Transitions in the global container system

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In 2005-7, before the crisis, the global container system was in a phase of full growth related to:

- transported volumes
- the building of new and ever larger containerships & terminals
- with China as the new epicentre of the global container system.
Typical pictures 2005-7: growth!
But there’s a also another side to growth....
Highway A15 in the port of Rotterdam: a horror scenario is forthcoming!
Angst voor ‘nachtmertelief-decaterelen’

PAPENDRECHT - Als de Tweede Maasvlakte er eenmaal ligt voor de kust bij Oostvoorne en er worden geen maatregelen genomen op de wegen ernaartoe, dan ontstaan op de rijksweg A15 en A16 in de Drechtsteden ‘nachtmerteliefs-decaterelen’.

Dat zeg de Papendrechtse verkeerswethouder André van Leeuwen. „Wanneer de Tweede Maasvlakte eenmaal in bedrijf is, dan verdubbelt het aantal containers dat daar verschept wordt naar zo'n twintig miljoen. En die moeten allemaal aangevoerd worden. Dan slibben zowel de A15 als de A16 dicht. Dat moeten we voor zijn.”
Very high congestion levels on A15 and the Rotterdam network to be expected by 2033
Elements of the A15 horror scenario

- Continued high growth of cargo volumes expected towards 2033
- Severe congestion problems on A15 at the moment—‘incidental’ congestion increased most dramatic in recent years
- Capacity A15 reduced because of important road upgrading programme in 2011-2018 (1.7 billion Euro)
- Extra traffic expected, related to construction of Maasvlakte 2
- Sustainability issues related to road transport: CO2, PM10 etc.
Container big issue A15 horror scenario

- Growth expected in container throughput Rotterdam: 10.8 million teu in 2007 to 33 million teu in 2033.
- In 2007: 60% containers to/from hinterland transported by road.
- 30% containers on A15 are empty.
- Heavy congestion at deepsea terminals for container truckers/barges.
- Container: signs of system-failures? (congestion, empties, negative externalities, etc.)
A transition/system innovation in the container-system is needed!

- To ensure a ‘**sustainable accessibility**’ of the port of Rotterdam.
- A transition/system innovation:
  - New technology, new institutions, deep economic impact, etc resulting in a **structural change of society**.
  - Example: transition from coal to oil/gas, demographic transition and: **the container!**—a driving force in the globalisation of production.
Transumo A15-project: five elements of a transition of the container-system

• Extended gates/containertransferia: virtual deepsea terminals: a transition from pull to push

• 24/7-distribution with 3TEU-trucks

• Dedicated inland infrastructure at deepseaterminals + improved visibility (tracking/tracing) + new barge concepts

• Transport prevention: grey container/foldable container

• Auctions, slot management, emission trading
Transumo A15-project: five elements of a transition of the container-system

• Extended gates/container transfer: virtual deepsea terminals

• 24/7-distribution with 3-TEU trucks

• Dedicated inland infrastructure at deepseaterminals + improved visibility (tracking/tracing) + new cargo concepts

• Transport prevention: fully container foldable container

• Auctions, slot management, emission trading

Result: a reduction of container transport on A15 by 30-33% in 2033!
During the Transumo A15-project three important additional innovations appeared!

- Maasvlakte 2: fixed modal split in contracts new container terminal operators:
  - Road: 35% (2007: 59%)
  - Barge: 45% (2007: 30%)
  - Rail: 20% (2007: 11%)

  **Very important innovation: is it the end of free choice in hinterland transport?**

- Take off containertransferium, extended gates & pull/push-strategies: realisation in Alblasserdam, ECT: Venlo, Duisburg, etc.

- Maasvlakte 2: Environmental zone: clean trucks: Euro 5/6
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- Maasvlakte 2: fixed modal shift in contracts new container terminal initiatives
  - Road: 35% (2007: 59%)
  - Barge: 45% (2007: 30%)
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  Very important innovation: end of free choice in hinterland transport?

- Take off containertransferium & extended gates: realised in Alblasserdam, ECT: Venlo, Duisburg gates.

- Maasvlakte 2: Environment zone: clean trucks: Euro 5/6

Result: a reduction of container transport on A15 by 40-45% in 2033!
Effects of modal split measures and of Transumo A15-transition package (2033)

33 million TEU: total throughput port of Rotterdam by 2033

10m feeder

5m shortsea

18 million

5.4m barge

2m rail

10.6m road

18 million

8.1m barge

3.6m rail

6.3m road

2.0m

Deepsea containers transported by road and using the A15 highway by 2033

4.3m: A15

Autonomous

Modal split MV2

Effect Transumo A15
The innovations presented resulted in strong reductions of road transport of containers on highway A15, but an unsatisfactory feeling remained: no real transition or system innovation of the container system has been produced in the Transumo A15-project....Innovations presented are incremental innovations...Are radical innovations to be expected?
Also, Perpetuma increases the average rate of moves per hour. 90 Teu will be placed under the crane in contrast to the 6 Teu now.

Radical new technology?
Radical new technology?
A radical reversal of the system of global production related to declining globalization patterns and local production?
The container industry adopting a Boeing 787 Dreamliner strategy in addition to the Airbus 380-strategy?

...smaller, faster and more reliable ships and terminals using direct calls?
In the Transumo A15-project 12 ‘container gurus’ were interviewed on system innovations/ transitions to be expected.
Results interviews with ‘containergurus’

- No technological ‘breakthrough innovations’ in the container system to be expected in the coming years:
  - No ‘Boeing 737 Dreamliner of the container industry’.
  - The economies of the large ship continues as the driving force.
- Innovation aversion in the container industry: ‘no guts’ for real innovations.
- Organisational innovations are the real promising innovations
  - From pull to push (extended gates/containertransferia)
  - Flow concepts: keep the container moving
- And: IT-innovations: tracking & tracing and increased transparency in container operations: focus on transparency of container terminals.
  - Towards European Port Information Systems
- Innovation needed on the **hinterland transport systems**: road, rail, inland shipping and shortsea.
  - Terminal innovations focused on inland transport system.
Conclusion: there is a dominant transition/system innovation in the container system to be expected: modal split-contracts deepsea terminals on Maasvlakte 2

- This is a transition from the free modal choice to a restricted choice.
- Is related to the use of extended gates/containertransferia: from pull to push
  - A relation with the push/pull transition of the Toyota production system/lean manufacturing/JIT.
- Places large demands on new concepts for inland shipping.
- Is a very ambitious innovation and a lot of questions remain, related to the implementation and enforcement of the contracts.
- However: it is a radical new innovation, driven by both sustainability & accessibility…
- demanding new types of infrastructure/terminals, new types of regulation and new types of governance.
Thank you very much for your attention!