



## Chapter 3: Inland & Intermodal Transportation



## Key Discussion Questions

- What is Intermodal?
- Why is inland transportation important to consider in international operations?
- What types of inland moves occur?
- What are the major characteristics of inland transportation...
  - in the U.S.?
  - in other major regions of the world?

## Our Two Largest Trade Partners



## What is Intermodal Transportation?

- A seamless form of transportation via two or more modes, with authority under a single bill of lading.
- Domestic service is generally door-to-door using a truck-rail-truck combination.
- Commonly referred to as piggyback service.



## How does it work?

- One call does it all!
  - The shipper tenders the load to the IMC. We do the rest!
- IMC arranges all legs of the move with service providers, including origin drayage, rail linehaul, and destination drayage.
- IMC traces shipments and handles all service issues directly with service providers to ensure on-time deliveries.

## Intermodal Equipment Options

- Trailers
  - Most often rail owned (thus called rail trailers.)
  - Available in 45' and 48' lengths.
  - Trailers move via TOFC, or Trailer-on-Flatcar, service.



Rail Trailer



TOFC Train

## Intermodal Equipment Options

- Containers
  - Most are steamship or railroad owned.
  - Available in 20', 40', 45', 48', and 53' lengths.
  - Have a demountable chassis. Containers move via COFC, or Container-on-Flatcar, service.



Container in tow



COFC (doublestack) train

## Intermodal Equipment Options

- Chassis
  - Used for container movement on the road.
  - Various types of chassis'; chassis used depends on container size and weight.



Mounting of container on a chassis.



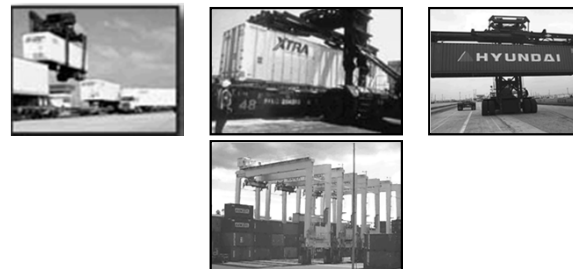
Bare Chassis

## Choosing the Equipment

- The type/size of equipment that is loaded is normally based on the product being shipped.
  - High density, or heavy products (lumber, steel) are normally loaded in smaller units, as the equipment will reach its legal weight capacity before its cubic capacity.
  - Light, bulky commodities (foam, tissue, plastics) are normally loaded in larger units, as the equipment will reach its cubic capacity before it reaches its legal weight limit.
- The type/size of equipment that is loaded sometimes also depends on the lane.
  - Not all equipment is available in all lanes.

## Equipment Handling

- Trailers or Containers are loaded to or from rail flatcars or well cars by overhead lifts, cranes, or side loaders.



## Service Options

- TOFC, or Trailer-on-Flatcar, involves moving a trailer on a rail flatcar.
  - Often referred to as piggyback service.
- COFC, or Container-on-Flat car, involves moving steamship or rail containers on a flatcar or wellcar without its chassis.
  - Containers are stacked two-high (thus referred to as doublestack service) with smallest units on the bottom.
  - Advantages of doublestack service include a smoother ride resulting in less product damage.



## Service Times

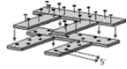
- Each Railroad and Stacktrain Operator publishes transit guides for all service lanes.
  - Transit guides allow for selection of most optimum ramps and routing based on customer's service requirements. Several rail carriers offer varying levels of service, including guaranteed service.
  - Each published transit time has an origin ramp gate cut-off time and expected destination ramp availability day and time.

**Chicago to Los Angeles**  
Mondays (cutoff) and All Days (availability)

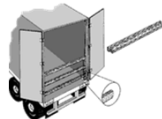
Service	Route	Cutoff Day	Time	Train ID	Available Day	Time	Transit Days
STANDARD	145	Monday	2359	CHLA	Friday	0600	4
3RD AM	145	Monday	1900	CHWX	Thursday	0800	3

## Damage Prevention

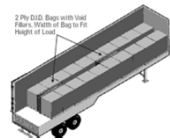
- Blocking and Bracing is a requirement of the AAR for all Intermodal shipments. Any damage claims filed on shipments that had no or inadequate blocking and bracing will be denied by the railroads.
  - The blocking and bracing methods used depend on the commodity and packaging used. Each railroad has very specific guidelines and requirements.



Floor Blocking



T-Braces



Air-Bags

## Standard Documentation

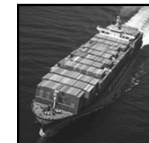
- Bill of Lading
  - A single bill of lading provides authority for movement via all legs of an Intermodal move.
- Waybill
  - Provided by IMC to the railroad with all pertinent information the railroad needs to move the shipment from origin ramp to destination ramp.
- J-1 Interchange
  - Provided by the railroad or steamship line which documents the dray carrier the equipment was interchanged to, along with the condition of the equipment.
- Proof of Delivery
  - Signed by the consignee, proves that the shipment was received in good order.

## U.S. Rail System

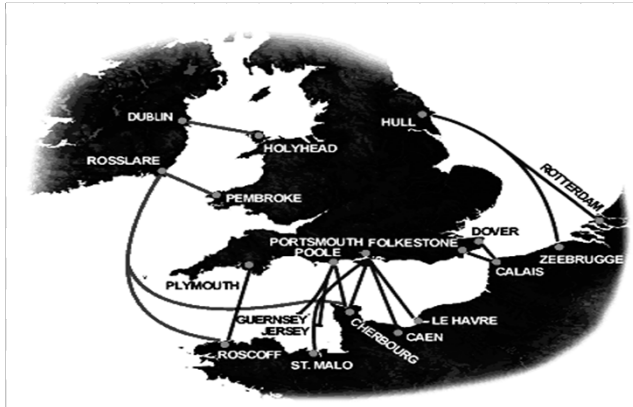
- 4 major Class I Railroads operate in the U.S.:
  - Burlington Northern Santa Fe (BNSF) and Union Pacific Railroad (UP) both operate primarily west of the Mississippi.
  - Norfolk Southern (NS) and CSXT both operate primarily east of the Mississippi.
- Smaller regional Railroads include:
  - Kansas City Southern (KCS)
  - Wisconsin Central (WC)
  - Illinois, Iowa, Missouri, Minnesota Rail Link (IRML)
  - Iowa Interstate (IAIS)
  - Florida East Coast (FEC)
  - Illinois Central (IC) - owned by the CN
- Two Canadian Railroads:
  - Canadian National (CN)
  - Canadian Pacific (CPRS)
- Two Mexican Railroads:
  - Tex-Mex Railway
  - TFM (Transportación Ferroviaria Mexicana)

## Stacktrain Operators

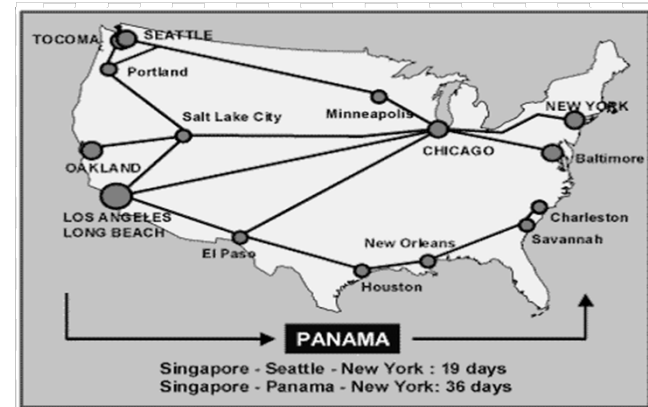
- Service is also available via numerous Stacktrain Operators
  - Most often associated with a Steamship Line, a Stacktrain Operator has its own supply of containers and purchases transportation directly from the railroads. They in turn sell that service to Intermodal Marketing Companies. Their main purpose is to reposition ocean containers back to the port cities for the Steamship lines.
  - Generally operate from east coast and mid-western states going to west coast port cities.
  - Examples of stacktrain operators include Railbridge, Mitsui, Centex, and Hanjin.



## Landbridges Facilitate IM Activity



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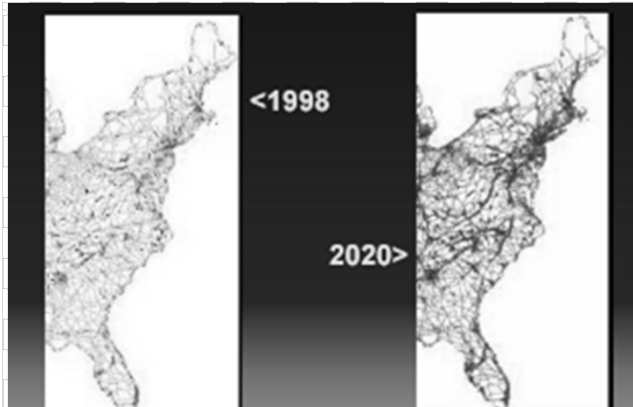
## U.S. Intermodal Challenges

- Port & Road congestion
  - poor transfer facilities
  - excess handling and transfers
- Lack of rail lines to/from ports
  - Long Beach Harbor Example
- Inadequate bridge clearance
- Cost of correction is phenomenal

## The Impact of Congestion

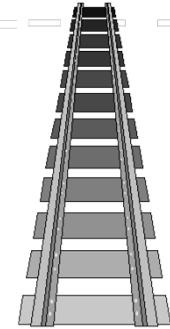
- Higher Cost to Serve Markets
  - Reduced Schedule Reliability
  - Reduced Access & Scale Economies
- ↓
- Smaller Market Area can be served within requirements for cost and service quality
- ↓
- Loss of Urban/Connection Advantages  
Reduced Productivity  
Reduced Opportunity for Attracting Business

## Congestion Projections



## U.S. Intermodal Challenges

- Port congestion
  - poor transfer facilities
  - excess handling and transfers
- Lack of rail lines to/from ports
  - Alameda Corridor project
- Inadequate bridge clearance
- Cost of correction is phenomenal



## Innovative Congestion Solution



- Alameda Corridor Project
  - \$2.4 billion project
  - 20-mile freight rail expressway between the neighboring ports of Los Angeles and Long Beach and the transcontinental rail yards and railroad mainlines near downtown Los Angeles.
  - Benefits
    - Reduced traffic congestion on surface streets by eliminating conflicts at 200 street-level railroad crossings.
    - Slashed emissions from idling cars and trucks by 54 percent.
    - Cut emissions from locomotives by 28 percent.
    - Increased efficiency of cargo distribution network to accommodate growing international trade.

[http://www.acta.org/newsroom\\_video.htm#](http://www.acta.org/newsroom_video.htm#)

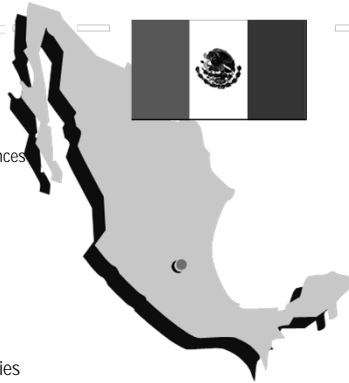
## Inland Transport To/From Canada



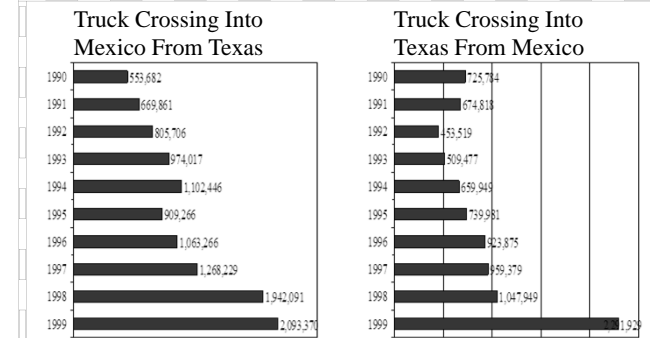
- Primary mode
  - trucks move 70% of freight in/out/within Canada
    - rail has lost growing % of freight to truck
- Infrastructure is most similar to U.S.
- Focus on less regulation and privatization
- Competes with U.S.
  - transshipment (landbridge)
  - \$6.8 billion of U.S. exports move thru Canada

## Inland Transport To/From Mexico

- Primary mode
  - trucking is primarily owner/operator
    - no major LTL companies
    - US carriers develop alliances with Mexican carriers
- Major issues
  - infrastructure is improving slowly
    - congestion within cities is problem
  - lax quality of service, equipment, and drivers
  - must use multiple third parties



## Cross-Border Truck Traffic Between Texas and Mexico



Source: Texas A & M International University, Texas Center for Border Economic and Enterprise Development, 5/10/2000, Inbound Logistics, June 2000, p.34

## Inland Transport in Latin America

- Primary mode
  - truck is only option in many countries
  - rail service and quality vary by country
    - Argentina has extensive rail network
    - Brazil has an inadequate rail system
  - intermodal shipping is uncommon
- Privatization of the transportation industry
- Freight rates are on the decline

## Inland Transport in W. Europe

- Primary mode
  - over 70% of European freight moves via lorry
  - less than 20% of freight moves by rail
  - less than 5% moves via combined transport
- Major issues
  - road congestion and pollution
  - heavy government & EC involvement
  - EC Road Transport Directive

## Combined Transport U.S. vs. Western Europe

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>■ US system</li> <li>- 123,358 miles of track</li> <li>- 16 million TEU's</li> <li>- private ownership</li> <li>- little passenger traffic</li> <li>- profitable industry</li> <li>- good service levels</li> <li>- good IM facilities</li> </ul> | <ul style="list-style-type: none"> <li>■ European system</li> <li>- 96,929 miles of track</li> <li>- 6.5 million TEU's</li> <li>- govt. ownership</li> <li>- heavy passenger traffic</li> <li>- unprofitable industry</li> <li>- poor service levels</li> <li>- lack of IM facilities</li> </ul> |
|--|--|

## Inland Transport in E. Europe

- Primary mode
  - land transport is superior to ocean services
    - transshipments through W. Europe and Scandinavian ports via truck, rail, barge
- Major issues
  - infrastructure is being addressed slowly
    - low clearances, lack of facilities, incompatible track
  - environmental & geographic problems
    - sever winter weather, size of region

## Land Transport in Asia

- Great variation in modes and infrastructure
  - rail is used for long distance moves
  - truck is used for local transportation
- Key Issues
  - partnerships are key to successful transport of goods in and through Asian countries
  - heavy government involvement and ownership



## Land Transport in Asia

- China suffers from extensive bottlenecks
  - underdeveloped and overcrowded rail system
  - govt. plans to increase road network
- India
  - infrastructure problems are hampering growth
  - congested, poorly maintained roads
  - antiquated road system
  - US intermodal companies may provide help

