



# Green Transport Partnership

## A Glance at Clean Freight Strategies: Weight Reduction

### What is the challenge?

According to the Energy Information Administration, U.S. freight trucks used over 35 million gallons of diesel fuel in 2001. Truck fuel consumption increases with the weight of the vehicle. Many standard truck components are made of heavier material, such as steel, without weight savings in mind. Heavier trucks require more fuel to accelerate and to climb hills, and may reduce available capacity for cargo.

### What is the solution?

For every 10 percent reduction in truck weight, fuel consumption is reduced by five percent. Generally, the empty truck makes up about one-third of the total weight of the truck plus payload. Using components made of aluminum or other lightweight materials can reduce the empty truck weight, known as the "tare weight," thereby saving fuel.

The tare weight of a typical combination truck can be reduced in both the tractor and trailer. Weight saving options for the tractor include:

- Cast aluminum alloy wheels are approximately 44 lbs lighter than traditional wheels giving a total weight savings of 440 lbs.
- Aluminum axle hubs can save over 130 lbs compared to steel.
- Centrifuse brake drums save nearly 100 lbs compared to standard brake drums.

Aluminum cab frames can be at least several hundred pounds lighter than steel frames, but are currently unpopular with truck buyers. They are perceived to be less durable and add \$1500 to \$1700 to the cost of the truck. All major truck manufacturers offer lightweight tractor models that combine many weight saving options and are more than 1,000 pounds lighter than comparable models. These generally cost about \$2,000 more.

The potential for weight savings is often even greater in the truck trailer. Lightweight components for trailers include:

- aluminum roof posts (saves about 75 lbs)
- aluminum floor joists (saves about 300 lbs)
- aluminum upright posts (saves about 600 lbs)
- aluminum hubs and wheels (saves about 900 lbs)

Together, these options can cut empty trailer weight by 2,000 lbs and add about \$2,000 to the trailer price. These features are currently used only in selected niche operations like heavy-goods and refrigerated foods carriers, but could be employed by virtually all truck van trailers.

## The results are in...

A 3,000-pound reduction in vehicle weight (approximately four percent) improves fuel economy by 1.8 percent. For a typical long-haul freight truck, this would reduce fuel use by nearly 300 gallons annually, save \$450, and reduce greenhouse gas emissions by more than one metric tonne per year. In addition, for trucks that reach the maximum legal road weight, lightweight components allow for more cargo and increased productivity.

## Next Steps

Individual lightweight components can be selected as options on all new trucks. Most truck manufacturers offer lighter versions of their models that incorporate a package of weight saving measures. Two examples are:

- Kentworth offers a lightweight version of its T800 day-cab tractor that weighs 12,900 lbs, about 2,100 lbs lighter than the base model T800.
- Freightliner offers a lightweight version of the Century Class S/T truck intended for dry and liquid bulk haulers as well as other weight sensitive operations. It is 1,200 lbs lighter than the base model.

Talk to your dealer about lighter weight versions of the truck you are considering. For more information contact the American Trucking Association at [www.trucking.org](http://www.trucking.org).