

INCREASING PROFITABILITY BY LOWERING YOUR REAL COST OF OWNERSHIPSM



Run SmartSM



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REAL COST OF OWNERSHIP

No one has to explain TCO—Total Cost of Ownership or Total Cost of Operations—to you. You live with the numbers every day as you work to turn a profit. And Freightliner Trucks recognizes this is no easy task. Companies' costs of operations are so important that industry magazines regularly write articles on the topic, and many of the ads in these publications—for everything from lubricants to tires—promise cost-lowering breakthroughs. Owner/operators and fleet managers alike know that TCO is important.

Most TCO discussions start with fuel efficiency and include other contributing factors like scheduled maintenance. But as Freightliner Trucks has done the

research and talked to our customers, we developed an even greater appreciation for the fact that calculating overhead and what it really costs to run a successful business in the trucking industry is different for every customer.

That's why Freightliner Trucks has set out to broaden the discussion and help fleet managers and owner/operators get a clearer picture of their **Real Cost of Ownership**™ (RCO). RCO is a comprehensive consideration of hard and soft costs over the lifetime of a vehicle. Some of the costs are hard numbers you can get by using a calculator—like monthly diesel expenses—and others, such as driver turnover rates and customer loyalty, are a bit more difficult to express in dollars and cents. But these real-life challenges factor into the RCO for your business just as much as an increase in the price of tires.

Freightliner's definition of RCO for the on-highway segment recognizes five main contributing factors to maximizing profitability:



FUEL EFFICIENCY:

Freightliner® trucks feature world-class design and advanced aerodynamics. Powered by the high-performance, high-efficiency Detroit™ DD15® engine, the Cascadia® Evolution achieves up to a 7% fuel economy increase compared to the first-generation, EPA 2010-compliant Cascadia model. The Detroit DT12™ automated manual transmission further enhances fuel economy. Freightliner Trucks offers customizable alternative fuel and lightweight options to fit a variety of businesses.



CONNECTIVITY:

Detroit™ Connect telematics let you capture, transmit and analyze data directly from your trucks. Detroit Virtual Technician™ removes the guesswork from engine repair; Visibility fleet software delivers sophisticated real-time data on your vehicles' routing, location and idle time; and the On-Board Tablet simplifies driver communication and record-keeping.



SAFETY:

Freightliner trucks feature many industry-leading safety systems. The Cascadia and Cascadia Evolution come with 36 available safety features, and boast an ergonomically designed, noise-minimizing cab that meets European and FMCSA requirements, contributing to overall driver comfort and safety. And the Freightliner In-Cab Training (FIT) System offers drivers full-body workouts in the comfort of the cab. A healthier driver is a safer driver.



QUALITY:

Freightliner trucks are designed to maximize reliability and longevity. Freightliner rigorously tests our products to ensure each model meets or exceeds customer business needs. And Freightliner's cutting-edge manufacturing technology, including robotics and automated systems, achieves precise results. Quality construction and durable materials help Freightliner trucks hold their value. The result? The Cascadia and Cascadia Evolution have the highest resale value in the industry.



UPTIME:

Freightliner's robust support footprint features hundreds of service locations with Detroit factory-certified technicians. That includes over 400 dealership/parts and service locations—more than 120 of them Elite Support Certified. Additionally, with almost 200 ServicePoint® facilities and a 24/7 toll-free hotline, no matter where you are in North America, you're covered. And Detroit Connect's advanced telematics/diagnostic tools help you spot small issues before they become big problems.



Nussbaum Transportation went beyond fuel efficiency in considering RCO for its 260-truck fleet.

Brent Nussbaum, CEO of Nussbaum Transportation, heads up a family trucking business with roots going back to 1945. Located in Hudson, Ill., just outside of the twin cities of Bloomington and Normal, the company has a fleet of 260 trucks. With that many trucks on the road, diesel costs add up fast, but Nussbaum also has a list of other factors he considers when making decisions on which truck brand to invest in. The company has traditionally enjoyed a driver turnover rate well below the industry average and considers the comfort and reliability of its fleet to be extremely important factors to its RCO.

“Three years ago we were trying to do better on fuel efficiency,” Nussbaum says. “We looked at a

number of options and talked to the Freightliner engineers in Portland. We started with a test of five Freightliner trucks and did an extensive review. The Freightliner Cascadia was completely different from what I expected. Not only did we improve operational costs, but the Cascadia also received overwhelming driver acceptance.”

In developing its philosophy of Real Cost of Ownership, Freightliner Trucks factored in fuel efficiency, safety, connectivity, quality and uptime to produce a solution that does more to integrate the driver, the truck and customers’ businesses to maximize profitability.

ADVANCING FUEL EFFICIENCY

The math is pretty simple. The less you spend on fuel the more you make on each run. Improved fuel economy has a direct impact on a company’s bottom line. That’s why Freightliner Trucks takes an integrated approach to maximizing fuel economy.

Clearly, the more fuel-efficient the truck, the greater the potential profit margin. But ensuring your vehicles achieve the best fuel efficiency possible is not as simple as it sounds, because so many factors affect fuel efficiency. Fleet managers can see fuel efficiency across their fleet and know that even if the trucks are the

same makes and age, maintained in a similar fashion and running comparable routes, miles per gallon numbers can vary greatly. That's because three key factors play a role in fuel economy:

- Aerodynamics
- Powertrain spec'ing and parasitic loss
- Vehicle operation—the driver and vehicle maintenance

Punching a Hole Through the Air

There are big savings to be had by paying attention to how your vehicle glides through the air. A tractor trailer is a big vehicle, but optimizing even the little details that can reduce drag will pay off in improved fuel mileage.

To further boost fuel efficiency on the Cascadia Evolution, Daimler Trucks North America's engineers focused on the details using the only OEM-owned and -operated full-scale wind tunnel in North America to shape mirrors, integrate antennas, flare out chassis side fairings and elongate side extenders to lower drag by redirecting airflow around the truck.

You might not have access to a wind tunnel, but a visual inspection of your truck will likely turn up areas for savings. Cabs and trailers are different heights and widths, so making sure the angles of side extensions, fairings and spoilers are correctly designed so air passes around the trailer can add as much as 10% to fuel efficiency. Chassis side fairings can improve fuel economy up to 3% and cab side extenders up to another 3%. Don't forget to minimize your trailer air gap as much as possible during the spec'ing process—36 to 48 inches is optimal.



Airflow testing at Daimler Trucks North America's wind tunnel.



Efficiency Enhancements

1. Bumper Air Dam
2. Hood-to-Bumper Fill
3. Bumper Closure
4. Cooling Enhancements
5. Windshield Seal Improvements
6. Elliptical-Shaped Mirrors
7. Side Extender Filler Piece
8. Rear Wheel Covers
9. Integrated Antenna
10. Chassis Side Fairing Enhancements
11. 20-Inch Side Extenders

Spec'ing to Optimize

Getting the most out of every gallon of fuel starts before the truck travels its first mile on the highway. Spec'ing the truck for optimized fuel efficiency with the proper engine, transmission, axles and other components will pay off big in cost savings.

Combining world-class design and advanced aerodynamics with the power of a high-performance, high-efficiency Detroit™ DD15® engine and Detroit DT12™ transmission, enables the Freightliner Cascadia Evolution to achieve up to a 7% increase in fuel economy compared to the first-generation, EPA 2010-compliant Cascadia model.

Thousands of hours of engineering, design and testing went into developing the DD13®/DD15® engine, DT12™ automated manual transmission

and Detroit axles for one of the most fuel-efficient and reliable trucks on the road. These components* work together as one *integrated* Detroit™ Powertrain, resulting in maximum performance, fuel economy and durability, and lowering customers' Real Cost of Ownership.

When spec'ing a new truck it is critical to achieve a balance between the power needed and the economy desired. Detroit developed the lighter-weight DD15 engine to produce less friction, reducing parasitic loss. A 6x2 tandem axle configuration with an automatic load transfer suspension eliminates the rear-rear differential and interaxle driveshaft, reducing parasitic loss from the drivetrain plus decreasing the overall weight of the tractor. And the new automated manual DT12 transmission uses an aluminum case to further reduce weight. The addition

*Not including the DD13 engine.

of an automated manual transmission provides consistent and precise shift points to increase fuel economy by keeping the engine in the RPM "sweet spot." Using a direct-drive transmission versus overdrive can further assist in decreasing parasitic loss from the drivetrain. Additionally, the DT12 transmission offers an eCoast feature that places the transmission in neutral when power transfer is not needed, further reducing fuel consumption.

"Fuel economy for an on-highway truck is extremely important. It adds up to about 35% of the costs of operations," said Dawn Rinehart, Real Cost of Ownership manager at Daimler Trucks North America. But even the most efficient truck on the road needs a smooth and steady driver in order to achieve the best fuel mileage.

The Driver is Key

Freightliner Trucks recognizes the big influence drivers have on fuel efficiency. Each driver's style and habits are important factors in lowering Real Cost of Ownership. Reducing speed, keeping RPMs low, cutting idling times and anticipating hills and braking are all things drivers can do that will add up to big fuel savings.



In fact, the driver has up to a 30% impact on overall fuel economy, and given today's tight margins, squeezing every last tenth of a mile out of a gallon of fuel makes an impact. That means good driving habits are critical. A few steps every driver, regardless of experience, can take that will increase fuel efficiency are:

- Slowing down. Reducing speed by just 5 MPH to 62 MPH boosts fuel economy by up to 8%. On a 250-mile run, that will add just 18 minutes to the trip but save you big at the fuel pump.
- Reducing idle times, as well as air conditioning compressor and radiator fan on times.
- Using cruise control, which boosts fuel economy by up to 6%.
- Paying attention to scheduled maintenance and checking air pressure in the tires.
- Managing acceleration rates and engine braking usage. Custom engine programming can greatly assist in teaching proper throttle management.

10 Tips from the Pros to Improve Your RCO

STAY ON SCHEDULE: Every truck is different, so make sure you work with your dealer's service department to identify when and how to maintain each component. Not only will paying attention to maintenance schedules keep your truck running at its optimal performance, it could help to avoid costly downtime for repairs.

KNOW YOUR ENGINE: Running your truck's engine in its "sweet spot" and staying in that RPM range as much as possible increases fuel efficiency. Decreasing idle time is also a major factor. Ask your dealer or engine representative to verify the specs and programming that will maximize your fuel economy potential. Selecting the idle reduction system that best suits your operation is key.

WHERE THE RUBBER MEETS THE ROAD: Consider low-rolling-resistance tires. Wide-based tires are lighter weight and provide lower rolling resistance than most dual-tire combinations.

GET PUMPED: Monitoring tire pressure while driving and spotting dramatic pressure changes can help prevent a blowout and improve tire life. For wide-based tires, tire pressure is critical to long tread life and low rolling resistance. Tires typically rank as the top maintenance cost and account for most roadside issues.

MIND THE GAP: Reducing trailer drag boosts fuel efficiency. Make sure your spec calls for a trailer gap that is as tight as possible, while still allowing room for trailer swing and back-of-cab access. A gap of 36 to 48 inches is recommended.

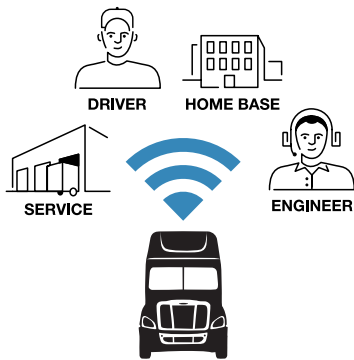
IMPROVE THE FLOW: Consider aerodynamic enhancements to your trailer such as side skirts and tails. Choosing a U.S. EPA SmartWay®-certified trailer will help reduce the drag of your overall tractor/trailer combination.

REDUCE THE DRAG: Little things mean a lot when it comes to aerodynamics. Bug deflectors, antennas, visors and even a license plate that hangs below a cab or a trailer increase drag, which cuts fuel mileage.

UNDERSTAND WHEN AND HOW TO LUBE: Spec'ing low-lube or non-greasable components will cut down or eliminate lube intervals, saving you money over the long run. Consider non-greasable driveshafts, brakes and fifth wheels. When you do have to lubricate, synthetic fluids and greases can extend maintenance intervals and, in the case of the drivetrain, cut down on energy lost due to friction.

PICK THE RIGHT LIGHTS: The service life of LED lights far exceeds that of incandescent lights. Not only will you increase uptime and reduce labor for bulb replacement, you will also avoid potential citations from law enforcement.

BE SMART: Requiring SmartWay Certification on your spec guarantees you will have an aerodynamic cab and low-rolling-resistance tires.



STAYING CONNECTED

Being in the trucking business means being constantly on the go. Your trucks are spread all over the map, often far from your regular maintenance facility. The ability to capture, transmit and analyze data directly from your vehicles can dramatically improve fleet efficiency.

A Frost & Sullivan study of the trucking industry estimated that in 2012 approximately 28% of the total fleets in the U.S. were equipped with some form of telematics. Many truckers complained that some early telematics systems did not perform as promised, and trucks equipped with some systems today still do not have robust data gathering and strong communications capabilities to drivers and fleet dispatchers.

In creating Detroit Connect, the engineering team focused on offering actionable diagnoses in real time by using the Detroit™ Virtual Technician™ onboard diagnostic system—standard on all Cascadia models equipped with Detroit engines—to capture and transmit data as the truck rolls down the highway.



The Detroit Virtual Technician means that Freightliner owners and drivers can directly communicate with factory-trained technicians about a potential problem with their Detroit engine or transmission and know what options exist for getting service. In many cases the maintenance can be scheduled during planned downtime and not interrupt delivery of important cargo.

Detroit Connect telematics solutions go beyond Detroit Virtual Technician to take the guesswork out of engine repair. They include Visibility fleet software to deliver sophisticated real-time data, and the On-Board Tablet to simplify driver communication and record-keeping. This total package solution results in better communications, improved uptime and more information to help fleet managers and owner/operators run their businesses.

Nussbaum Transportation CEO Brent Nussbaum points out that having the ability to diagnose an issue and, if necessary, order a part and have it waiting at a repair facility down the road maximizes uptime. “Our drivers can get in, get the work done and get where we need them to be,” Nussbaum says.

“The fact is a lot of trucks are taken into the shop but don’t really need to be,” says Henry Albert, owner of Albert Transport in Statesville, N.C., and one of Freightliner Trucks’ Team Run Smart™ Pros. “A check-engine light comes on, but there might not be anything critically wrong. That’s the beauty of Detroit Connect. You can find out what is going on while you are going down the highway and determine if you need to stop right away or if you can keep going and address the issue later.”

“The connectivity and support of the Detroit Virtual Technician system is something you hope you never have to use,” Albert says. “But it can be a big help and improve uptime.”

For fleet managers, the Visibility fleet software uses wireless communication and a GPS satellite network to deliver real-time data on an entire fleet via a secure website.

This makes it easier to monitor the status of each truck in the fleet, with critical data such as location, route, trip costs, idle time, after-hours truck movement and fuel consumption. This enables fleet managers to adjust routes, schedule vehicle maintenance and plan driver training.

The Detroit Connect On-Board Tablet comes with four useful apps that help streamline driver reporting responsibilities and communications. The tablet makes it easier to track hours of service, keep drivers informed through text or voice messaging, and document pre- and post-trip inspections, while providing advanced navigation. This device drives increased uptime and helps maximize driver performance.

SAFETY FIRST

A safe, healthy and stress-free driver is a productive driver. But truck driving is a demanding profession. Road congestion, weather conditions and delivery deadlines are just a few of the issues drivers encounter every day. And fleet managers will tell you that the driver shortage and high churn rates make it challenging to keep trucks on the road.

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The driver experience benefits from spacious, ergonomically designed, noise-minimizing cabs.

Keeping Your Best Assets

According to the American Trucking Association (ATA), the turnover rate at large truckload carriers dropped 6 percentage points during the fourth quarter of 2013—but was still a staggering 91% per year. This was the eighth consecutive quarter that the annualized number was above 90%. For smaller fleets, the numbers are a bit better, but the ATA says they averaged 79% during the last three months of 2013. This turnover rate results in high recruitment and training costs for trucking companies, while contributing to low morale, quality issues and service reliability gaps. Trucking companies estimate it costs between \$6,000 to \$9,000 to recruit and train a new driver. When the annual turnover rate in the industry hangs steady at just below 100%, driver satisfaction becomes a critical concern.

Nussbaum says that since switching to Freightliner trucks, his firm has been able to further reduce an already

impressive driver retention rate. Nussbaum Transportation now has a turnover rate that is about a third of the national average. “We consider what we buy and the truck we put our drivers in to be very important to their overall job satisfaction,” Nussbaum says.

Ergonomics and Healthy Drivers

Freightliner has been focused on improving the driver experience, and the Cascadia and Cascadia Evolution models are the latest examples of how engineering and design can improve ergonomics, driver health and wellness, and enhance safety on the road. The driver experience benefits from spacious, ergonomically designed, noise-minimizing cabs.

And while Detroit engineers look at every opportunity to reduce fuel consumption, they also know the easy-to-operate DT12 transmission

enables drivers to reach their optimal performance sooner and stay in the most efficient “sweet spot” longer, further enhancing the driver experience. With no clutch pedal to push at each shift and a shifter located right by the steering wheel, the DT12 reduces effort while letting the driver focus their attention on the road. But changes to today’s trucks go beyond efficiency and creature comforts, with safety being a top priority.

Staying Safe

The National Highway Traffic Safety Administration reported that there were a total of 33,561 deaths caused by all types of vehicle accidents in 2012. While the trend during the past decade regarding deadly traffic accidents has been improving, the latest available annual figures represented a 3.3% increase.

The human costs of a highway accident can be devastating. But even if an accident does not result in any injuries, it can still cost a company significantly in repair bills, losses in uptime and increased insurance premiums. No doubt about it, safety plays an important role in RCO.

Safety is a critical concern for owner/operators and fleet managers. No one sets out on a route expecting to be involved in an accident, but focusing on safety and having a truck with the latest safety features can be a life saver.

Freightliner Trucks offers important safety features. From steering wheel airbags to the LifeGuard Rolltek® seat designed to help protect drivers

in rollover accidents, Freightliner is constantly looking for ways to improve safety. The features built into the Freightliner Cascadia and Cascadia Evolution models make them the safest trucks the company has ever produced.

“Driver safety is critical for many obvious reasons. But there is a financial aspect to safety, as well. Whether a customer of Freightliner is self-insured or purchases insurance, liability is always a risk,” said Dawn Rinehart. “Safety has a direct impact on the bottom line.”

QUALITY THAT PAYS

Freightliner Trucks strives to lead the industry in both design innovation and manufacturing excellence. Each new truck model undergoes rigorous testing to make sure it meets or exceeds customers’ expectations and business needs. Freightliner trucks are manufactured using the latest technology, including robotics and automated systems to achieve precise results.

Some of the industry-leading quality-control steps taken by Freightliner include:

- All tractor models are dyno tested to eliminate any potential issues with drivability.
- Every Freightliner truck receives a laser alignment and, if the customer desires, a pre-delivery inspection and/or DOT-level inspection right at the plant.
- All Cascadia and Cascadia Evolution models built since October 2013 feature a chassis air, fuel and electrical routing system that drastically cuts down on chafing potential and makes it easy for drivers to identify these items during a pre-trip inspection. Freightliner does not paint over air lines, so they can be easily identified by their assigned colors, which can help drivers avoid DOT violations which could negatively impact Compliance, Safety, Accountability (CSA) scores.

“The focus on quality can be seen in the overall reliability and the extended service intervals of our trucks,” says Mike McHorse, on-highway marketing segment manager for Freightliner Trucks. McHorse notes this attention to quality extends from the engine to the transmission, axles, brakes,



From 2008 to 2013, the Freightliner Cascadia and Cascadia Evolution have had the best resale value in the industry.



electrical system and how the overall truck is constructed. It is also having an impact on anticipated engine life.

“Not that long ago, the B50 life of an engine before it would need a top-end rebuild used to be around 800,000 miles. It’s now 1.2 million miles for the DD15 engine,” McHorse says. “That can extend the life of a truck and it can save \$5,000 to \$7,500 in repair costs during that time.”

McHorse says Freightliner Trucks has revamped its manufacturing processes during the last decade, increasing the amount of auditing that takes place along the assembly line. Daily quality meetings are held to discuss recent warranty repairs to identify any manufacturing improvements that can be made. “We do a great deal more monitoring during the process, both computer auditing and manual checks.

Freightliner pulls two trucks from the line each day and does a complete audit of those vehicles, and everyone on the line has the authority to shut down the line to catch a problem,” he says.

Nussbaum says the quality shows through even after hundreds of thousands of miles for the Freightliner Trucks in his fleet. His company has already changed over 90% of its fleet of 260 trucks to Freightliner, yet the first trucks still “have a great ride and are handling like they are new. After 300,000 miles on the road, when you close the doors, they are still tight.”

The focus on quality manufacturing and durability is also apparent when Freightliner owners decide it’s time to sell their trucks. From 2008 to 2013, the Freightliner Cascadia and Cascadia Evolution have had the best resale value in the industry,

according to used vehicle sales price data from National Automobile Dealers Association (NADA) and Kelley Blue Book.

UPTIME

There is one fact no one disputes—a truck that is off the road, even for routine maintenance, is not making money for its owner. In discussions with its customers, Freightliner consistently heard one major concern shared by most truckers—uptime.

Freightliner Trucks offers 24/7 customer support and over 300 full-service dealerships across North America.



“If I’m down, it’s a double-edged sword,” says Henry Albert, a driver with more than 30 years of experience and an owner/operator since 1996. “I’m paying the repair shop and if the wheels aren’t turning, I’m not making money.”

Albert, who owns Albert Transport, was selected by *Overdrive* magazine as its 2007 Trucker of the Year and is a Team Run Smart™ Pro. He points out that when repair work is unscheduled, it might mean dealing with a dissatisfied customer. “Their load did not get there on time and it really doesn’t matter why,” he notes. “Your reputation is tied to your reliability.”

Estimates vary for the cost of an unscheduled day of downtime. Most observers put it at between \$300 to \$1,000 per day. Downtime can actually add up to equal all annual scheduled maintenance and repair costs on a truck, excluding tires. The loss of potential loads caused by downtime and the hit to a trucking company’s reputation based on perceived reliability issues further cuts into profits down the road.

“Our focus at Freightliner Trucks is downtime reduction and maximizing uptime,” said Rinehart.

When you need service, it is important to find a dealer or repair shop stocked with the parts you need and a mechanic trained to work on your truck. The robust support footprint of Freightliner Trucks features hundreds of service locations with Detroit factory-certified technicians throughout North America. That includes over 400 dealership/parts and service locations—with more than 120 of them being Elite Support—certified dealerships. Additionally, with almost 200 ServicePoint® facilities and a 24/7 toll-free hotline, customers are never far from help getting back

on the road. And with trucks featuring Detroit Connect advanced telematics/diagnostic tools, Freightliner offers a unique system that minimizes unplanned downtime.

Rinehart points out the Cascadia and Cascadia Evolution (with Detroit engines) have 50,000-mile intervals between oil changes for long-haul applications. At \$250 to \$300 per oil change, the savings can add up quickly. The increased intervals mean two less oil changes per year based on the average miles driven for most on-highway trucks, allowing for additional revenue combined with \$600 savings in oil changes per truck per year.



SUMMING IT UP— WHAT RCO MEANS TO YOU

Real Cost of Ownership is a way of looking at the truck as a critical part of your business and not just a cost center. In the past, the focus has been on fuel mileage, scheduled maintenance costs and resale value. These costs are important to any customers’ bottom line, but RCO brings a broader, real-life perspective to the discussion.



By using the five pillars—fuel efficiency, connectivity, safety, quality and uptime—trucking companies can get a better picture of how the trucks they buy influence a full range of critical factors in their businesses. The answers required for maximizing RCO are different for each company and customer, depending on the particular daily requirements and influences of their businesses.



RCO takes into account the real-world situations that drivers, trucks and their customers’ businesses face on a daily basis. Having reliable, fuel-efficient trucks on the road with skilled, experienced and satisfied drivers behind the wheel with access to a broad service and support network and advanced diagnostics systems are a huge part of maintaining a profitable trucking operation. Managing the individual Real Cost of Ownership factors for your company is the most efficient way to maximize profits.



FreightlinerTrucks.com/RCO

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