

Twin-40 Container Operations ... The Landside Part of the Equation

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- Quay planning issues with Twin-40 cranes
 - Quay crane configuration, wheel loads & rail gage
 - Transporter type, aisles, and alignment
 - IBC operations
- Container yard planning issues
 - Alternative transporter configurations
 - Twin-40 yard cranes?
 - Aisle configurations

Bigger Ships, More Capacity

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- Single hoist - one container per cycle
- Twin-20 spreaders - 2 TEU per cycle
- Dual hoist cranes to break the cycle into semi-independent segments and increase productivity with two separate sets of controls and operators – dual cycles w/ 2 TEU/cycle
- Twin-40 cranes - 4 TEU per cycle with single set of controls and operator

Conventional Twin-20 Spreader

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Twin-40 / Quad-20 Spreaders

- Multi-box handling – increased productivity!



2 – 40' containers



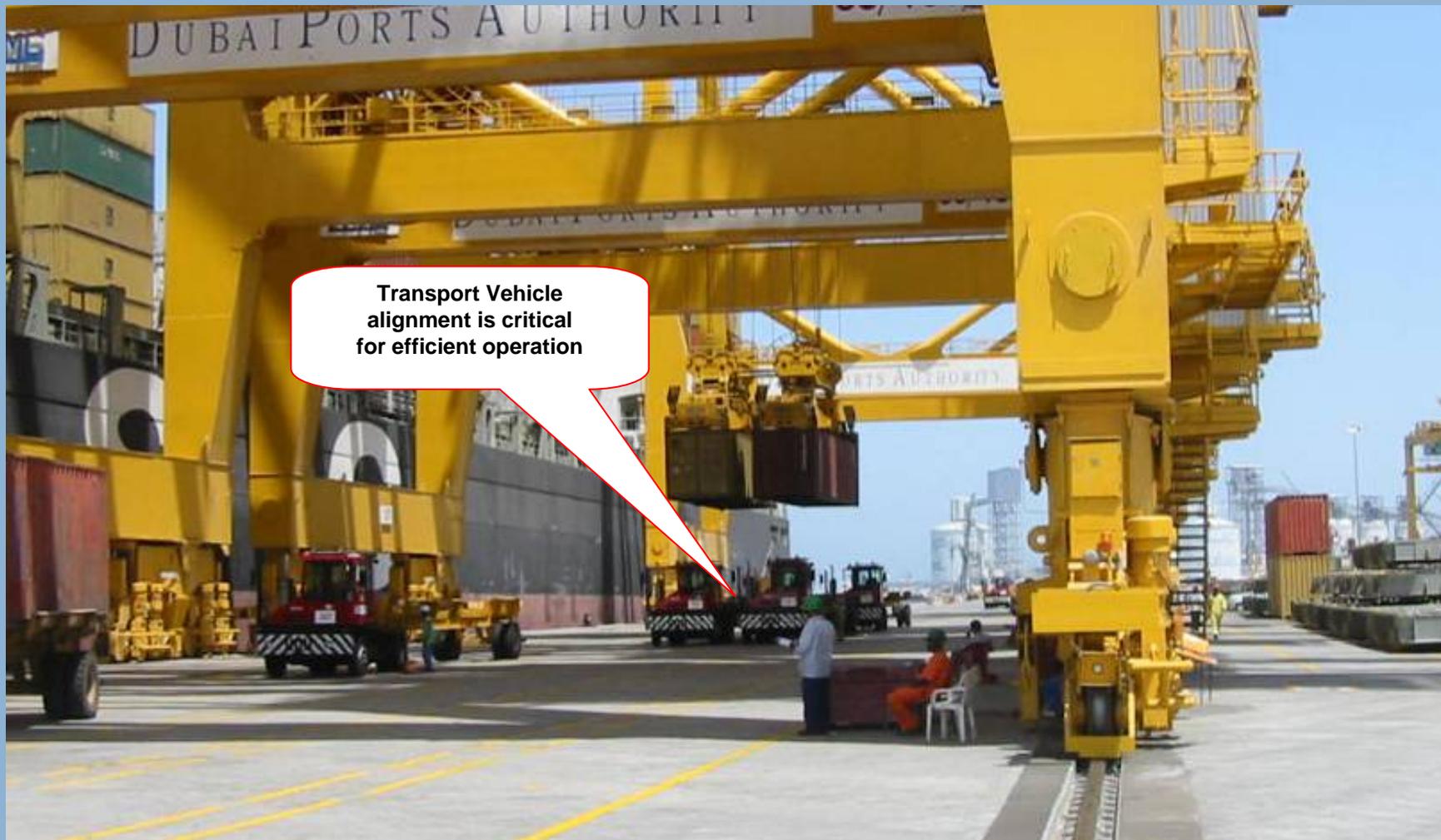
4 – 20' containers

- Heavier crane and transport wheel loads
- Greatly increased requirement for yard transport vehicles to maintain uninterrupted productivity
 - Sequencing of transporters
 - Alignment of multiple transporters under crane
- IBC handling, especially for quad 20' operation
- Impact on yard handling equipment

Twin-40 Cranes - Dubai

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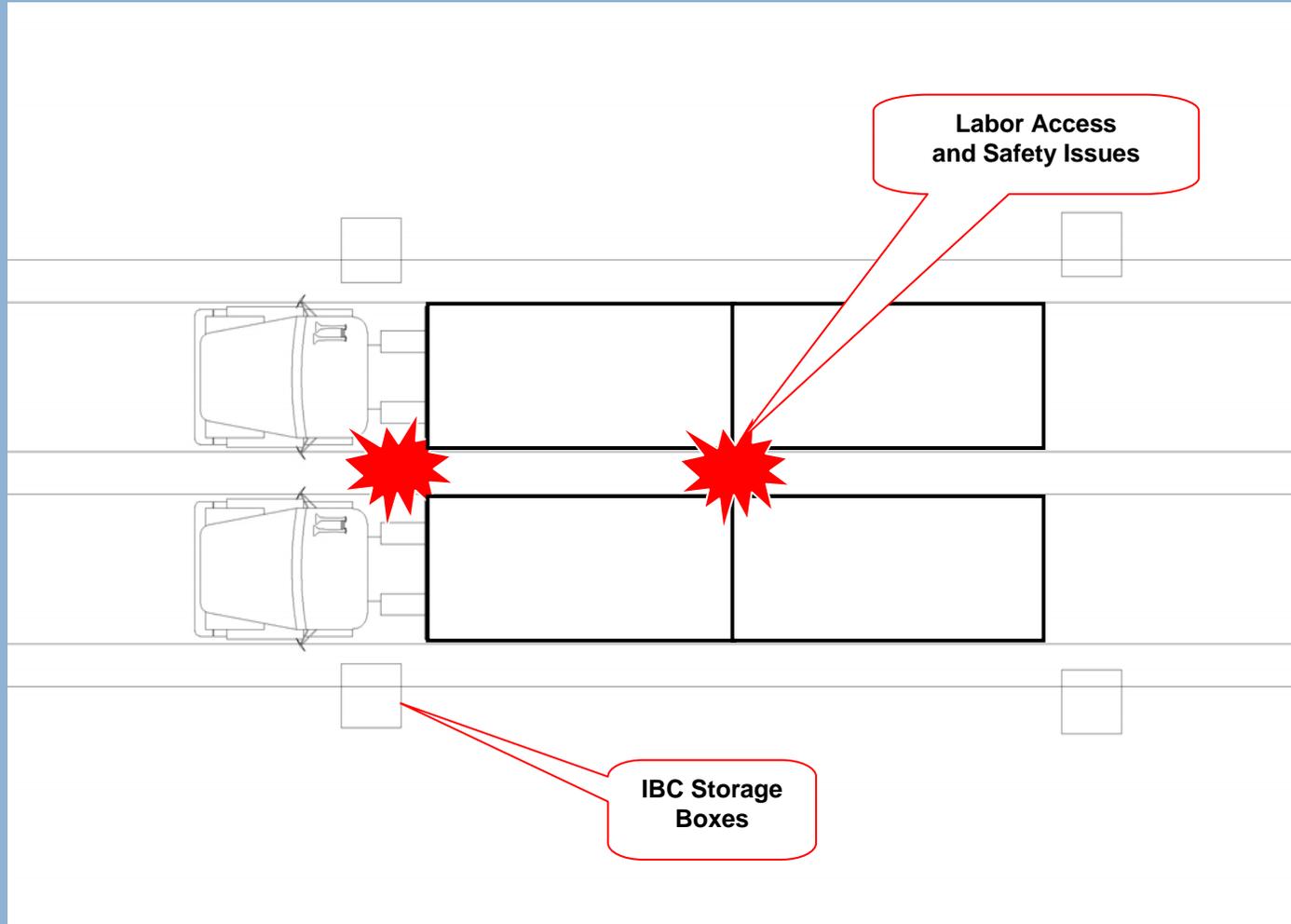


Alignment under the quay crane

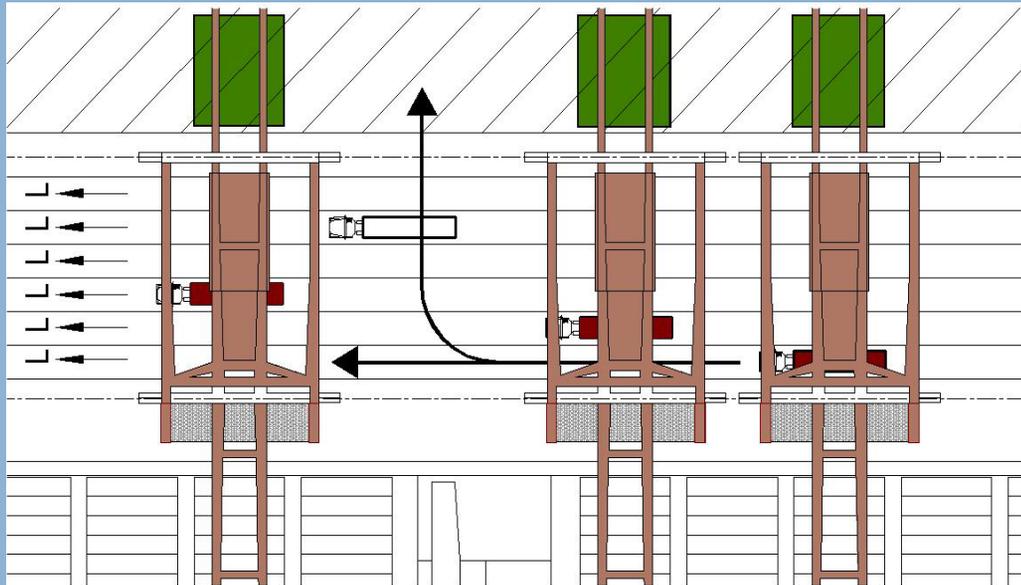
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- IBC Operations
 - IBC operations in lanes beneath crane
 - IBC operations on elevated platform
 - IBC operations upstream/downstream of cranes
- Hatch cover operations
 - In the back reach
 - Between the legs
- Transport vehicles have different operational implications
 - Yard chassis operations
 - Shuttle carrier operations
 - AGV operations



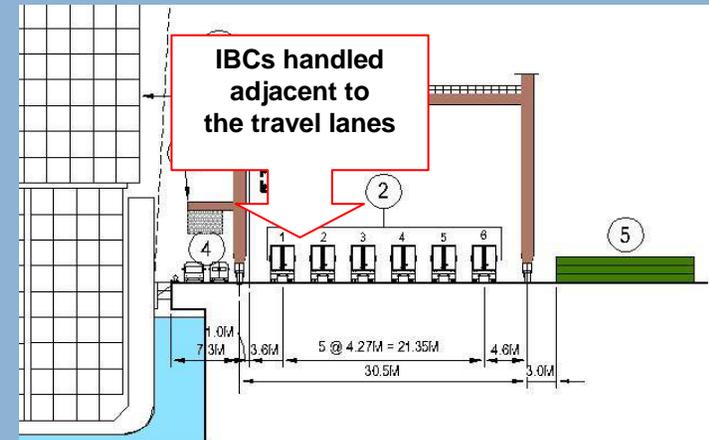
1: Single / Chassis / In Lanes



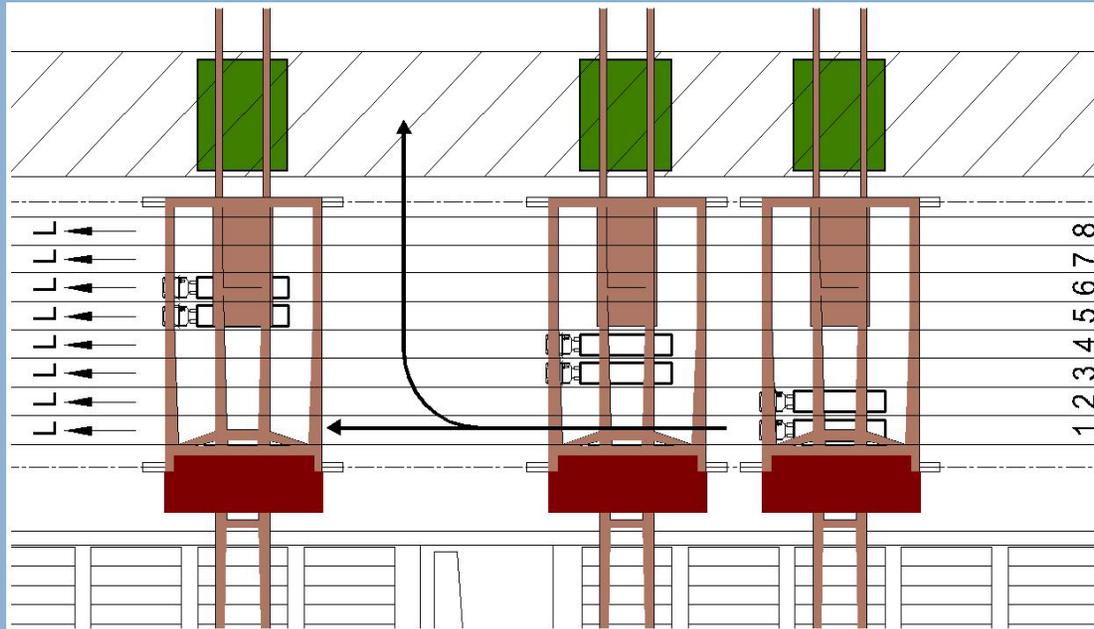
OPTION 1: SINGLE LIFT - TRUCKS - CONING IN LANES

1:400

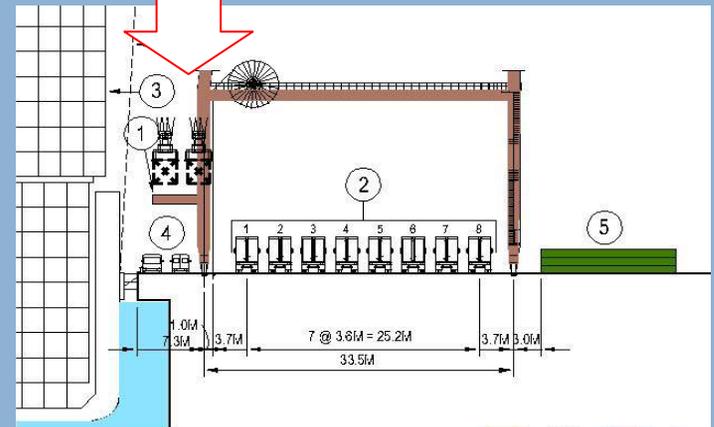
- 30.5M GAGE CRANE
- 6 WORKING LANES
- 1ST AND 7TH CRANES SHARE



3: Twin / Chassis / IBC Platform



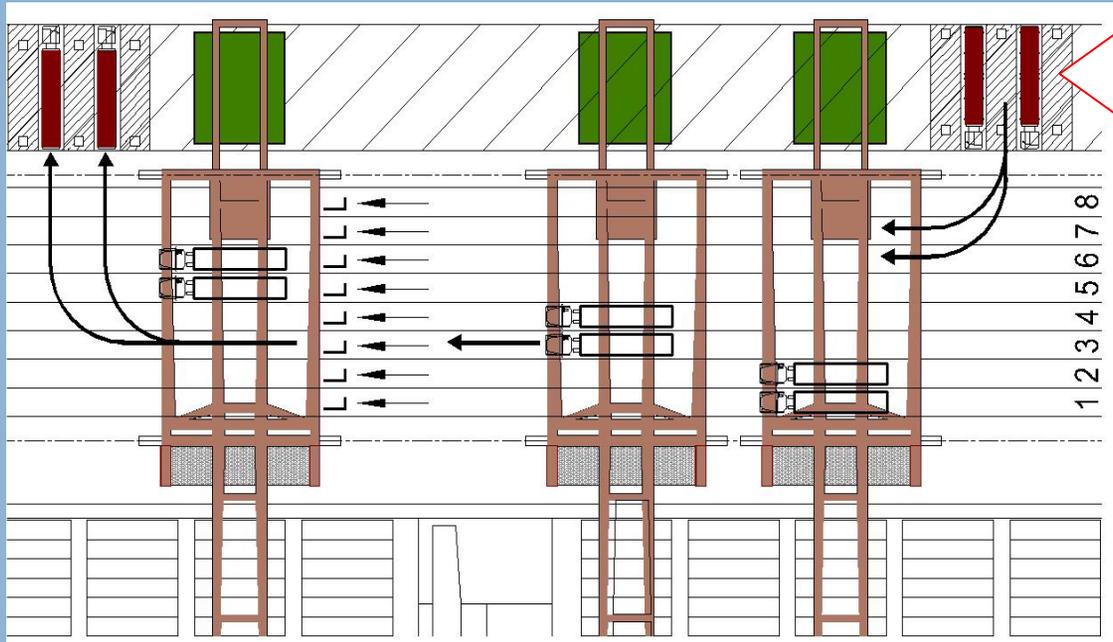
IBCs handled on a crane mounted platform



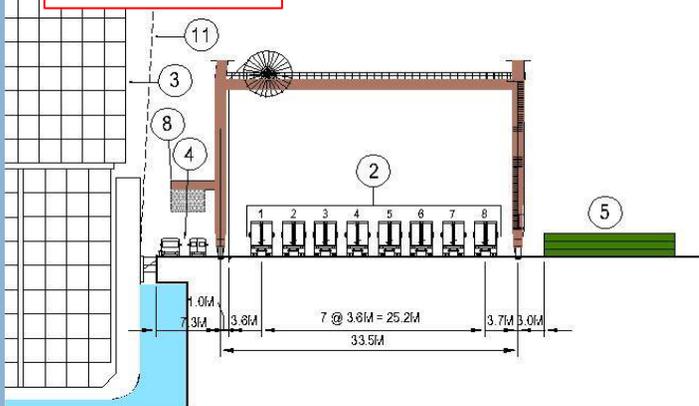
OPTION 3: TANDEM LIFT - TRUCKS - CONING ON PLATFORM

- 33.5M GAGE CRANE
- 8 WORKING LANES
- 1ST AND 5TH CRANES SHARE

4: Twin / Chassis / IBC Downstream

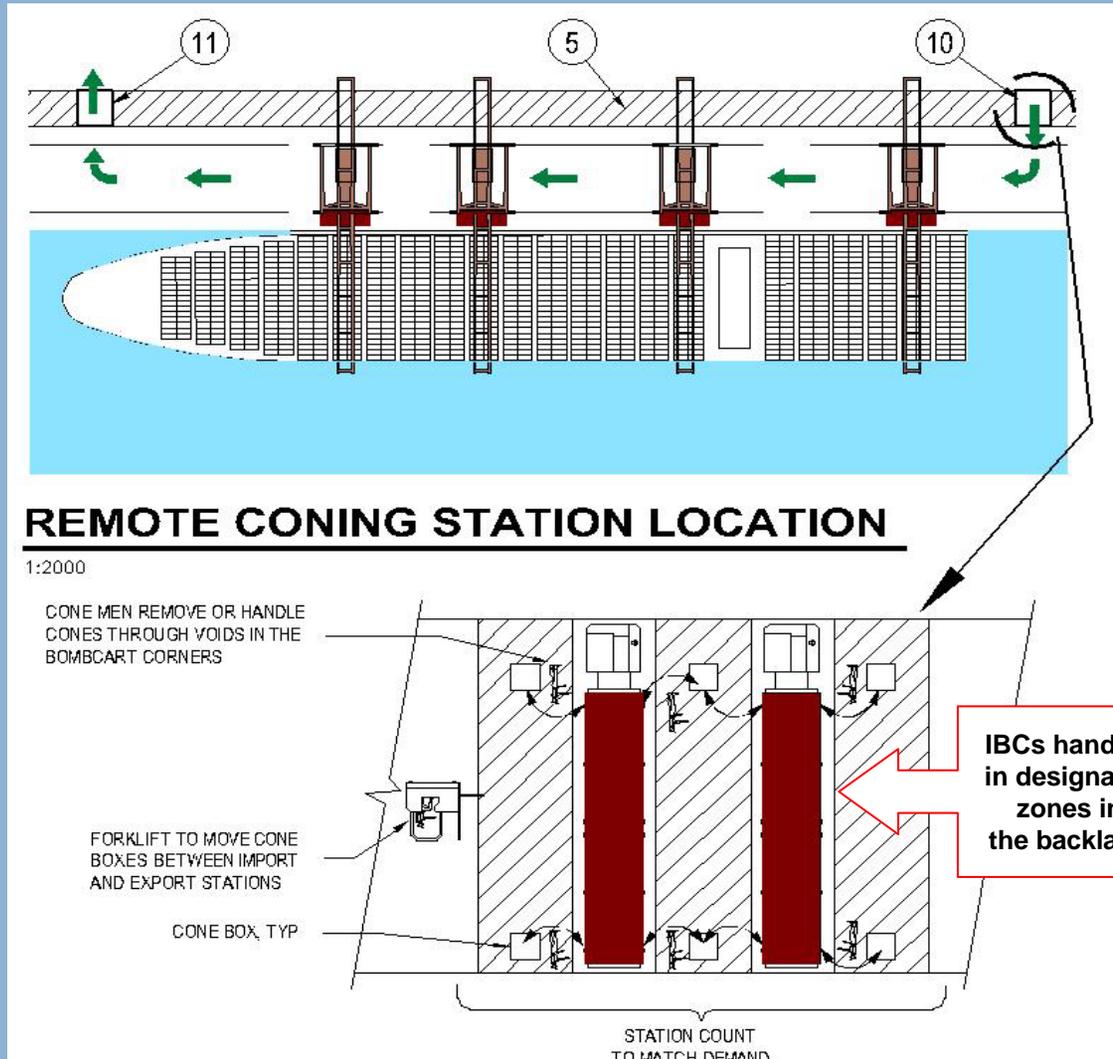


IBCs handled in designated zones in the backland

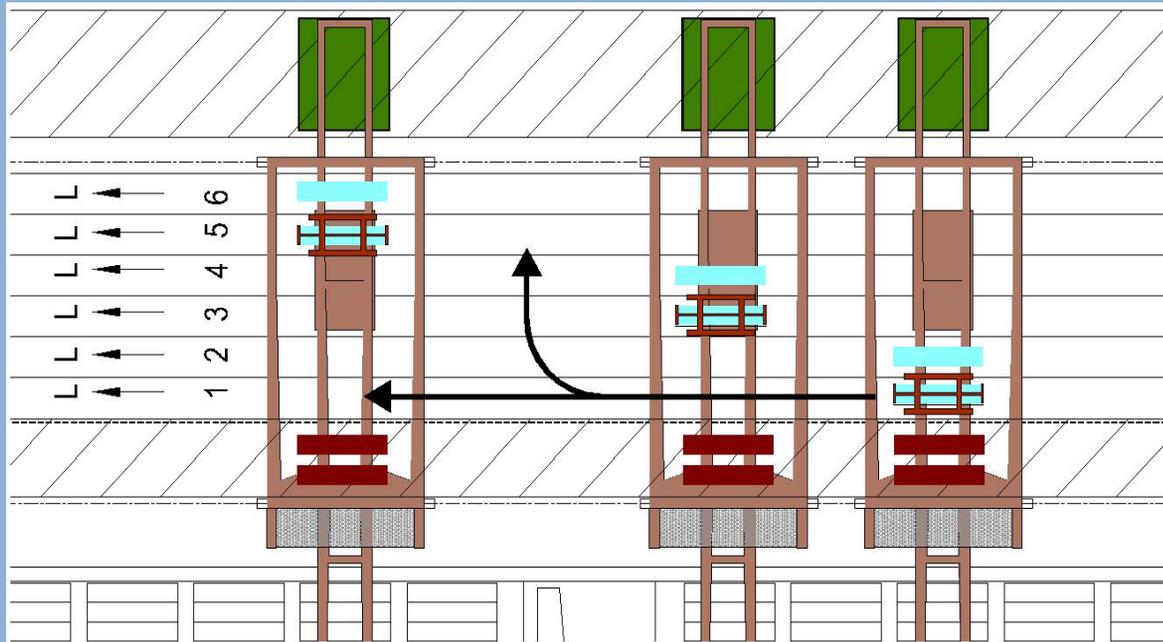


OPTION 4: TANDEM LIFT - TRUCKS - CONING OFF QUAY

- 33.5M GAGE CRANE
- 8 WORKING LANES
- 1ST AND 5TH CRANES SHARE

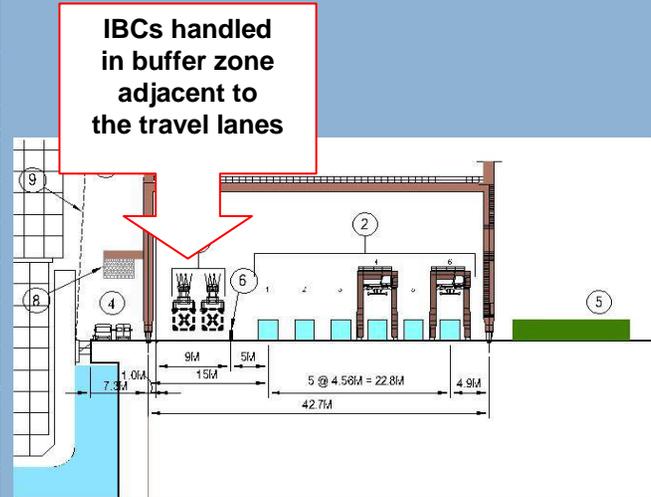


7: Twin / Shuttle / In Buffer

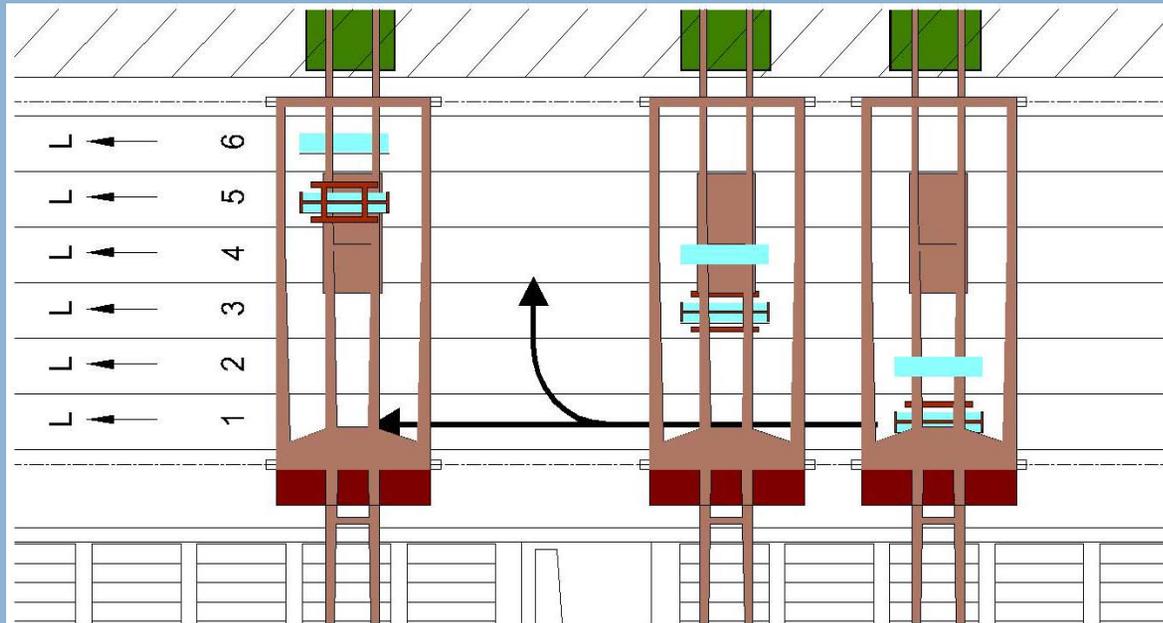


OPTION 7: TANDEM LIFT - SHUTTLE CARRIER - CONING IN QUAY BUFFER

- 42.7M GAGE CRANE
- 6 WORKING LANES
- 1ST AND 4TH CRANES SHARE
- SHUTTLE CARRIERS SHARE LEG SPACE



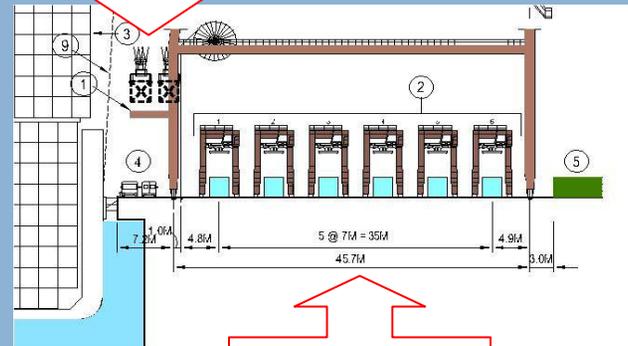
8: Twin / Shuttle / WS Platform



OPTION 8: TANDEM LIFT - SHUTTLE CARRIER - CONING ON PLATFORM

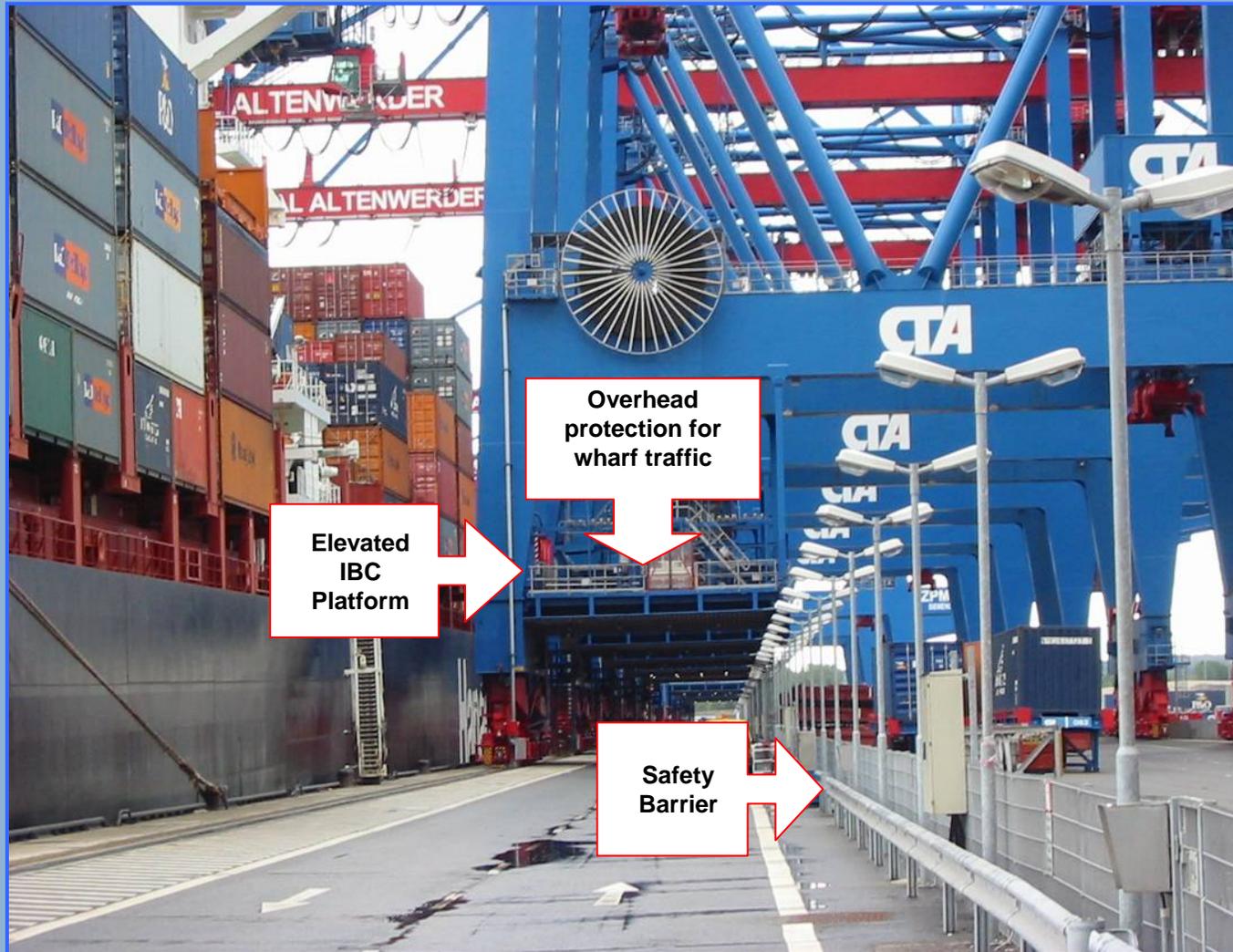
- 1:400
- 45.7M GAGE CRANES
 - 6 WORKING LANES
 - 1ST AND 4TH CRANE SHARE
 - SHUTTLE CARRIERS IN INDEPENDENT LANES

IBCs handled on a crane mounted platform



Implication is wider crane gage

- On-crane IBC platforms have a lot of appeal
 - Safety
 - Space efficiency
 - Overhead protection for vessel service lanes
- Downstream IBC operations for tandem trucks is an option
- Downstream IBC operations may be the only option for Quad-20 operations
- Wider than 100' gage cranes have a lot of appeal with Twin-40 Operations



Transport Options for Twin-40 Cranes

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- Two single yard chassis/AGVs
- Twin-40 yard chassis/AGVs
- Straddle or Shuttle Carriers



– Pros

- Only one unit is required for the quay crane to execute a move
- Less expensive than strads
- Fewer drivers than with multiple single trailers

– Cons

- Will not fit under a standard RTG
- More dangerous to drive – poor rear visibility; labor acceptance risk
- Quad 20s with four CY locations causes long cycle times
- IBC operations must occur on the crane



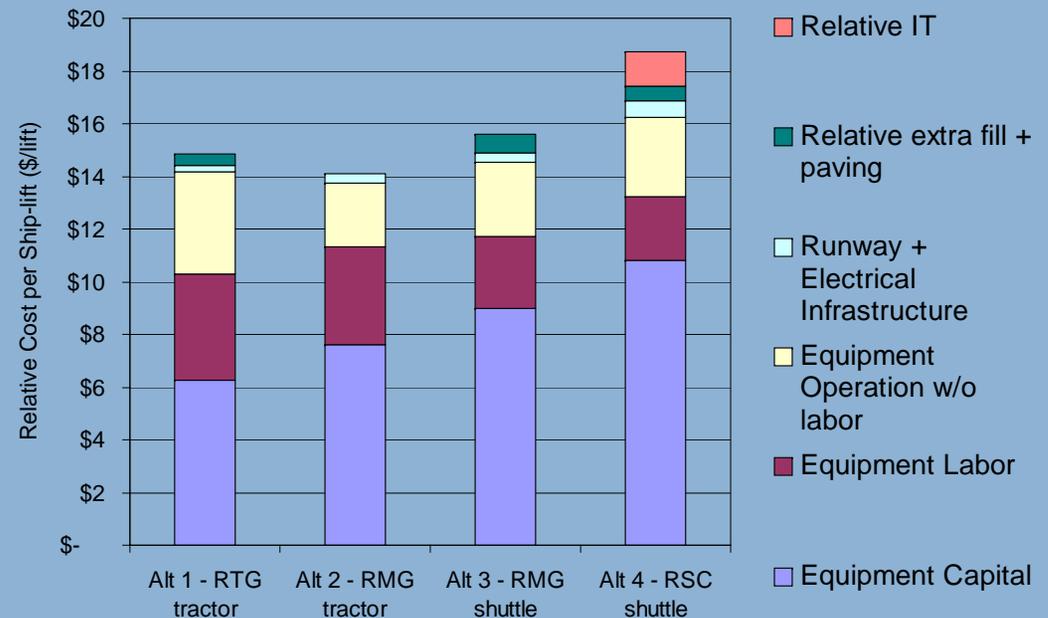
Paceco Twin BufferStation

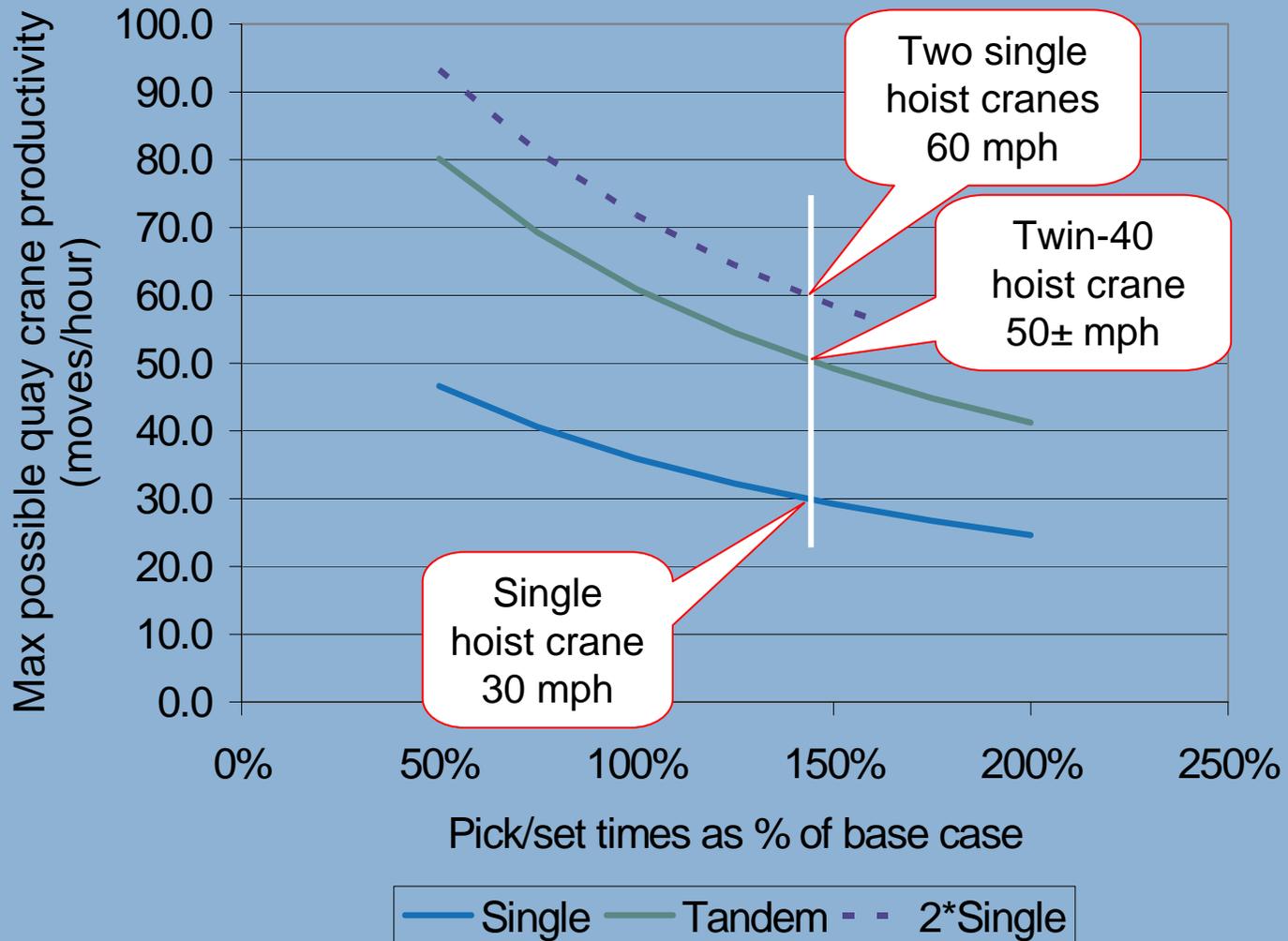
- Used to convert standard twin-40 lift crane to a dual hoist crane
- IBC operations on the BufferStation
- Separates tandem containers and spots them to single transporters



What is the actual productivity?

- Simulation modeling is a great analysis tool
 - Spread Sheet Modeling
 - Discrete Event Modeling
 - Comparative data sets
- Decisions supported by statistical data





- Understand crane gage and wheel load implications
- Understand IBC operational options
- Understand yard transport system options
- Understand yard handling options
- Analyze the terminal as an overall system
- Analyze sensitivity to various storage strategies and equipment mixes
- Analyze expected productivity and cost per move

Is Twin-40 operations for you?

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