"Tools to Lead and Manage Competitive Ports"

Port & Intermodal External Industry Pressures
Global Trade: Current Course & Direction?

Cargo Demands, Capacity, Funding, Port Productivity & Environmental Challenges

North American Port Gateways
What We Know Today... Will Be Surely Be Different Tomorrow!
To Be Competitive Today...
Marine/Intermodal Terminals Must Reduce Throughput Cost & Increase Cargo Velocity Securely and as Stewards of the Environment
Functional Classification of Global Maritime Cargoes

All Maritime Cargo

General Cargo
- Break Bulk: Sacks, Cartons, Crates, Drums, Pallets, Bags
- Neo-Bulk: Lumber, Paper, Steel, Autos
- Containerized: Containers, Lift On/Lift Off (Lo/Lo), Roll On/Roll Off (Ro/Ro)

Bulk Cargo
- Liquid Bulk: LNG, Petroleum, Molasses, Chemicals, Vegetable Oil
- Dry Bulk: Grain, Sand & Gravel, Scrap Metal, Coal/Coke, Clinker, Fertilizer
The “Port”
One of the Many Diverse Constituencies in the Cargo Transportation Logistics Chain

Objective:
A multimodal “Seamless” integrated world wide cargo conveyance system.
The Global Container Industry Continues to Consolidate...

- **Total number of slots**
- **Slots controlled by top 20 carriers**
- **Slots controlled by 4 global alliances**

**Thousands of TEU Slots in Operation and on Order**

- **1995**:
  - Total: 5,053
  - Top 20 carriers: 2,244
  - 4 global alliances: 1,479
  - Percentage: 44.4%

- **2000**:
  - Total: 8,180
  - Top 20 carriers: 4,850
  - 4 global alliances: 2,674
  - Percentage: 59.3%

- **2005**:
  - Total: 9,763
  - Top 20 carriers: 6,881
  - 4 global alliances: 4,027
  - Percentage: 70.5%
The North American Freight Paradox: The Nation’s Ports and Their Intermodal Linkages are Experiencing the “Best of Times and the Worst of Times” in Terms of Growth and Demands on Capacity
At Current Productivity and Growth Levels by 2020 North American Ports & Their Associated Intermodal Systems Will Be Severely Congested. In Today’s Supply Chain Congestion Can’t be an Excuse…
We do not have an “intermodal system” as such. Rather we have an aggregation of multiple, private and public modes, each of which are “stove-piped” within their own individual areas of interest with little or no true cross communication and collaboration.
Poll of the Top 1000 “Blue Chip” Multinational Shipper Priorities

- 38% Competitive Freight Rate
- 43% Schedule Reliability & Consistency
- 12% Transit Time & Speed
Today’s Logistics Truth:

“The customer wants more and is willing to pay less for it.”
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International Maritime Cargo Demand Trends
World Bank’s 2010 “Global Economic Prospects”

World Output will Increase 33% in 10 years

<table>
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<tr>
<th>Year</th>
<th>Output Trillions</th>
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<tr>
<td>2000</td>
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<tr>
<td>2010</td>
<td>$40 Trillion</td>
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World Container Forecast to 2024 in TEUs
(186% Increase in Next 20 Years)

Source: Global Insight, 2004
### 2003 World Container Gateways

**“The World’s Top 10 Port Gateways”**

- **Hong Kong**: 20.4
- **Singapore**: 18.41
- **Shenzhen**: 11.28
- **Pusan**: 10.65
- **Kaohsiung**: 10.36
- **Rotterdam**: 8.84
- **Hamburg**: 7.11
- **Antwerp**: 6.17
- **US Ports**: 5.45

**POLA + POLB**

Hong Kong Alone is Equal to the Top 15 North American Container Ports

Source: Port Engineering Management, Vol. 22- Issue 6 - December 2004
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<th>Year</th>
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<td>Italy</td>
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</tbody>
</table>

Source: Global Insight, 2005
The Growing Asian Import Trade Challenge

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Global Interdependent Economics Have Resulted in a Major Product Sourcing Shift to Asia

Source: Clarkson Research Studies
Today, more than 60% of all North American container trade is with Asia. European container flows have held steady (19% market share).

2005 North American Trade Regions
Total: 24.1 Million Units

- China: 41%
- North Asia: 12%
- North Europe: 13%
- Caribbean/Central America: 8%
- Southeast Asia: 7%
- Mediterranean: 6%
- Indian Subcontinent: 6%
- East Coast South America: 3%
- Oceania: 3%
- Other: 1%

Source: PIERS; Port Reported Throughput; Norbridge Analysis
Last 5 Years Asia-US Container Trade Increased 12% CAGR and China Accounted for 95% of the Increase

Source: PIERS, Port Reported Throughput, Norbridge
China-US: Twin Engines of the World

Population:
US: 298 million
China: 1,307 million
(1/5 World)

The number of Chinese children in elementary school is equivalent to the total US population.
Mainland China Container Port Growth
(Compound Annual Growth Rates)

Mainland China Container Port Throughput

5 Yr Average = 27.2%
Increased Volume
China’s Ministry of Railways Signed a 5 year Cooperation Agreement with the US BNSF Railroad for Intermodal Rail Development

- Develop China’s high volume efficient intermodal network
- $242 billion program to 2020
- On-dock & near-dock intermodal transfer yards at ports
- Ministry to build 18 mega-terminals with 7 at seaports, 40 smaller Intermodal terminals
Shanghai International Shipping Center
Yangshan Deep Port & Logistics Park

New Port City
New Logistics Park

20 Mile New Port Access Bridge Constructed in 3 yrs

54 New Berths
To 2015 China & India Are Projected To Continue To Drive North American Container Trade

10 Year CAGR by Trade Lane: 2005-2015

- **China**: 9% Annual Growth
- **North Asia**: 7% Annual Growth
- **North Europe**:
- **Southeast Asia**:
- **Indian Subcontinent**:
- **Caribbean / Central America**:
- **World Total**:

Source: Global Insight, Norbridge
Emerging New Mexican Intermodal Gateways & Corridors – Nearly 4 Million TEUs

Lazaro Cardenas
- Phase I: 700K TEU
- Fut. Phase: 2.0 mil TEU

Guaymus
- 1.0 mil TEU

Punta Colonet
- 1 mil TEU Throughput

Lazaro Cardenas
- Phase I - 700K TEU
- Fut. Phase - 2.0 mil TEU
Marine Terminals Corporation (MTC) with partners Evergreen, Yang Ming, Hanjin, and China Shipping Announce Plan for a 1 Million TEU, $1 Billion Greenfield Port Development at Punta Colonet Harbor, Baja Peninsula
New North American Container Gateway

Prince Rupert Port Authority

the new world port

opening a new world of opportunity
Connecting Canada’s Pacific & Eastern Intermodal Gateway Strategies

Potential Northeast Gateway

“North America’s North East Gateway”
The Emerging CN Transcontinental Land Bridge

- **Pacific Gateway**: Prince Rupert
- **Northeast Gateway**:

  - Unconstrained, fluid rail line

**Prince Rupert Transit Times**

- Initial Transit Times
  - Chicago: 107 hours
  - Toronto: 108 hours
  - Montreal: 115 hours
  - Memphis: 135 hours

22 hours shorter by rail to Chicago than Vancouver (CP)
Southeast Asian Manufacturing Centroid Shift

Current Inbound U.S. Cargo Flow

Eastbound: All Water Flow

Eastbound: US Intermodal Rail Flow

Western Centroid Shift

U.S. Intermodal Rail Flow
Southeast Asian Manufacturing Centroid Shift

Current Inbound U.S. Cargo Flow

Western Centroid Shift

U.S. Intermodal Rail Flow

Westbound All Water/Suez Flow

Westbound Intermodal U.S. Flow
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North American Port & Intermodal Capacity Trends
Can North American Marine Terminals Handle the Forecasted Freight Volumes?...
2010 Projected Public Port Capacity Shortfall

75% of the 16 Ports Studied will have Significant Capacity Problems by 2010
By 2020 Most US Container Port Gateways Will Double or Triple in Volume
By 2020 demand will exceed current capacity of many U.S. ports by as much as 200%.
Future US Truck Traffic Growth In Urban Consumption Zones

Today

2020

Source: USDOT FHWA Freight Analysis Framework
POLA/POLB Challenge: Truck Congestion

Goods movement is a major contributor to traffic congestion and a bottleneck to future growth.

I-710 Typical Day  I-710 During 2002 Port Lockout
North America’s future economic and environmental health is at risk as a result of declining transportation efficiency and reliability.
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Latin America
North/South
Freight Corridors
Emergence of the Demand for a North-South Freight Corridor
Latin American Gross Domestic Product Growth, Last Two Decades

- 1980 - 1991: 1.7%
- Early 1990's: 3.0%
- Late 1990's: 6.0%
Major Increase of Trade Expected Between U.S. and Latin Americas

Global Investment Shifts to Latin America

- Chemicals
- Textiles
- Wood Products
- Electronics
- Vehicles

Forecasted: 16 Million TEUs @ 6% CAGR

Expected 6 Million TEUs @ 3.5% CAGR
“Free Trade Area of the Americas” (FTAA)

Largest Free Trade Zone In the World
(Over $14 Trillion in 2006)
A Tripling of US Exports with the Majority
Bringing Manufactured Products to
Central & South America…
North America’s North-South Multi-Modal Super Transport Corridor Coalition (NASCO)

An Inland Port Network along NAFTA Corridor Routes. Specifically Planned to Alleviate Congestion at Ports, Urban Intermodal Centers and at Border Crossings.
Trans-Texas Multi-Modal High Priority Freight Corridor TTC-35
Kansas City’s SmartPort

Investor Based, Non-Profit Economic Development Organization Supported by both the Public and Private Sectors. A Regional International Trade Processing Center, Permitting Freight to Clear US Customs in Kansas City and Avoid Border Delays.
Canadian Intelligent Super Corridor (CISCOR)
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Maritime Vessel Technology Trends
In 1955 Malcolm McLean, sold McLean Trucking, and secured a bank loan of US$42 million to build the world's first container ship.
World Container Ship Evolution

1st Generation (Pre-1960 - 1970)
- Ideal X
- 1,700 TEU

- Panamax
- 2,305 TEU

3rd Generation (1985)
- Post Panamax
- 3,220 TEU

- Super Post Panamax
- 4,848 TEU

5th Generation (2000 - 2005)
- 8,600 TEU
Madison Maersk (3,928 TEUs) in the Panama Canal
(Current Max Panamax = 5000 TEUs)
Today’s Mega Ships - Measuring Up

Eiffel Tower – 990 feet

Regina Maersk – 1043 Ft, 140 Ft wide, 6000+ TEUs
Today’s Mega Ships - Measuring Up
How Wide, How Deep?

- **Pre-1970**: 1,700 TEU, <10 Containers Wide
- **1970-1980**: 2,305 TEU, 10-11 Containers Wide
- **1985**: 3,220 TEU, 11-13 Containers Wide
- **1986-2000**: 4,848 TEU, 13-17 Containers Wide
- **2000-2005**: 8,600+ TEU, 17-24 Containers Wide
### SUMMARY OF WORLD CONTAINERSHIP FLEET IN SERVICE AND ON ORDER (OCTOBER 2005)

<table>
<thead>
<tr>
<th>Ship Type</th>
<th>5000-5999</th>
<th>6000-6999</th>
<th>7000+</th>
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<tr>
<td><strong>Slots on Order</strong></td>
<td>371,509</td>
<td>435,032</td>
<td>1,561,394</td>
<td>4,323,417</td>
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<tr>
<td><strong>Ships on Order</strong></td>
<td>68</td>
<td>67</td>
<td>183</td>
<td>1,113</td>
</tr>
</tbody>
</table>

**Source:** Containerisation International Yearbook 2005

- **Current Vessel Capacity =** 2,304,286 Slots
- **Order Book Vessel Capacity =** 2,367,935 Slots

**A 103% Increase in Fleet Slot Capacity on Order**
10,000 TEU Container Ships Currently on Order

Zim orders four 10,000 TEU container ships from Hyundai Shipyards in Korea; will double its carriage capacity. Zim will take delivery of the ships, second half of 2009.

Cosco orders four 10,000 TEU containerships from Hyundai Heavy Industries to be delivered in 2008. $505 M Deal.

Source: North Sea Terminal Bremerhaven GmbH & Co
The new-build known as “M/S Emma Maersk”, was christened at the Odense-Lindo Shipyard in Denmark in August 2006. The nominal capacity of the new vessel could be as high as 14,000 TEUs based on its reported LOA of 397 m, Beam of 56 m, Draft of 15.5 m, Gross Tonnage 170,974 gt, Speed 25.5 knots.

Source: Journal of Commerce August 2006, Marine Log December 2006
A.P. Moller-Maersk L Class M/S Emma Maersk
(14,000 TEU Vessel - 22 Containers Wide)

Length: 1,302 ft, Width: 207 ft, Net Cargo: 123,200 tons
Key Cranes: 10, Engine: 14 in-line cylinders diesel engine (110,000 BHP)
Cruise Speed: 31 mi/h, Full Crew: 13, Construction cost - US $145 M+

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The 15,000 TEU Containership

“...the ship is a flight of fancy... but such a ship is within the current state of the shipbuilder’s art...”

R. G. McLellan, P&O Containers
The 15,000 TEU Containership

LOA. = 400 m (1,312 ft.)
Draft = 14 m (46 ft.)
BEAM = 69 m (226 ft.)
Container Ship-in-a-Slip Concept
The 18,000 TEU Malaccamax
Reported Predictions/Benefits

- By 2010 on Asia-Europe Trade Route
- 30% Cheaper than 4800 TEU Panamax Vessel, primarily due to “Economies of Scale”
- US$40/TEU Savings

Source: Dynamar Consultancy, Rotterdam
Emergence of North American Fast Feeder Short-Sea Coastal Vessels

The New Frontier: Transshipment and Short Sea

2,000 - 3,000 TEU Feeder Ship

10,000 to 15,000 TEU Mega Ship
Emerging Viable Container On Barge Coastal Shipping Concepts & Inland Intermodal Port Potential
High-Speed, Low Wake, Intermodal Float Technology
Port & Intermodal Terminal

Competitive Mandates

Ports & intermodal linkages must change the current cost versus value relationship in the logistics chain. Become Value Added Multipliers...

Successful ports & intermodal terminals in the next decade must invest in and leverage technology to improve terminal productivity, cost, effectiveness and reliability for all modes of transportation...securely as environmental stewards.
Executive Management Conference for Latin America and the Caribbean
February 12, 2007, Miami, Florida

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Global Maritime Logistics & Port Operating Trends

Macroeconomic Situation

Thank You