



# The Challenge of Multimodal Transport Development in China

– Lessons from the U.S.

# China's fast growing logistics and freight sector in a changing economy

In 2015, total freight volume

**42 billion tons**

2.5 times of the US total freight volume

China's freight volume is expected to grow at

**7%**

annually during the 13th Five-Year period ( 2016-2020 )

Logistics costs represent

**16%**

of China's GDP, which is 8-10% higher than developed countries.

Total freight turnover

**180 trillion ton-kilometers**

2 times of the US total freight turnover

China's freight intensity is

**4 X**




bigger than that of the US

Road freight accounts for

**79%**

of the total freight volume in 2013.

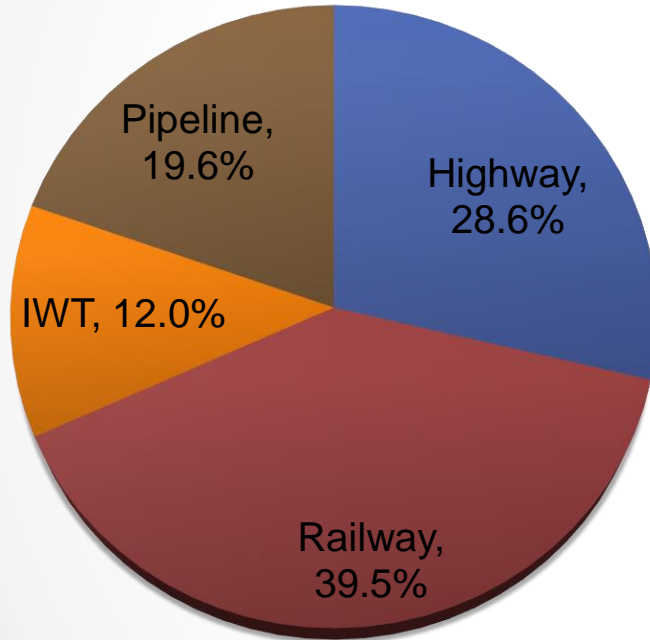
# Infrastructure Development in China and US

	U.S.	China
 Expressway	100,000 km	123,500 km (longest in the world)
 Railway	230,000 km (longest in the world)	121,500 km
 Navigable IWT	42,000 km	127,000 km

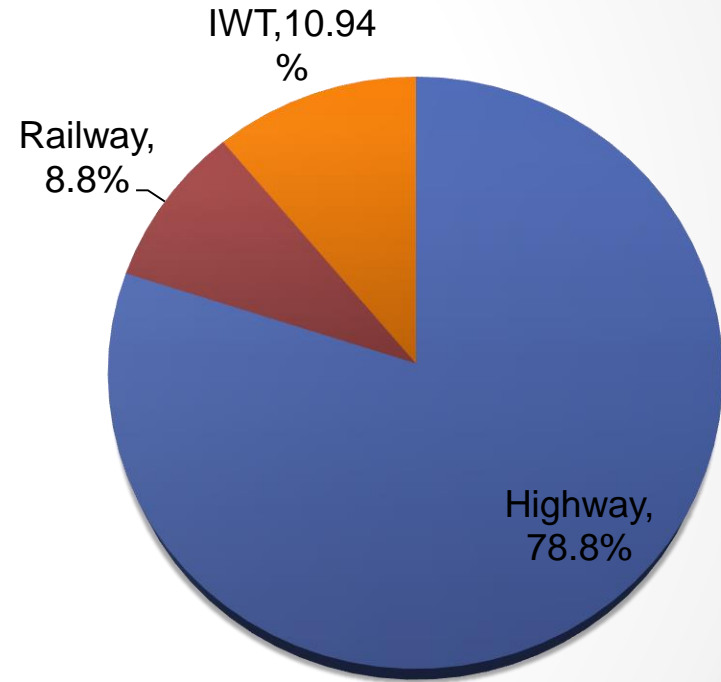
Both U.S. and China have large and similar transport infrastructure network, but the quality of freight transport service differ significantly...

# Modal share comparison

## Total Freight Volume in the U.S



## Total Freight Volume in China



- China's freight relies heavily on highways...

# Containerization rate comparison

Containerization rate in China's is only **2.3%** of the total rail freight volume, versus **49%** of the U.S.



In the US, port-railway intermodal transport accounts for more than **20%** of the port container freight;

In China, the port-railway transport accounts for **0.3%** of the port container freight.



# Trucks – in China versus U.S

- **In China**, The trucking industry consists mainly of small businesses (one to three trucks); many **old trucks** are still in operation.
- **No standard** vehicle configuration exists: Over 20,000 types of freight vehicles manufactured in China and less than 20 percent of them are containerized.



- **In the U.S**, the trucking equipment are characterized by **large-scale**, **specialization** and **standardization**.

# Other Challenges of intermodal freight in China

- **lack of efficient freight hubs** to facilitate seamless intermodal transport, which causes a missing link between various transport modes.



Ying Nan International logistics center is 32km far from Ying Nan South Railway station



- **Inadequate standardization of equipment**, making the interconnection between modes inefficient.

- **Insufficient sharing of Information.** Information of intermodal transport is fragmented and not shared among various stakeholders.



# Lessons and Experience from the US Intermodal Transport System

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# Lesson 1: Establishment of Market Oriented Railway System

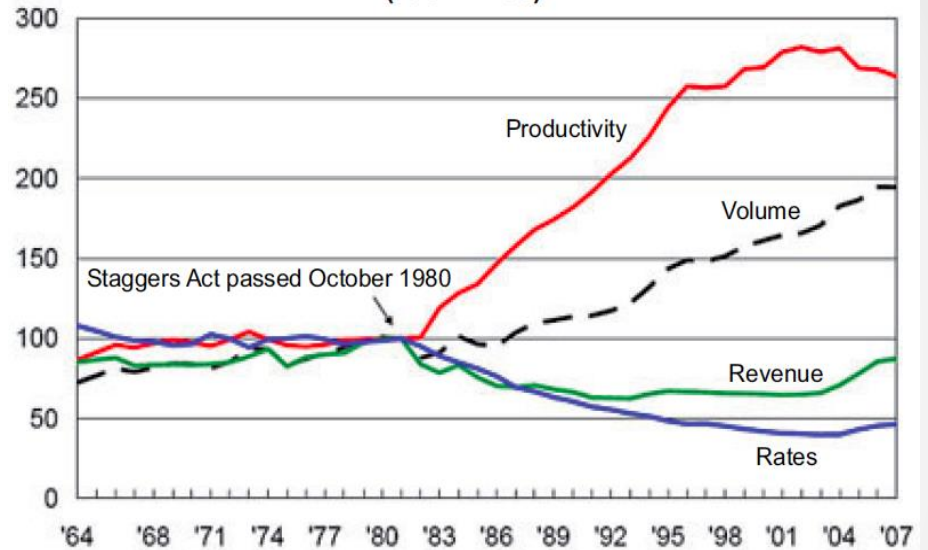
## **Staggers Rail Act of 1980 Deregulated the Railway Sector in the US.**

- Railways permitted to charge any rate according to market needs or opportunities
- Railways permitted to determine the most efficient routing for shipment
- Interstate Commerce Commission (ICC) authorized to exempt traffic from regulation except to prevent abuse of rail's market power. **On this basis, all intermodal traffic was exempted in the early 1980s.**

# Staggers Rail Act

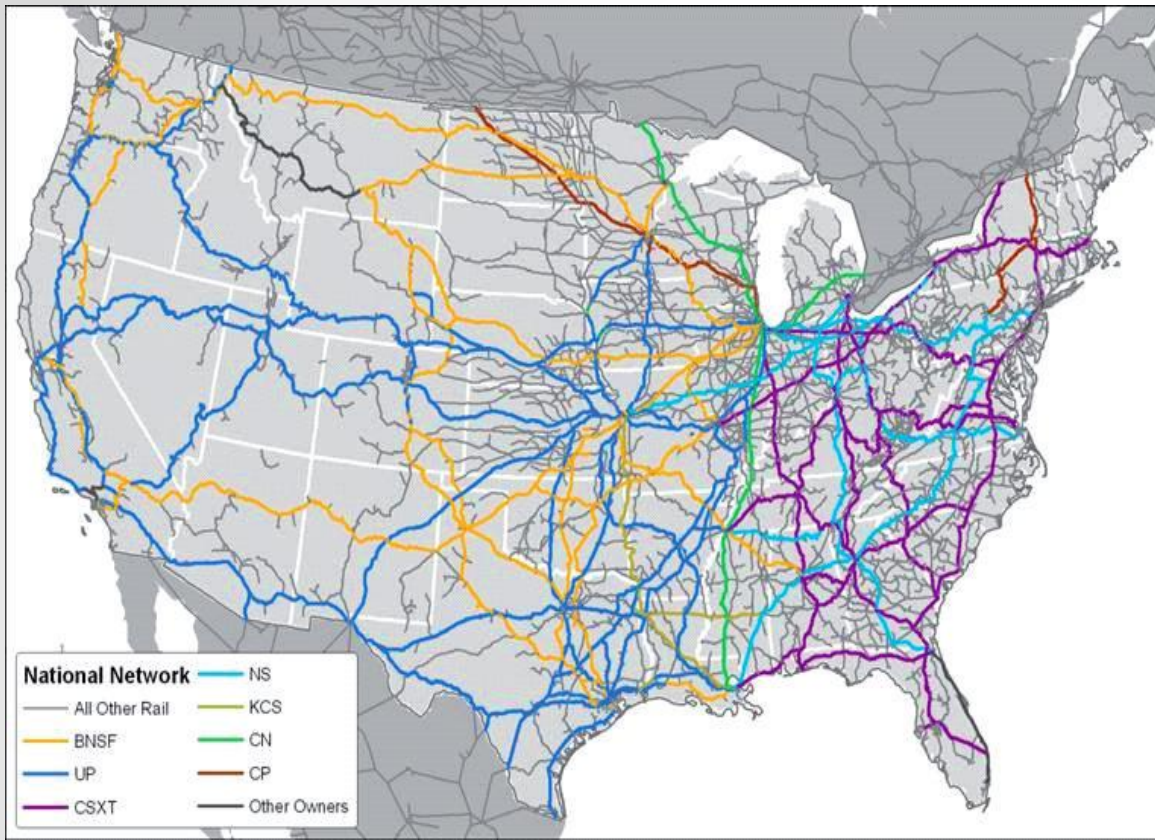
- In the U.S., rail freight traffic declined after the WWII. From 1950 to 1980 rail's market share dropped by 33%.
- The real break-through, came when the U.S. Congress passed the **Staggers Rail Act** in October 1980.

U.S. Freight Railroad Performance Since Staggers  
(1981 = 100)



Rates are revenue per ton-mile; volume is ton-miles. Source: AAR

Due to an increased flexibility and economic freedom freight railways were able to design services more to customer needs, quote market-based freight rates and deal with their infrastructure as required. As a result, the total volume measured in revenue ton miles doubled in the post-Staggers era.



The deregulation under the Staggers Rail Act has restored the **competitiveness** and **viability** of rail freight services.

**This process has fundamentally changed the market structure.**

Today, there are only **7** Class I railways in contrast to about **40** in 1980.

Among these, BNSF, UP, CSXT and NS account for **89%** market share.

Source: AAR/Cambridge Systematics: National Rail Freight Capacity Study, 2007

**Consolidation** of the U.S. freight rail industry has generated substantial productivity gains. The creation of large networks enables railways managing the infrastructure much more efficiently by achieving economies of scale.

# Lesson 2: Applying New Operational Model and Standardized Equipment

**Container on Flatcar (COFC)** is the transportation of both marine and domestic containers on a flat car. American railways emphasize that the COFC movement is made without the container being mounted on a chassis



Source: KombiConsult



Source: BNSF

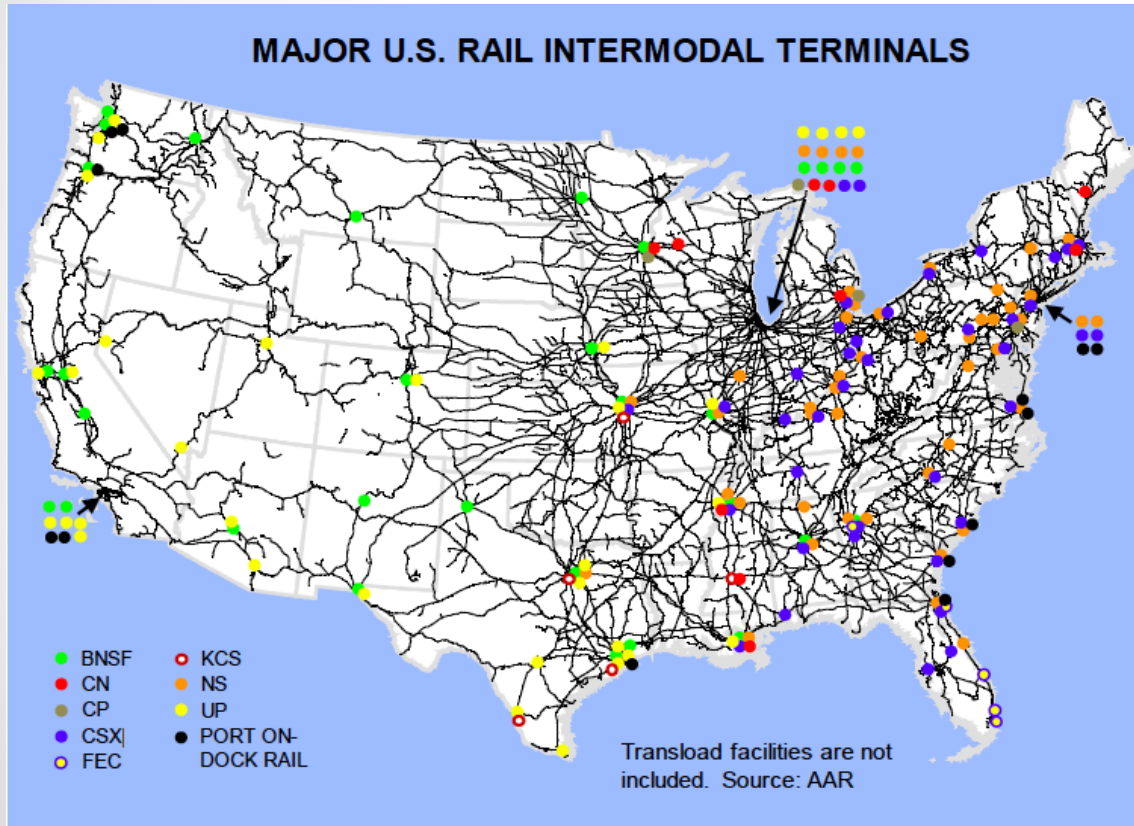
**Trailer on Flatcar (TOFC)** is the movement of a semi-trailer or a container mounted on a chassis on a special flat car.

**Double-stack** is the movement of containers on articulated wagons, which enables one container to be stacked on another. This production system has effectively revolutionized intermodal transport, and massively boosted rail productivity by allowing for the movement of virtually double the number of containers within the same train length





# Lesson 3: Investing on Key Intermodal Terminals



The overwhelming majority of intermodal terminals in the U.S. are owned by the major freight railways. They are part of the fully-integrated private railways.

These facilities have been built and completely financed by them. In most cases the railways do not only control but also manage the terminals themselves using their own staff.

- **Truck Traffic Management.** The intermodal terminal are well designed for the traffic management to avoid interferences with internal movements.
- **Current U.S. terminals feature a wheel-based operation.** Every intermodal loading unit is parked on wheels on the interim parking spot. This is self-evident for a trailer, but containers remain on the chassis used for their road conveyance



UP intermodal terminal ICTF Los Angeles

# Lesson 4: Focusing on Key Corridors: Alameda Corridor

The **Alameda Corridor** is a 20-mile (32 km) freight rail “expressway” that connects the national rail system near downtown Los Angeles to the ports of Los Angeles and Long Beach, running parallel to Alameda Street. One important use of the corridor is to carry cargo containers to and from the ports.

The Alameda Corridor allows trains to bypass 90 miles (140 km) of early 20th-century branch line along a high-speed grade-separated corridor, avoiding more than 200 street-level railroad crossings where automobiles previously had to wait for lengthy freight trains to pass.



# Conclusion

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

1. Deregulation of rail freight traffic:
  - Productivity gains
  - Mergers: economies of scale; reduction of interfaces
2. Commercially oriented development
  - Dedicated intermodal services
  - Qualified service levels
  - Partnerships with logistics service providers
3. Technological innovations
  - Double-stack
  - IT-based central booking/reservation systems
  - RFID and OCR identification technologies at terminal
  - Standardized intermodal equipment
4. Intensely used freight corridors
  - Enlargement of network
  - Well-designed intermodal terminals
  - Intermodal wagons



# World Bank –MOT Initiative for Intermodal Freight and Logistics Development

## National Level

1. Promoting an efficient intermodal freight transportation system in China
  - *Introducing harmonized standards for equipment, documentation and information systems used to move freight across different modes*
  - *strengthening national institutions and stakeholder participation in freight transportation and logistics*
2. Intermodal Freight Strategy for the Yangtze River Economic Belt
3. Development of Action Plan for Efficient and Green Freight Corridor Improvement
  - *improving the capacity and efficiency of the major freight corridors*
  - *improving service levels and integration at selected intermodal freight nodes/hubs*
4. Truck Traffic Management Improvement in Ports.

## Local Level

The World Bank is also committed to providing financing support and technical assistance to the multimodal transportation related pilot projects at local level, such as:

1. **Xia Men:** *An intermodal freight hub is currently under construction outside of Xiamen Port (20 km from the port) to serve as an inland port to process incoming and outgoing freight to Xiamen Port. . The freight hub will facilitate intermodal transport among sea, rail and road and connect the Xiamen Port to the major freight corridor serving Fujian and Jiangxi province.*
2. **Yan Tai:** *An intermodal transport system consisting of freight hubs in Yantai and Dalian and ship services across the Bohai Bay is currently being developed, which will reduce the distance between Yantai and Dalian from 1400 kilometers by road to 165 kilometers by sea. Drop-and-pull transport will be implemented so that only the container trailer will be shipped across the bay and towed by a tractor at the freight hub.*
3. **Hubei provincial:** The World Bank is providing a US\$150 million loan to support the construction of the Yakou Navigation-Hydropower Complex to upgrade the waterway capacity on Han River in support of inland waterway development, and also supporting the Hubei government to improve inland waterway transport utilization and intermodal connectivity for the Han River.

# Thanks !

