



T | B | A®

Simplifying your operation

IT tools are now essential for small to medium sized terminals

Cost & service pressures are only going to increase in the aftermath of unprecedented consolidation in liner shipping – IT tools provide the silver lining



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TBA

✓ | Who is this TBA ?

- ✓ | TBA Group is the software solutions part of KoneCranes. Founded over 100 years ago, KoneCranes are world-leaders in lifting business & material handling.
- ✓ | While we are part of a large global organization, TBA Group is collection of small, but highly focused and specialized organizations. Formed with merger of 3 companies TBA- CSA- DBIS
- ✓ | Leadership within our small group rests with the individual branches with the founders of these companies.

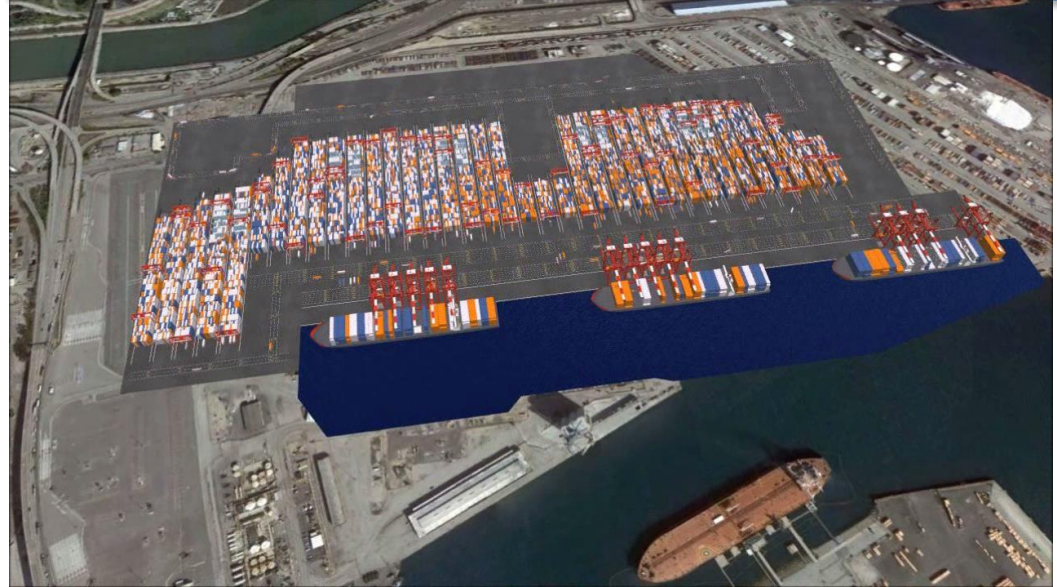
TBA Group Highlights

- ✓ | TBA – Global recognized leader in terminal design, simulation, modelling & optimization.
- ✓ | 9 of top 10 largest global operators use TBA services including, DP World, AP Moller terminals, PSA Hutchison etc.
- ✓ | TBA has been involved in majority of the cutting edge terminals developments – Rotterdam World Gateway, APMT Maasvlakte II, Euromax, Rotterdam, Long Beach Container Terminal, London World Gateway, Jebel Ali, etc.
- ✓ | Terminal Operating System for container, bulk, break bulk & warehousing
- ✓ | Overall TOS : +100 sites. In Asia. Thailand, Malaysia, Philippines & ME. Leading provider of bulk TOS in S Africa. TOB in a box – for bulk/break bulk terminals.
- ✓ | Leading provider of automated guided vehicle fleet management software ECS & Automated Warehouse Systems – Europe

- ✓ | Design of new facilities:
 - APMT North America – Norfolk
 - DPWorld – Antwerp Gateway
 - HPH / Euromax Rotterdam
 - DPWorld - London Gateway
 - HPH / ECT – barge / feeder terminal Rotterdam
 - DP World - Jebel Ali CT2
 - DPWorld – Fishermans Island Terminal
 - Transnet – Nquga & Durban Container Terminal
 - HPH Tercat - Barcelona Muelle Prat
 - APMT – Maasvlakte II terminal
 - DP World - Jebel Ali CT3 & CT4
 - DPWorld – Rotterdam World Gateway
 - Lekki Port
 - Khalifa Port

- ✓ | Extension of existing facilities:
 - APMT Algeciras
 - DPWorld – Southampton container terminal
 - Port of Gothenburg
 - APMT – Tanjung Pelepas
 - HHLA – Burchardkai Hamburg
 - HPH - Thamesport extension
 - PSA Voltri Terminal Europe
 - Packer Avenue Terminal Philadelphia
 - HHLA – Tollerort container terminal Hamburg
 - ICTF – UPRR Long Beach
 - Northport, Malaysia
 - Global New York
 - Port Otago

Long Beach Container Terminal 2017



Ports of Auckland (2008 – 2018)



Fact

Terminal IT tools are now well established for larger terminals

Increasing Automation across the globe



✓ | Furthermore automation is now spreading rapidly in high labor cost countries – automation

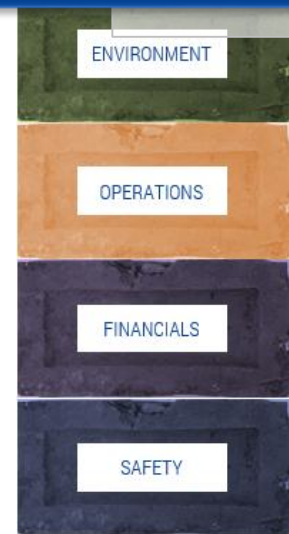
Question

How relevant is IT tools & optimization for small to mid sized terminals?

Automated yards & or full auto

- | | |
|-----------------|---------------|
| ✓ London (2) | ✓ Abu Dhabi |
| ✓ LA / LB (2) | ✓ Algeciras |
| ✓ Nagoya | ✓ Antwerp |
| ✓ New York | ✓ Barcelona |
| ✓ Pusan (2) | ✓ Brisbane |
| ✓ Rotterdam (6) | ✓ Dubai |
| ✓ Sydney | ✓ Hamburg (2) |
| ✓ Tokyo | ✓ Kaohsiung |
| ✓ Norfolk | ✓ Lazaro |
| ✓ Semarang | ✓ Qingdao |
| ✓ Surabaya | |

Building blocks for Business case



Contents:

1. IT Tool in Terminal design, expansion and investment decision
2. Global development in automation & its penetration
3. What tools are relevant for small to mid facilities
4. Terminal operating environment & benefit of IT
5. Concluding remarks

Industry backdrop:

We have witnessed an unprecedented shake up of the liner shipping industry in last 2 years.

With 8 of the top 20 lines being affected. Since the conference it was announced that OOCL will be taken over by COSCO.

Consolidated companies and larger alliances will put further pressure on terminals for improved service requirements

Liner Leader board 2015	
1	Maersk Line
2	MSC
3	CMA CGM
4	Hapag Lloyd
5	Evergreen
6	COSCO
7	CSCL (2016)
8	MOL (2017)
9	Hanjin (2016)
10	APL (2016)
11	OOCL
12	Hambug Sud (2017)
13	NYK (2017)
14	Yang ming
15	Hyundai
16	PIL
17	K Line (2017)
18	UASC (2016)
19	Zim
20	Wan Han



Role of technology & optimization tools

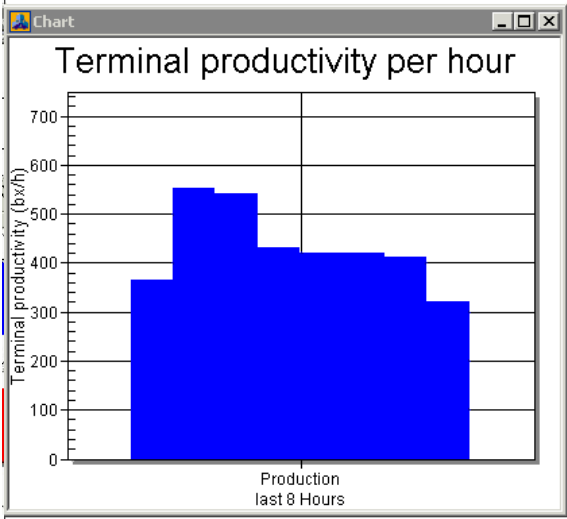
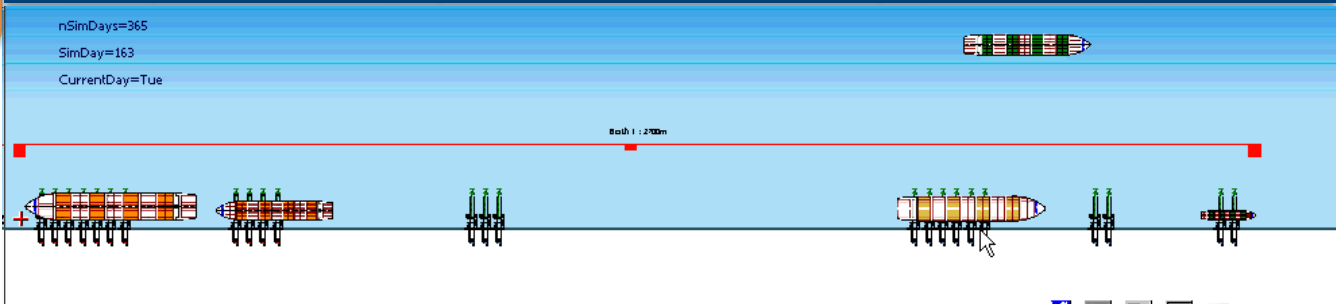
- ✓ | Some examples

Technology tools to optimize terminal design & expansion

terminal design & expansion

(Capacity simulation)

Capacity simulation - quay, rail and road to define key operational requirements



Controller

Help

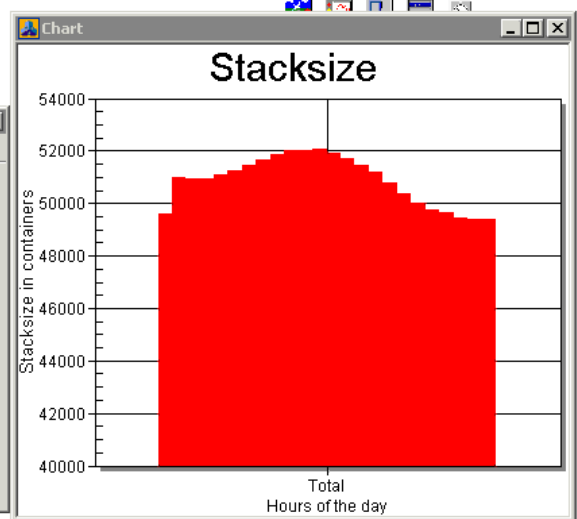
162:00:18:59.0351

Stop Step

Init Reset

Slower

Cancel Apply



What is the impact of changing call size even with same volume?

Can the rail/berth handle the targeted volume?

How many cranes or tracks are required. What is impact of call size changes

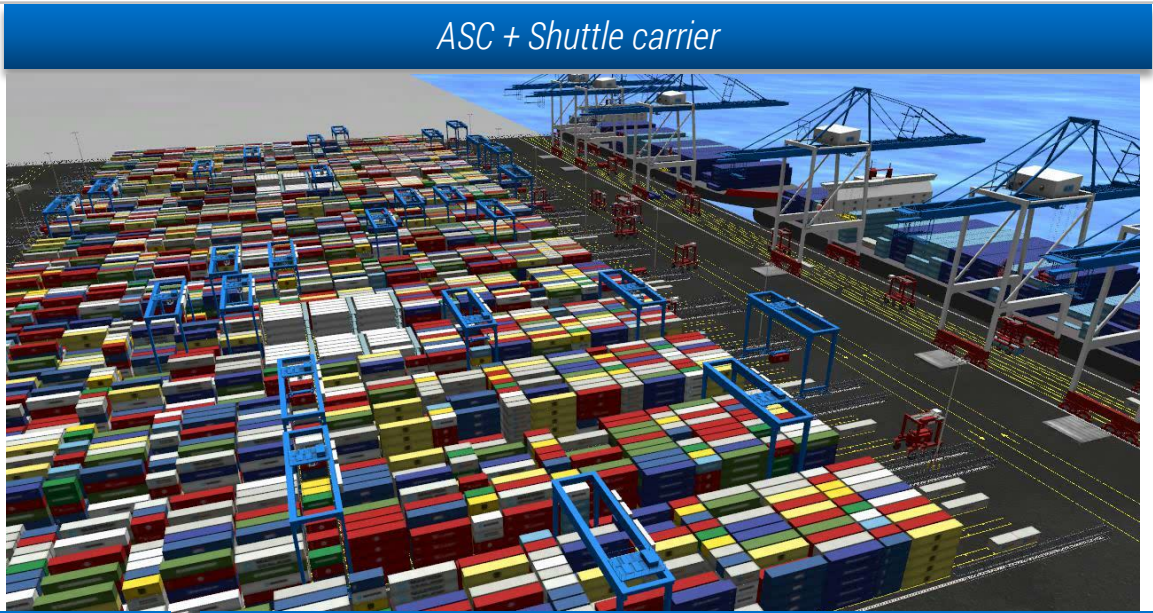
What is the peak handling demand on the yard?

What is the yard inventory over time?

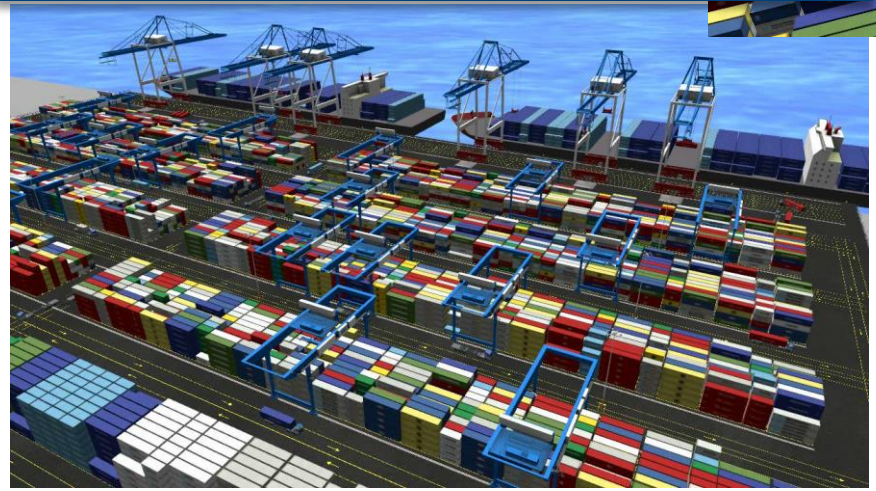
Testing modes – quantification & optimization

(Capacity simulation)

Terminal yard simulation



C-RMG + TT operation

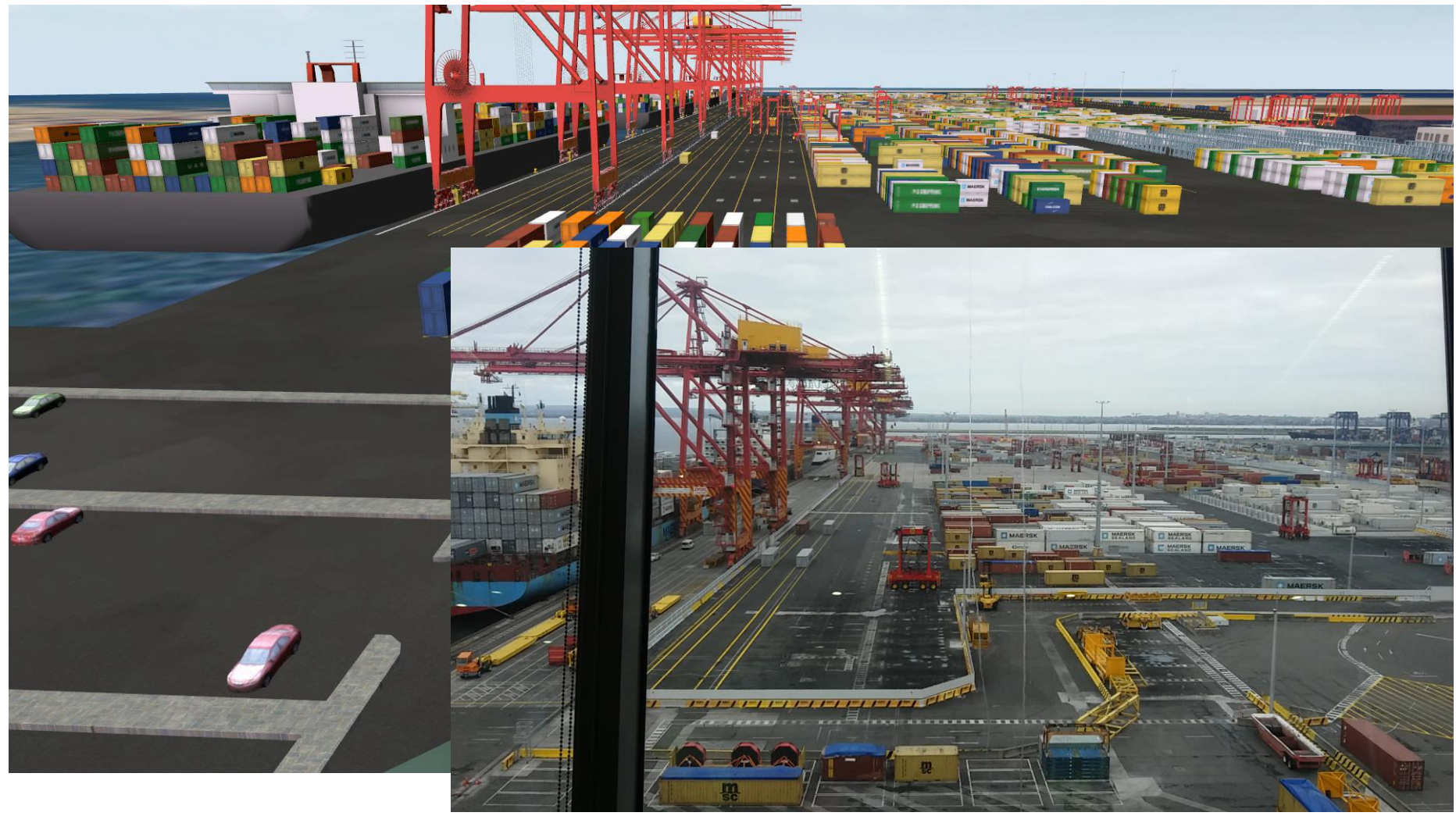


RTG + TT operation



The role of technology

Simulation 2010 Vs. Live operation 2015

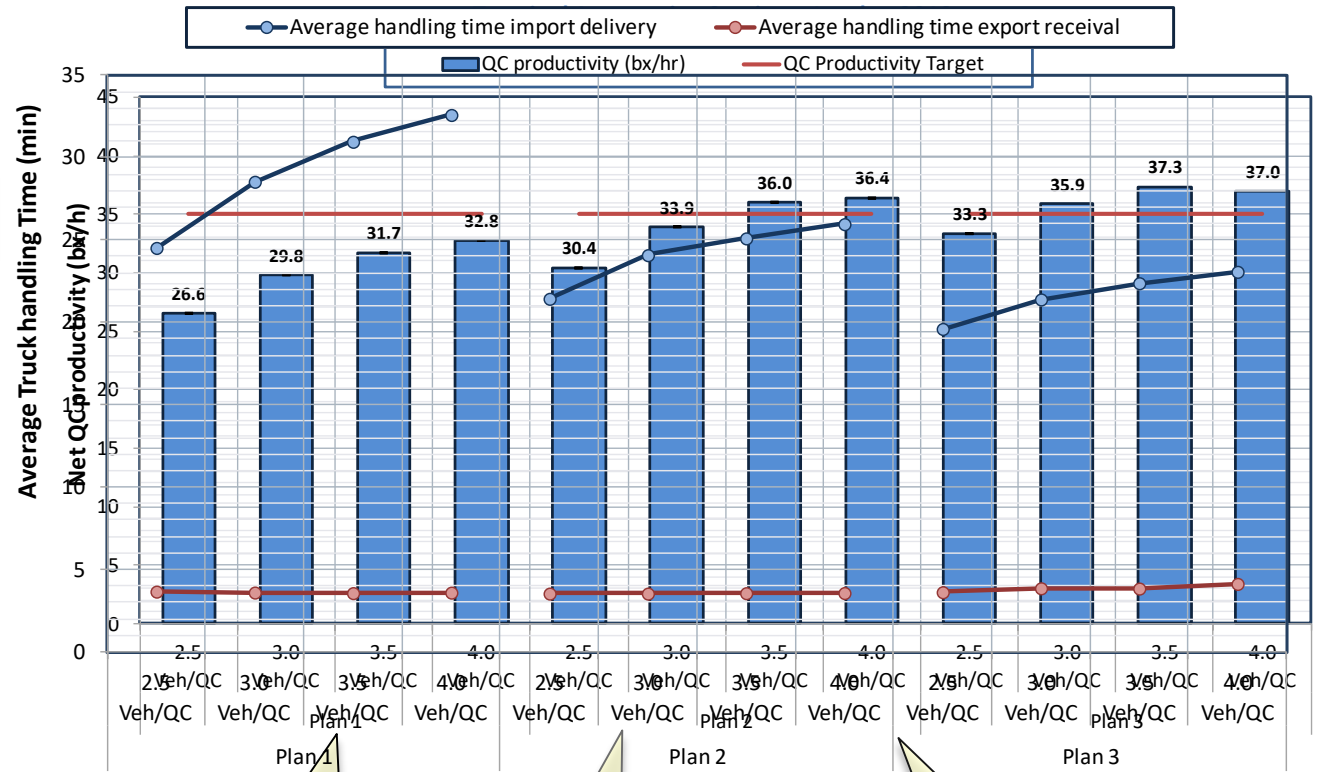


- ✓ | Videos are from Control tower. (quality of simulation video is much improved now as compared to 2010)
- ✓ | Simulation is with 6 QC, but live operation is 2 QC only

Truck handling time at Truck-IC
Terminal Automation Services Productivity 2013
Quay crane productivity

(Capacity simulation)

Terminal simulation
Selected alternatives



Plan 1 does not meet performance target due to insufficient stacking cranes

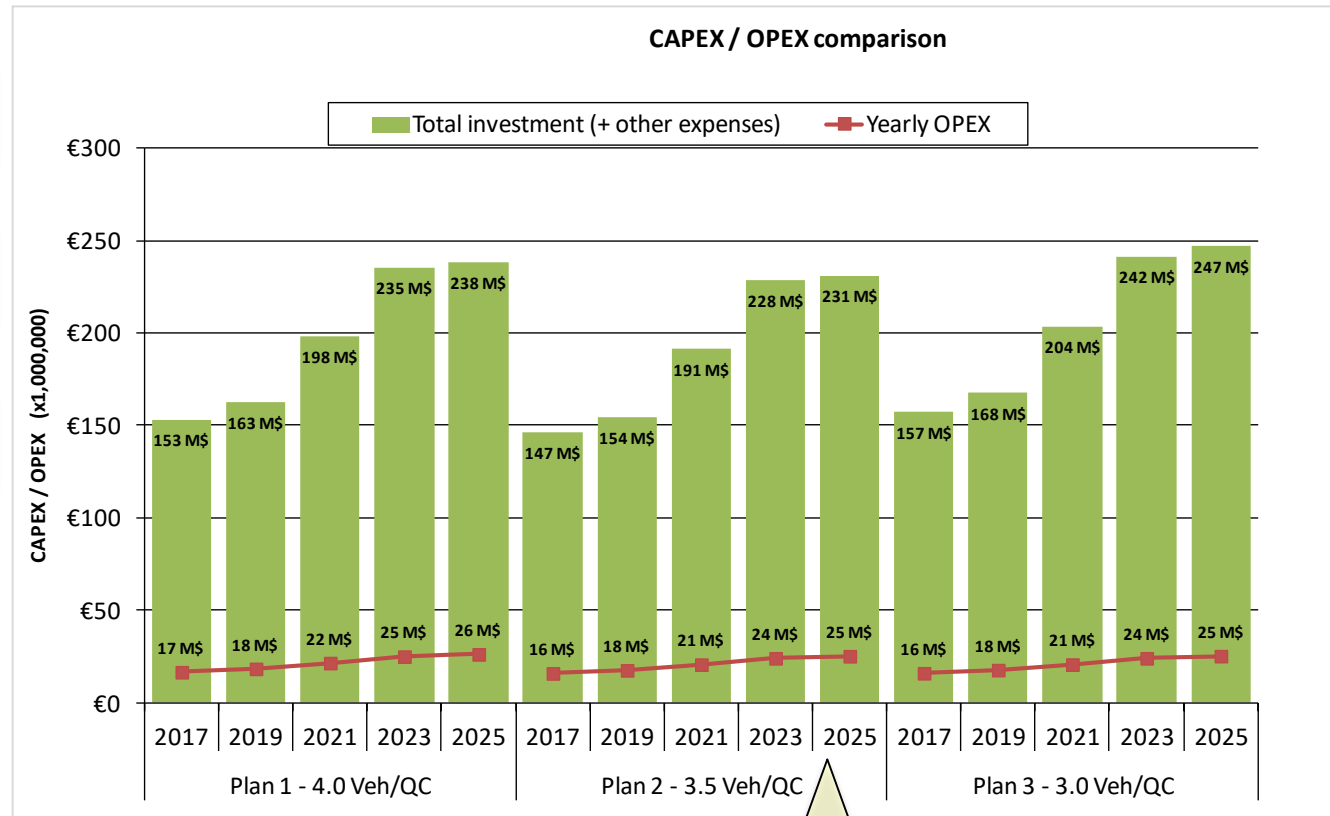
Plans 2 & 3 offer a better truck service when compared to plan 1

Plans 2 & 3 can meet the target using 3.5 & 3.0 ShC per QC

(Capacity simulation)

Terminal simulation
Selected alternatives

CAPEX/OPEX
Analysis



Plans 2 & 3 have similar operating costs, however plan 2 requires 16 M\$ less investment

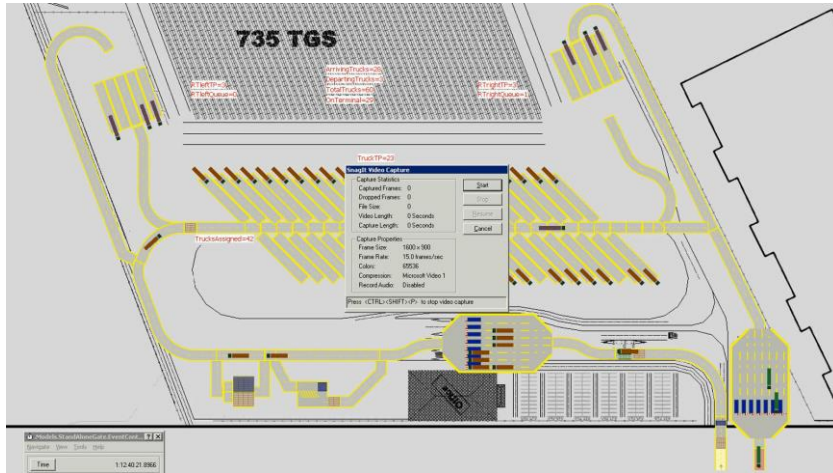
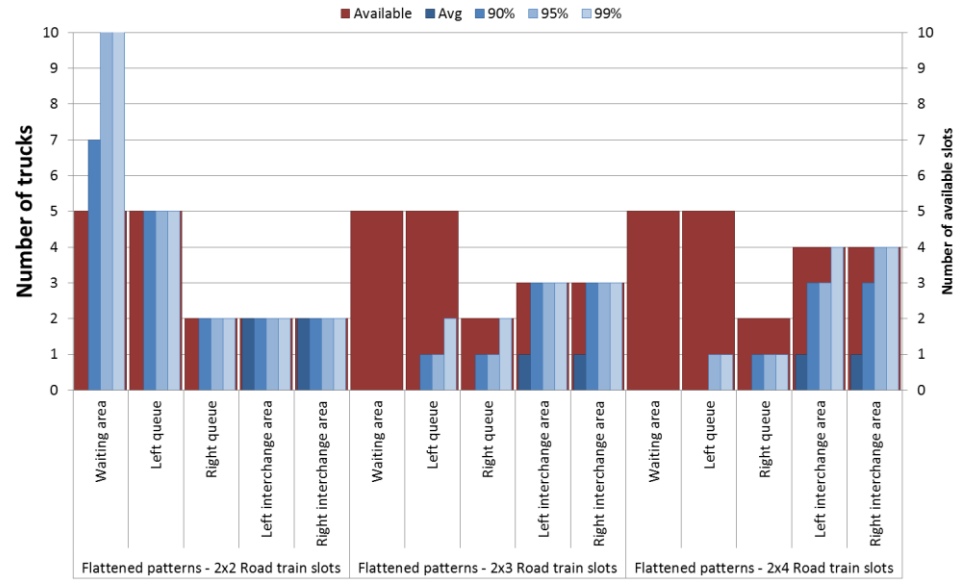
(Capacity simulation)

Terminal simulation
Selected alternatives

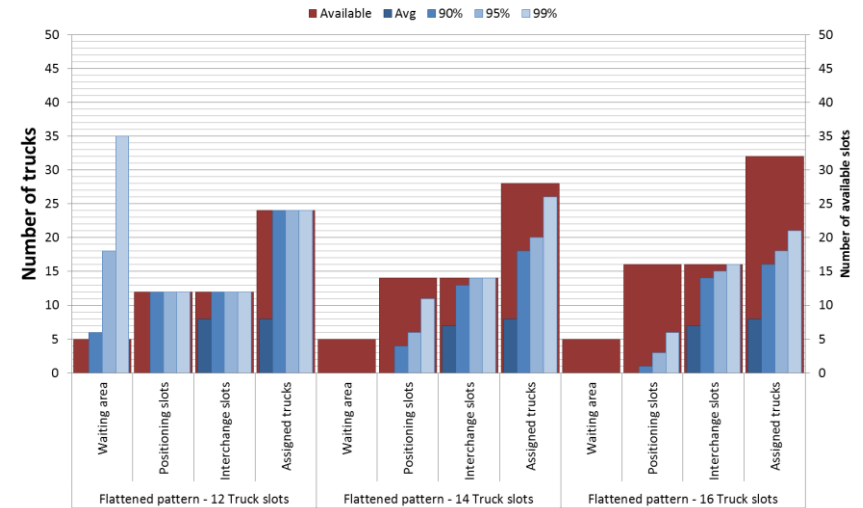
CAPEX/OPEX
Analysis

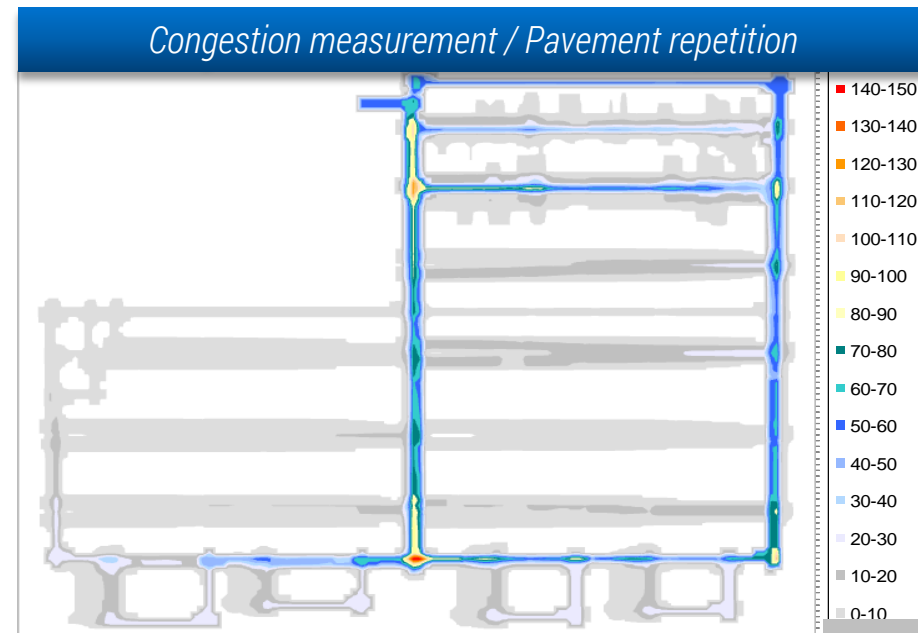
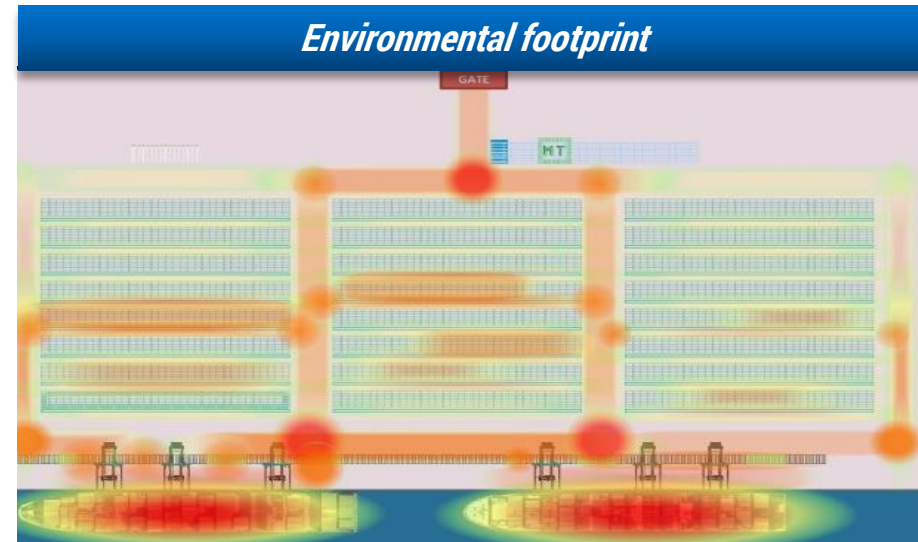
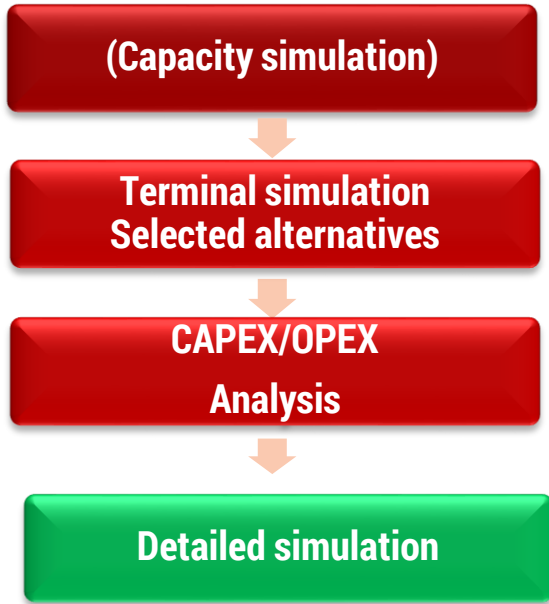
Detailed simulation

Road train slot occupancy vs. capacity - 0.8M TEU



Truck slot occupancy vs. capacity - 0.8M TEU

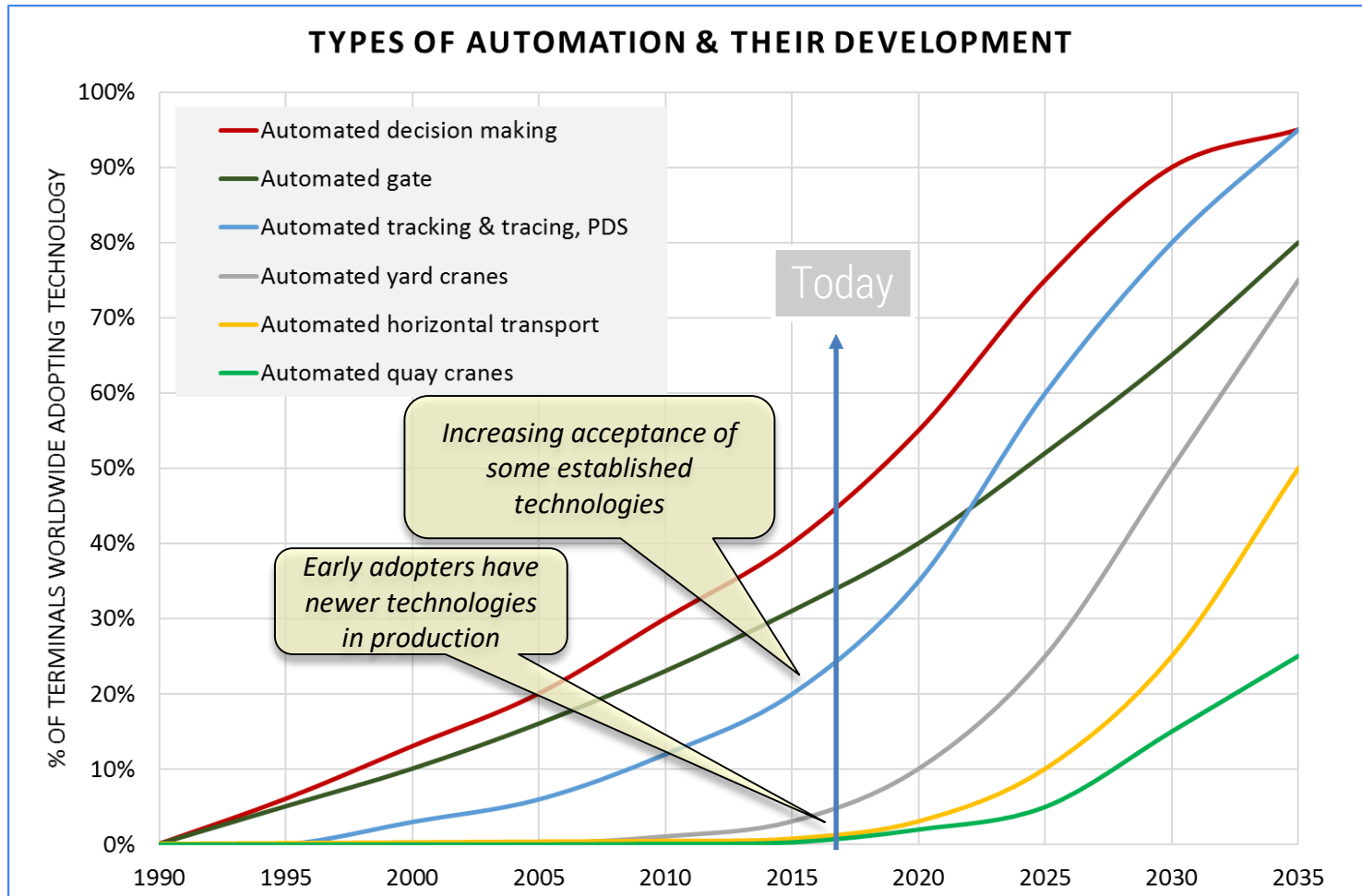






Automation & penetration

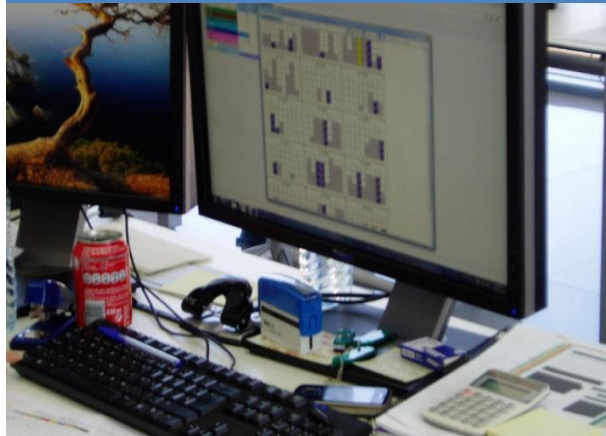
✓ | Global developments



- ✓ | Many automation technologies are now well proven. Some are now in production with early adopters
- ✓ | Terminal must still aim for the right balance technology & conditions, but automation is not only for a few
- ✓ | Yes, these are global developments, but they highlight the need for Myanmar terminals also to embrace change & move forward.

Process Automation: Gate operations

1. Truck appointment, including container number



2. LPR + OCR



3. OCR read + known appointments →
>99.9% quality



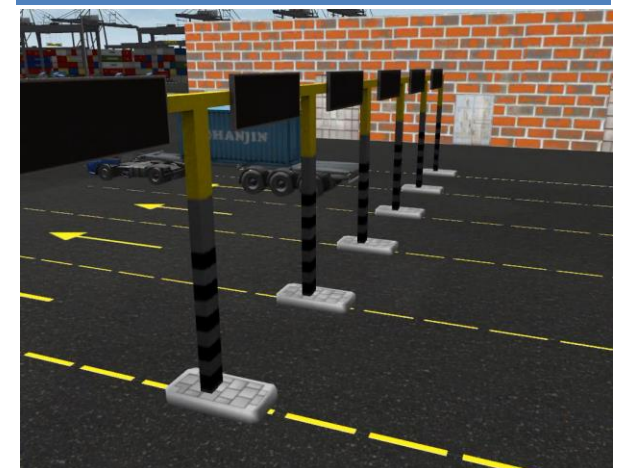
4. X-ray / radiation scan



5. Pedestal for driver ID + ticket



6. Routing advise





What tools/IT are most relevant/beneficial for small/mid sized terminals?

- ✓ | Some examples

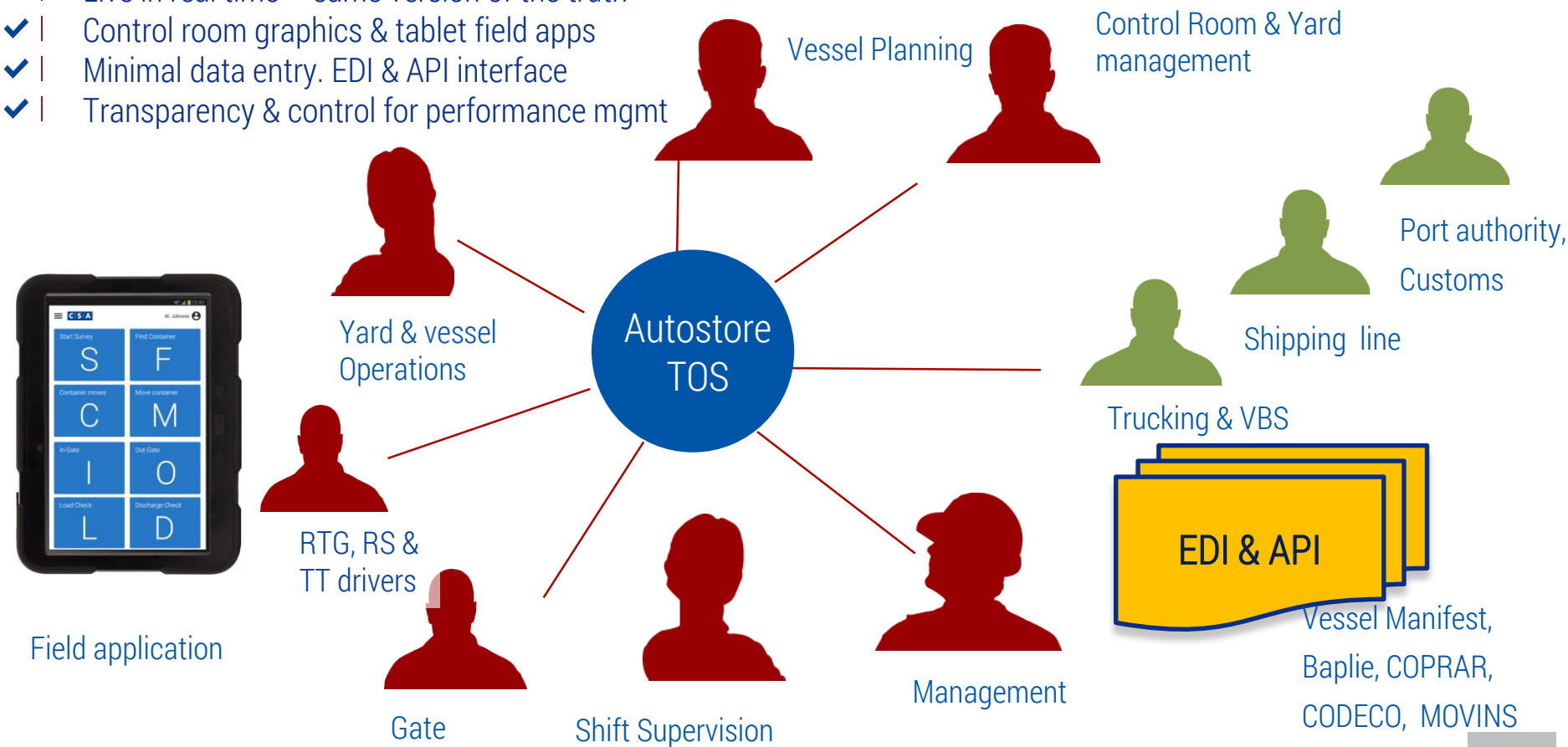
Overview – Simplify your work & provide visibility & Control

TOS – Links the three container logistics channels with the terminal

- ✓ | Physical movement
- ✓ | Information flow
- ✓ | Financial channel

Links - Internal & external users

- ✓ | Live in real time – same version of the truth
- ✓ | Control room graphics & tablet field apps
- ✓ | Minimal data entry. EDI & API interface
- ✓ | Transparency & control for performance mgmt

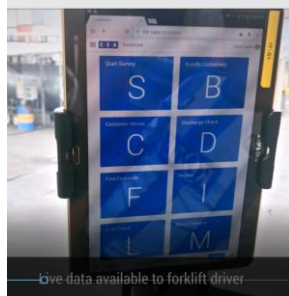
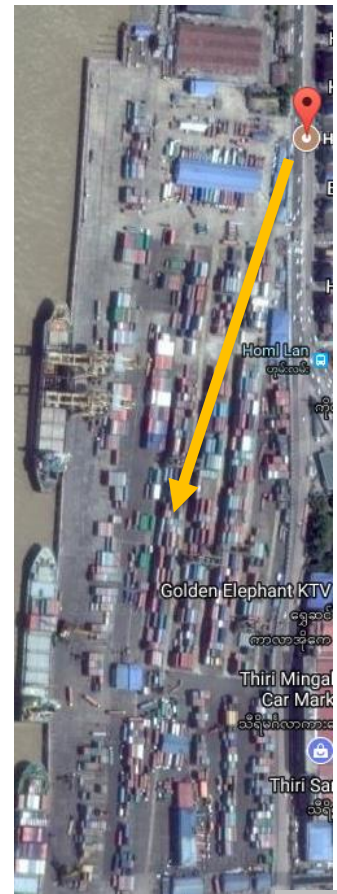
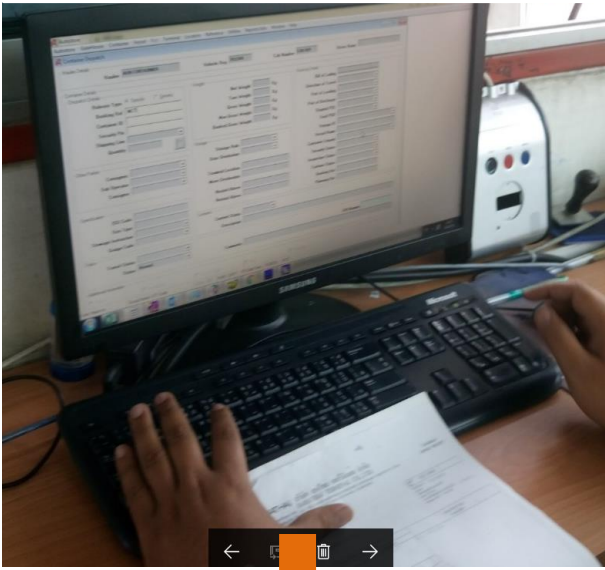


Simple Gate operation

Gate Operation. information flow to Mobile Handling Equipment



Pre arrival Booking information/checks/registration



Instructions to yard MHE update from them

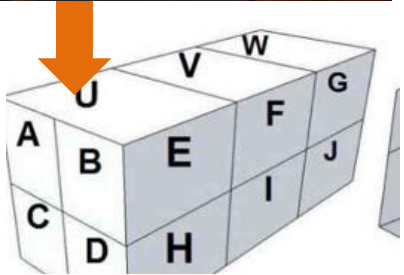
Auto allocation of optimal yard slot

Live instructions to RTG or RS driver



Survey

Manage truck in the terminal



Damage details & Attach photos

Container checks for MSKU9890960

#	Instruction	Type	Status
2	Check side panels	Optional	Not Checked
12	Check the Seal is intact	Mandatory	Not Checked

Refreshed: 2017-03-1

Autostore

Autostore Truck Container Vessel Rail Terminal Location Reference Utilities Reports/Jo

Vehicles on Terminal

Actual Arrival	Visit Type	Haulier
2016-10-14 16:00:37	Road Despatch	BANGPEYAI TRANS
2016-10-14 16:18:46	Road Despatch	BANGPEYAI TRANS
2016-10-14 16:38:44	Road Despatch	BANGPEYAI TRANS
2016-10-14 16:39:19	Road Receipt	JT GL OBAL
2016-10-14 16:40:03	Road Receipt	JT GL OBAL
2016-10-14 16:45:52	Road Receipt	T SAVE
2016-10-14 16:46:49	Road Receipt	NNN.
2016-10-14 16:47:47	Road Despatch	CPM.

Reports/Jo Window Help

- General Reports
- Road Reports**
 - Cargo Despatch Note
 - EIR Tally Sheet
 - Equipment Interchange Report
 - Gate House Log
 - Gate-Log Report
 - Haulier (Vehicle) Average Dwell Time
 - Haulier (Vehicle) Dwell Time
 - Haulier (Vehicle) Dwell Time from Booking
 - Haulier (Vehicle) Dwell Time Summary
 - Hazard Report
 - Lorries Per Day
 - Lorries Per Hour
 - Trip Ticket
- Vessel Reports
- Rail Reports
- System Reports
- File/Data Reports
- Jobs
- Scheduled Reports/Jo

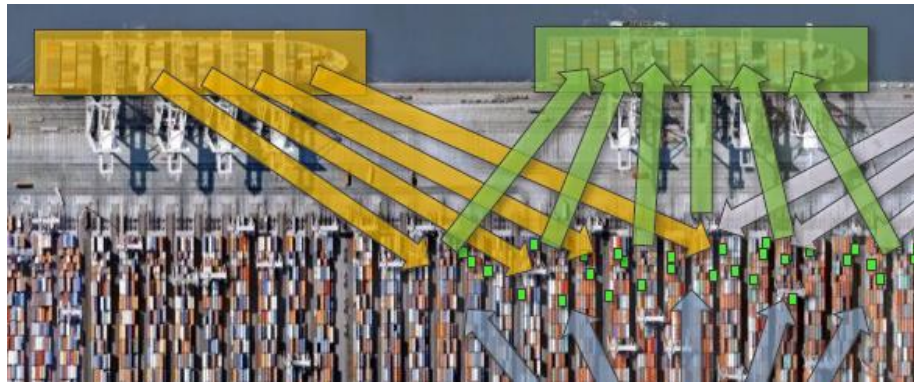
Automated container decking (position assignment) based on algorithms & parameters



- ✓ | Optimal grounding decision, balancing many a criteria
- ✓ | Improved and more consistent decision making

Autostore Vessel operation & EQU planning

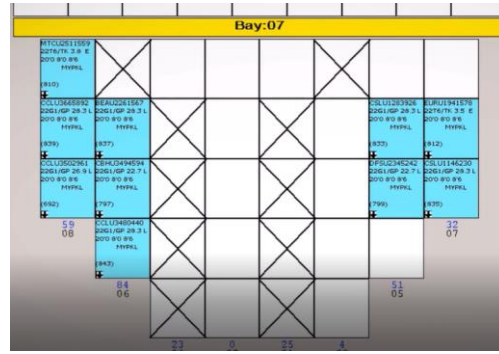
Automated grounding decision & workload management



MHE Moves
Outstanding Moves

Booking Ref	Container ID	Voyage ID	From Block	From Location
	RJAS7053015	4801 PORTB-TER	1: RJAS70530_1	3.1:RJAS70530
	RJAS7053020	4801 PORTB-TER	2: RJAS70530_2	3.2:RJAS70530
	FSCU8131665	CE1444	Vessel A	01-06-10-L
2017H	SMUU9006015	4A01 PORTA-TER	4: WAGON A_4	1.4:WAGON A
2017G	TRLU7116319	4A01 PORTA-TER	3: WAGON A_3	1.3:WAGON A
2017E	TRLU7291996	4A01 PORTA-TER	4: WAGON A_4	1.4:WAGON A
2017F	TRLU7240058	4A01 PORTA-TER	3: WAGON A_3	1.3:WAGON A
	TBAU1234560	20170510		IMV-B
	MEDU19150719			TR-04-C-1

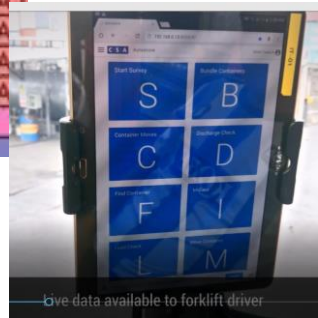
Yard controller can follow operations & exceptions



CISA Autostore

Container Moves

Container ID	From Location	To Location	G
FSCU000516	TERMINALTRUCK	SP-17-D<	e



Display for RS & RTG drivers & key personnel

- ✓ | Using a reporting engine BI allows user to make any report based on the TOS/Autostore database
- ✓ | Create and customize own reports
 - Using drag and drop
 - No programming skills required, No database skills required
 - Do it once and schedule reports for email
- ✓ | Create & monitor dashboard & KPI



CISA Booking Planning Execution **Reporting** Commercial Admin

Reports Report Builder

Filter report

Reports

Stock Reports Container Balances Container Bookings Overview Container Dwell Time Container Enquiry Container History Container History Summary Container Inspection Container Inventory Container Inventory - Statement Container Inventory By Shipping Line Container Inventory Content Container Inventory Detention Container Inventory VGM Container Inventory with Booking Ref Container Stock Container Storage Time Container Weight Operation Receipt Frustrated Export/Import Containers Hazardous Container Inventory Hazardous Container Summary	Truck Reports Cargo Despatch Note Equipment Interchange Tally Sheet Gate Log - Additional Info Gate-Log Trip Ticket Truck Average Dwell Time Truck Dwell Time Truck Dwell Time from Booking Truck Dwell Time Summary Trucks Per Day Trucks Per Hour Weight Receipt	Vessel Reports Vessel Discharge List Vessel Discharge Manifest Vessel Discharge Tally Sheet Vessel General Statement Vessel Load List Vessel Load Manifest Vessel Load Tally Sheet Vessel Performance (External) Vessel Performance (Internal) Vessel Statement of Fact Vessel Terminal Departure Vessel Throughput Vessel Throughput - DG/OOG
KPI Reports CHE Moves CHE Performance	System Reports Alarms User Actions	

CISA Booking Planning Execution **Reporting** Commercial Admin

Reports Report Builder

TIBC Jaspersoft®

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What's new in Jaspersoft Version 6?

Dashboards:
A single web environment for creating visualizations, with a mash-up of Reports, Ad Hoc Views, and web pages

All New JasperMobile Support:
View interactive reports and Dashboards from your smartphone or tablet with the JasperMobile app.

Activity Charging
Activity Charging Full



Conclusion- Need for change

Use IT Tools reduce cost & increase efficiency and are now essential to remain competitive

Liner shipping backdrop

- ✓ | Consolidation & larger alliances will put more pressure on terminals
- ✓ | Lines have suffered, but are now regrouping
- ✓ | What next when/if fuel prices rise again

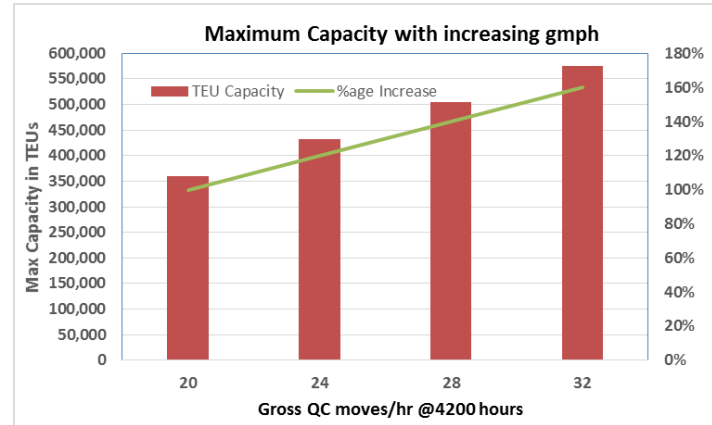
For Terminals

- ✓ | Largest vessels calling at medium sized ports are increasing. Where draft is not a restriction increase in call size is often 70-100% in call size.
- ❑ Question - Small & mid sized ports - What's your size ?
- ✓ | Call size increase means higher peak, much service & productivity requirement because vessel window is still the same
- ❑ Question – What will be the impact on service providers (in a contestable market where spare capacity is available)?
- ✓ | Community & environmental standards are adding costs & expectations

Ports have given rise to thriving cities & trades, but now ports are under pressure from urban encroachment & market condition, yet volumes continues to grow

Use if IT Tools Benefits

- ✓ | Expansion plan & capex decisions & alternatives can be objectively examined, cost benefit tested & quantified
- ✓ | Increased operating capacity, efficiency (quicker turn around) & higher productivity (lower OPEX) with existing infrastructure or high capex new hardware & EQU
- ✓ | Improved service to customer – TT time & improved information flow
- ✓ | Savings in fuel & admin
- ✓ | Saving in lost revenue due to error & omissions in invoicing. (~ 3% loss is not unusual)
- ✓ | Improve service level increases stickiness with the customer. EDI & using available low hanging digitization opportunities are readily available
- ✓ | Improved staff moral with learning opportunities, growth & pride in seeing the improvements
- ✓ | For example: increasing productivity from 20 to 24/28gmpH adds 20%/40% TEUs capacity. Many small & mid sized terminals are achieving this. Why not Myanmar?
 - Save high value - capex QC, RTG, infrastructure



Conclusion- Need for change

- ✓ | From global reference point - IT tools have come of age & their penetration is growing rapidly
- ✓ | ROI makes a compelling case for planned adoption even for smaller & mid sized terminals
- ✓ | Use of IT and optimization tools holds the silver lining to get more from less
 - Design new terminals & future developments plan using the best tools at hand.
 - Deploy available technologies in a planned manner & the right balance technology & cost
 - Drive performance & optimize operations using best tools and assistance
 - Train staff in operations and for safety
- ✓ | Staff determine the success of IT tools, but let us not underestimate their ability & adaptability
- ✓ | “ If we are standing still we are going backwards” , but when it comes to technology, this rule is applied exponentially... in we are standing still, you are would be going backwards very fast
- ✓ | It takes great effort & planning to maintain forward movement, but rewards are worth it
in contestable market if & when spare capacity is available there will be winner & losers.

Thank you for your attention

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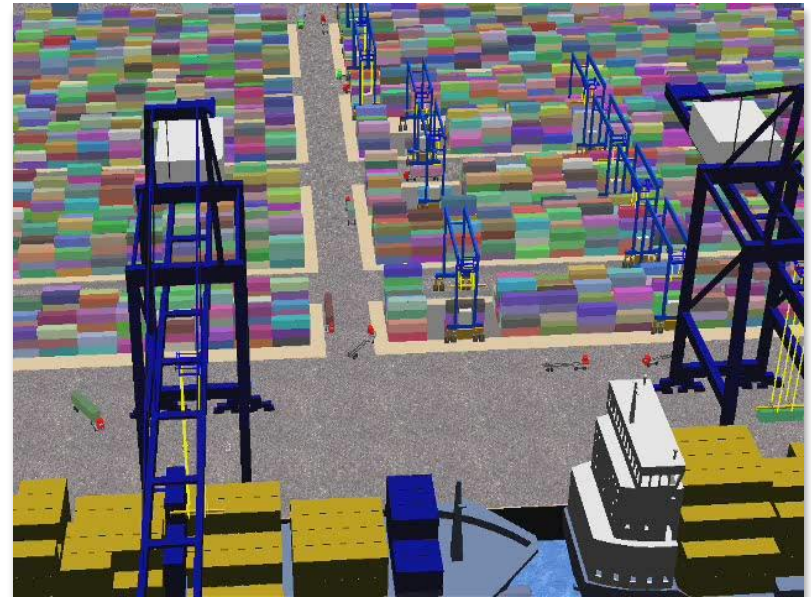
info@tba.nl

- ✓ | Optimization of existing facilities (layout, TOS, operations):
 - DPWorld Port Botany, West Swanson (2006 - 2008)
 - HHLA – Container terminal Altenwerder (2007 – 2008)
 - Durban Container Terminal (2007)
 - DPWorld Caucedo, Chennai, Manilla , Sokhna (2007 - 2010)
 - APMT Rotterdam (2007 – 2010)
 - TSI Vancouver (2008 - 2009)
 - Ocupa Manzanillo (2008)
 - Port of Napier (2009-2010)
 - PNCT New York (2010)

- ✓ | Performance assessment of equipment specifications
 - NTB (2004, 2006)
 - Euromax (2005)
 - APMT-PTP (2006)

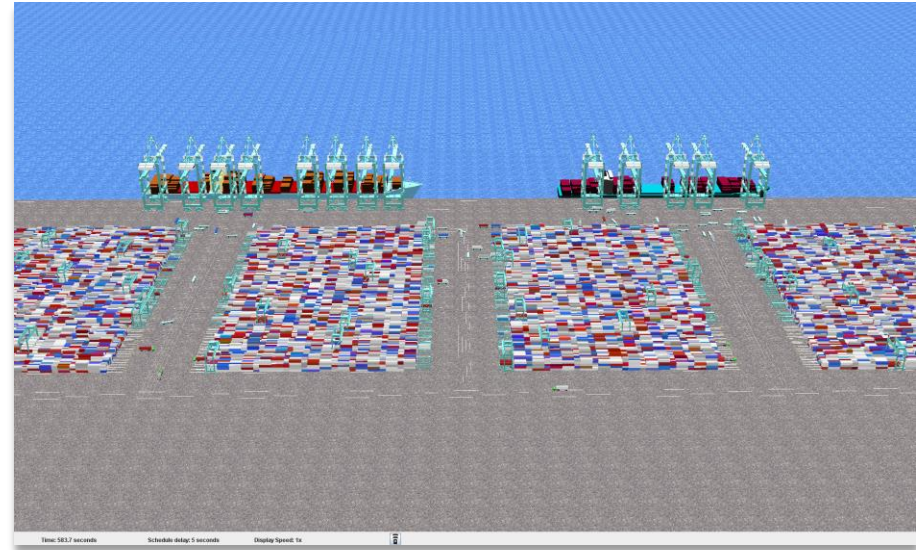
- ✓ | Optimization Terminal Operating Systems (CONTROLS):
 - DPWorld Pusan Newport (2006, 2010)
 - APMT Portsmouth, Rotterdam, Algeciras (2006 - 2008)
 - Eurogate Hamburg (2007)
 - MSC Home Terminal (2007 – 2009)
 - DPWorld Antwerp Gateway (2008 - 2009)
 - Gothenborg Havn (2009)
 - DP World Callao (2010)
 - Nampton (2010)
 - Busan New Port (2010)

- ✓ | Delivery Automated Equipment Control Systems (TEAMS)
 - CTA (Hamburg, 2002)
 - Euromax (Rotterdam, 2008)
 - Antwerp Gateway (2007)



✓ | Design of new facilities:

- APMT North America – Norfolk (2003 – 2007)
- DPWorld – Antwerp Gateway (2004 – 2007)
- HPH / Euromax Rotterdam (2004 - 2008))
- DPWorld - London Gateway (2005 – 2008)
- HPH / ECT – barge / feeder terminal Rotterdam (2006)
- DP World - Jebel Ali CT2 (2006)
- DPWorld – Fishermans Island Terminal (2007 - 2008)
- Transnet – Nquga & Durban Container Terminal (2007)
- HPH Tercat - Barcelona Muelle Prat (2007)
- APMT – Maasvlakte II terminal (2008 - 2009)
- DP World - Jebel Ali CT3 & CT4 (2008)
- DPWorld – Rotterdam World Gateway (2009)
- Lekki Port (Nigeria, 2010)
- Khalifa Port (2010)



✓ | Extension of existing facilities:

- APMT Algeciras (2003 – 2008)
- DPWorld – Southampton container terminal (2008)
- Port of Gothenburg (2004, 2007 - 2008)
- APMT – Tanjung Pelepas (2005 – 2008)
- HHLA – Burchardkai Hamburg (2006)
- HPH - Thamesport extension (2006)
- PSA Voltri Terminal Europe (2006)
- Packer Avenue Terminal Philadelphia (2006 – 2007)
- HHLA – Tollerort container terminal Hamburg (2007)
- ICTF – UPRR Long Beach (2007)
- Northport, Malaysia (2007 - 2008)
- Global New York (2009)
- Port Otago (2009)
- Namport (2010)



- ✓ | Burchardkai Hamburg (600,000 TEU)
- ✓ | Tollerort Hamburg (600,000 TEU)
- ✓ | Acacia Ridge Brisbane (500,000 TEU)
- ✓ | Antwerp Gateway (450,000 TEU)
- ✓ | UP Long Beach (1,500,000 containers)
- ✓ | Port Botany Rail yard (490,000 TEU)
- ✓ | Euromax Rail Terminal (450,000 TEU)
- ✓ | Hupac Intermodal Galarate (1,000,000 TEU)
- ✓ | Ludwigshafen Intermodal (150,000 TEU)
- ✓ | WCT Meerhout (250,000 TEU)
- ✓ | CXSI Ohio (500,000 TEU)
- ✓ | Kutno intermodal (250,000 TEU)
- ✓ | Frenkendorf, Switzerland (250,000 TEU)
- ✓ | Chullora, Sydney 450,000 TEU
- ✓ | Dynon, Melbourne (600,000 TEUs)
- ✓ | Moorebank, Sydney (1,500,000 TEUs)
- ✓ | MCS, Sydney (450,000 TEUs)
- ✓ | NSW Ports Port Botany 3,00,000 TEU

