7 Proven Techniques to Combat Rising Fuel Costs
Seven Proven Techniques to Combat Rising Fuel Costs

Even when diesel prices hold steady, they still represent the highest operating cost, after labor, for the typical motor carrier.

When fuel prices jump, they not only drain profits, but also put some trucking companies out of business. According to the American Trucking Associations (ATA), for every 10-cent rise in the cost of diesel, 1,000 fleets go bankrupt.

For these reasons, motor carrier executives are always searching for ways to wring additional fuel economy from the pump.

This document takes an in-depth look at what you can do to lower your fuel costs. Simply put, it comes down to:

- Choosing the right equipment for your operation
- Maintaining the tool
- Controlling the use of the equipment
- Controlling idling
- Getting the best rate for your services
- Finding the right fuel at the best price
- Reducing pilferage

The higher the price of diesel, the more dramatic the paybacks in improved fuel economy, as the following formula demonstrates.

Considering fuel at $3.00 per gallon shows that an increase of just 0.1 mpg is worth more than $800 for one unit that travels 100,000 miles annually.

You can calculate your own potential fuel savings by plugging in your current mileage, mpg and fuel costs and multiplying that number by the total number of vehicles in your fleet.

<table>
<thead>
<tr>
<th>Miles per Gallon</th>
<th>Fuel Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td>$3.00/gallon</td>
<td>$49,998</td>
</tr>
<tr>
<td>6.1</td>
<td>$3.00/gallon</td>
<td>$49,180</td>
</tr>
<tr>
<td>6.2</td>
<td>$3.00/gallon</td>
<td>$48,387</td>
</tr>
<tr>
<td>6.3</td>
<td>$3.00/gallon</td>
<td>$47,619</td>
</tr>
<tr>
<td>6.4</td>
<td>$3.00/gallon</td>
<td>$46,875</td>
</tr>
<tr>
<td>6.5</td>
<td>$3.00/gallon</td>
<td>$46,154</td>
</tr>
<tr>
<td>6.6</td>
<td>$3.00/gallon</td>
<td>$45,455</td>
</tr>
<tr>
<td>6.7</td>
<td>$3.00/gallon</td>
<td>$44,776</td>
</tr>
<tr>
<td>6.8</td>
<td>$3.00/gallon</td>
<td>$44,118</td>
</tr>
<tr>
<td>6.9</td>
<td>$3.00/gallon</td>
<td>$43,478</td>
</tr>
<tr>
<td>7.0</td>
<td>$3.00/gallon</td>
<td>$42,856</td>
</tr>
</tbody>
</table>
1. **Smart Spec’ing**

One step in improving fuel economy is to make sure you convert as much energy out of the fuel as possible. In other words, consider fuel economy in making your buying decisions. One size does not fit all. Fleets should determine the following:

- Payload and gross weight limitations.
- Payload cubic volume dimension limitations.
- Loading and unloading processes and equipment.
- Time sensitivity and distance considerations.
- Terrain and climate conditions.
- Grades to be climbed.
- Sleeper bunk requirements, if any.

**A. Engine.**

The next step is to choose the engine with the power and torque to move the load in the most economical way, keeping in mind displacement, weight, peak torque requirements and startability. Additionally, you should consider resale value and the potential for any business changes.

**B. Drivetrain.**

The next step is to ensure the power created in the power plant translates to road speed and performance in the most efficient manner. That means mating the engine with the appropriate transmission, driveline, rear axle and tires. Engines with low rpm and high torque can result in vibration unless all components are spec’ed for the task.

Some engines are geared to run optimally around 1,400-1,450 rather than the previous 1,700 rpms. As a result, companies might spec a 13-speed transmission with a 325 rear end ratio.

But such a change means retraining drivers. Because of the narrower rpm ban for proper shifting and a more severe fuel penalty, drivers must be trained to drive by the sight of the tachometer and not by the sound of the engine. And when down-shifting, they need to wait longer to grab the lower gears.

**C. Tires.**

Larger capacity tires have more resistance. Spec the tires with the least rolling resistance for your application. This gives you the most fuel efficient tire. Evaluate the potential weight or fuel economy benefit of wide based single tires. While numerous low rolling resistance tires offer improved fuel economy, fleets must still consider other factors before making a buying decision. These include durability, traction, and retreadability. Of course, no tire delivers optimal benefits without proper tire inflation.

Tire rolling resistance accounts for about one-third of a truck’s fuel consumption. In other words, a 3 percent reduction in rolling resistance produces about a 1 percent gain in fuel economy.

The change in tire wear over time affects your rolling resistance in different ways between brands and compounds, thus changing your fuel economy differently over time, another thing to consider when choosing tire brands.

All axle positions are not equal; tires on different axles make different contributions to fuel economy. Changing trailer tires to fuel-efficient types pro-

---

**Approximately 7% of all truck tires are under-inflated by 20 psi or more**
duces a larger effect than changing tractor tires to fuel-efficient types.

D. Aerodynamics: Cabs.
While aerodynamic cab designs are preferable, the distance between the cab may play just as much of a role in creating, or eliminating, drag.

Between 55 and 65 mph, half of the fuel burned is used to overcome air resistance while the remaining half is used to move the load. The percentage of fuel needed to overcome air resistance increases dramatically as vehicle speeds increase. In fact, for every mph over 55, you reduce your fuel efficiency by 0.1 mpg.

Tests conducted by a major OEM show the impact from the following aerodynamic aids:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Fuel Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under hood air cleaners</td>
<td>+1-2 percent</td>
</tr>
<tr>
<td>Roof cap with trim tabs</td>
<td>+6.5 percent</td>
</tr>
<tr>
<td>Side fairings</td>
<td>+1-3 percent</td>
</tr>
<tr>
<td>Under cab and chassis fairings</td>
<td>+0.75-2 percent</td>
</tr>
<tr>
<td>Trailer gap reduced from 46 inches to 38 inches</td>
<td>+1-2.5 percent</td>
</tr>
</tbody>
</table>

In addition, accessories such as exhaust systems, mufflers, air filters, non-aerodynamic mirrors, bug deflectors and under frame pallet racks should be eliminated to achieve maximum fuel efficiency.

But again, there’s a trade-off between fuel and operating efficiency. Some fleet managers might opt to use aerodynamic devices such as wind deflectors but not full fairings. That’s because the cost of repairing damaged fairings could outweigh fuel savings.

E. Aerodynamics: Trailers.
Trailers also play a major role in fuel consumption. For example, smooth-side trailers such as interior sheet and post, plate or FRP trailers offer improved fuel economy. Also, experts recommend that you spec’ only those trailers with the height and width you actually need.

These other aerodynamic devices have demonstrated paybacks:
- Bubble Nose
- Under-Frame Air Deflector
- Aerodynamic Trailer Side Skirts

In particular, aerodynamic trailer side skirts stand out for their contribution to fuel economy. This equipment reduces drag that would otherwise occur when air flow buffets trailer tires and axels.

According to independent tests, trailer skirts from top manufacturers deliver fuel savings of about 5 percent — or even more. In addition, advanced side skirts feature the strength and flexibility to keep costs down by withstanding punishing conditions and resisting damage.

2. Maintenance
It’s not just the equipment that you buy but how you maintain it that helps save fuel.

Perhaps no single practice has as much impact on fuel economy as properly inflating tires. Unfortunately, most fleets don’t do a good job of this.

According to a report from the Federal Motor Carrier Safety Administration, approximately 7 percent of all truck tires are under-inflated by 20 psi or more. Only 44 percent of all tires are within 5 psi of their target pressure. The study also identified mismatched dual tires as a “significant challenge.” Approximately 20 percent of all tractor dual tire assemblies and 25 percent of all trailer dual assemblies have tires that differ in pressure by more than 5 psi. That translates into an estimated 0.6 percent
fuel economy loss, not to mention other operating costs.

Maintaining tire pressure is labor- and time-intensive. For an 18-wheel vehicle, it can take 20 to 30 minutes to check all of the tires and inflate any that may be low. To complete this task once each week on every tractor and trailer becomes a challenge for many fleet operators. As a result, tires are often improperly inflated.

According to FMCSA, “There are numerous tire pressure monitoring and automatic inflation systems available from vendors that are specifically tailored to commercial vehicles. If such systems could be installed for approximately $1,000 per tractor-trailer combination, and if they were effective in mitigating incidences of improper tire inflation, such systems would indeed be highly cost effective. Return-on-investment periods even for an average fleet would be between 1 and 2 years.”

Other critical maintenance items include reducing air and fuel filters at proper intervals and using oils, preferably synthetics, with proper viscosity.

According to the U.S. Department of Energy, fleets can improve fuel economy by 1 percent to 2 percent using the manufacturer’s recommended grade of motor oil. For example, using 10W-30 motor oil in an engine designed to use 5W-30 can decrease fuel economy by 1 percent to 2 percent. Using 5W-30 in an engine designed for 5W-20 can decrease fuel economy by 1 percent to 1.5 percent. Motor oil labeled “Energy Conserving” in the performance information contains friction-reducing additives that improve fuel economy.

Fleets should also repair any body damage that could impede a vehicle’s aerodynamic performance.

### 3. Driving Habits

The variable with the largest impact upon fuel economy is traditionally the hardest to control: the drivers. That’s because they control the main factors that contribute to fuel consumption: road speed, engine speed, acceleration, tire inflation, shifting, sudden stops and idle time.

It is not uncommon for fleets with units spec’ed identically to see as much as a 25 percent variance in fuel economy between the least effective and most effective drivers. (5.0 mpg compared to 6.7 mpg). Other performance tips include:

- **Cruise control.** Engine makers recommend that 80 percent of driving time should be in cruise mode as fuel economy increases and driver fatigue decreases.

- **Congestion.** Today’s roads are crowded and getting more so. The amount of new roads and highways is remaining constant while the amount of traffic and commercial vehicle traffic continues to grow exponentially. An estimated 15 percent of the miles operated on congested roads translate into a 7 percent fuel economy penalty. And 25 percent is equivalent to a 14 percent penalty.

- **Load.** A 10,000-pound reduction in payload increases fuel savings by about 4.4 percent.

- **Weather.** Seasonal fluctuation can account for approximately a 15 percent swing in fuel economy.

- **Distance and time in top gear.** Every 10 percent drop in time spent in top gear = .05 mpg loss.

Convincing drivers they are part of the solution may be a tough task, but you can do it with the proper information. Some fleets have implemented on-board communications technology to capture real-time operating information such as idling, truck speed and miles per gallon. They use that information to coach drivers and to improve individual and team performance.

### A. Out of Route Miles

Out-of-route miles burn fuel needlessly. According to one estimate, such mileage accounts for 3-10
percent of a driver’s total mileage each year. Consider a truck traveling 100,000 miles a year and getting 6.0 miles per gallon and an average cost of $3 per gallon. The out-of-route fuel cost would vary between $1,500 and $5,000 annually. And that’s for one truck.

While the driver does have much control of moving a load from Point A to Point B, consider installing automated dispatch and routing programs that help fleets make sure that happens in the most efficient and economical manner.

B. Achieving Driver Buy-in

Incentives have proven effective in gaining driver participation in fuel savings efforts. Drivers tend to favor incentives in the form of money or “shared savings” programs. Regardless of the type of incentive, it should be fair, completely understood by both the driver force and management and easy to administer.

For an incentive program to work effectively, all drivers must have an equal opportunity to benefit. Managers must consider all aspects of their operations and develop a system that gives all drivers an equal chance to benefit from their fuel consumption efforts. For example, a driver with an auxiliary heating and air conditioning system can potentially achieve greater fuel savings than one lacking those tools.

Finally, an incentive program must be easy to administer. If a program is complicated and cumbersome, people will loose interest.

4. Idling

One immediate benefit from involving the drivers is getting their support in breaking the idling habit. According to government estimates, the average truck consumes 0.8 gallons of fuel for every hour it idles. The U.S. Environmental Protection Agency reports the average truck idles 6-8 hours a day for more than 300 days per year.

For a 50-unit truck fleet, that’s 60,000 gallons of wasted fuel a year. Industry-wide, truck idling eats up nearly one billion gallons of diesel fuel every year, according to government estimates. Even by conservative estimates, that’s enough to fuel a 25-unit truck fleet to the sun and back.

Any way you do the math, that’s an expensive habit. Not to mention the fact that idle times in the range of 30 percent to 40 percent of total engine operating time drive up the cost of engine maintenance and shorten engine life. The trucking industry estimates that long-duration idling costs the truck owner $1.13 per day in maintenance costs, based on the need for more oil changes and overhaul costs.

Truckers cite numerous reasons why they opt to let their rigs run. At the top of the list are comfort and convenience. Keeping the motor running allows drivers to heat or cool their cabs and sleeper compartments. In addition, idling provides the juice to power appliances such as refrigerators, microwaves and computers. Plus, many drivers simply idle out of habit or to cover up noises on the outside thereby providing better rest and relaxation.

In colder weather, keeping the engine idling allows for easier and faster startups — at least on older engines. Today’s modern engines don’t need that jump-start according to manufacturers.

Until recently, drivers traditionally saw any attempt to control idling as a threat to their independence and most trucking executives accepted it as a necessary cost of doing business.

But that was before spikes in the cost of fuel and the advent of idle reduction technologies. These technologies can be divided into two categories: mobile and stationary.

Stationary technologies include electrifying truck parking spaces to provide energy to operate on-board electric components. Increasingly, truck stops are offering electrical power for truckers to “plug and play.”
The 110-volt AC current is sufficient for heating, cooling and battery charging and on-board appliances. Trucks equipped with an inverter/charger — available from truck manufacturers for up to $1,400 — simply pull up to an outlet at a parking space and plug in. Electrification has yet to enjoy widespread penetration among truck stops because of its high infrastructure costs (up to $2,400 per space).

Mobile technologies include:

- Idle limiting devices (available in all electronic engines today) that offer a shut-down timer that turns the engine off after a certain period of time has elapsed.

- Devices that automatically stop and restart the engine based on battery voltage and engine and/or cab/sleeper thermostat settings.

- Direct-fired heaters that provide heat to the cab or the engine, or both. These units offer high efficient heat and are powered by on-board fuel and batteries. The drawback is that they offer no cooling to occupants and can be a power drain.

Mobile communications technologies offer fleet managers the means to measure idle time in real time, allowing them to coach their drivers based on behavior as it occurs.

The ability to capture more current and accurate information provides fleet managers with the tools they need to better manage their operation. That means that the marketplace — not some government regulator — can provide the impetus to make idling controls effective.

5. Fuel Surcharges

The impact of higher fuel prices varies fleet to fleet depending how much of the increase they are able to recoup in fuel surcharges or higher rates. Most fleets have instituted surcharges which automatically trigger when the price of fuel rises above a pre-determined minimum.

The Energy Information Administration provides weekly retail diesel fuel price data with an explanation of the methodology on its website (http://www.eia.gov/oog/info/wohdp/diesel.asp). Many shippers and truckers use that weekly retail price information in their fuel pricing formulas.

Unfortunately, fuel surcharges allow a fleet to recover only a certain percentage of the fuel costs. For instance, these surcharges apply only to loaded miles. Empty miles, out-of-route miles and engine idling cannot be recovered. For many private fleets, there is scant opportunity to pass on fuel costs with a surcharge.

6. Buying Strategies

The search for fuel economy begins with analyzing your fleet’s operation and controlling where, when and how you buy your fuel. For instance, a regional operation makes decisions that optimize the fuel quality, availability and cost of the fuel bought. Having a large portion of the fleet on the road at any one time subjects many a fleet to wide price fluctuations.

Some fleets mandate that dispatchers not only route units to run the shortest number of miles, but to do price sorts by region and limit the number of gallons a driver can purchase on the road. The goal is to keep as much fueling in the home terminal as possible. To increase the likelihood of that happening, they spec twin 200-gallon tanks on their units. Various sources include:

- **Commercial Travel Plazas.** While many fleets rely on these truck stops because of their competitive fuel prices, they must be careful to monitor the specifications and quality of fuel. Many truck stop operators (and chains) use multiple vendors for fuel supplies, so the integrity of the fuel sources should be considered. Truck stops often insist on payment upon delivery, so there is little opportunity for any cash “float.” In addition, fleets can buy in bulk from truck stops but there is usually a fee.
associated with it to pump the fuel.

- **Leasing Companies.** These vendors offer high quality fuel in all seasons, usually with a full-service island attendant. Their prices are competitive with truck stops, and they usually send a consolidated bill for fuel on a weekly basis with 15-day terms for payment.

- **Key or Card Lock Facilities.** These facilities offer an unattended fuel source for driver fueling. Depending on the volume pumped, the fuel inventory may become somewhat stagnant. They generally offer quality fuel, but may not be as quick as other high volume suppliers to adjust their fuels for drastic changes in temperature. Their payment terms generally are variable.

- **Local Service Stations.** While truck fleets traditionally have shied away from local stations because access to this pump is usually difficult for a larger commercial vehicle. When prices are rising, more fleets look at these independents as an option. However, fuel quality at such facilities is as variable as the operator.

- **“Wet” Fueling Services.** Some heating oil companies are willing to bring a tank truck to a fleet vehicle yard and pump fuel directly into the parked vehicle tanks. However, they are often not aware of the need for winter blending, and may deliver straight #2 Heating Oil spec fuel in severe cold conditions. Additionally, fleet operators need to be concerned about the potential for a fuel spill on their private property and the considerable cost (and negative publicity) of a cleanup effort.

- **Home Fueling.** A company’s own fuel tanks and pumps may offer the utmost in convenience for its drivers and — depending upon the volumes purchased — many fleets have been able to negotiate favorable pricing from available bulk fuel suppliers. But they are quick to note the obligations and liabilities of owning their own fueling facilities and the considerable responsibility for the administration of the process.

Whatever option you choose, make sure that you’re not driving a lot of out-of-route miles to get to a fueling location. Otherwise, you’ve defeated the purpose.

**Hedging Your Bets**

Once you’ve determined where to buy your fuel, you must then negotiate your price. While fuel hedging or purchasing “fuel futures” has grown in popularity, especially on the part of many large companies, it is not a silver bullet.

Fuel hedging provides fleets with the option to purchase fuel from one source over a period of time, typically a year, at a pre-determined price regardless of the price fluctuations likely to occur. If prices go up, the fleet pays the lower negotiated price. On the other hand, if prices go down, then the fleets pay the higher negotiated price.

Fleets often get themselves into trouble when they implement hedging as a way to reduce cost and outperform the market. There is no guarantee that you will be able to lock prices before they go up.

In addition, more companies — again particularly among the larger carriers — have hired fuel managers. This position’s responsibilities might include the purchase of diesel, gasoline, propane, natural gas and even electricity. These managers look at various pricing mechanisms including:

- **Fixed prices** — Where the cost of your fuel is locked in against unknown prices in the future.

- **Ceilings** — Where a cap is placed on the highest price you will pay for fuel.

- **Floors** — Where you participate in the downturn of the market to a specified level.
• **Specialized Programs** — Based upon current market conditions and are offered based on availability.

**7. Fuel Security**

Even more insidious than idling is the growing threat of theft, which literally siphons off all your efforts to boost fuel economy.

Small quantities can be stolen by simply filling a small portable container while fueling up a large vehicle at an unattended fuel pump. Portable pumps or siphons can be used to transfer fuel from the fleet truck to a container or another personal vehicle in an unobserved location and fuel directly if in an uncontrolled location. And people can literally pull a privately owned vehicle up to an unattended pump.

Fleets have countered that temptation by taking the following steps:

- If you own your pumps, have them calibrated periodically and use card-lock type systems.
- Compare mpg performance records by vehicle/driver to spot unexplained high mpg spikes.
- Compare fuel tickets and cumulative meter readings for reconciliation.
- Perform unannounced surveillance of fuel facilities at frequent and irregular intervals. Bring along a video camera.
- Take engine fuel throughput readings from the ECM and compare to records of pumped fuel.
- Use a third party for fueling.
- Investigate locking caps and anti-siphoning tank inserts.

**Resources**

**Original Equipment Manufacturers (OEMs).** All OEMs have websites and can be easily located on any search engine. Most of these have available information on vehicle fuel economy.

**Diesel Engine Manufacturers.** All medium and heavy-duty engine manufacturers also have websites that can be located via a search engine.

**Petroleum Companies.** Major petroleum refiners and distributors also have websites that can be located via a search engine.

**Tire Manufacturers.** Major Truck Tire Manufacturers also have websites that can be located via a search engine.

**Industry Organizations and Associations:**

- American Trucking Associations/The Technology and Maintenance Council (www.truckline.com)
- The Society of Automotive Engineers (www.sae.org)
- The Motor and Equipment Manufacturers Association (www.mema.org)
- The National Private Truck Council (www.nptc.org)
- The American Petroleum Institute (www.api.org)
- Tire Industry Association (www.tireindustry.org)
- US Department of Energy (www.doe.gov)
- US Department of Transportation (www.dot.gov)
- Energy Management Institute (www.energyinstitution.com)