



SUSTAINABLE TRANSPORTATION

**Green Initiatives That
Benefit the Environment
and Your Business**

ArcBest[™]



ABSTRACT

Green transportation and sustainable freight transportation are increasingly important issues in light of rising fuel costs and environmental concerns. Although all forms of transportation contribute to greenhouse gases and congestion, trucking has the largest impact. In the U.S. alone, heavy-duty trucks haul 70 percent of all freight. Trucks also account for approximately 57 percent of global freight emissions, making it more important than ever for companies to focus on minimizing their environmental footprint. Companies like ArcBestSM and its carrier ABF Freight[®] play an important role in creating and maintaining sustainable practices in the industry.

This paper looks at sustainability issues in the transportation and logistics industry, from understanding the challenges presented and potential green transportation initiatives to examining how ArcBest integrates sustainable practices into its operations. ABF Freight has been a SmartWay Partner since 2006, a Green 75 Supply Chain Partner for seven consecutive years and the winner of the 2014 SmartWay Excellence Award, all of which demonstrate the company's commitment to green transportation.



ENVIRONMENTAL IMPACT OF TRANSPORTATION

While the freight and logistics industry is necessary for a thriving economy, creating a sustainable transportation model is critical for protecting the environment. In general, freight transportation makes up 16 percent of corporate emissions. Although sustainability is a hot environmental issue, it's also an important strategy for maintaining company costs.

For example, by adopting moderate fuel efficiency standards, businesses can save significantly on annual fuel costs. As the Environmental Defense Fund's Green Freight initiative points out, carbon and costs are so intrinsically linked that when companies improve one, it also improves the other.¹

The Environmental Protection Agency (EPA) estimates that trucks and trains move approximately 9 billion tons — more than 80 percent — of the country's freight every year. Transporting this cargo poses a substantial impact on the environment, with trucks and locomotives burning an estimated 35 billion gallons of diesel fuel annually. Traditional freight carriers emit in excess of 350 million metric tons of the greenhouse gas, carbon dioxide, every year, along with air pollutants such as particulate matter and nitrogen oxides.²

In 2015, the EPA announced new regulations designed to increase the fuel economy of Class 8 trucks by up to 40 percent. As the industry continues to adapt to such changes, many companies already have implemented green technology that benefits businesses, customers and the environment. This document provides more information about the challenges transportation companies face and the strategies they're using to overcome those challenges and head into the future.³

GREEN TRANSPORTATION CHALLENGES

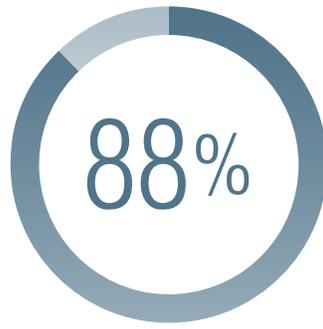
The transportation industry and the environment have historically had somewhat of a paradoxical relationship. Transportation is a vital part of the economy, but it impacts the environment both directly and indirectly. A top challenge facing transportation companies is balancing the need to maintain efficient standards to best serve customers while also integrating sustainable practices and technology into operations.

To do so, transportation carriers and logistics companies must respond to the evolving social, political and ecological pressures to address their environmental impact. The state of the environment has been a major issue since the link between chlorofluorocarbons and acid rain dramatically changed environmental policies in the 1970s & 1980s. In the period from 2002 to 2035, experts estimate that transportation volumes will grow in the following ways:





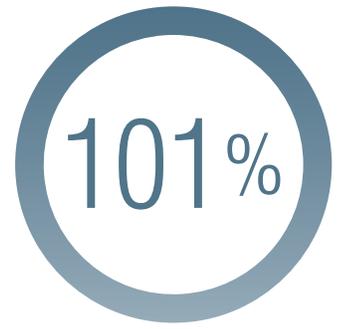
Water 



Rail 



Truck 



Intermodal 

This level of growth places stress and increasing congestion on a network that's already in heavy use. To move toward sustainability, the transportation industry needs to address multiple facets of a complex problem. Major issues include noise reduction⁴, air quality, biofuels, safety, efficiency, growth, air quality, competition and costs⁵. One of the greatest challenges is the prohibitive cost of modifying equipment to comply with stringent green standards, which in turn can raise customer costs.



SMARTWAY TRANSPORT PARTNERSHIP

To help freight transportation and logistics companies save money while reducing their fuel consumption, air pollution, greenhouse gas emissions and other harmful environmental impacts, the EPA created the SmartWay program. This voluntary program offers a comprehensive system for tracking and documenting freight emissions and fuel use. SmartWay's three main components include:

- **The SmartWay Transport Partnership:** The EPA and freight transportation carriers, logistics companies and stakeholders partner to measure and improve their operations and reduce their carbon footprint.
- **SmartWay Brand:** SmartWay partners and affiliates use the SmartWay brand to raise awareness, improve the freight industry's image, and designate that they have improved their practices and operations.
- **SmartWay Global Collaboration:** The program works across the world with various organizations to create unified accounting methods in the global freight sector in addition to supporting global policymakers in adopting sustainability programs similar to the SmartWay program⁶.

ABF Freight, the ArcBest LTL carrier, has been a SmartWay partner since 2006. In 2014, the company received the SmartWay Excellence Award because of its position as an industry leader in freight supply chain environmental performance and energy efficiency.



SMART SOLUTIONS OFFER GREEN CAPABILITIES AND SUSTAINABILITY

Through ABF Freight, ArcBest has been an active participant in the conservation movement for decades. The company began voluntarily limiting the top speeds of its trucks to conserve fuel and reduce emissions beginning in 1976. In 1994, the company incorporated new trucks with computerized engine shut-offs, which effortlessly reduced idling and minimized fuel consumption while limiting emissions.



BENEFITS OF USING ENVIRONMENTALLY FRIENDLY EQUIPMENT

Transportation makes up about one-third of energy consumption around the world, and moving freight accounts for nearly 25 percent of the transportation industry and 8 percent of the world's carbon dioxide emissions. Based on this, it's easy to see why sustainability and green practices are of such importance in the freight transportation industry. Implementing sustainable practices also benefits transportation companies and their customers, as many green strategies also reduce costs long term.

For example

Reduced idling minimizes wear and tear on the engine, which lowers maintenance costs while also offering cleaner emissions.

Aerodynamic vehicles can reduce greenhouse gas emissions by 5.5 tons per vehicle and save up to 2,430 gallons of fuel every year.

Optimized routes increase efficiency from point A to B & may reduce each truck's fuel consumption by 10 percent to 15 percent per day.

ABF Freight makes a conscious and determined effort to increase fuel efficiency and reduce fuel consumption with a strict maintenance and replacement program. For example, in 2016, the company purchased 600 road tractors that offered decreased emissions, better fuel economy and automated manual transmissions. Automated manual transmissions alone can boost fuel economy by 1 percent to 3 percent on average because this technology uses a computer to shift the truck's manual transmission at the best time. Because they eliminate the need for a manual shifter and clutch, they also make these vehicles easier to drive, which can reduce the costs associated with recruiting and training drivers.

Additionally, ABF Freight limited the maximum speed for its fleet of road tractors to 62 miles per hour to optimize each vehicle's fuel efficiency. At this speed, each truck emits 18 fewer tons than identical vehicles operating at 68 miles per hour.

The company also purchased 800 new 28-foot trailers with aerodynamic skirts to add to its fleet of 15,000 trailers (already retrofitted with that feature) to improve fuel economy and reduce wind resistance. When buying trailers, the company chooses smooth-sided (interior post) trailers for additional improved wind resistance. These are key strategies for reducing aerodynamic drag, which causes the most energy losses for trucks traveling at highway speeds. According to the EPA, improved aerodynamics could offer enhanced fuel economy up to 15 percent. An aerodynamic long-haul truck also saves an average of 16.7 metric tons² of carbon dioxide, 1,651 gallons of fuel and more than \$6,000 in fuel costs.⁹



REVERSE LOGISTICS



In addition to equipment improvements, companies can implement strategies to reduce, reuse and recycle in day-to-day logistics. Reverse logistics relies on strategies such as the recycling of goods and materials, product repairs and the proper disposal methods for unwanted goods to move toward sustainability while improving customer experience. Although reverse logistics isn't necessarily a new concept, it is an effective strategy to increase sustainability. As Gailen Vick, founder and former president of the Reverse Logistics Association (RLA), notes, "Reverse logistics is inherently green. Repairing, refurbishing or recycling a product instead of throwing it in a landfill automatically does good for Mother Earth."¹⁰

Reverse logistics reduces transportation companies' carbon footprints, but it also helps enhance cost reduction, which makes it a smart choice on multiple levels. This environmentally friendly strategy includes asset recovery, refurbishing, remanufacturing, recycling and reusing. Jeff Robe, RLA's former director of marketing, notes, "Reverse logistics addresses questions including: At a product's end of life, can some components be salvaged and reused? Can the materials be ground up, recycled and made into additional parts?"¹¹



As an example of reverse logistics in action, ABF Freight recycles all used cleaning solutions, oil and antifreeze as well as used oil filters wherever possible and where required by law. Used parts get recycled as scrap metal, and retread tires are regularly in rotation. Cloth shop rags are the cleaning tool of choice over paper towels, and used engine batteries are returned to the manufacturer.

HOW GREEN SOLUTIONS HELP COMPANIES & THE ENVIRONMENT



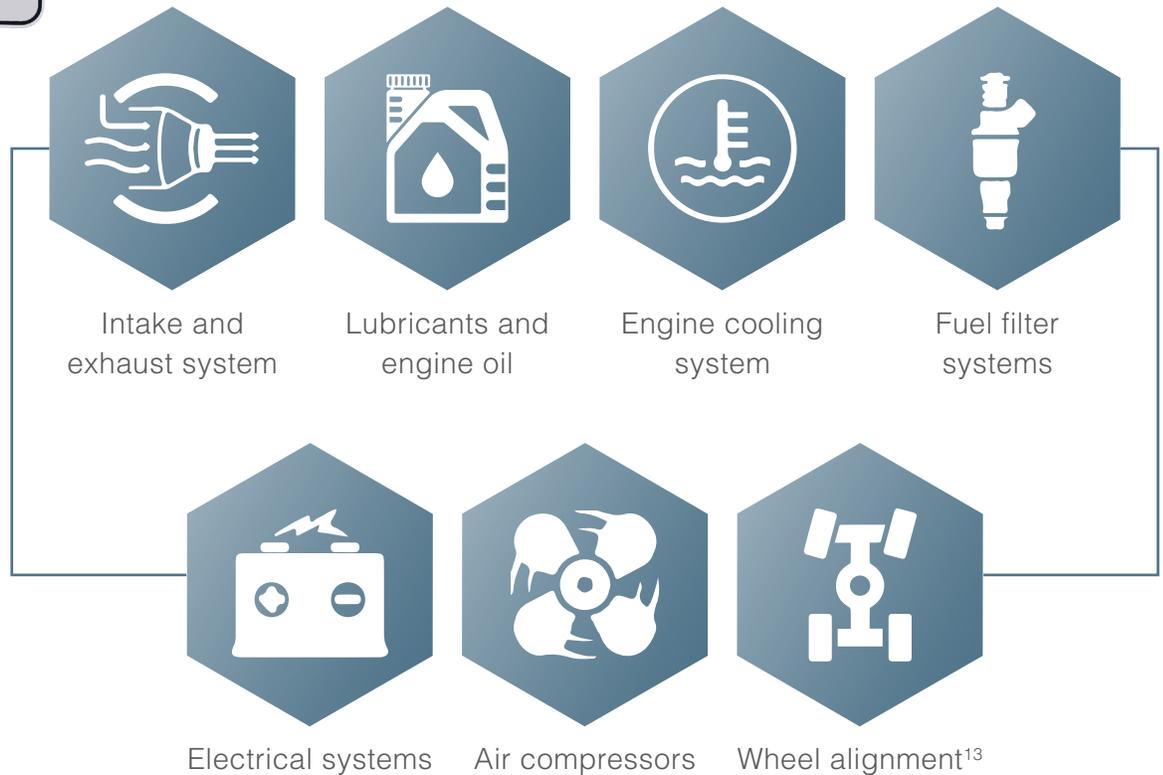
In August 2011, the EPA and the National Highway Traffic Safety Administration (NHTSA) issued Phase 1 standards for fuel economy and fuel efficiency of medium- and heavy-duty trucks manufactured in model years ranging from 2014 to 2018. The goal of these standards was to reduce carbon emissions by 270 million metric tons while saving roughly 530 million barrels of oil over the life of these vehicles. In August 2016, the EPA and the NHTSA announced the second phase of their standards, which are applicable on medium- and heavy-duty trucks and vehicles through model year 2027. In the end, these new standards are expected to lower carbon emissions by 1.1 billion tons.

The EPA and NHTSA standards deal with new models, but it's up to transportation companies to maintain and modify their existing equipment to maximize performance, reduce emissions and contain costs for sustainability that extends beyond the model years stipulated in the Phase 1 or Phase 2 standards.¹²

EMISSIONS VS. PERFORMANCE



ArcBest recognizes the role that performance maintenance plays in fuel efficiency and reducing emissions. The company continually evaluates ABF Freight equipment to make sure all vehicles are maintained at peak performance for clean, fuel-efficient freight transportation. This is particularly important because [preventive maintenance](#) on the engine and other truck parts is essential to operating at peak condition while improving vehicle reliability, saving on fuel, reducing emissions and enhancing safety for drivers. Components with a substantial impact on fuel economy include:



Tire maintenance is another effective way to reduce greenhouse gases and enhance fuel efficiency. Approximately 13 percent of a truck's energy use is due to tire rolling resistance. Improperly inflated tires flex under the weight of the truck, producing heat and increasing the rolling resistance, which unnecessarily wastes fuel. Tire inflation just 10 psi below the recommended levels reduces fuel efficiency between 0.5 and 1 percent.¹⁴

IDLING



Computerized engine shut-off reduces the ABF Freight fleet's idling time. In turn, the company also reduces the amount of fuel its trucks consume. A diesel engine idling for just one hour burns a gallon of fuel.¹⁵ If each engine in a fleet of 100 vehicles idles for an hour each day and the average diesel price per gallon is \$2.30, the annual cost of wasted fuel would be \$83,950.



Idling also increases engine wear and emissions. Rest-period idling accounts for an estimated 55,000 tons of nitrogen oxides, 400 tons of particulate matter and 11 million tons of carbon dioxide.¹⁶ By reducing the idling of its fleet, a company minimizes its overall fuel costs as well as emissions.

PREVENTING POLLUTION



Although fuel economy and emissions are both important environmental issues, stormwater pollution is another growing concern. The problem occurs when snow melts or rain flows over pollutants (oil, dirt, fuel) before passing through storm drainage systems and into local streams and creeks. According to the EPA, stormwater pollution is the biggest source of water pollution in the U.S.¹⁷

ArcBest complies with state and federal regulatory requirements and follows industry best practices for dealing with stormwater runoff to protect area waterways from potentially harmful chemicals. All company facilities that participate in fueling or maintenance activities are stormwater permitted and have stormwater pollution prevention plans.

Additionally, optimal management practices and operations reduce the possible impact of stormwater runoff related to company facilities and activities. ABF Freight stores fuel for its trucks and tractors in facilities with high fuel use. It favors aboveground storage systems over underground. In circumstances where underground tanks are used, all such tank systems are in full compliance with state and federal guidelines. Any new storage installations are state-of-the-art, double-walled fiberglass tanks and lined with integrated spill and overflow prevention and electronic monitoring systems.

EMISSIONS LAWS BY STATE

The federal government and U.S. Environmental Protection Agency mandate emission standards according to the type of fuel and vehicle.¹⁸ States aim to manage emission levels with inspection programs that require monitoring of vehicle emissions and the repair of any problems as part of state registration and/or inspection procedures. Because each state determines its laws, they vary widely across the county.

Click on the states below to view emissions laws.



Alabama: None

Alaska: None

Arizona: The state requires most cars, RVs and trucks to undergo an annual emissions test. Exemptions include alternative fuel vehicles, hybrid vehicles less than five years old and new vehicles. Fees vary by county.¹⁹

Arkansas: None

California: The state has strict emission rules. Vehicles in all counties but six must have emissions checked when renewing the registration every two years. Fees vary.²⁰

Colorado: New vehicles are exempt for the first seven model years, and vehicles from eight through 11 model years receive emission inspections through onboard diagnostics. Older vehicles receive an I/M 240 dynamometer test.²¹

Connecticut: The state requires emissions testing on all vehicles every two years (with some exceptions). The Connecticut Department of Motor Vehicles notifies vehicle owners within 45 days of the due date for official emissions tests.²²

Delaware: Most vehicles are required to have one of three types of exhaust emission inspection tests based on the type and age of the vehicle: idling, a two-speed test while the vehicle is at 2,500 rpms and onboard diagnostics.²³ The state DMV sends notices in advance of the required testing.²⁴

Florida: None

Georgia: The state requires most vehicles to pass emissions testing to renew the vehicle's registration.²⁵

Hawaii: None

Idaho: The state requires emissions testing in Ada County, Canyon County and the city of Kuna.²⁶

Illinois: The Illinois Environmental Protection Agency requires most vehicles to undergo emissions inspections as part of the license plate renewal, typically every two years.²⁷

Indiana: Emissions inspections are required every two years for most vehicles.²⁸

Iowa: None

Kansas: None

Kentucky: None

Louisiana: Emissions testing is required as part of the motor vehicle inspection and maintenance program in the five parishes of Baton Rouge.²⁹

Maine: Emissions testing is required as part of Maine's Enhanced Auto Inspection Program.³⁰

Maryland: Maryland's Vehicle Emissions Inspection Program requires testing as part of a vehicle's registration renewal.³¹

Massachusetts: Emissions testing and passing inspection is required annually as part of the Massachusetts Vehicle Check Program.³²

Michigan: None

Minnesota: None

Mississippi: None

Missouri: Emissions inspections are required as part of the Gateway Vehicle Inspection Program in the St. Louis metropolitan area.³³

Montana: None

Nebraska: None

Nevada: The Nevada Department of Motor Vehicles requires emissions inspections annually for most vehicles.³⁴

New Hampshire: The New Hampshire Department of Safety's Division of Motor Vehicles requires annual emissions inspections.³⁵

New Jersey: Emissions tests are required as part of a vehicle's annual inspection.³⁶

New Mexico: The New Mexico Motor Vehicle Department requires emissions testing for all vehicles in the Bernalillo County area.³⁷

New York: Emissions testing is required for most vehicles in New York state, either using on-board diagnostics or low enhanced inspection, depending on the age and the type of vehicle.³⁸

North Carolina: On-board diagnostic testing for vehicle emissions is required in 48 counties in North Carolina & includes most cars and light-duty trucks. Diesel-operated vehicles are exempt.³⁹

North Dakota: None

Ohio: The Ohio Environmental Protection Agency requires onboard diagnostic testing for most vehicles (unless they meet exemption guidelines)⁴⁰ every two years.⁴¹

Oklahoma: None

Oregon: Vehicles driven in or near the Portland Metropolitan area must have a Certificate of Compliance proving that the vehicle passed the Department of Environment Quality's emissions test.⁴²

Pennsylvania: The state of Pennsylvania has region-specific emissions testing due annually during a vehicle's state inspection.⁴³

Rhode Island: Rhode Island requires all motor vehicles to pass emissions inspections every two years. Diesel vehicles with a model year of 1996 or newer must also pass a diesel opacity test at specially designated Diesel Opacity Stations.⁴⁴

South Carolina: None

South Dakota: None

Tennessee: Vehicle emissions testing is a required part of the registration renewal process, and the testing can be completed at any of the testing stations regardless of where the vehicle is registered.⁴⁵

Texas: The Texas Department of Public Safety requires emissions testing in 17 counties: Brazoria, Fort Bend, Galveston, Harris, Montgomery, Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, Travis, Williamson and El Paso.⁴⁶

Utah: Utah requires vehicle models less than six years old to undergo emissions testing every two years. Vehicles older than six years must have an emissions test annually. Diesel vehicles are exempt in Utah County.⁴⁷

Vermont: All vehicles 1996 or newer are subject to annual on-board diagnostic system checks as part of the state's yearly inspection program.⁴⁸

Virginia: Virginia requires emissions inspections every two years unless the vehicle meets state-specified exemptions.⁴⁹

Washington: The state requires emissions testing for most vehicles in most of Spokane, Snohomish, Pierce, King and Clark counties.⁵⁰

Washington, D.C.: Testing is required as part of a vehicle's annual inspection.⁵¹

West Virginia: None

Wisconsin: Emissions testing is required upon renewal of license plates or transfer of ownership. The Wisconsin Department of Transportation notifies vehicle owners when they require emissions testing.⁵²

Wyoming: None



SUMMARY

From recycling used oil to embracing aerodynamic truck designs, the ArcBest commitment to sustainability is evident in its practices and procedures.

The company's green initiatives work to move the freight industry forward, addressing and reducing its impact on the environment while also conserving operating costs. ArcBest practices stem from its commitment to maintaining environmental quality, resulting in national recognition for its responsibility. Its awards and accolades include:



2014 SmartWay Excellence Award from the EPA, which identified ABF Freight as a "true industry leader in freight supply chain environmental performance & energy efficiency"⁵³



Quest for Quality Awards given to ABF Freight and Panther Premium Logistics by Logistics Management magazine in recognition of customer service⁵⁴



SmartWay Green 75 Supply Chain Partner for seven consecutive years

Improved efficiencies boost green appeal while managing costs. As ArcBest works to stay ahead of the curve and maintain excellent sustainable standards, it also offers reliable service and solutions that improve overall customer experience.



To learn more about ArcBest freight and logistics services, visit arcb.com.

- ¹ <http://business.edf.org/projects/featured/green-freight/journey/>
- ² <https://nepis.epa.gov/Exe/ZyNET.exe/P1002LP4.txt?ZyActionD=ZyDocument&Client=EPA&Index=2006%20Thru%202010&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&UseQField=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D:\ZYFILES\INDEX%20DATA\06THRU10\TX\00000005\P1002LP4.txt&User=ANONYMOUS&Password=anonymous&SortMethod=hj-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hjfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=4#>
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- ⁴ <https://people.hofstra.edu/geotrans/eng/ch8en/conc8en/ch8c1en.html>
- ⁵ <http://www.inboundlogistics.com/cms/article/green-transportation-on-the-road-to-sustainability/>
- ⁶ <https://www.epa.gov/smartway/learn-about-smartway>
- ⁷ https://www.edf.org/sites/default/files/10881_EDF_report_TheGoodHaul.pdf
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- ¹¹ <http://www.inboundlogistics.com/cms/article/full-circle-reverse-logistics-keeps-products-green-to-the-end/>
- ¹² <https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-greenhouse-gas-emissions-commercial-trucks-overview>

- ¹³ <http://www.truckingefficiency.org/operational-practices/preventive-maintenance>
- ¹⁴ http://fleetowner.com/fuel_economy/fuel-economy-0701
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- ¹⁶ http://www.afdc.energy.gov/uploads/publication/hdv_idling_2015.pdf
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- ²² <http://ctemissions.com/frequently-asked-questions/getting-the-emissions-test/what-vehicles-get-tested>
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