect real financial performance needs
Aegir survey results - lease issues

- **Balance between ‘fixed’ and ‘variable’ rents** (i.e., property and throughput respectively)

- **Balance between fixed rent and MAG revenues**
  (pressure from rating agencies for ports)

- **Issues surrounding lease capitalisation** for companies from changing IASB/FASB regulations and resulting impact on leases

- **Shorter term** property usage from greater peaks
Alternative and evolving funding structures
Alternative funding – answers coming world wide, even Florida: Florida Port Financing Commission

- Florida has fifteen ports

- Florida Port Financing Commission (1996), established to obtain joint funding and obtain reduced costs for Florida Ports

- Bonds paid through a combination of sources, including motor vehicle registration fees

- Revenues and fees are deposited with: State Transportation Trust Fund

- Florida Seaport Transportation and Economic Development Council acts as Trustee

- There is growing interest in bond project finance in Europe (eg, European Investment Bank application for Project Bond Initiative); the Florida Port Financing Commission example is closely being looked at by Europe
Availability Payments – the Miami Tunnel

• Goal: decongest traffic by diverting port traffic away from downtown

• Cost: $1 billion (started May 2010; opened August 2014)

• Funded with Availability Payments (or Maximum Availability Payments) where Public sector directly reimburses Concessionaire without direct charges to the public eg, tolls

• Concession: 35 years
Leasehold - ground leases
Caribbean example

• Challenges:
  – Capital constrained port authority
  – Port needs intermodal and logistics park (eg, distribution centre) capabilities to remain competitive
  – Port needs to increase revenues streams; optimized underutilized valuable lands

• Solutions:
  – Attract private sector capital without selling land ie, long term leasehold
  – Access national pension fund capital to finance development
  – Generate revenues through combination of ground rents and throughput participation fees

• Opportunities:
  – Significantly increase cargo throughput
  – Increase revenues
  – Increase competitive advantages
Private sector – off port: 
Pension fund commitment to alternative (ie, port) use of major landholding

• Challenges:
  – Major port with little intermodal capability
  – $16 billion pension fund with near port land to be ‘underdeveloped’ for ‘Big Box’ retail

• Solutions:
  – Present pension fund with alternative development option – port related
  – Prepare comprehensive revenue stream comparison analysis: Big Box versus on dock intermodal facility

• Opportunities:
  – Pension fund would significantly increase its ROI and value of site
  – Port significantly increase cargo throughput and competitive advantages
  – Fund commits $450 million to the project
Most radical solution on the way: privatizing the Port Authority option

- Need for capital to expand and modernize major ports exceeding governments’ ability to fund them
- This will force changes in the PA structure (ie, corporatization, privatization)
- Statutes limiting the securitization/collateralization of port land will change to release tied up equity
- Examples:
  - Port of Rotterdam corporatization resulting in significant financial performance increases
  - Port of Brisbane privatization 2011 (A$2.1 b)
  - Ports Kembla and Botany (A$5.07 b)
  - Potential privatization of the port in Melbourne
  - Port of Piraeus – most recent, end of 2016:
    - Cosco buys 67% of PA
    - Pays approximately US$405m – 70% over stock market price
    - Enterprise value is 23x; more realistic would be 8-10x’s
    - Only makes sense if major growth expected – difficult here
Conclusions/takeaways
Conclusions

• Terminal operators/shipping lines need to co-operate to mitigate negative impact of larger ships/alliances.

• Price hikes for shipping lines: PA’s pay for infrastructure, port users use it at subsidized prices. End consumer must choose: pay with taxes (ie, subsidies) or pay real cost of transportation in goods pricing; either way, they pay.

• New era upon us of lower margins and returns; may result in some investors and operators leaving the market.
Takeaways

1. Radical changes coming on how port infrastructure will be financed/owned.

2. PA’s to continue facing increasingly challenging competitive environment and funding markets, forcing change on how they are structured.

3. Balancing of stake and share holder interests’, environment and other issues will continue but, PA’s will increasingly look, be operated and structured like private sector enterprises; port economic development goals will be addressed after the ‘bottom line’, not above.
Thank you!

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Senior Analyst – Ports & Terminals
Drewry Research | Drewry Maritime Advisors
Since 2003, Aegir Port Property Advisers have been a pioneer consultancy engineered to meet the unique property challenges of the ports and maritime industries. Aegir’s focus is to enhance a port’s competitive and financial value by more strategically using its major asset.

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.

Aegir & Drewry: helping you navigate the world of ports by bridging the gap between the port and property sectors.

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.

- Over 400 port assignments in 50 countries in the past 10 years.
- Since 2010, provided commercial and due diligence advice in port M&A and financing with a value of approximately $20bn.
- In last 5 years provided advice on vessel valuations on asset value of more than $180bn (combined).
- In last five years advised on container shipping industry investments totalling $6bn.