Terminal Overload: How Can Technology Help?

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Long Beach, CA
Terminal Overload: How Can Technology Help?

**Moderator:**
- Taso Zografos, President, ZDEVC0

**Panelists:**
- John Allen, Vice President, Business Process Engineering, ITS ConGlobal
- Jarno Kuipers, Senior Manager, Terminal Development, Kalmar
- Krystle McBride, Port Planner, AECOM
- Brant Ring, Vice President, Business Unit Operations, BNSF Railway
Imagine...

autonomous ships move over 100K TEUs
Imagine...

at-sea, fixed container transfer yards
Imagine ... at-sea, movable transfer yards
Imagine . . .

landside robots managing container stacks
Imagine . . .

dedicated cargo transporters
Imagine...

freight trains moving at hyper speeds
Imagine . . .

sensor equipped smart containers
Current research . . .

Texas A&M
Imagine ... lighter - smarter containers
Imagine . . .

smarter more efficient drayage
Imagine . . .

Drayage takes to the air
Imagine...

machines load-unload containers
Imagine... you can transload anywhere.
DOING MORE WITH LESS

Volume

Capacity

Throughput

Productivity
John Allan
Business Process Engineering
ITS ConGlobal
INTERMODAL TERMINAL OVERLOAD: HOW CAN TECHNOLOGY HELP?

**Headline:** How to effectively and proactively share data to help each stakeholder in the supply chain improve terminal service in a connected environment.

- **Operations Optimization**
  - *Does it exist?*
  - *No one entity has complete control.*
  - *How to incent participants to get into the game?*

- **Proactive visibility to what is coming at me.**
  - *Enhancing a participants” experience comes with a price*
  - *Can it lead to differentiated services?*
INTERMODAL TERMINAL OVERLOAD: HOW CAN TECHNOLOGY HELP?

Headline: *How to effectively and proactively share data to help each stakeholder improve terminal service in a connected environment.*

- Telematics at a terminal level
  - *Wide range of benefits and touch points*
- Business Intelligence
  - *Broad information sharing is required to make it as effective as possible.*
- The Last Thought – “Information Super Highway”
  - *Are you a free flowing tributary or a big glob of cholesterol blocking the artery?*
Kalmar Terminal Design Services

**Investigate**
Map the options for Terminal Design alternatives to meet the objectives
- Identify different layout options at a high level

**Qualify**
Research the alternative solutions and numerically assess the feasibility of the options
- Full range of layout options
- Full business case calculations including CAPEX, OPEX and ROI analysis on preferred options
- High level delivery and project plan
- Terminal capacity calculations and fleet size estimations

**Demonstrate**
Demonstrate and validate that the selected option can meet the objectives
- Terminal simulations to demonstrate the design
- 3D modelling of preferred terminal design
Challenge: Same footprint, more throughput

Solution 1: Reduce dwell time
Difficult
• Already short at most rail terminals
• Depending on customers

Solution 2: Increase yard density
Difficult, but doable
• New equipment/operational mode
• Housekeeping/shuffle moves
Increase yard density (solution 2)

**From:** Wheeled  
Flexible setup

**To:** Stacking
Mitigate housekeeping/shuffle moves

A more planned operation
- Active management
- Accurate information

More moves capacity
- Additional equipment
There is no single optimal terminal design. There are only many specific designs that match specific footprints, container flows and service levels.
Some design suggestions

Decouple trucks & trains
• Stacking makes it possible to minimize the impact of the truck surge on the train operation.
• Use buffers available to prepare your operation.

Keep some flexibility
• Test different scenarios, for example by calculations and simulations.
• Enable flexibility for exceptions as productivity is reached by solving exceptions quickly. E.g. live loading

Don’t forget your systems & customers
• Stacking means planning and your systems should support that.
• You will have a need for more and more accurate information from your customers.
• Your customers will be impacted by the mode change, don’t forget to manage their expectations (& trailers).
There is no technology that can compensate for a bad design, but luckily technology can help you in creating the right design.
Thank you

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Kalmar Terminal Design Services

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Krystle McBride
Transportation Planner
AECOM
Data is the Foundation of Advancement

• Robust, connected data systems are vital – data must not only be collected but also continually communicated
  • E.g. unit availability, chassis status, exceptions
• Appointment systems can reduce peak congestion
  • Especially dynamic systems, which can be updated based on real-time status communications
• Mobile apps can facilitate both of the above and speed gate processing, among many potential benefits
Technologies Can Build on Each Other

• Example: TOS features & complexity
• Improving data systems and implementing appointments gives the TOS vital information to plan for the future
• Advanced rehandling (right) – for grounded units, TOS can identify buried units that will be delivered shortly and dig them out before the truck arrives
• Further improved with automation - almost no added cost for rehandles, which can be performed automatically during idle time
• Only works if the TOS knows when a unit will be delivered!
Terminals of the Future

• No manual data entry anywhere on terminal or at gates
• Automatic, real-time communication of status to all customers via apps
• Fully integrated systems that can automatically share information to all relevant parties (through blockchain?)
• Little or no gate transaction time
• Appointments for at least all unit pickups
• Fully electric cargo handling equipment (particularly starting in CA)
• Increased automation – maybe even automated tractors
Brant Ring
Vice President, Business Unit Operations
BNSF Railway
RailPASS

Expediting the Entry Process
Emerging Technology
Ground Personnel
Drive the Facility
AUTOMATED YARD CHECK VIDEO

NOT FOR DISTRIBUTION OF REPRODUCTION
Cranes

Horizontal Movements

Checkpoint

Inventory Management
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