

# Improved Aerodynamics

## A Glance at Clean Freight Strategies

### ENERGY & FUEL SAVINGS

#### Aerodynamic Long Haul Combination Truck

Gallons saved:

**1,650**  
gallons

CO<sub>2</sub> savings:

**16.8**  
metric tons

Fuel Economy Increase:

**11%**

MPG (original 6 mpg):

**6.6**  
mpg

Fuel Cost Savings:

**\$4,810**

Using a streamlined-profile tractor with aerodynamic devices can improve fuel economy by over **3 percent** and will reduce fuel costs by over **\$1,500**. When adding an aerodynamic trailer, you can get up to an **11 percent** increase in fuel economy, saving **16 metric tons** of carbon dioxide.

### WHAT IS THE CHALLENGE?






Aerodynamic drag (wind resistance) accounts for most truck energy losses at highway speeds. Reducing drag improves fuel efficiency. The longer the drive and the higher the speed, the greater the potential efficiency benefits become. Manufacturers have made significant progress over the past two decades in reducing the drag coefficient (a measure of wind resistance) of a typical freight truck from about **0.8** to about **0.65** – an improvement of nearly **20 percent**. Additional efforts to improve aerodynamics could result in a further **25 percent** reduction in the drag. This could have a significant impact on fuel economy. For example, cutting drag by **20 percent** could boost fuel economy up to **15 percent** at highway speed.

### WHAT IS THE SOLUTION?

A number of options exist to improve aerodynamics and improve fuel efficiency.

#### Tractor Aerodynamics


Truck tractor aerodynamic options:

-  **Roof fairings** (an integrated air deflector mounted on the top of the cab)
-  **Side extender fairings** (to reduce the gap between the tractor and the trailer)
-  **Side tank fairings**
-  **Aerodynamic front bumper** (to reduce air flow beneath the truck)
-  **Aerodynamic mirrors**

Truck manufacturers offer aerodynamic models that include a streamlined front profile, sloped hood, and a full package of add-on devices. Selecting these features for a typical tractor model can improve fuel economy by over **3 percent**. However when improving a classic combination truck with no aerodynamic features, one can see up to a **15 percent** increase in fuel economy.

#### Trailer Aerodynamics

Truck trailer aerodynamic options:

-  **Gap Reducer** (these devices affix to the front of the trailer to minimize the gap between the tractor and trailer, minimizing air turbulence in turn)

### ENERGY & FUEL SAVINGS

#### Aerodynamic Tractor Annual Savings

Fuel Economy Increase:

**3.6%**

MPG (original 6 mpg):

**6.2**  
mpg

Fuel Cost Savings:

**\$1,690**

#### Single Unit Truck Annual Savings

Gallons saved:

**75**

CO<sub>2</sub> savings:

**0.8**

metric tons

Fuel Economy Increase:

**5%**

MPG (original 8.54 mpg):

**8.97**  
mpg

Fuel Cost Savings:

**\$285**



**Side Skirts** (these panels hang down from the sides of a trailer at the bottom edge to enclose the open space between the rear wheels of the tractor and the rear wheels of the trailer)



**Cargo Configuration** (reduces drag by arranging cargo as low as possible and at uniform height)



**Wheelbase and fifth-wheel settings** (positioning the trailer as close to the rear of the tractor as possible to reduce tractor-trailer gap). For freight carried on flat bed trailers, securing loose tarpaulins and closing the curtains on curtain-sided trailers can improve fuel economy by up to **2.5 percent** and **4.5 percent**, respectively.

Gap reducers that decrease the trailer gap from **45 to 25 inches** can improve fuel economy as much as **2 percent**. According to the manufacturers, the addition of trailer side skirts can also improve fuel economy by up to **5 percent**.

#### Single Unit Truck Aerodynamics

Single unit truck aerodynamic options:



**Streamlined front profile** with sloped hood to reduce drag



**Rounded air deflector** can be added to van-style bodies to reduce drag

When using rounded air deflectors, manufacturers claim fuel savings of up to **5 percent**, which reduces annual fuel use by about **80 gallons** and saves over **\$300** in fuel costs. Single unit trucks with higher annual mileage could realize even larger benefits.

### SAVINGS AND BENEFITS

An aerodynamic long-haul combination truck can realize a fuel economy increase of **11 percent**, as compared to a typical long-haul combination truck. This would result in about **1,600 gallons** saved, reducing fuel costs by over **\$4,800** and saving **16 metric tons** of carbon dioxide. A single unit aerodynamic truck improves fuel economy by **5 percent**, saving **75 gallons** and nearly **1 metric ton** of carbon dioxide. The initial expense of installing aerodynamic features can be quickly recouped through fuel savings.

## NEXT STEPS

**1**

Trucking firms can specify aerodynamic options when purchasing a new truck and consider adding aerodynamic devices to existing trucks and trailers. Some aerodynamic options are standard on many trucks, like a streamlined hood. Others can be purchased and installed for an additional cost.

**2**

For more information on aerodynamic devices, contact your local truck dealer, truck equipment vendor, or trucking association.