Fuel is consumed by the tractor’s engine as it pulls a trailer down the road.
At highway speed, aerodynamic drag accounts for over 65% of the fuel consumed by a tractor-trailer.

The table below illustrates the contribution to fuel burn at various speeds, assuming a zero grade, properly inflated tires, and that the power train losses can be modeled as a constant relative to vehicle speed.

<table>
<thead>
<tr>
<th>VEHICLE SPEED</th>
<th>AERODYNAMIC DRAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 mph (32 kph)</td>
<td></td>
</tr>
<tr>
<td>33 mph (53 kph)</td>
<td></td>
</tr>
<tr>
<td>40 mph (64 kph)</td>
<td></td>
</tr>
<tr>
<td>50 mph (80 kph)</td>
<td></td>
</tr>
</tbody>
</table>
Since aerodynamic drag is but one source of fuel consumption, reducing aerodynamic drag by 20% will not result in a 20% reduction in overall fuel consumption. Rather, it will be 20% multiplied by the percentage contribution of aerodynamic effects at that particular speed.

For example, a 20% reduction of aerodynamic drag via the use of aerodynamic devices would have an overall effect of reducing fuel consumption by approximately 9.4% at 50 miles per hour.

These fuel savings would rise as speed increased to a maximum value of approximately 14.4% at 75 miles per hour.

**As a rule of thumb, aerodynamicists approximate the percentage of fuel saved by an aerodynamic device as 50% of the percent change in drag.**

**TRACTOR-TRAILER AERODYNAMICS**
A truck in motion encounters resistance from the air flowing into and around it. This drag is made up of pressure drag and skin friction drag.

The oncoming airflow pushes against the front of the tractor, creating a high-pressure region, just as it does on the wheels and the front of the semi-trailer.

The truck moving forward in the air flow creates a low-pressure region behind the tractor and the semi-trailer: these areas “suck” the vehicle backwards.
The most fuel efficient and profitable trucking fleets utilize aerodynamic trucks, minimize the gap between the truck and trailer, install side skirting to prevent air from hitting the trailer’s rear axles and TrailerTail® technology to streamline airflow at the rear of the vehicle.

HOW TRAILERTAIL® TECHNOLOGY WORKS

TrailerTail® technology lowers vehicle fuel consumption by reducing low-pressure suction drag that occurs directly behind the tractor-trailer. The large low pressure area at the back of the trailer acts as a vacuum causing drag and a turbulent vortex is created by unstable airflow. TrailerTail® technology diminishes the low pressure area, reducing drag and streamlining the airflow to improve vehicle stability and fuel efficiency.
Drag reduction for different TrailerTail® lengths (left) and drag reduction for AeroTrailer™ (TrailerTail® and side skirt combination package).

The higher the bar on the graph, the greater the reduction in aerodynamic drag.

TrailerTail® fuel savings are complimentary to other aerodynamic technologies. TrailerTails® reduce aerodynamic drag by over 12%, equating to over 5% fuel efficiency improvement at 65 mph and over 12% efficiency improvement when combined with ATDynamics side skirts and other minor trailer modifications.