Corridors and the Maritime / Land Interface: North America and the Pacific

Jean-Paul Rodrigue
Associate Professor, Dept. of Economics & Geography, Hofstra University, New York, USA

Email: ecojpr@hofstra.edu
Paper available at: http://people.hofstra.edu/faculty/Jean-paul_Rodrigue
Mounting Capacity and Time Pressures in Global Freight Distribution

Time is the essence...

- Surprising time underperformance:
  - Only 63% of transpacific container vessels arrived on time at their scheduled port calls.
  - 53% for transatlantic port calls.
- The major factor behind delays is port congestion:
  - Multidimensional concept.
  - Physical docking capacity.
  - Transshipment capacity.
  - Storage capacity.
  - Inland capacity.
- Reinforce the importance of the maritime / land interface.
A Hard Pill to Swallow: The Emma Maersk
Logistics and the Acceleration of Freight

- The velocity of freight
  - Shipment and transshipment.
  - No significant speed improvements in recent decades.
  - Intermodal operations; the most important element.
  - Logistical threshold:
    - Time based management of distribution becomes a possibility.
    - From push (supply based) to pull (demand based) logistics.

Push Logistics

- Shipment
- Transshipment

Pull Logistics

- Containerization
- Logistical threshold

Transshipment
Elements of the Maritime / Land Interface

**Foreland (Shipping Network)**

- Road
- Rail
- Coastal / Fluvial

**Port System**

- Gateways

**Inland Freight Distribution**

**Hinterland (FDC)**
Foreland: Liner Shipping Networks

Conventional liner / break bulk services

Mainline services

Feeder services

First order network

Second order network

Third order network

Regional Port System

Regional Port System
Two Major Transpacific Pendulum Routes Serviced by OOCL, 2006 (The Wal-Mart Express)

Note: Paths are approximate and transit time includes port time

Source: OOCL Web Site
Largest American Importers of Asian Goods Through Maritime Container Transport, 2004 (in TEUs)
Gateways and Hubs as Central and Intermediate Locations

- **Gateways & hubs**
  - Nodes offering an accessibility to a large system of circulation.
  - Obligatory (semi) points of passage.
  - Convergence of transport corridors.
  - Centrality and intermediacy.

- **Gateways**
  - Favorable physical location.
  - Intermodal and stable in time.

- **Hubs**
  - Transmodal and subject to change.
  - Commercial decisions.
  - Delays vs. frequency of services.
Main North American Trade Corridors and Metropolitan Freight Centers
The Hinterland Effect: Interdependencies and Imbalances

- Macro-economic and physical imbalances
  - Globalization has made the economies of the Pacific Rim more integrated.
  - These interdependencies however come with acute imbalances.
  - The core of these imbalances is at start macro-economic:
    - Comparative advantages.
    - Foreign direct investments.
    - Debt and asset inflation.
  - Macro-economic imbalances have an outcome in the physical world of freight flows:
    - International trade.
    - Container flows.
    - Transportation rates.
    - Structure of long distance transport services.
The “Perpetual Motion” Machine: The Dynamics of the World’s Most Significant Trade Relationship

Goods

Bonds (IOUs)

$ for goods

$ for bonds

Unemployment

Investment

Reserves

China

United States

USD

Interest Rates

Borrowing

Asset Inflation

Debt

Borrowing

Investment

Reserves

USD
World’s 10 Largest Exporters and Importers, 2005

Billions of $US

- Belgium
- Canada
- Italy
- United Kingdom
- Netherlands
- France
- Japan
- China
- United States
- Germany

Imports and Exports
Containerized Cargo Flows along Major Trade Routes, 1995-2005 (in millions of TEUs)
Maritime Freight Rates (USD per TEU), 1993-2006
Container Traffic at Major Transpacific Container Ports: Mirror Images?

2004 Traffic
- Less than 2 million TEU
- 2 million to 4 million TEU
- 4 million to 7 million TEU
- 7 million to 10 million TEU
- More than 10 million TEU
Port Holdings as Elements of the Maritime / Land Interface

- Horizontal integration using fixed assets
  - Gain a foothold in a wide variety of markets (strategic positioning).
  - Financial assets.
  - Managerial expertise.
  - Gateway access.
  - Leverage.
  - Traffic capture.
  - Global perspective.
Major Port Holdings, 2007

APM Terminals
Dubai Ports World
Hutchison Port Holdings
Port of Singapore Authority
Eurogate
Stevedoring Services of America

Dr. Jean-Paul Rodrigue, Dept. of Economics & Geography, Hofstra University
Gateways and Hinterland Effect

Pacific Asia

Inefficient Inland Freight Distribution

SEZ

North American West Coast

Efficient Inland Freight Distribution

Corridor
Container Transport Costs from Inland China to US West Coast ($US per TEU)

- Land access to final destination (USA)
- Port handling (USA)
- Maritime transport
- Port handling (China)
- Land access to port (China)
Containers Handled by the Port of Los Angeles, 1995-2005 (in TEU)
Port of Los Angeles / Long Beach, Inland Flows

- Marine Terminal
- Intra-terminal
- On-dock rail yards
- Near-dock rail yards
- Off-dock rail yards
- Transload facility
- Warehouse
- Transload facility
- Warehouse
- Alameda Corridor
- Rail
- Off-dock rail yards
- Non-local destination 16%
- Non-local destination 13%
- Non-local destination 13%
- Non-local destination 22%
- Local destination 34%
- Non-local destination 2%
The “Agile Port” System (Maritime / Rail Container Terminal Cluster)

On-dock rail terminal

Dedicated Rail Corridor

Local & regional distribution

Maritime / Land Interface

Foreland

Port Terminal

National rail distribution

Inland Rail Terminal

Hinterland

Transloading

Local & regional distribution
Container Port Traffic and Ownership of Major Rail Lines, 2005

Dr. Jean-Paul Rodrigue, Dept. of Economics & Geography, Hofstra University

Dr. Jean-Paul Rodrigue, Dept. of Economics & Geography, Hofstra University

Port Traffic in TEU (2005)

- Less than 300,000
- 300,000 to 500,000
- 500,000 to 1,000,000
- 1,000,000 to 3,000,000
- More than 3,000,000

Dr. Jean-Paul Rodrigue, Dept. of Economics & Geography, Hofstra University
Potential Location of Major Transmodal Rail Facilities: Maritime Gateways and Inland Hubs

Dr. Jean-Paul Rodrigue, Dept. of Economics & Geography, Hofstra University
Conclusion: Improving the North American Maritime / Land Interface

Transpacific trade
  - Substantial rebalancing of the global economy.
  - Emergence of global production networks.
  - Imbalanced freight flows.

The Maritime / land interface
  - An interaction between maritime shipping networks, gateways and their corridors.
  - Improving the velocity of freight from an intermodal and transmodal perspective.
  - The throughput of a gateway must be supported by the throughput of its corridors (vice-versa).
  - The introduction of a new generation of containerships (above 10,000 TEU) may force solutions.