

Overview of Carrier Strategies

Truck and rail transportation provides a cost-effective means to transport much of America's freight.

There are simple actions that can be taken to make ground freight more efficient and cleaner for the environment.

The technologies presented in this overview and practices can help truck carriers save fuel and money, reduce air pollution, and cut carbon dioxide emissions that contribute to climate change.

Idle Reduction

An idling truck burns nearly 0.8 gallons of diesel fuel per hour. Reducing unnecessary idling could save each truck more than \$3,000 in fuel costs, reduce air pollution, and cut more than 9 metric tons of carbon dioxide annually.

- ▶ On-board idle reduction systems include auxiliary power units that provide electricity to the cab, direct-fired heaters and coolant systems that provide temperature control, and programmable automatic engine shut-off systems.
- ▶ Truck plazas equipped with truck-stop electrification systems allow trucks to draw electrical power and in some cases heating, cooling, telecommunication, and Internet hookups from a ground source.

Improved Aerodynamics

Reducing the aerodynamic drag of a typical line-haul combination truck by 20 percent could cut annual fuel use by more than 1,600 gallons, save over \$6,000 in fuel costs, and eliminate more than 16 metric tons of carbon dioxide.

- ▶ Tractor aerodynamics can be improved by adding integrated roof fairings, cab extenders, side fairings, and aerodynamic bumpers. New truck buyers can purchase aerodynamic models with streamlined profiles.
- ▶ Trailer aerodynamics can be improved by minimizing tractor-trailer gaps; adding side skirts and rear air fairings; and arranging cargo and tarpaulins as low, taut, and smooth as possible.
- ▶ Single-unit trucks can be improved with rounded air deflectors or by purchasing new streamlined models.

Improved Freight Logistics

Improved logistics can reduce a truck's empty miles. Eliminating a line-haul truck's empty miles could save \$4,500 in fuel and reduce 12 metric tons of carbon dioxide annually.

- ▶ Improved logistics include load matching, more efficient routes and delivery schedules, and improved shipping and receiving practices.
- ▶ A carrier may employ low-cost options such as triangular routing, coordinating loads with other fleets, and checking electronic load boards, or the carrier may purchase freight broker services and logistics software.

Automatic Tire Inflation Systems

Retrofitting a line-haul truck with an automatic tire inflation system could save 100 gallons of fuel annually and reduce tire wear and maintenance while eliminating 1 metric ton of carbon dioxide.

- ▶ Truck fleets that find it too difficult or expensive to regularly monitor tire pressure should consider installing automatic tire inflation (ATI) systems on drive and trailer tires.



For more information on SmartWay, please visit www.epa.gov/smartway or call 734-214-4767.

- ▶ An ATI system used on a typical line-haul truck can generally pay for itself in just over three years while decreasing the risk of expensive tire failure caused by underinflation.

Single Wide-base Tires

Specifying single wide-base tires on a new combination truck could save \$1,900 and reap annual fuel savings of 3 percent or more while cutting carbon dioxide by more than five metric tons.

- ▶ Single wide-base tires save fuel by reducing vehicle weight, rolling resistance and aerodynamic drag. These tires can also improve tank trailer stability by allowing the tank to be mounted lower.
- ▶ There are several single wide-base tire models from which to choose, plus these tires can be retreaded.

Driver Training

Even highly experienced drivers can boost their skills with training potentially raising fuel economy by 5 percent or more, which would save \$3,000 in annual fuel costs and cut 8 metric tons of carbon dioxide.

- ▶ Effective driver training programs can improve fuel economy by 5 percent or more. Some reports indicate that fleets could achieve a 10 percent fuel economy improvement through driver training and monitoring.
- ▶ Among other techniques, drivers learn progressive shifting, engine speed optimization, idle reduction, smoother braking and acceleration, anticipatory driving, speed control, and optimal gearing.

Low-Viscosity Lubricants

When used in a line-haul truck, synthetic engine and drive train lubricants can improve fuel economy by up to 3 percent, saving nearly 500 gallons of fuel and cutting up to 5 metric tons of carbon dioxide annually.

- ▶ Low-viscosity synthetic or semi-synthetic lubricants flow more easily and withstand the extreme pressure of engine, transmission, and drive train systems better than conventional mineral oil blends.
- ▶ The operator of a typical line-haul truck can save up to \$5,500 annually by switching to low-viscosity lubricants, with additional savings possible due to reduced wear and maintenance of truck systems.

Intermodal Shipping

Intermodal freight transport combines the best attributes of both truck and rail shipping. A freight train emits two-thirds less greenhouse gas emissions for every ton mile than a typical truck.

- ▶ Carriers can maximize resources by using freight trains to handle the long-distance portion of a freight move, especially for less time-sensitive cargo that is shipped over 500 miles.
- ▶ Intermodal options include trailer on flat car (TOFC), container on flat car (COFC), double stack service, rail bogeys and dual-mode trailers, and rail platforms that can accommodate standard trailers.

Longer Combination Vehicles

A freight truck using longer or multiple trailers can haul more cargo than a standard combination truck, potentially saving more than \$13,000 in fuel costs and 34 tons of carbon dioxide on a ton-mile basis annually.

- ▶ Common longer combination vehicle (LCV) configurations include the Rocky Mountain Double, Turnpike Double, Triple, and Eight-Axle Twin Trailer.
- ▶ A motor carrier operating in states that permit LCVs can reduce the number of trips required to haul a given amount of freight—saving time and money and reducing emissions.

Reduced Highway Speed

A line-haul truck that reduces its top speed from 65 to 60 miles per hour could cut its annual fuel bill by nearly \$4,900 while eliminating almost 13 metric tons of carbon dioxide.

- ▶ Reducing highway speed also reduces engine and brake wear, which cuts down the cost and frequency of maintenance service and keeps revenue earning equipment on the road longer.
- ▶ Any truck carrier can adopt a speed management policy at little or no cost. The most successful speed reduction policies combine electronic engine controls with driver training and incentives.

Weight Reduction

Reducing 3,000 pounds from a line-haul truck by using lighter-weight components could save up to 240 gallons of fuel annually and eliminate more than 2 metric tons of carbon dioxide.

- ▶ Aluminum alloy wheels, axle hubs, clutch housings, and cab frames can trim hundreds of pounds from a truck tractor. Downsizing to a smaller engine can also provide significant weight savings.
- ▶ Thousands of pounds can be reduced from a truck trailer using aluminum roof posts, floor joists, upright posts, and hubs and wheels.

Hybrid Powertrain Technology

Hybrid vehicles can provide roughly \$1,000 in fuel savings and cut carbon dioxide up to 4 metric tons per year when used in stop-and-go freight applications such as parcel delivery service.

- ▶ Hybrid vehicles have two propulsion power sources, making it possible to capture energy otherwise lost during braking. These power sources boost main engine, which in turn runs more efficiently.
- ▶ Most hybrid vehicles use an internal combustion engine for the main power source with various secondary power and energy storage configurations, including electric and hydraulic systems.