

# RAIL FREIGHT

Environmentally Friendly

## What is Rail Freight?

Rail freight transport is the use of railroads and trains to transport cargo as against to human passengers.

Shipping freight by rail is often a less expensive alternative to over-the-road (OTR) transportation which can help companies to significantly cut their overall transportation costs. Along with cutting freight costs, rail shipping is a long-term supply chain solution that can provide door-to-door service and economic value for businesses looking to keep pace with increasing consumer demand.

A freight train, cargo train, or goods train is a group of freight cars or goods wagons (International Union of Railways) hauled by one or more locomotives on a railway, transporting cargo all or some of the way between the shipper and the intended destination as part of the logistics chain. Trains may haul bulk material, intermodal containers, general freight or specialized freight in purpose-designed cars. Rail freight practices and economics vary by country and region.

Also, since less carbon-based fuel is used when rail shipping, it is also better for the environment.

When considered in terms of ton-miles or ton-kilometers hauled per unit of energy consumed, rail transport can be more efficient than other means of transportation. Maximum economies are typically realized with bulk commodities (e.g., coal), especially when hauled over long distances. However, shipment by rail is not as flexible as by the highway, which has resulted in much freight being hauled by truck, even over long distances. See the Rail Freight show in Figure 1.1.



Figure 1.1. Rail Freight

Moving goods by rail often involves transshipment costs, particularly when the shipper or receiver lack direct rail access. These costs may exceed that of operating the train itself, a factor that practices such as containerization aim to minimize.

There are two major types of rail freight

- Intermodal rail freight
- Bulk rail freight

**Intermodal rail freight** the transportation of shipping containers and truck trailers by rail allows railroads to provide their customers cost-effective, environmentally friendly service for almost anything that can be loaded into a truck or a container.

Customers receive the flexible service that trucks provided, but at a competitive rate only rail intermodal can offer. The general public benefits, too, from the reduction in highway crowding and harmful discharge and from the reduced cost of moving goods to market. Starting with the advent of the modern shipping container in the 1950s, freight railroads have invested heavily to build the world-class intermodal rail network that secure global competitiveness: See the Intermodal rail freight show in Figure 1.2.

- New and expanded intermodal terminals at ports and internal use advanced technologies to transfer containers to and from trucks in minutes.
- Additional track capacity and advanced signaling systems allow for faster, more frequent intermodal trains.
- Bridge and tunnel improvements accommodate the additional height that double stack trains require.
- New locomotives and intermodal flat cars handle traffic growth.



Figure 1.2. Intermodal rail freight

Most importantly, intermodal rail has benefited rail customers with competitive rates and unmatched efficiency of scale. Thanks in part to intermodal freight rail, average rail rates have fallen 46% since 1981 allowing most rail shippers to move nearly twice as much freight for the same price paid more than 30 years ago. Freight rail remains committed to maintaining and growing the most cost-effective and efficient intermodal rail network in the world.

**Bulk rail freight** Bulk cargo constitutes the majority of tonnage carried by most freight railroads. Bulk cargo is commodity cargo that is transported unpackaged in large quantities. These cargo are usually dropped or poured, with a spout or shovel bucket, as a liquid or solid, into a railroad car. Liquids, such as petroleum and chemicals, and compressed gases are carried by rail in tank cars. See the Bulk rail freight show in Figure 1.3.

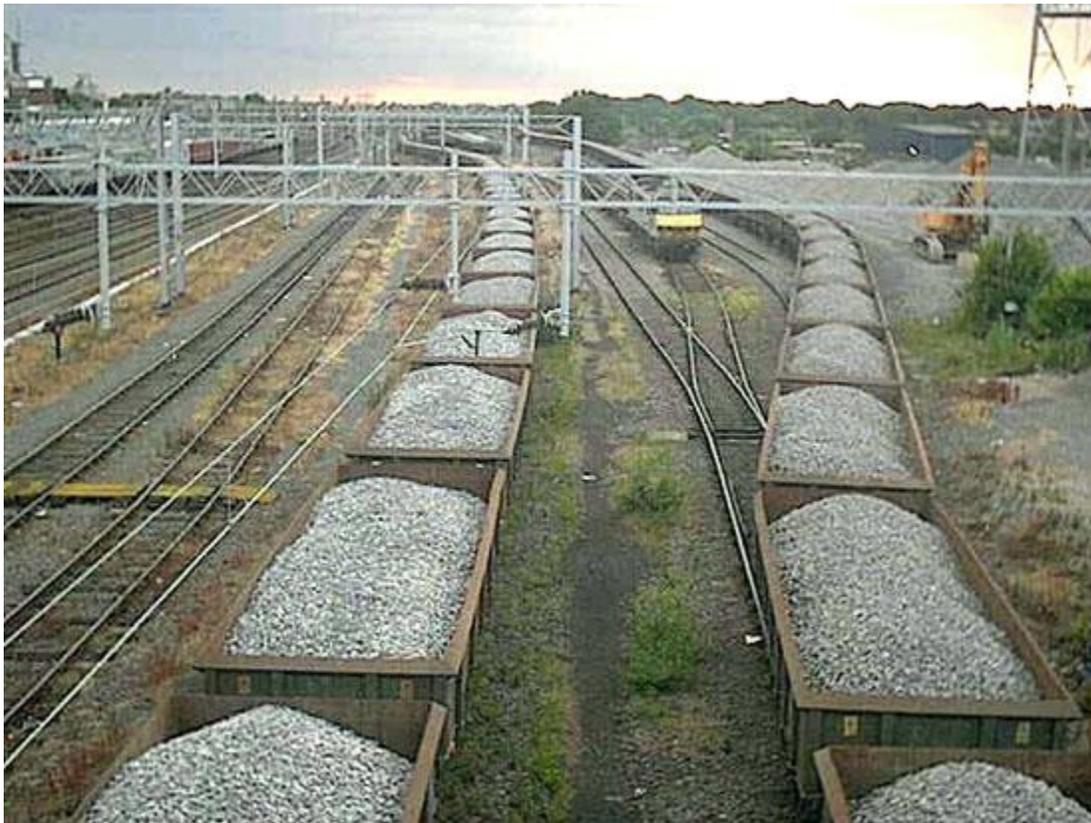


Figure 1.3. Bulk rail freight

Hopper cars are freight cars used to transport dry bulk commodities such as coal, ore, grain, track ballast, and the like. This type of car is distinguished from a gondola car (US) or open wagon (UIC) in that it has opening doors on the underside or on the sides to discharge its cargo. The development of the hopper car went along with the development of automated

handling of such commodities, with automated loading and unloading facilities. There are two main types of hopper car:

- Open hopper car
- Covered hopper car

**Covered hopper cars** are used for cargo that must be protected from the elements (chiefly rain) such as grain, sugar, and fertilizer.

**Open hopper cars** are used for commodities such as coal, which can get wet and dry out with less harmful effect.

Hopper cars have been used by railways worldwide whenever automated cargo handling has been desired. Rotary car dumpers simply invert the car to unload it, and have become the preferred unloading technology, especially in North America; they permit the use of simpler, tougher, and more compact (because sloping ends are not required) gondola cars instead of hoppers.

### **Advantages of Rail Freight**

- Rail transport can be cost effective.
- Shipping via train is more environmentally friendly.
- Trains are capable of hauling large loads.
- Railways are reliable.
- Rail freight can be efficient.
- Rail options provide you with access to capacity.
- Increased security and a reduced risk of a weather delay and cargo loss

### **Functions of Rail Freight**

- Modal shift, improved capacity and throughout.
- Expand market area, reduce distribution costs and congestion.
- Long distance container flows, continually of global commodity chains.
- Integrated global transport chains.

### **Types of Rail Freight**

**Short distance** Conventional transport economics underlines that rail is not a very suitable mode for short distances. Short distance rails corridors are thus established under very specific circumstances, namely where there is acute congestion and a modal shift to rail is required to improve the capacity and throughput of a gateway or hub. This often concerns on-dock rail facilities where containers are exiting / entering a port terminal on rail instead of on truck, but the destination of these rail shipments often goes much further inland. The

Alameda corridor is an example of a short distance rail corridor of 20 miles (32 km) aiming at expanding the throughput of the San Pedro port cluster by shifting away containerized traffic from trucks. The Panama Canal Railway is a dedicated corridor for maritime shipping lines to shuffle containers to and from the Atlantic to the Pacific side of the canal.

**Hinterland access** the rail corridor is a strategy to expand the market area of a gateway, often linking on-dock rail facilities to an inland terminal facility where containers are moved to trucks to their final destination. It is particularly suitable with dense hinterlands such as along the Rhine/Scheldt delta. Over a longer distance, a network of inland ports can emerge.

**Land bridge** a land bridge is a long distance continental rail corridor linking gateways which ensures the continuity of global supply chains. The North American land bridge is mainly the outcome of growing transpacific trade and has undergone the containerized revolution; container traffic represented approximately 80% of all rail intermodal moves. Land bridges are particularly the outcome of cooperation between rail operators wishing to capture long distance traffic and shippers wishing to reduce shipping time and costs, as well as having additional options to route cargo.

**Circum-hemispheric** Such systems of circulation go beyond rail corridors to integrate a sequence of maritime and land transportation corridors in a seamless fashion. A circular transport chain across a hemisphere is thus established. Such corridors are emerging, with the Northern East-West Corridor initiative (spearheaded by the International Union of Railways), connecting the Atlantic with the Pacific through the trans-Siberian has been in the design phase for decades. The “Belt and Road” initiative (spearheaded by the Chinese government) has a similar objective, but mostly focused in Central and South Asia. In addition to rail corridors, it also includes a maritime transportation component (dubbed the maritime silk road) connecting China, Southeast Asia, South Asia and Eastern Africa.