Mediterranean container hubs of the future

Harilaos N. Psaraftis
Laboratory for Maritime Transport
National Technical University of Athens
Motorways of the Sea

- 2 in the Med
- How will they relate to container transport development in the area?
The top 10 (2007)

<table>
<thead>
<tr>
<th>RANK</th>
<th>PORT</th>
<th>2007 TEU</th>
<th>2006 TEU</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gioia Tauro</td>
<td>3.45m</td>
<td>2.94m</td>
<td>+17.3%</td>
</tr>
<tr>
<td>2</td>
<td>Algeciras</td>
<td>3.41m</td>
<td>3.24m</td>
<td>+4.8%</td>
</tr>
<tr>
<td>3</td>
<td>Valencia</td>
<td>3.01m</td>
<td>2.61m</td>
<td>+16.5%</td>
</tr>
<tr>
<td>4</td>
<td>Barcelona</td>
<td>2.60m</td>
<td>2.32m</td>
<td>+12.6%</td>
</tr>
<tr>
<td>5</td>
<td>Ambarli</td>
<td>1.94m</td>
<td>1.45m</td>
<td>+34%</td>
</tr>
<tr>
<td>6</td>
<td>Malta Freeport</td>
<td>1.90m</td>
<td>1.49m</td>
<td>+21.5%</td>
</tr>
<tr>
<td>7</td>
<td>Genoa</td>
<td>1.86m</td>
<td>1.66m</td>
<td>+12%</td>
</tr>
<tr>
<td>8</td>
<td>Port Said East (SCCT)</td>
<td>1.78m</td>
<td>1.60m</td>
<td>+5.6%</td>
</tr>
<tr>
<td>9</td>
<td>Piraeus</td>
<td>1.37m</td>
<td>1.39m</td>
<td>-2.0%</td>
</tr>
<tr>
<td>10</td>
<td>La Spezia</td>
<td>1.19m</td>
<td>1.14m</td>
<td>+4.4%</td>
</tr>
</tbody>
</table>

Source: Lloyds List
The top 10 (2017)
Factors for the future

- Economic
- Social
- Technological
- Political
- Environmental
- Legislative
Crude remarks

- General increase of traffic
- Much of traffic is transhipment
- Increase of private port operator role
- Investment growth

- Some of container traffic (Far East – Europe) completely bypasses the Med
- Port infrastructure and hinterland connections are lacking vis-à-vis Northern Europe
Global issues and the ‘push-down, pop-up’ principle

- If you push one button down,
At least another one will pop up
Button no. 1: speed reduction

- Savings in fuel costs
- Means to reduce emissions
- Pick up slack in containership overcapacity

- Killing 3 birds with one stone?
GL: “An efficient ship is a green ship”
Lloyds List, 30 July 2008

- GL first suggested slowing down some three years ago – and today, the idea has been accepted by most shipping lines in the container trade, said a GL spokesman.

- “We recommend that shipowners consider installing less powerful engines in their newbuildings and to operate those container vessels at slower speeds,” he said.
How much slower?

- From 20-25 knots, go down to 15-18

- Fuel consumption: grows as the cube of speed
'Pop-up’ effects of speed reduction

Will need:
- Either more ships
- Or bigger ships
- Or both

To maintain same level of throughput
Hypothetical example

- String of 20 (identical) container ships
- Payload $W = 50,000$ tonnes
- Base speed $V = 21$ knots
- Fuel Consumption at 21 knots = 115 tonnes/day
- Assume fuel price $p = \$600/tonne$
- Fuel bill = $\$69,000/day/ship$

- Reduced speed $v = 20$ knots
- FC at 20 knots = 100 tonnes/day (cube law vs. 21 knots)
- Fuel bill = $\$60,500/day/ship$
2 scenarios

- 20 ships at 21 knots (scenario A)
  - Total fuel burned/year/ship = 41,975 tonnes
  - Total fuel cost = $503,700,000.

- 21 ships at 20 knots (scenario B)
  - Total fuel burned/year/ship: 36,500 tonnes
  - Total fuel cost = $459,900,000, **REDUCED**.

- **NET REDUCTION IN CO2 EMISSIONS: 231,410 TONNES/yr**
Potential impact

- Fuel costs will go down
- Other ship operational costs: + or -
- Cargo in-transit inventory costs will increase
- Net effect on total costs: unclear
Impact on network design and ports

- Unclear, but:
- Expect ‘hub and spoke’ to become more prevalent
- Speculate that role of big Med hubs will increase
- Environmental side-effects: unknown
  - (expect ‘cold ironing’ to be used extensively)
Button no. 2: make ships bigger

- Economies of scale
- EMMA MAERSK: ~11,000 TEU
- STX designs 22,000 TEU monster boxship
- Claims will reduce per container shipping costs by 40 percent.
- 460-meter long, 60-meter-wide
- Will be available in one- or two-propeller configurations and be capable of speeds of between 24 to 26 knots.
Questions (naïve):

- Which, among Med ports, will be able to accommodate such ships?
- At what cost? (infrastructure and other)

Answer: ???

☐ (will more ships completely bypass the Med?)
Button no. 3: use cleaner fuels

- Important for Sulphur Emissions Control Areas (SECAs)
- The Med is not currently a SECA (the Baltic and North Seas are)
- But environmental considerations may make it one in the future
‘Pop up’ effects of cleaner fuels

- Ship operational costs: will increase
- Freight rates: will go up
- Shippers in the Med may be more prone to use land alternatives
- Goal to shift cargo from land to sea: down the drain
- CO2 total emissions: up!
Button no. 4: container security

- ISPS code (2002)
- EC regulation 725/2004
- EC directive 2005/65
- SAFE port act (USA)
- C-TPAT
- etc
‘Pop up’ effects of increased security

- Delays in container screening
- Increased costs
- Penalization of maritime mode versus land ones, especially road
Conclusion

- Prospects for container Med port development are currently positive, BUT:
  - A holistic approach is needed to formulate best alternatives for the future
  - The current fragmented approach will further increase ‘push-down, pop-up’ situations
Thank you!

Coordinates

- hnpsar@mail.ntua.gr
- www.martrans.org