

The use of automated trucks on long-haul routes has the potential to provide equal or lower cost, higher velocity and greater reliability, compared to intermodal rail. This creates an opportunity for modal conversion from intermodal to truck for moves of greater than 600 miles.

A shift of containers from intermodal rail to highway would move traffic from a rail system that generates negligible congestion for motorists, and in which the infrastructure is privately funded, to a highway system that is already congested, and in which the tax revenues collected for maintenance fall short of the funds needed to maintain the system. Carbon emissions would rise as a result of such a shift, given that rail uses about 40% of the fuel per ton-mile used by trucks.

Loads Originated (M)		
Country	2016	2017
Canada	3.08	3.45
Mexico	0.57	0.59
USA	13.49	14.01
Total	17.14	18.05

The volumes are substantial. North American railroads handle over 18 million intermodal container and trailer loads each year. More than 4 million long-haul import loads move by rail from the West Coast, across sparsely populated areas to consumption zones in the Eastern U.S. In these lanes, automated trucks have the potential to be an operational fit in several ways.

1. Rail intermodal traffic is generally over 600 miles in length, which is more than one 11-hour driver day. This length of haul is beginning of the range in which intermodal is currently desirable. Removing the driver from the truck cab increases the miles per operating day, moving the modal indifference point to beyond 600 miles.
2. Rail intermodal is based on a terminal to terminal system, in which containers are offloaded at intermodal ramps and placed onto trucks for final delivery. One model of automated truck operations is based on terminal-to-terminal linehaul movement of driverless trucks, combined with terminal to receiver movement of the load using a human driver. For current intermodal freight, transition to a terminal to terminal trucking system should have no negative impact on shipper service levels.
3. Major trucking companies and freight forwarders already make the intermodal versus truck choice for their customers, so mode selection and order execution systems are already in place, making the selection of an automated truck seamless for customers.
4. Automated trucks will offer capacity fungibility across multiple routes in ways that intermodal cannot. Intermodal rail has an inflexible network. Automated trucks could move to their next loaded opportunity by use of the highway system, without having to return a long-haul driver (or a train crew member) to his home terminal on a regular basis.

Shifting 1 million loads (25% of the West Coast, East-bound import intermodal traffic) to highway movement would add 30 to 45 Billion revenue ton miles of truck freight per year to the Western highway systems.

Complete treatment of the economics requires looking beyond the private, firm-level direct costs of automated trucking. The additional public modal-conversion costs for carbon output, highway maintenance, safety investments and lane capacity should be included in the overall economic analysis of autonomous trucking.

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