RTSA Technical Session

US Port & Intermodal Challenges

April 21, 2015

5:30 p.m.
Consulting firm with 100+ years of port and intermodal planning and facilities engineering experience
Agenda

- Accommodating Larger Ships
- Intermodal Terminal Roles
- Environmental & Community Challenges
- Port Consolidation
Accommodating Larger Vessels

Landside Challenges
Accommodating Larger Vessels

High Vessel Productivity...

...stresses terminal resources
Inventory, Flow, and Productivity

- Inventory is a function of:
  - Mean storage dwell time
  - Dwell time distribution
  - Vessel lift counts
  - Vessel spacing

- Flow rate across the waterside is a function of:
  - Crane productivity
  - Number of cranes

• Flow rate across the landside is a function of:
  • Dwell time statistical distribution
  • Vessel lift counts
  • Vessel spacing
Accommodating Larger Vessels

Compressing Lifts to Fewer Calls Means:

- **Higher performance** for shipping lines
- More cargo in **inventory** for the same volume
- Higher landside **demand** for the same volume
- **Lower productivity** in delivery to the landside
- Higher demand on landside operating **resources** (gate, chassis, delivery equipment)
- **Knock-on** effects that can spin out of control
Accommodating Larger Vessels

Out of Window Vessel Impacts

- Decreased STS crane productivity
- Increased terminal operating costs
  - Longer ITV travel distances
- Increased terminal traffic congestion
- Decreased OTR truck turn times
IY Role in Freight Logistics Systems
IY Role in Freight Logistics Systems

Increasing Complexity

1. Traditional transfer terminals
2. “Hub and Spoke” terminals
3. Agile ports/Inland ports
4. Multi-modal integrated logistics centers
Traditional Transfer Terminals

- Point-to-point
- Direct service between two IYs

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<th>Global III, Rochelle, Illinois (Union Pacific)</th>
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<td><strong>Footprint</strong></td>
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<td><strong>Throughput</strong></td>
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Source: http://www.uprr.com/customers/intermodal/featured/global/index
**North Baltimore, Ohio**

- 202 Hectare Facility
- 2 million TEUs at full build-out
- 30 trains per day

Source: [http://www.nationalgateway.org/projects/project/69, Google Earth, & PB Analysis](http://www.nationalgateway.org/projects/project/69, Google Earth, & PB Analysis)
Hub and Spoke

Northwest Ohio creates new hub and spoke network

Before NWOH

Interchange with western rails

After NWOH

Chicago Bypass for Western interchange

Source: CSX Intermodal Market 2011
Rail Route Serving Charleston

Using Existing Norfolk Southern Tracks.

Service Estimates:
- Estimated import cut-off: 6PM
- Available next morning in Greer.
- Estimated export cut-off: 6PM
- Available next morning at NS Seven Mile Yard in Charleston.
Inland Ports

- Connects the Port of Charleston via overnight rail offered by Norfolk Southern
- Extends the Port’s reach 212 miles inland
- Provide shippers with access to more than 95 million consumers within a one-day drive.
- Additional benefit of access to empty containers for regional shippers to move their goods.
- Entice direct investments from 20-40 companies over the long term.
Agile Port Concept: Link on-dock rail facilities to a nearby inland rail terminal through a dedicated rail corridor.

Cargo storage and rail sorting operations moved inland where there is more available land.

Source: Center for Commercial Deployment of Transportation Technology
IY Role in Freight Logistics Systems

Agile Port
Looking Forward: A Strategic Opportunity for Improved Freight Transportation

Increased Agility and Flexibility through a Systems Approach

Source: Center for Commercial Deployment of Transportation Technology
Multi-modal integrated logistics centers

- Over 24 inland intermodal distribution areas
- Provide value-added services
  - Container devanning and repacking
  - On site warehousing and distribution
  - Light manufacturing, packaging, and branding
  - Truck, rail and container maintenance

Multi-modal integrated logistics centers

- A **Regional International Trade Processing and Technology Centre**.
- Non-profit, investor-based, economic development organization.
- Provides technology-based solutions designed to facilitate and improve the region’s freight transportation system and economic development.
- Raise awareness and understanding of supply chain management.

Source: KC Smart Port
• Average truck length of haul ~ 1,000 miles in 2000.
• From 2000-2010, the average length of haul in trucking fell to 500- to 600-miles as distribution centers grew and rail became a viable alternative.
• Since 2010, average length of haul in trucking has further decreased as a result of increasing gas prices and environmental concerns.

Source: Parsons Brinckerhoff Analysis
Environmental & Community Challenges
1. Middle Harbor Terminal
2. China Shipping Terminal
3. SCIG
Middle Harbor
$1.2 billion facility to be one of the most technologically advanced terminals in the world.
Environmental analysis indicated direct project impacts would not have a disproportionately high and adverse impact on the surrounding minority and low-income populations.

However, the cumulative effects of the project, ongoing operations, and other development and projects in the region were expected to have significant, unavoidable, cumulative air quality and noise impacts.

In spring 2009, the POLB established a mitigation grant program to fund projects that would improve air quality in the region.
Community-Based Mitigation Elements:

- $10 million for community health impact grants targeted at “sensitive receptors” (HVAC, windows, tree planting, etc. at schools, hospitals, senior centers, and more)
- 2007 EPA Trucks by 2012
- Cargo Handling Equipment of 750 Hp or more must meet EPA Tier 4
- 5-Year New Technology Review
- LEED elements, such as compact fluorescent lightbulbs, solar carports, and five-year energy audit by outside consultant
China Shipping Terminal
POLA granted permit and lease to China Shipping to construct large container terminal complex.
Environmental and Community Challenges

POLA China Shipping Settlement

• No site-specific environmental review was prepared as required under California Environmental Quality Act (CEQA)
• No measures were adopted to protect the environment or nearby residents from the project’s significant impacts.
• Port was not responsive to community needs so National Resources Defense Council, Coalition for Clean Air and two community groups sued POLA.
• After year and a half of litigation, the court of appeal issued injunction to stop all construction and operation of terminal until POLA complies with the law.
In 2003, POLA settled litigation by creating a $50 million environmental mitigation program:

- **$23.5 million** for community aesthetic mitigation projects in San Pedro and Wilmington
- **$20 million** for the reduction of air quality impacts
- **$10 million** to the Gateway Cities Program for use as incentives to replace, re-power or retrofit existing diesel-powered on-road trucks
- Establishment of the First Port Community Advisory Committee in the US
- All cargo handling equipment changed to alternative natural gas or electric.
Southern California International Gateway (SCIG)
$500 million privately-funded railyard
Rail facility proposed for 153-acre site located adjacent to Long Beach residents.

No effective mitigation to protect the surrounding community.

BNSF, the project’s sponsor, unresponsive to community concerns.

City of Long Beach and six other parties filed a lawsuit against the City of Los Angeles and BNSF over the project.
Key Elements:

- Electric-powered rail-mounted gantry cranes
- 10 liquefied natural gas (LNG)-fueled yard hostlers
- New LEED-certified administration building
- High mast lighting with automation and energy efficient/directional shielding
- Automated truck entry gate to reduce on-road queuing
- Dedicated truck routes using GPS guidance systems
- On-road trucks meeting 2007 EPA on-road stds Ultra-low-emitting switching locomotive engines
- Soundwall
Additional Mitigation Requested/Agreed:

• Low-Emission Drayage Trucks
• Periodic Review of New Technology and Regulations
• Substitution of New Technology
• Intensive Landscaping on West Side of Terminal Island Freeway
• Zero Emission Technologies Demonstration Program
• San Pedro Bay Ports CAAP Measure RL-3 (clean locomotives)
South Carolina Inland Port
$500 million privately-funded railyard
SC Inland Port Mitigation

- 30-acre Inland Port that handled 42,555 rail moves in its first year
- 24 homes purchased and demolished to construct facility
- Local community impacted by noise from rail operations
- Commitment to public for landscaped buffer between homes and rail
Environmental and Community Challenges

SC Inland Port Mitigation

Preliminary Buffer Schematic
Port Consolidation Strategies
Competitive Challenges
VPA assumed control of the Port of Richmond in 2002

220 mile rail haul distance from VIP to NIT
Unified management of two ports’ marine cargo terminals under one CEO and shared organization
Seaport Alliance

- The two port commissions will act jointly on Seaport Alliance policy, while maintaining policy functions for their individual ports
  - to enhance regional job creation and economic growth
  - to combine resources and join capacities needed to compete, and
  - to protect market share and bring additional business to facilities.
- Ports have **limited capacity to handle larger vessels**, and need to work together to **plan investments** to meet the changing industry requirements.
Questions?