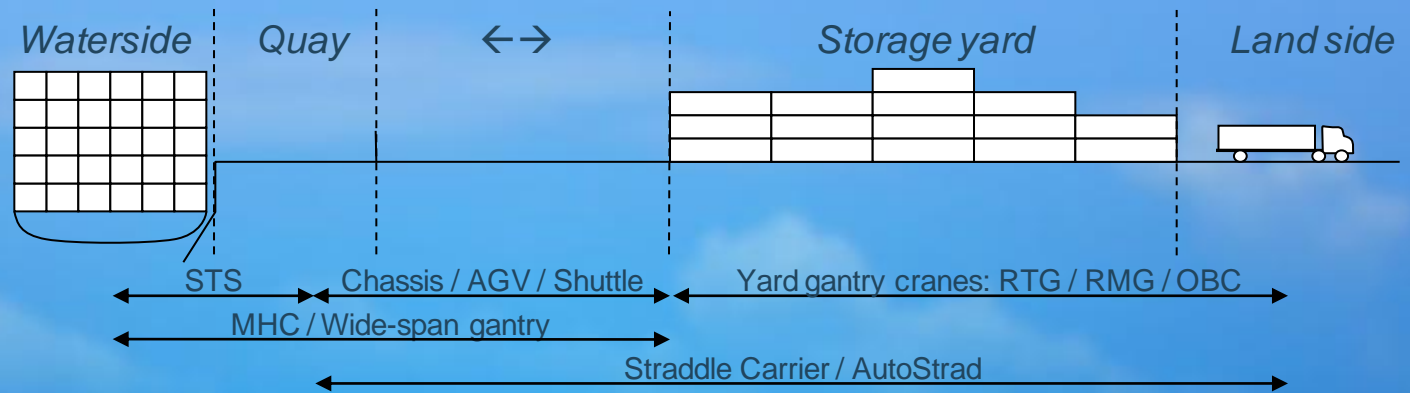# Marine terminals and their environments

Peter van Duyn
Espero Logistics Solutions

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• Container handling process

| Waterside | Quay | ←→ | Storage yard | Land side |

STS

Chassis / AGV / Shuttle

Yard gantry cranes: RTG / RMG / OBC

MHC / Wide-span gantry

Straddle Carrier / AutoStrad

Waterside handling equipment

- ■ Ship to shore gantry crane
- ■ Mobile harbour crane

Yard handling equipment

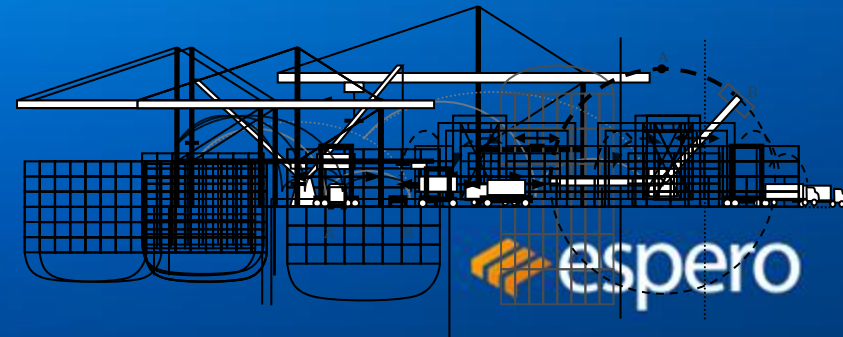- ■ Straddle carrier
- ■ Rubber tired gantry
- ■ Rail mounted gantry

Internal transport

- ■ Port tractor trailer
- ■ AGV
- ■ Shuttle carrier

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HHLA Buchardkai Hamburg

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Buchardkai some figures

- River port with draft of 16 m alongside (tidal)
- Area/ Lay- out 140 Ha with rail siding (8 X 700m) and Pack/Unpack/MT storage facilities
- Throughput 2.6 Mio TEUs
- Mode split 40 % truck 30 % rail 30 % feeder/barge
- Full straddle operation/Conversion to ASC double capacity
- Quay length 2800 m with 22 Quay cranes
- Dwell Time approx 4 to 5 days

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East Swanson Dock Melbourne

Rail terminal

Appleton dual road closure

Unpack/pack

Coode Road closure 2009

Empty container park

Dock extension 2010-2015

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ESD some figures

- City port with 13 m draft alongside (soon 14 m)
- Area/Lay-out 40 Ha with railsiding(4 X 1100m),pack/unpack/MT storage close by
- Throughput 1 Mio TEUs
- Modeshare 90 % truck 10 % transhipment
- Full straddle operation. Capacity with ASC 2 Mio TEUs
- Quay length 900m with 7 Quay cranes
- Dwell time approx 3 days

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International Benchmark Trends

	Current	**Forecast Design**
Berth Capacity	750 – 1000 TEUs/M	2000 – 2500 TEUs/M
Berth Productivity	Up to 90 Lifts/hr	150 – 250 Lifts/hr
Quay Crane design	90,000 Lifts/year	120 – 150,000 Lifts/year
Crane productivity	25 - 30 Lifts/hr	40 – 45 Lifts/hr
Area utilisation	20,000 TEUs/ha	30,000 TEUs/ha
Area efficiencies	60 – 80%	85%
Gate peaks	10 -12%	6 – 8%

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Figure 3 Container handling rates at selected ports, various years (in order of port TEU throughput)
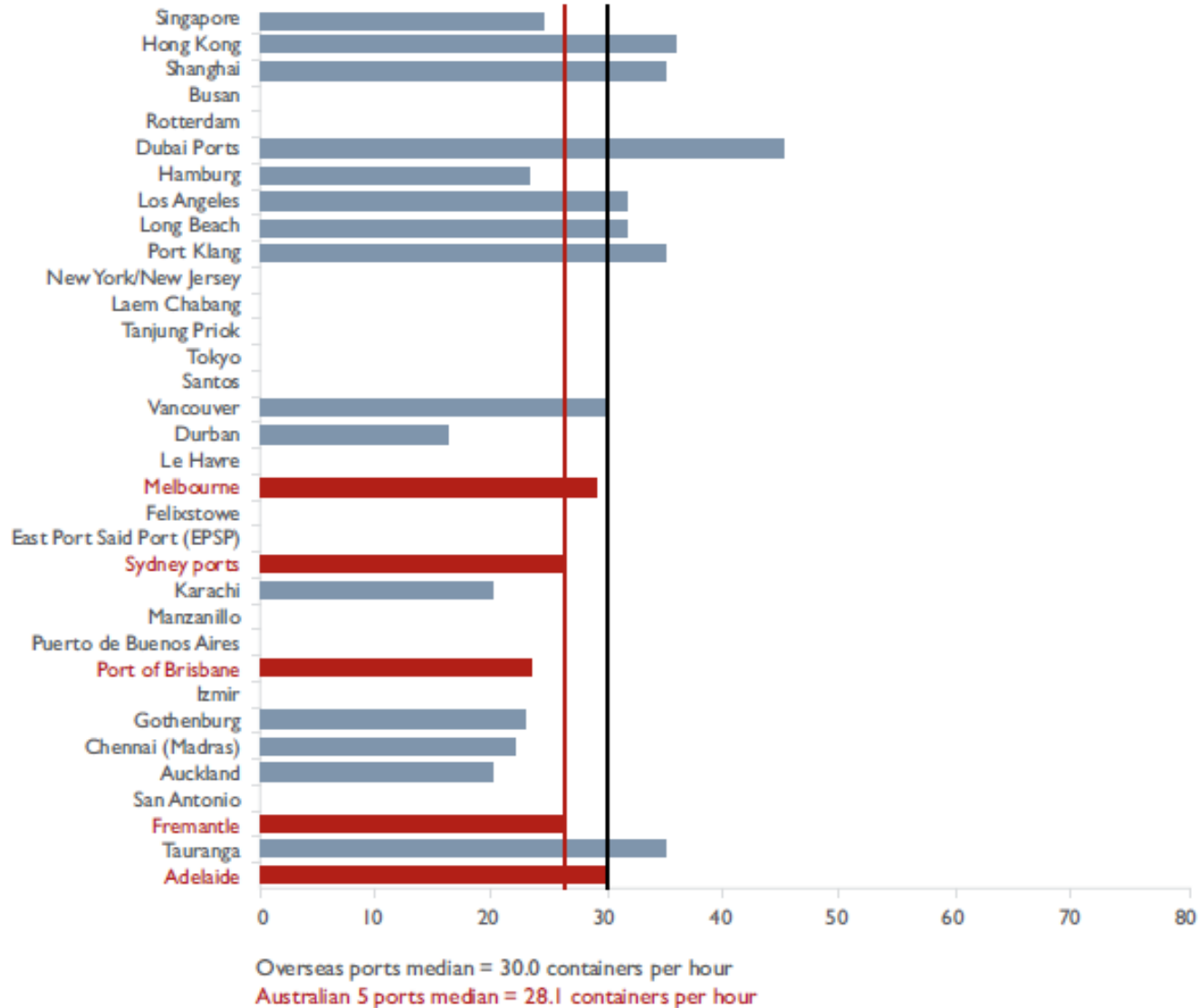
Overseas ports median = 30.0 containers per hour
Australian 5 ports median = 28.1 containers per hour

a. The black line represents the median for overseas ports while the red line is the median for Australian five ports

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Figure 4 TEU throughput per berth metre at container ports (in order of port TEU throughput)
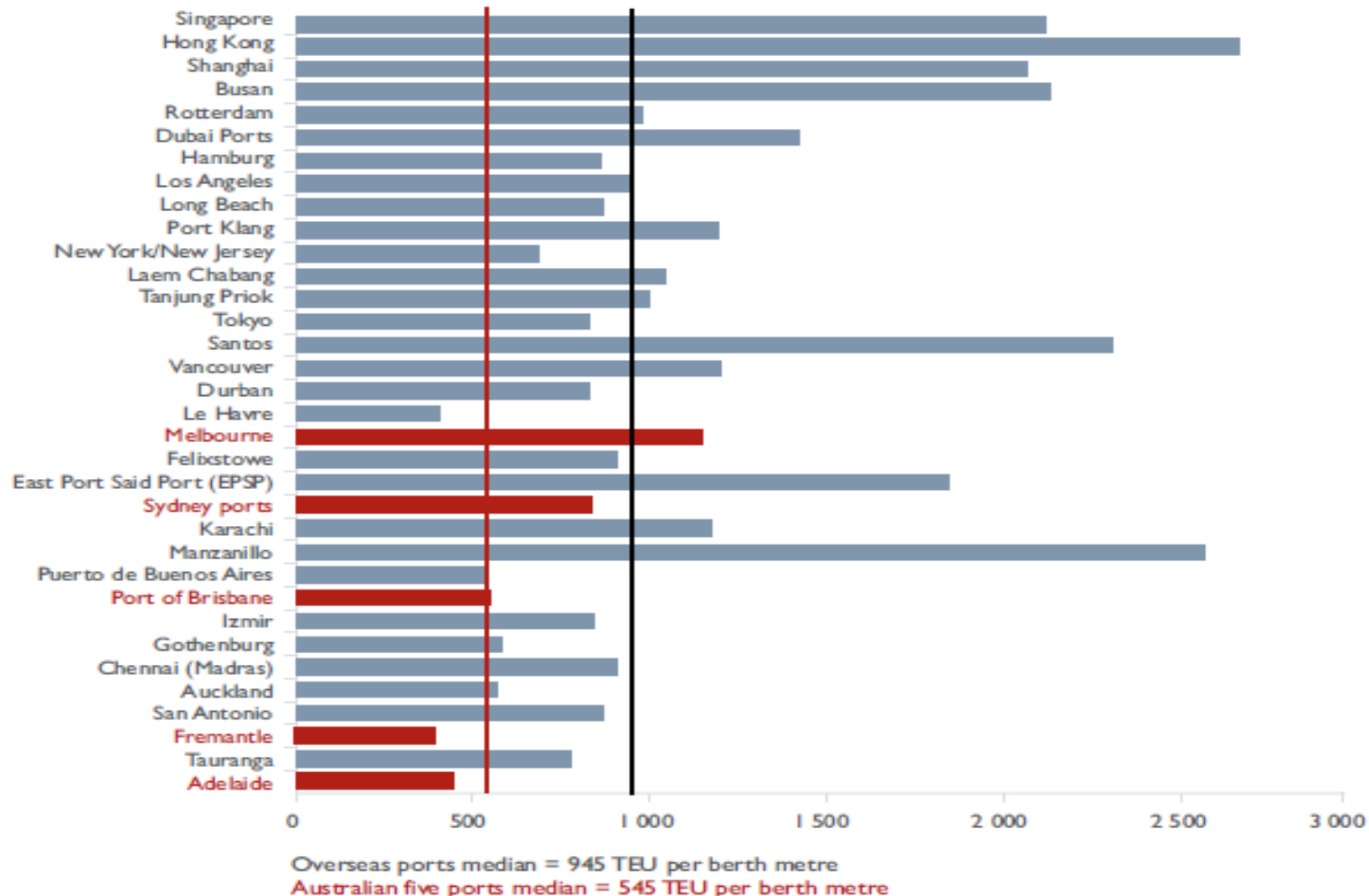
Overseas ports median = 945 TEU per berth metre
Australian five ports median = 545 TEU per berth metre

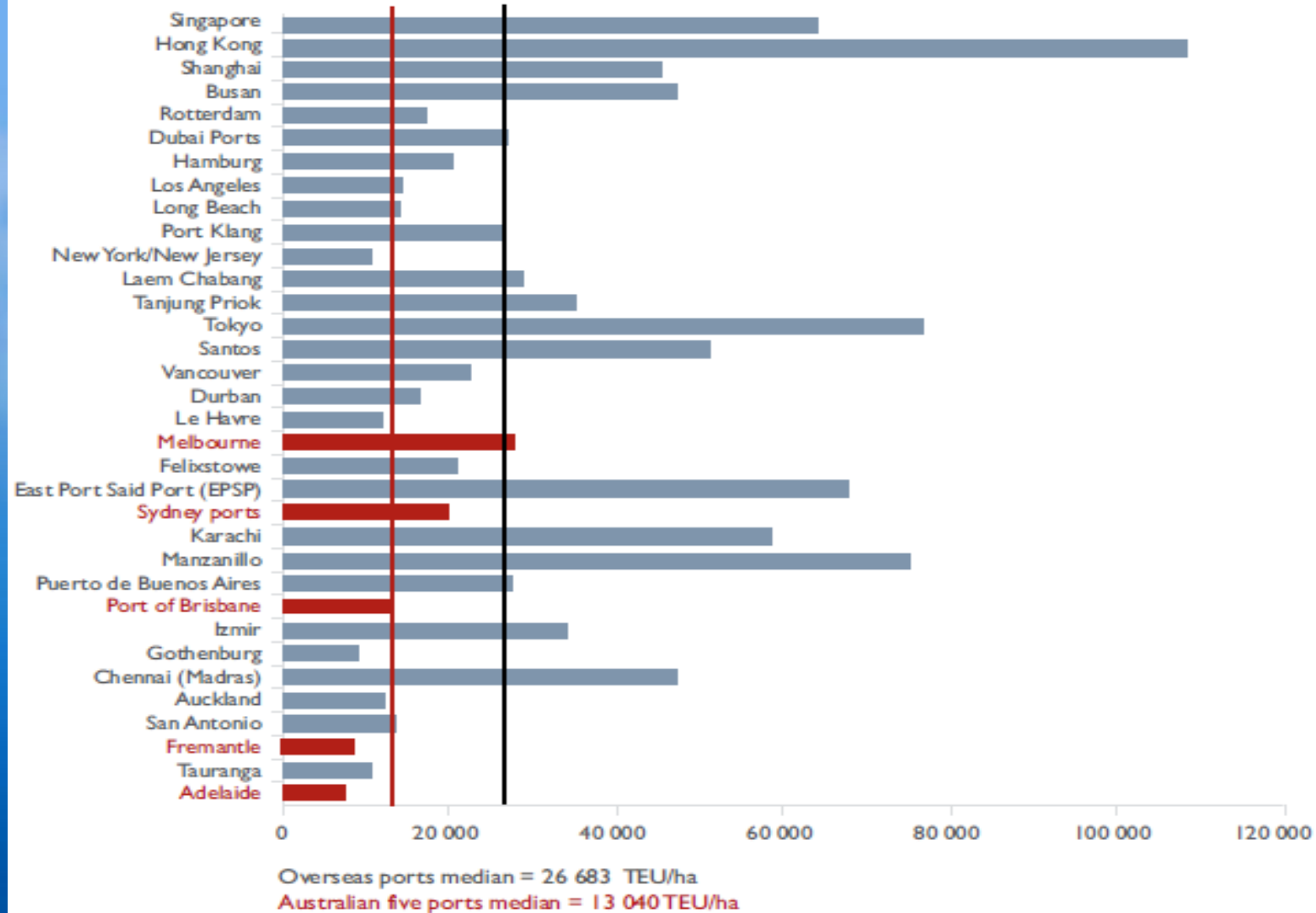a. The black line represents the median for overseas ports while the red line is the median for Australia's five capital city container ports

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Figure 5 Yard utilisation measured as TEU throughput per gross hectare at port terminal (in order of port TEU throughput)

Overseas ports median = 26 683 TEU/ha
Australian five ports median = 13 040 TEU/ha

a. The black line represents the median for overseas ports while the red line is the median for Australia's five capital city container ports.
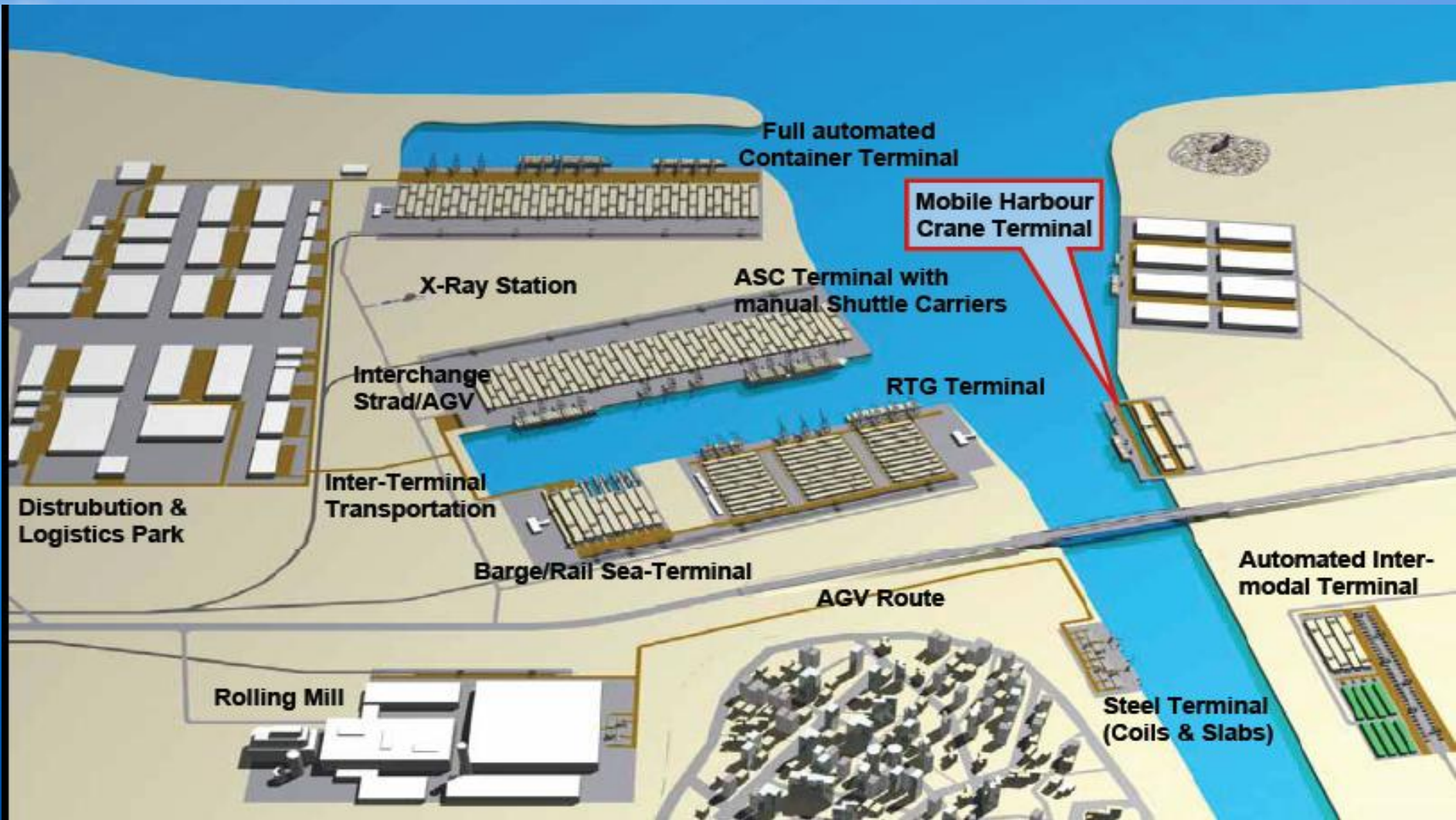
How to achieve modal shift ?

- Legislate (Port of Rotterdam new concessions @ Maasvlakte 2 mode split 35 % truck 45 % barge/feeder 20 % rail
- Introduce truck access levy (Sydney and Melbourne)
- Environmental concerns
- Update, improve and expand rail corridors
- Facilitate inter modal hubs
- Pier Pass at Port of Long Beach (force 24/7)

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Container shipping in the developing world

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The Future ??

Questions ?

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