

## Developing Infrastructure and Operating Models for Intermodal Shift (DIOMIS 2)

# Benchmarking Intermodal Transport in the U.S. and Europe

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UNION INTERNATIONALE DES CHEMINS DE FER  
INTERNATIONALER EISENBAHNVERBAND  
INTERNATIONAL UNION OF RAILWAYS

## Objectives of survey

- Comparison of American and European intermodal business
- Identification of US practices and technologies that could be transferred or adopted by European intermodal actors
- Recognizing common challenges



# Benchmarking intermodal transport US and Europe

Who provides intermodal services in the U.S.? -  
Class I freight railways (revenues > \$360m)



**CANADIAN PACIFIC**

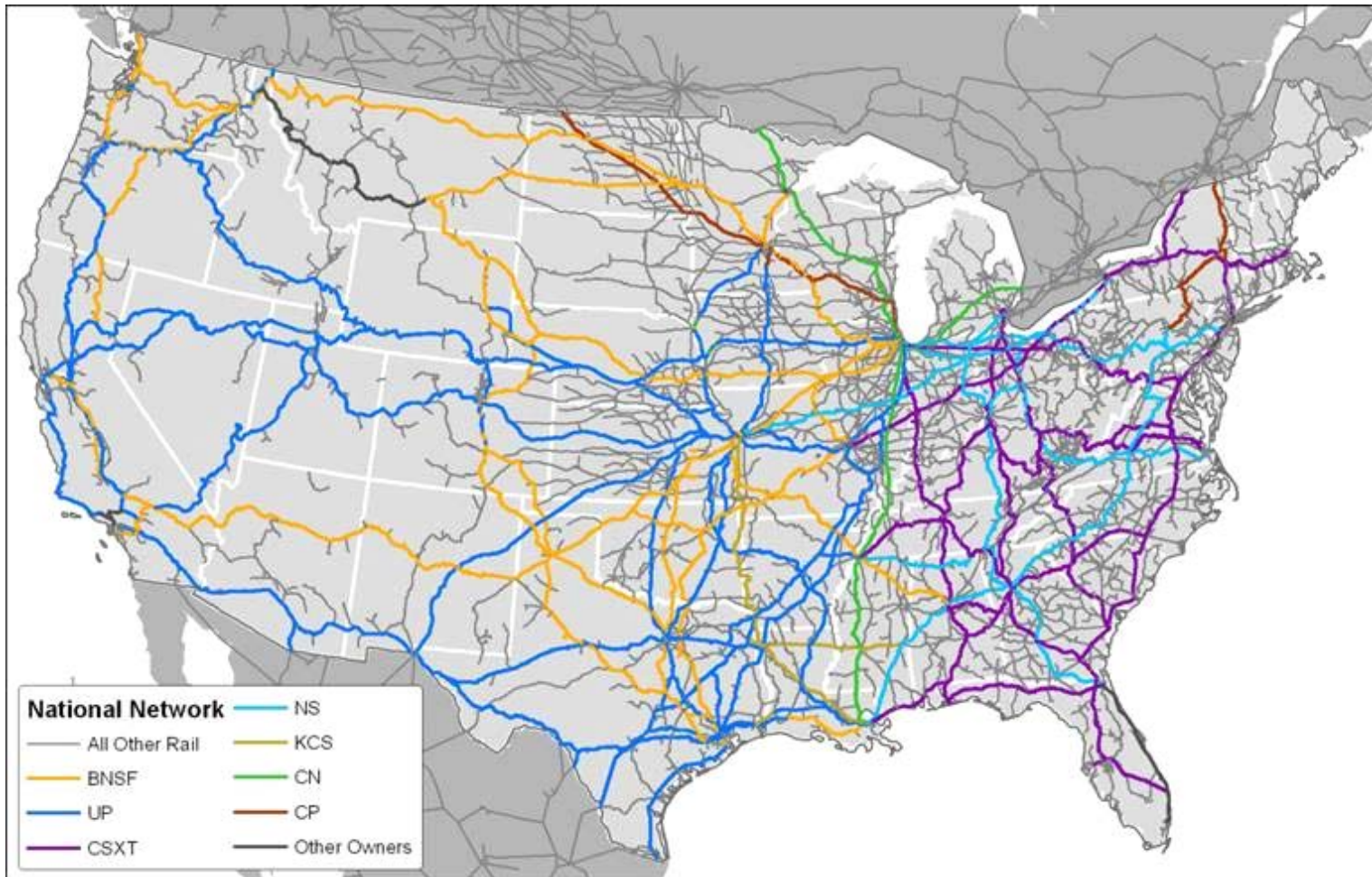


## U.S. Class I freight railways fully equipped

- Fully integrated, private railway companies owning most of critical resources to supply intermodal services
- Rail network
  - Own large networks
  - trackage rights – right to operate on foreign rail lines by own locos and staff
  - haulage rights: subcontract traction service to foreign railway.
- Intermodal terminals
- Locomotives
- Wagons:
  - Own wagons
  - TTX wagon pool : a cooperative society, collectively owned by major American railways.

# Benchmarking intermodal transport US and Europe

## U.S. rail network



## Intermodal market segments of U.S. railways

- **International traffic (container hinterland transport):**  
intermodal transport of sea-borne freight containers, mostly marine (ISO) containers between American sea ports and inland areas.
- **Domestic traffic (continental traffic)**  
intermodal transport of commodities with origin and destination in North America, employing domestic containers, liftable trailers (semi-trailers), and RoadRailers.

## Intermodal technologies

- Container on Flatcar (COFC):  
Transportation of both marine (ISO) and domestic containers on a flat car (container wagon)



## Intermodal technologies

### ■ Trailer on Flatcar (TOFC):

Movement of a semi-trailer or a container mounted on a chassis on a special flat car (piggyback transport).





## Intermodal technologies

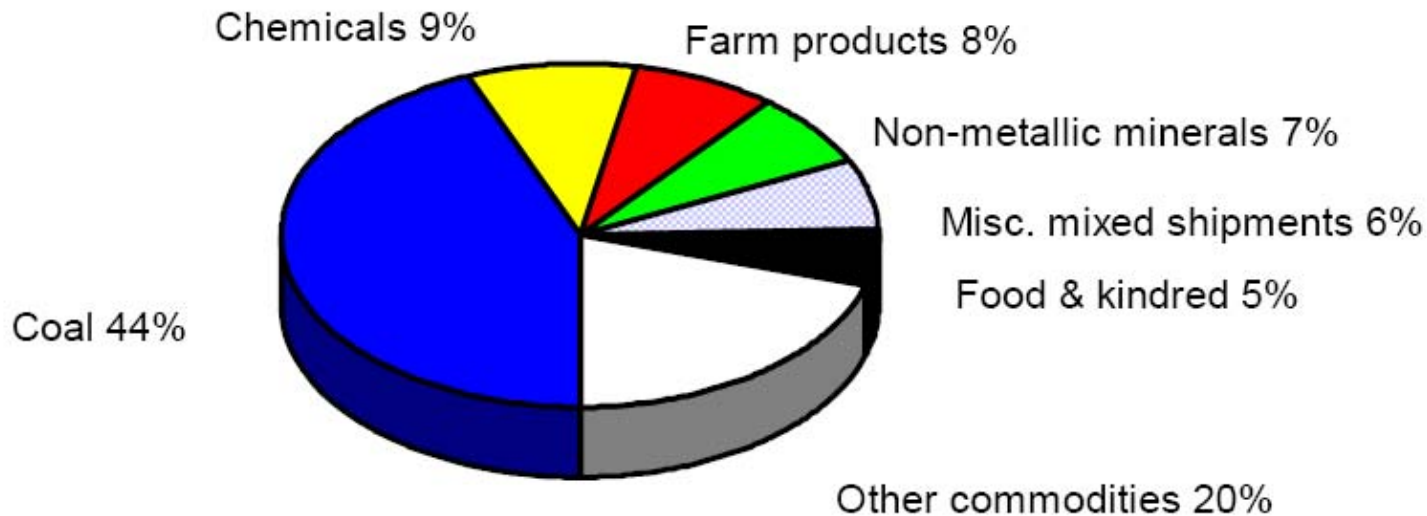
- RoadRailer technology:

Horizontal loading system of special trailer on bogie ;  
operated only by Norfolk Southern subsidiary as separate  
field of business in dedicated services.



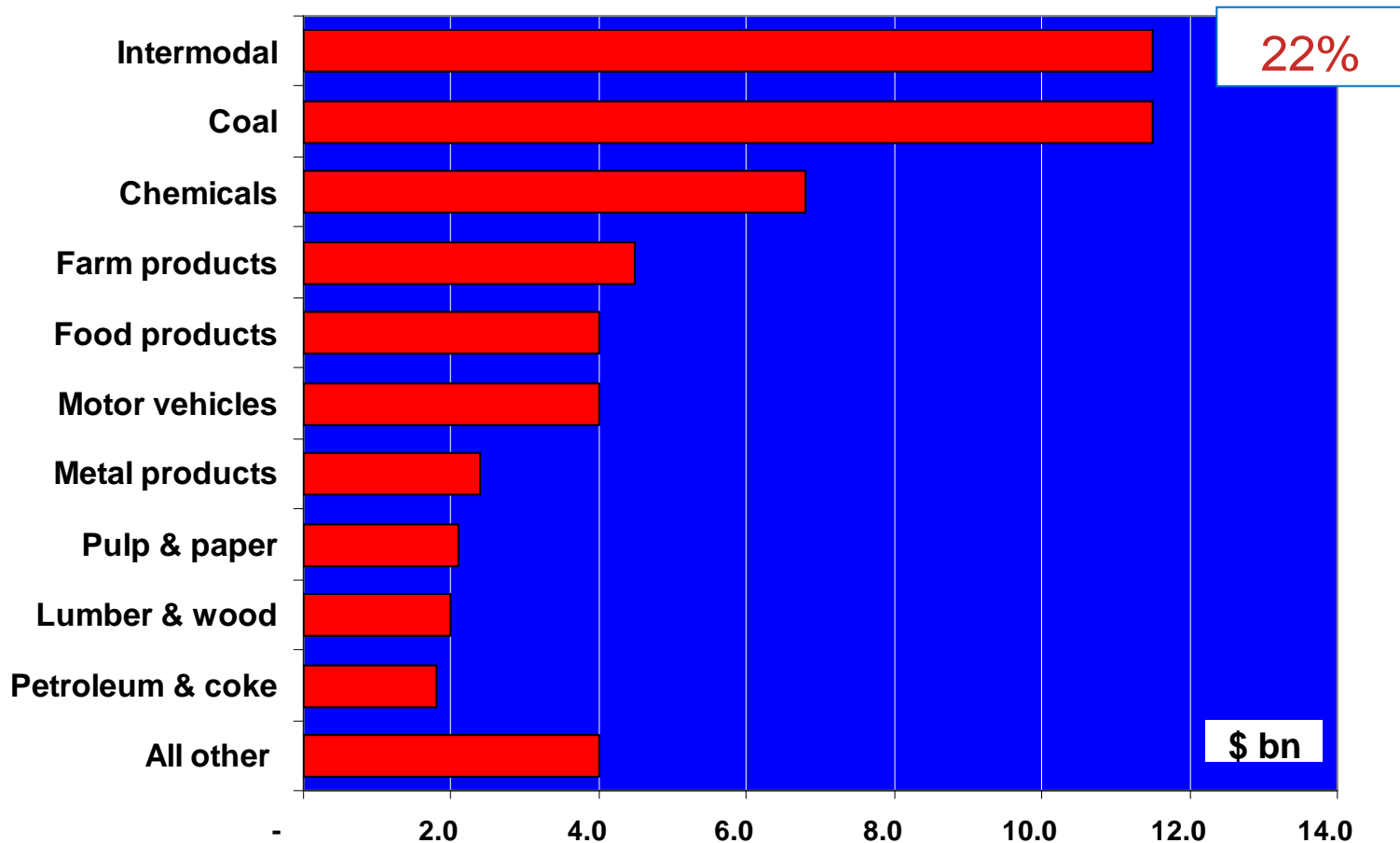
## U.S. Class I freight railways: traffic by commodity group

Tons Originated - 2007



**Intermodal traffic volume:  $\approx$  163m tonnes**

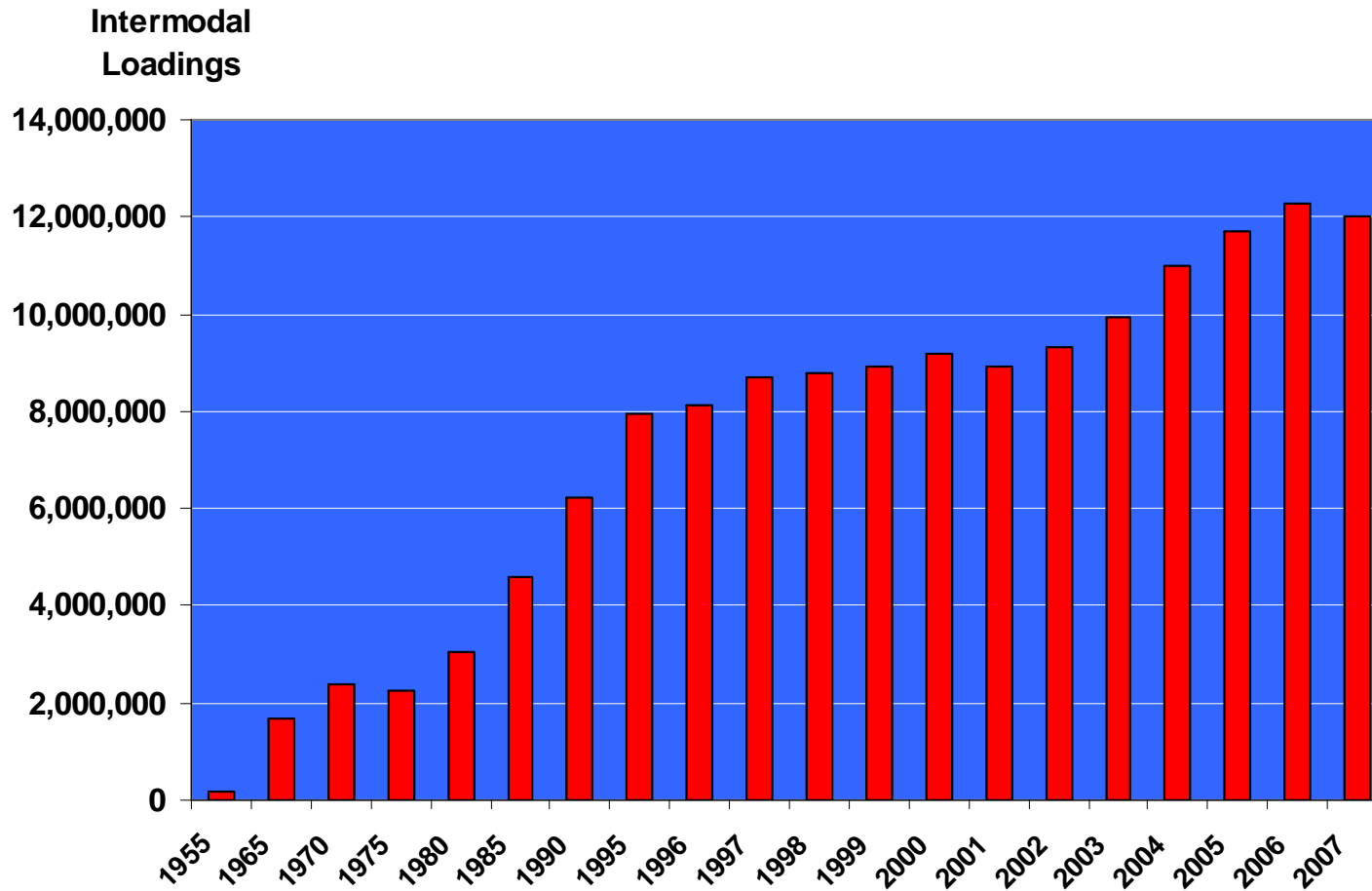
## U.S. Class I railways: gross revenue by type of freight



## Intermodal traffic in North America by markets 2007

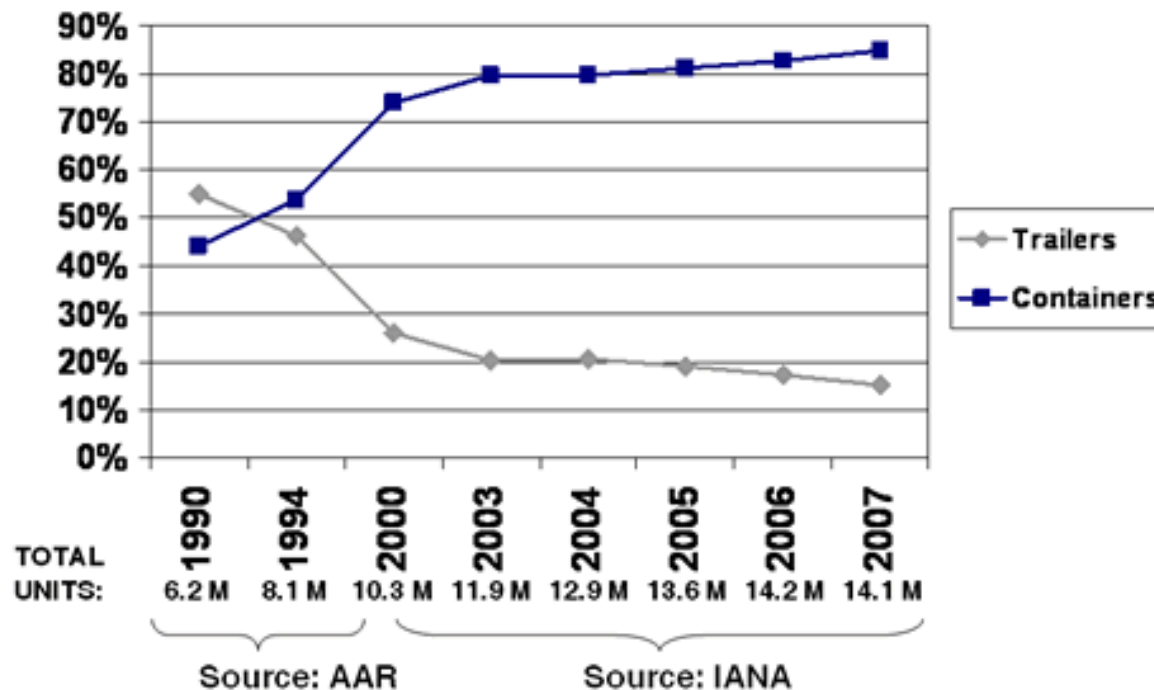
Market segment		Traffic volume	
		Loadings	TEU
Domestic	Containers	3,598,006	4,600,000
	Trailers	2,145,466	9,800,000
	Subtotal	5,743,472	14,400,000
International	Containers	8,335,480	14,300,000
Total intermodal		14,078,952	28,700,000

## Evolution of U.S. intermodal traffic 1955 - 2007



North American intermodal traffic:  
relative decline of trailer due to double-stack efficiency

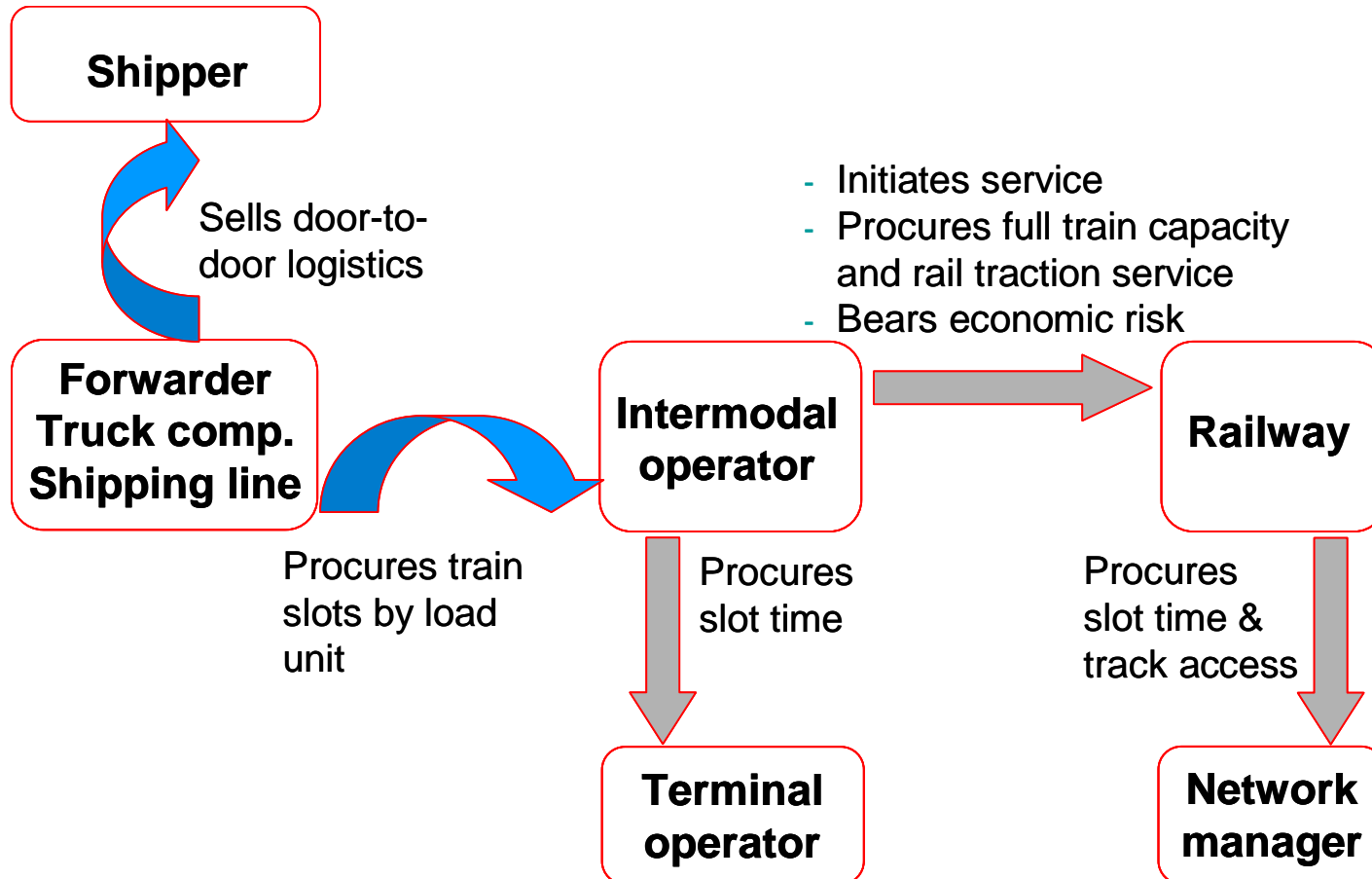
## 18 Year Equipment Trends



## Intermodal traffic in North America and Europe 2007

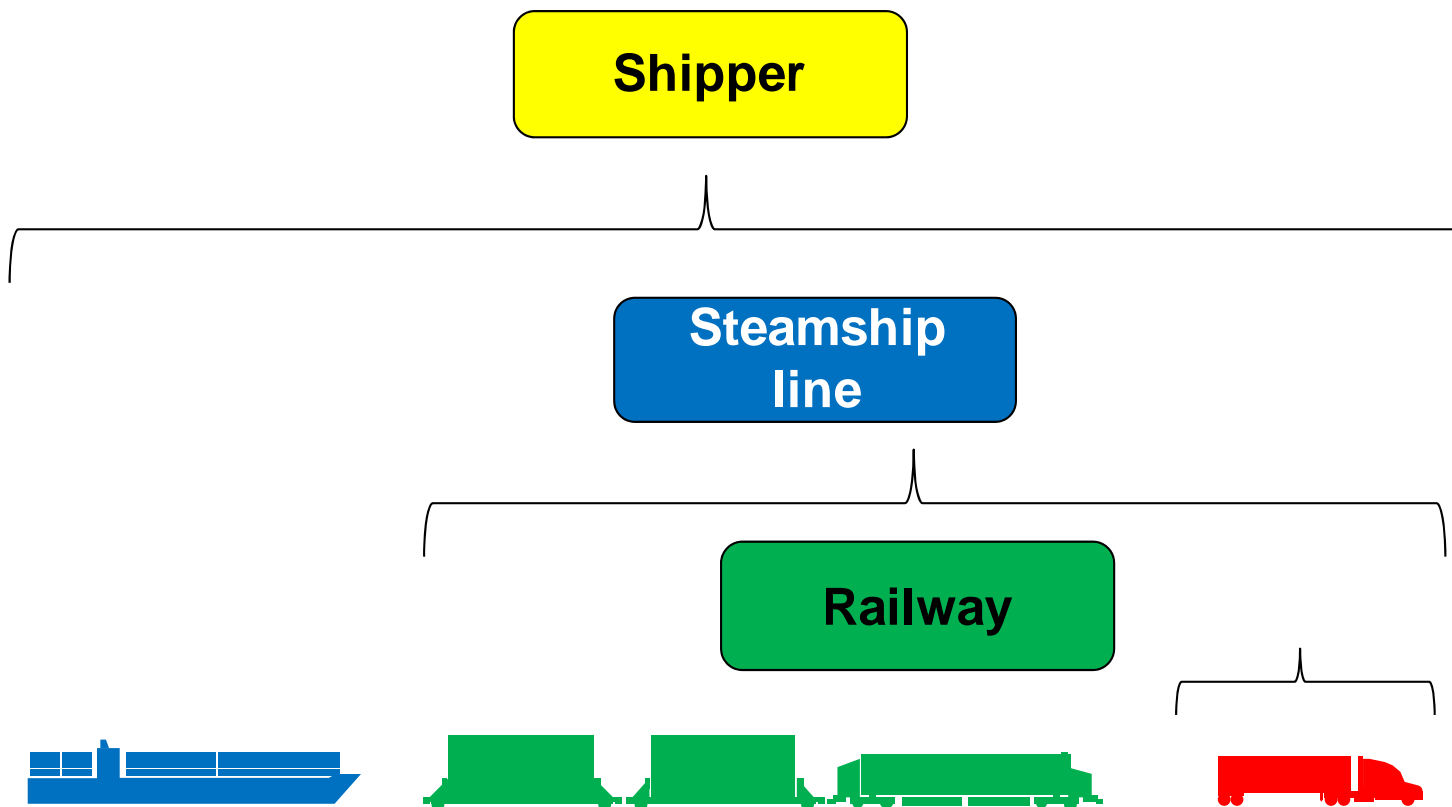
Market segment	Intermodal traffic volume (TEU)		
	North America	USA	Europe
Domestic / Continental	14,400,000	12,900,000	7,352,855
International / Container hinterland	14,300,000	11,800,000	9,759,965
Total	28,700,000	24,700,000	17,112,820

## Main business model in European intermodal traffic

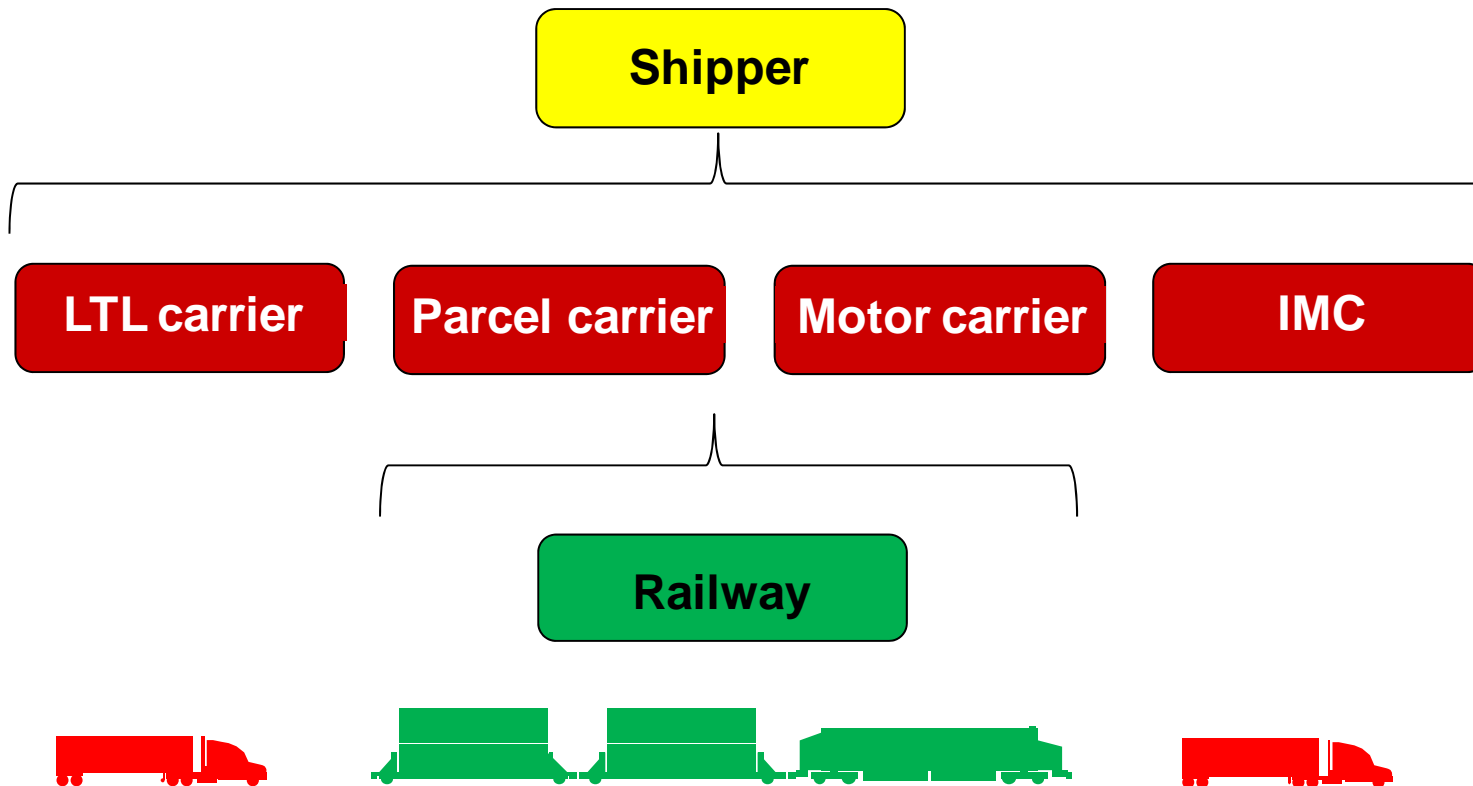




## Business model in U.S. International intermodal traffic



## Business model in U.S. domestic intermodal traffic



## Marketing policy

### ■ International traffic:

- Cost-efficient
- Regular, frequent

### ■ Domestic traffic:

- Time-sensitive
- Distinguished markets
- Cost-efficient



## Marketing policy in domestic traffic

- Partnerships with parcel carriers (UPS) or motor carriers (J.B. Hunt since 20 years!) - also in international traffic with shipping lines (APL) – which systematically shift traffic from road to intermodal:
  - Contributing base load
  - Loadings from other customers used to complete train capacity
- Supply of various service levels differentiated by speed of service (O/D transit time)
  - Premium services usually are geared to high-end customers e.g. parcel and LTL carriers (UPS)
  - Also used by „Express“ marine containers

## Marketing policy in domestic traffic

### ■ Example: BNSF

Trade lane	Distance		Service level	Service time (h)	Ø Speed (km/h)
	(miles)	(km)			
Los Angeles - Dallas	1545	2484	Expedited Service	68	37
			Premium Service	92	27
Los Angeles - Chicago	2120	3409	Expedited Service	59	58
			Premium Service	94	36



## Marketing policy in domestic traffic

- Supply of service levels differentiated by other features:
  - Priority access on train: reserved capacity.
  - Priority cut-off time and time of availability: last in the gate; first off the train - first out of gate.
  - Service guarantee: e.g. full or partly refund of freight rate if schedule is failed.
  - Guaranteed reservations of equipment
  - Proactive service monitoring: if train is running behind schedule the railways keep the customer informed of its status.
  - Subject to next-day rolling: shipments moved in “Standard” service level can be shifted on the next day departure.

## Price policy

- Mostly non-public prices („price authorities“)
- Price differentiation follows service level differentiation  
for domestic services: customer pay a premium for higher  
service levels
- Bill optimizer for international traffic
- Transloading issue at ports: marketing channel conflicts  
between international and domestic traffic

## Price policy

- Numerous surcharges:
  - Surcharge for transport of units carrying hazardous goods.
  - Surcharge for transport of temperature-controlled units.
  - Fuel surcharge: weekly adjusted based on the price index of the U.S. Federal Department of Energy
  - Alameda Corridor surcharge: levied to pay off bond debt & federal loan; e.g. \$38.62 for a loaded 40' seaborne container and \$12.96 for a loaded 53' domestic container or trailer)



## Key indicators of intermodal trains in the U.S.

Performance measures	Max	Top	Standard
Max train length (m)	3,050 (10,000')	1,830 - 2,440 (6-8,000')	1,340 (4,400')
Max speed (km/h)	113	96	-
Max axle weight (tonnes)	31.8		



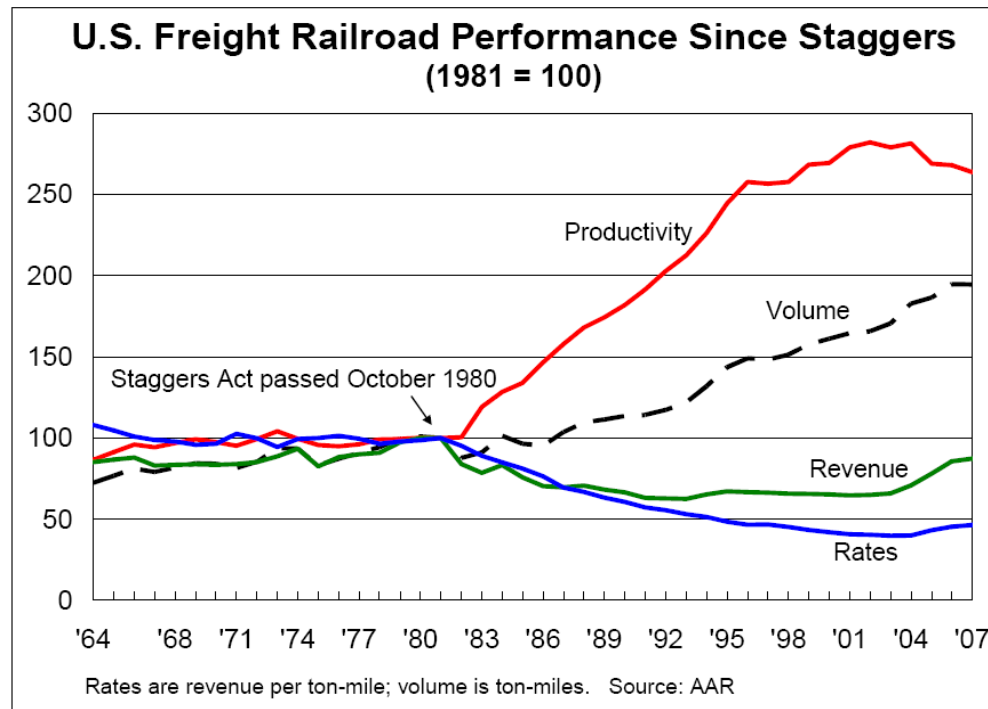
## Key indicators of intermodal trains in the U.S.

Performance measures		East	West
Loading capacity	(TEU)	250 - 350	450 - 600
	(Truckloads)	120 - 170	200 - 280
Length of haul	(km)	1,000 - 1,200	2,500 - 3,500



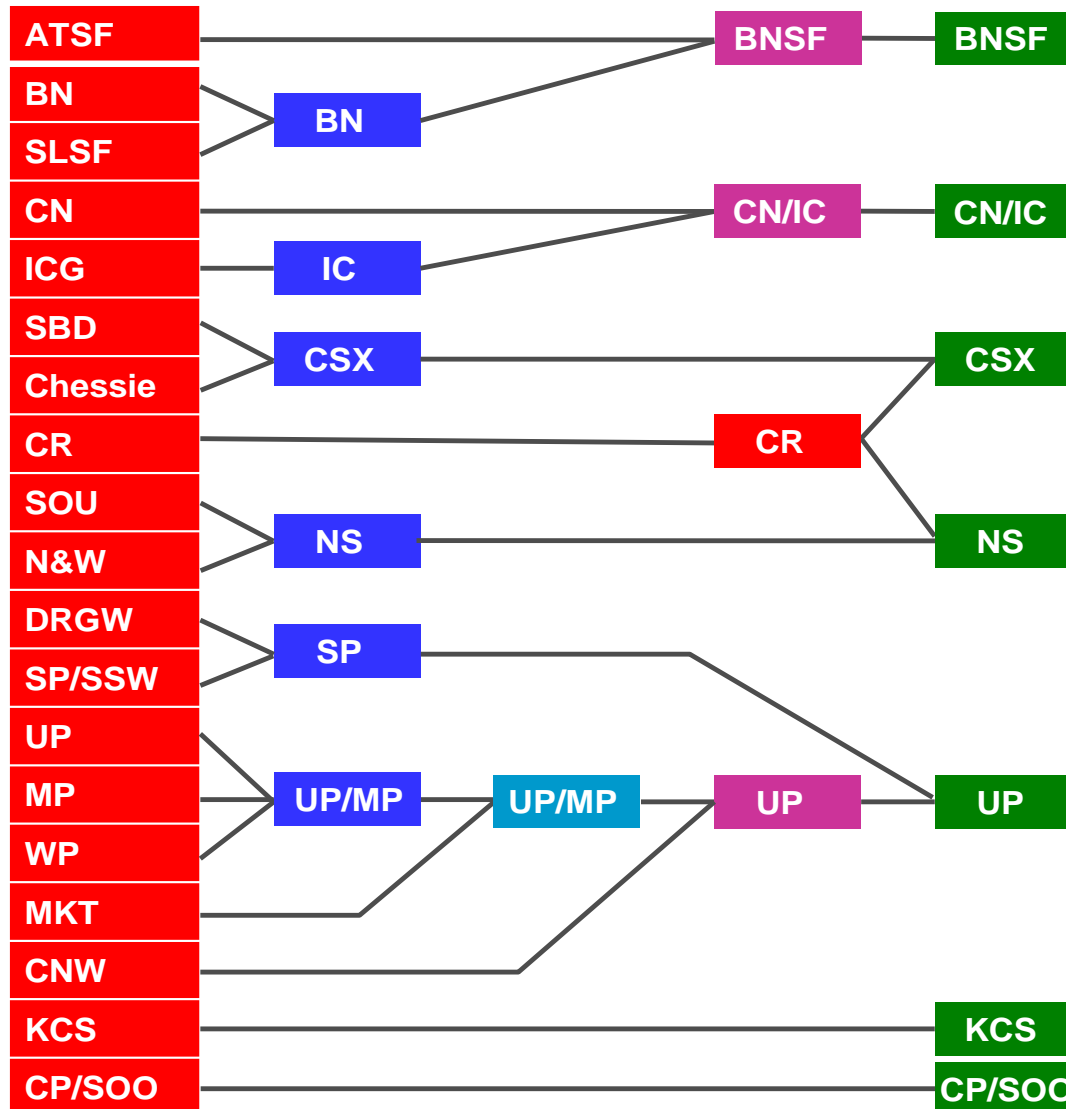
## Key drivers of intermodal growth in the U.S.

- Deregulation of freight rail traffic:
  - Productivity gains;
  - Mergers: economies of scale; reduction of interfaces



# Benchmarking intermodal transport US and Europe

## Mergers between Class I railways



## Key drivers of intermodal growth in the U.S.

- Clear, easy to understand and rather standardized business models and distribution channels
- Intermodal service innovations
  - Dedicated intermodal services
  - Service levels
  - Guaranteed services
  - Partnerships with LSP (parcel & motor carriers, steamship lines)
- Improved performance; goal: 92% rate of punctuality.



## Key drivers of intermodal growth in the U.S.

- Technology innovations
  - Doublestack wagons
  - Shuttle trains
  - IT-based central booking/reservation systems
  - RFID and OCR identification technologies at terminal
- Standardized intermodal equipment



## Key drivers of intermodal growth in the U.S.

- Heavy investments in rail & intermodal traffic:
  - Enlargement of network from single to double or triple track line
  - Raising of clearance (doublestack)
  - Advanced signalling systems (capacity increase)
  - Terminals
  - Intermodal wagons
  - Locomotives



## Key drivers of intermodal growth in the U.S.

- Strong U.S. domestic economy
- Growth of maritime container traffic particularly since 2001: elimination of trade barriers for Chinese products





# THANK YOU



**KombiConsult**  
beraten planen umsetzen

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Chart 43