Aperia | halo
TECHNOLOGIES | TIRE INFLATOR

CASE STUDY

Fuel Your Fleet's Profit by Eliminating Tire-Underinflation

Overview

With fuel and tire costs on the rise, successful fleet managers are improving margin by focusing on operational efficiencies within their control. At the top of that list is a money-saving measure that can directly reduce the cost of both fuel and tires. A proven investment successful fleets have made is deploying technology to actively manage fleet tire pressure. Tools to support effective tire management, such as the Halo Tire Inflator by Aperia Technologies, are readily available, industry tested and offer a rapid return on investment.

An award-winning truckload carrier recently conducted a comprehensive 12-month pilot with resounding success.

Currently, there are tens of thousands of Halos delivering positive results across more than 400 North American fleets. One large, award-winning truckload carrier recently conducted a comprehensive 12-month pilot to assess the performance of the Halo Tire Inflator with resounding success. Significant improvements in fuel economy and tire life were measured over the 12-month period, with average overall cost-savings per truck of $1,189, and a fleetwide deployment estimated to deliver savings of more than $4 million dollars annually.

A new truck, ready to roll, after being equipped with Halo Tire Inflation and Chrome Covers.

The Pilot

Aperia partnered with the Fleet to carefully design the 12-month pilot to ensure solid readings and trusted results. The pilot included Freightliner Cascadias - half equipped with Halo Automatic Tire Inflation and half control units. Monthly fuel economy readings and quarterly tread depth measurements were recorded over the testing period. Equipment and measurement details are outlined below.

Equipment:

Truck: Freightliner Cascadia

- 50% test units
- 50% control units

Tires: Michelin

- All virgin rubber
- Drive tire pressure target: 100 PSI

Tire Pressure Monitoring: PressurePro

- Sensors equipped on all test and control tires included in study
- Telematics equipped on all units

Automatic Tire Inflation Equipment: Halo Tire Inflator

- Drive tires equipped on all test units
- No inflation device equipped on control units

Measurements:

Tire Pressure

- Tire pressure measured through telematics

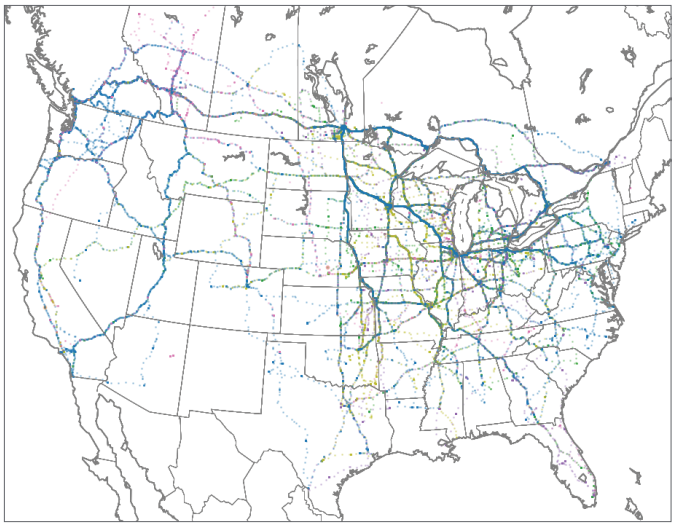
Tread Depth

- Measured quarterly by the Fleet

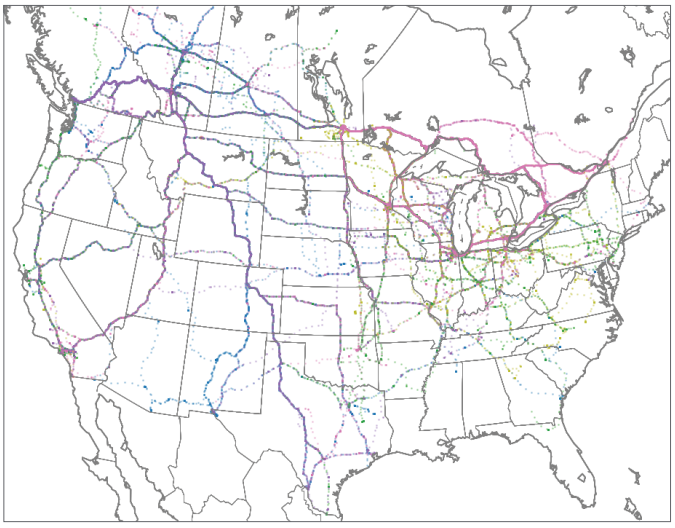
Fuel Economy

- Provided monthly by the Fleet

Halo Truck Routes



Control Truck Routes



The Fleet opted to test Halo in a diverse set of routes in order to best measure the system's fleet-wide impact. Careful consideration was given to ensuring test and control units share similar historical fuel economy readings, tread wear measurements, and routes.

Fuel Economy Data

Month-end fuel economy measurements for test and control trucks were provided by the Fleet. Average fuel economy, measured in miles per gallon over the 12-month study, was 9.00 for the test group, and 8.86 for the control trucks, highlighting an average fuel economy benefit of 1.58% for Halo-equipped trucks.

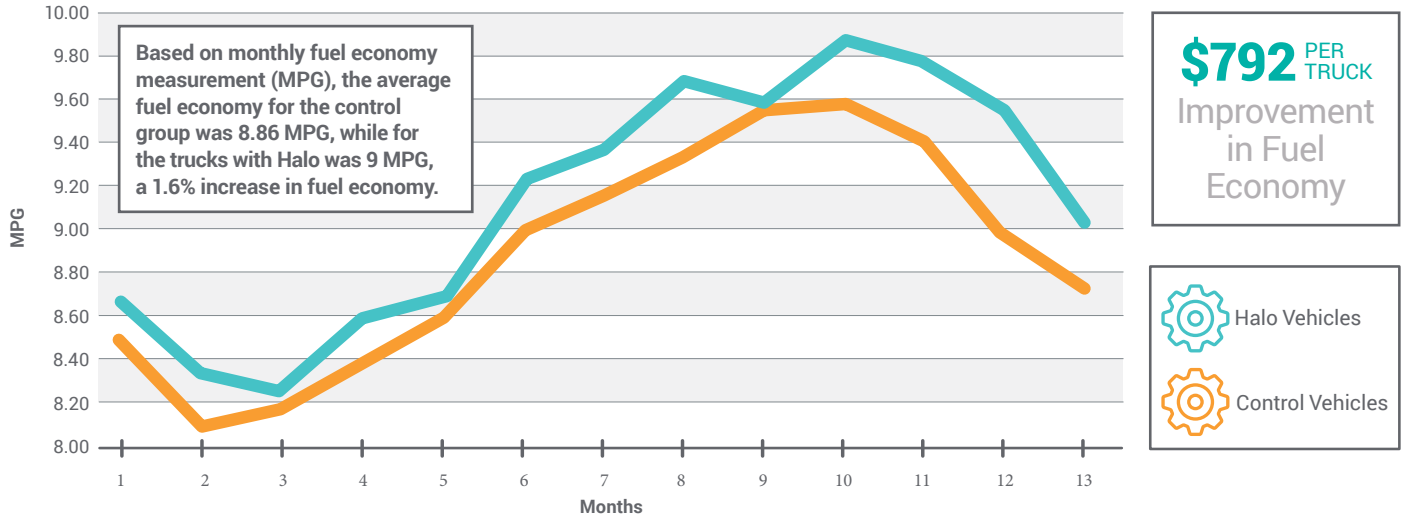
The average fuel cost per gallon during the test period was $3.25, resulting in an average annual fuel cost per truck of $49,472. Based on the 1.6% improvement in fuel economy, the estimated annual fuel cost savings per Halo-equipped truck was $792, or $3,166 over the Fleet's 4-year trade cycle.

Should the Fleet deploy Halo across its entire 3,400-unit fleet, they estimate fleet-wide savings of $2.69M in fuel savings alone.

Fuel Savings

Average miles per year	137,000
MPG	9.00
= Gallons per year	15,222
x Fuel cost ($/gal)	$3.25
= Fuel cost per truck per year	$49,472
x Fuel economy improvement	1.6%
= Fleet fuel savings per truck per year	$792
x Years in trade cycle	4
= Fleet fuel savings per truck per trade cycle	$3,166
x Trucks in given trade cycle	850
= Savings per trade cycle	$2,691,250

Fuel Economy



Tread Depth Data

Tread depth was measured by the Fleet quarterly during the 12-month testing period with a calibrated gauge, following industry best practices. Measurements for test and control tires were plotted by wheel position based on mileage and remaining tread, and the least squares regression model was used to determine the representative tire wear slope for each group.

The average tread wear rate (in 32nd in/mile) for test units was 4.200E-5, and control units 5.147E-5. The 12-month test demonstrated an 18.4% average rate of tread wear improvement for those tires with Halo installed.

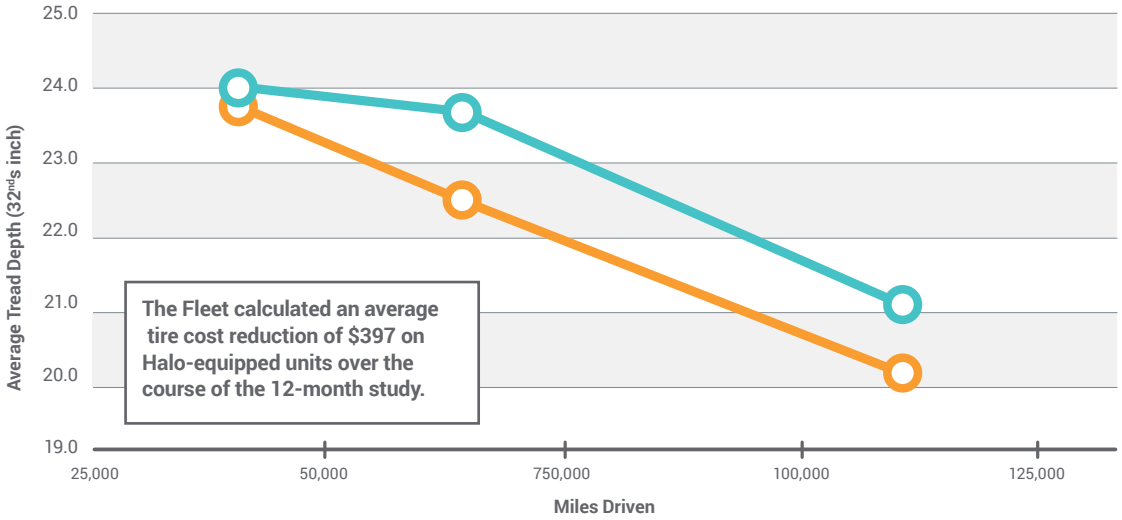
Based on the Fleet's typical tire cost and life, the Fleet calculated a cost per mile on its control trucks of $0.016, versus $0.0029 on Halo-equipped trucks. Considering annual Fleet mileage, an average tire cost reduction of $397 per truck was demonstrated over the course of the study. The Fleet expects to realize more than $1,500 in tire cost savings per trade cycle, per truck.

18.4%
IMPROVEMENT
IN TIRE LIFE

Tire Life

Tires per truck served by Halo	8
x Cost per tire	$330
= Tire cost per truck	$2,640
÷ Tire life (miles)	168,000
= Tire cost/mile	$0.016
x Tire life improvement	18.40%
= Savings per mile	$0.0029
x Average miles per year	137,000
= Fleet tire savings per truck per year	$397
x Years in trade cycle	4
= Fleet fuel savings per truck per trade cycle	$1,589
x Trucks in given trade cycle	850
= Savings per trade cycle	$1,350,820

Tire Tread Depth



$397 PER TRUCK
Improvement in Tire Cost

Halo Vehicles

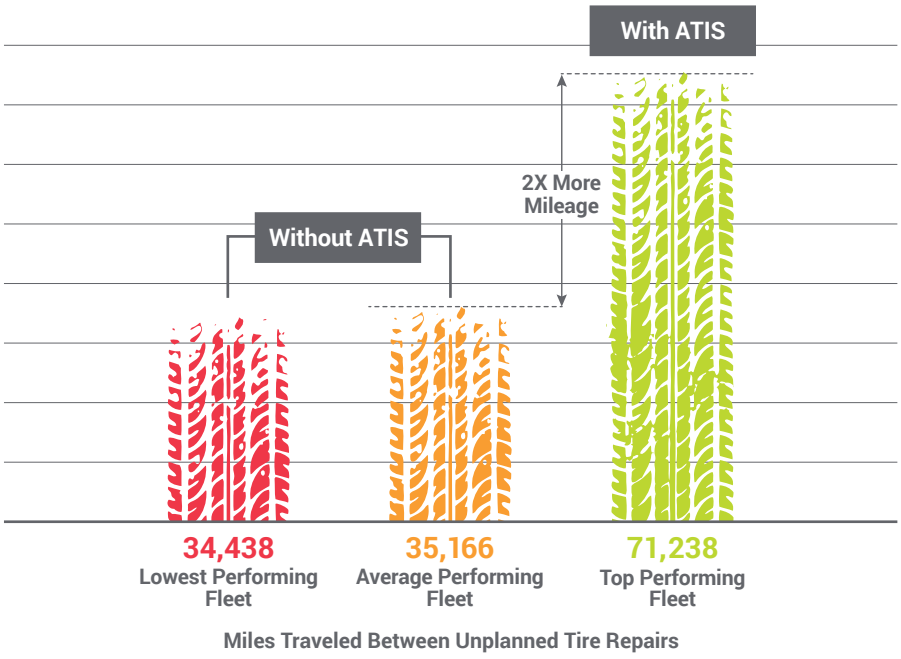
Control Vehicles

Safety Improvements

Beyond the measurable fuel cost savings and tread wear rate improvement, there were enhanced safety aspects as well. The use of an automatic tire inflation system like Halo significantly reduces the risk of tire blowouts and the potentially dangerous and costly consequences.

Tires are the Leading Cause of Unscheduled Roadside Repairs

American Trucking Association & Technology Maintenance Council Study



Estimated Cost of Ownership/Truck

Based on the pilot results, the Fleet established a replacement parts ratio to support the total cost of Halo ownership over a 4-year trade cycle. With a 2-year warranty in place, the cost would be cut in half, putting the total maintenance cost per truck at $14.87 USD.

Assuming the time saved from not checking and inflating tires would offset the replacement parts cost over the Halo's lifetime, only labor costs would need to be considered, resulting in an estimated cost of ownership per Halo unit at $19.97 USD.

Total replacement parts cost/truck		$14.87
Install Labor Cost	1 hour labor/truck x $65 USD/1 hour labor =	$65 USD/Truck
Total Cost of Halo Ownership/Truck	$14.87 USD + $65 USD =	$79.87 USD/Truck
Total cost of ownership per Halo		**$19.97 USD/Halo**

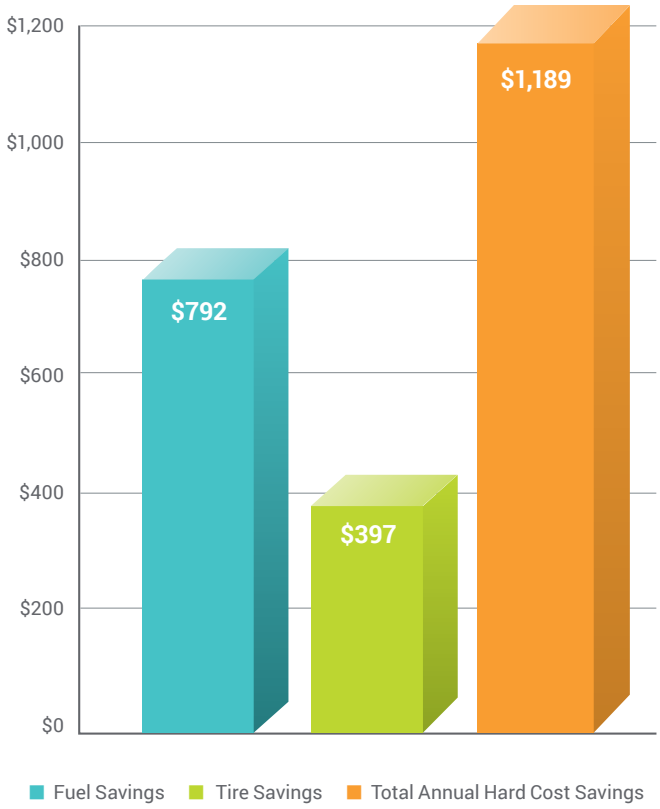
Net Savings Per Truck

Though the study demonstrated many intangible benefits in the way of increased peace-of-mind for the Fleet's drivers, and a reduction in catastrophic tire failure, the focus of this 12-month testing period was to measure Halo's contribution to Fleet fuel economy and tire life. By evaluating these hard cost savings alone, the Fleet calculated a $1,189 cost of ownership improvement per truck annually, or $4,756 improvement over its 4-year trade cycle.

Fleet Savings Breakdown

Total Annual Hard Cost Savings per Truck (Fuel and Tire Savings)	$1,189
x Trade Cycle/Life Cycle (Years)	4
= Total Cost Savings per Truck	$4,756
– Total Cost of Halo Ownership/Truck	$80
= Net Savings per Truck	$4,676

Savings Over 12-Month Test Period



Summary

At the conclusion of the test, the Fleet was impressed with the results delivered by the Halo Tire Inflator. Halo not only supported fleet safety targets and reduced fleet downtime, but it delivered tangeable benefits in the way of fuel economy and increased tire life.

Given the 1.6% improvement in fuel economy, 18.4% improvement in tire life, a calculated annual cost savings of $1,189 per truck, the Fleet moved forward with an expanded deployment, and began rolling out Halo across the Fleet.

About Aperia Technologies

Aperia is the world leader in tire inflation technology for tractors and trailers, and is continuously innovating to make transportation safer, more efficient, and better for the environment. The company's Halo® Tire Inflator and related products improve road safety and fuel economy while reducing tire expenditures, downtime, and maintenance costs for more than 400 commercial fleets.

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