A global analysis of port industry performance

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Background

Report D9.4 in PORTOPIA: exploring possibilities for benchmarking the European port system on specific indicators against non-European port systems (basis: PUBLICLY AVAILABLE DATA)

1. INDICATORS REPORTED BY INTERNATIONAL ORGANISATIONS AND ASSOCIATIONS
   - Global and regional port associations
   - International organizations

2. INDICATORS REPORTED BY NON-EUROPEAN NATIONAL STATISTICS AGENCIES AND OFFICES

3. INDICATORS REPORTED IN MISCALENEOUS SOURCES (per group of indicators)
International organisations and associations

Global port association - IAPH

- Nine technical committees, for example:
  - Ports finance and economics committee => socio-economic indicators and governance indicators;
  - Cruise committee => categories market trends and structure (i.e. passenger statistics) and environment and safety indicators;
- Website: datasets related to port traffic flows (mostly third-party data)
- Website: information and hyperlinks to relevant info of the member ports (corporate information, environmental issues, sustainability reporting, international port economic studies, traffic & Statistics).
- Restructuring phase
International organisations and associations

Regional port associations

• Regional port associations:
  • American Association of Port Authorities (AAPA)
  • Ports Australia
  • China Ports & Harbors Association (CPHA)
  • Indian Ports Association (IPA)
  • Port Management Association of West and Central Africa (PMAWCA)
  • ASEAN Ports Association (APA)
  • Association of Pacific Ports (APP)
  • APEC Port Services Network (APSN)
  • etc..

• General observations:
  • Focus on maritime traffic data (mostly annual and aggregated per port)
  • When disaggregated per type of goods: variations in classifications used
  • Some associations do not even publish port traffic data (e.g. CPHA)
  • Very few associations systematically report on other port performance indicators (governance, environment, logistics, socio-economic)
  • Range of initiatives: e.g. Green Port Award System (GPAS) of APSN
International organisations and associations

Regional port association: AAPA

- Website: port performance data for North American, Latin American and Caribbean ports (highly aggregated annual data);
- Reference to the economic importance of ports to the US economy;

AAPA continuously receives requests on how ports rank nationally and internationally. The question is ambiguous, however, since ports can be compared in many different ways - by volume or value of trade, number of cruise passengers, revenues, and storage capacity, as examples.

Moreover, sheer size of a port, in terms of traffic flow, says nothing about productivity, efficiency, or responsiveness to customers. These are just some of the criteria that a shipper might consider in evaluating port performance.

Statistics

- Freight Facts and Figures 2015 - USDOT Bureau of Statistics
- U.S. Maritime Administration Maritime Statistics Web Page
International organisations and associations

Regional port association: Ports Australia

• Wealth of data on Australia’s **port throughput and trade** (category ‘market trends and structure’).

• **Some socio-economic data:**
  • Direct and indirect employment of port authorities and port precincts
  • Methodology based on “A general framework for undertaking port impact studies in Australia ? Regional Impact of Ports” by BITRE (2000).

• **Some logistics and supply chain indicators:**
  • The average time alongside for all vessels (in hours).
International organisations and associations

International organizations: UNCTAD

• 1976: first UNCTAD studies on port performance (7 financial indicators and 11 operational indicators).

• UNCTAD Port Management Monographs

• UNCTAD publication: “Port Performance Linking Performance Indicators to Strategic Objectives” (Port Management Series, 2016). Focus on management benchmarking across a cooperative network of ports, and aims to build a port performance scorecard project.
International organisations and associations

International organizations: UNCTAD

4. PORTS

A. World container port developments
B. World container ports and liner shipping market developments
C. Private sector participation in ports
D. Outlook and policy considerations

- World container port volumes by region
- Container port volumes at top container terminals
- Container port volume growth

- Container port turnaround time
- Average time in port per vessel type
- Average cargo dwell time in sub-Saharan Africa

- Private participation in port infrastructure
- Leading global port investors

- Liner shipping connectivity index
- Bilateral liner shipping connectivity index trends
International organisations and associations

OECD:
- **Port-Cities program**: a.o. comparative analysis of 150 socio-economic impact studies on ports
- **Working papers**, e.g. “Efficiency of world ports in container and bulk cargo (oil, coal, ores and grain)”, “Ports and Regional Development: a European Perspective”

UN Regional Commissions of UN: UNESCAP and UNECLAC
- **UNECLAC**: container port throughput of 120 regional ports + report on the energy efficiency of terminals in Latin America.
- **UNESCAP**: port data under the ‘connectivity’ banner (container port throughput figures for Asia and the Pacific)

World Bank
- **Logistics Performance Index (LPI)** - six sub-indicators
- Online tool to show the evolution in time of the **quality of port infrastructure in a country** (1=extremely underdeveloped to 7=well developed and efficient by international standards) and to compare this figure with other countries
Non-European National Statistics Agencies & Offices

- United States, Australia, Canada, South Africa, China, etc..
Non-European National Statistics Agencies & Offices

Australia - Bureau of Infrastructure, Transport and Regional Economics (BITRE)

- “Waterline” reports on port performance in Australian ports.
- Maritime throughput indicators
- Landside throughput indicators (quarterly basis) — rail, truck
- Ship visits, as reported by Port Authorities
- Impressive set of data on trends in container handling productivity in Australia as well as the cost of importing and exporting containers.
• 2014: ad hoc report for evaluating **port performance measures in Canada and elsewhere** (main focus on congestion, responsiveness and fluidity in port systems worldwide).
• Cutting-edge and innovative port performance indicators in some **Canadian ports**, e.g. port of Vancouver: **Port Dashboard**

### Port Dashboard

Port Dashboard provides real-time monitoring tools for port users and stakeholders, plus supply chain performance metrics, maps and weather data.

#### Real-time monitors

Several real-time monitoring programs are in place throughout the Port of Vancouver to help keep users informed and enable better planning.

<table>
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<tr>
<th>Port Dashboard</th>
<th>GPS dashboard</th>
<th>Webcams</th>
<th>Noise monitoring</th>
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<tr>
<td>eHub app</td>
<td>Container truck GPS</td>
<td>Live video feeds</td>
<td>Noise data and information about our monitoring program.</td>
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<tr>
<td>Real-time supply chain status through the Port of Vancouver eHub app.</td>
<td>Container truck GPS data providing wait times at port terminals.</td>
<td>Live video feeds from around the port.</td>
<td>Noise data and information about our monitoring program.</td>
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#### Supply chain performance

We provide **reports and metrics** to assist terminals and other supply chain participants to plan accordingly.

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<th>Trucking metrics</th>
<th>Vessel metrics</th>
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Supply Chain Performance

Our Supply Chain Strategy is a multi-year, port stakeholder-supported series of initiatives developed to achieve sustainable growth in all cargo sectors by coordinating development of the most reliable and cost-efficient supply chain in North America. The goals of the program are to:

- lead and influence new operating practices
- measure and monitor service performance
- drive investment and participation in the network

Collecting, analyzing and reporting on data allows us to assess how well the gateway is performing. Early warning indicators derived from the Supply Chain Strategy Program can help initiate discussions and support major capital decisions and future planning. Some examples include:

Rail metrics

Container rail performance

To help increase visibility of the intermodal supply chain, the container rail performance update provides a terminal-level summary of the import rail footage on-dock, the estimated planned car supply, and the actual rail car production on a daily basis. The report is updated daily.

Nov 7, 2017 – Container Terminal Performance update [PDF]

Trucking metrics

Container truck GPS data

All container trucks permitted to serve the port are equipped with Global Positioning System (GPS) units. Summary data by terminal for the previous week and the previous month are available. Aggregated average turn times are shown based on data from the full fleet of TLS licensed trucks. The data reflects both regular and speed gate reservations. This report is updated once weekly on Tuesdays.

Nov 7, 2017 – Report_GPS Weekly Turn Time Report by Terminal [PDF]
Oct 17, 2017 – Report_GPS Weekly Turn Time Report by Terminal [PDF]
Sep 26, 2017 – Report_GPS Weekly Turn Time Report by Terminal [PDF]
Sep 19, 2017 – Report_GPS Weekly Turn Time Report by Terminal [PDF]

Vessel metrics

Gateway vessel on-time performance

The Container Vessel On-time Incentive program encourages container vessel operators to arrive on schedule, and thereby contribute to overall supply chain consistency. In support of this program, the Vancouver Fraser Port Authority reports monthly on gateway vessel on-time performance.

Vessel on-time arrival is measured within +6 hours of berth window start for the Container Vessel On-Time Incentive Program. In recognition of industry standard metrics, the Vancouver Fraser Port Authority also reports vessel on-time performance within +24 hours of scheduled berth window start. This report is updated monthly.

September 2017 – Summary Gateway Vessel On-Time Performance (Preliminary data) [PDF]
August 2017 – Summary Gateway Vessel On-Time Performance [PDF]
July 2017 – Summary Gateway Vessel On-Time Performance [PDF]
June 2017 – Summary Gateway Vessel On-Time Performance [PDF]
May 2017 – Summary Gateway Vessel On-Time Performance [PDF]
Port performance indicators reported in miscellaneous sources

- **Market trends and structure indicators**
  - International Maritime Statistics Forum (IMSF), top port listings, marine Transport System Performance Measures (U.S. Committee on MTS; market trends and modal split)

- **Socio-economic indicators**
  - Examples for the US, Port of Sydney, Asian ports

- **Governance and port-user satisfaction**
  - See also PORTOPIA report D6.1
  - Academic work on port governance, academic approaches on port user perception: potential for international benchmarking?

- **Environment and safety indicators**
  - See also PORTOPIA report D3.3
  - BSR report, Green Marine’s environmental program

- **Logistics and supply chain indicators**
  - Academic literature review on logistics and supply chain indicators
  - Centre for Supply Chain Management (CSCM)
  - Centre for Transportation Research (University of Texas) - Landside Access Needs
Conclusions

• PORTOPIA can be regarded as the most comprehensive port performance project in the world.

• Global best practice on comprehensive port performance measurement and reporting.

• Individual port authorities remain the key sources for a lot of data

• Enhance cooperation with port associations in view of developing international standards for performance measurement and reporting, and data collection.
Conclusions

Conclusions per indicator

• ‘Market structure and trends’ indicators:
  • Widely available (port throughput in particular) but methodologies and levels of aggregation differ;
  • No global port traffic dataset;
  • Modal split data is very hard to find in an international context.

• ‘Socio-economic indicators’:
  • Scarce and methodologies differ;
  • Harmonized methodology, even at a European level, very challenging.

• ‘Indicators on the environment, safety and security’:
  • Some information in sustainability reports and websites of individual seaports;
  • National statistics offices and regional port associations: not provided.

• ‘Logistics and supply chain indicators’:
  • Limited public reporting by international organizations or ports.

• ‘Governance indicators and user perception’:
  • Case-based information available.
Final observations

Availability of indicators dependent on:

- Regionalism of port performance indicators, for example:
  - Few datasets on economic impact of Asian ports
  - Differences in commodity group classification linked to local setting (cf. mining rich regions)

- The party collecting and reporting on performance indicators;

- Imposed/compulsory reporting vs. voluntary reporting

- Goal/objectives