



# How Ryder System, Inc. Validated TruckWings' Fuel Savings Through a Rigorous On-Road Test



SCOPE OF DATA:  
**2.7 MILLION MILES**



PROVEN RESULTS:  
**4.1% IMPROVED MPG**



**VALIDATION**  
FROM DRIVERS  
& MANAGERS



## Corporate Overview

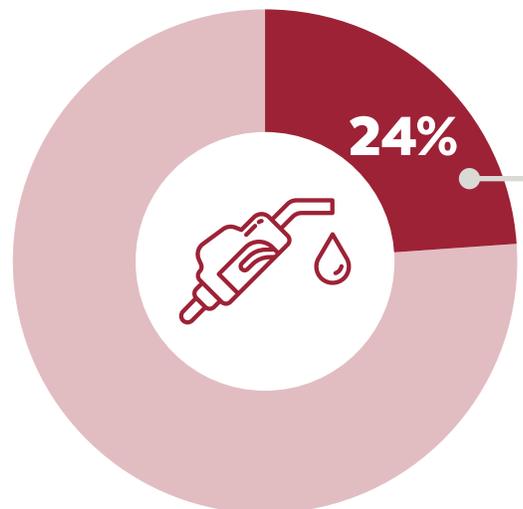
Ryder System, Inc. is a leading logistics and transportation company whose mission is to provide innovative fleet management and supply chain solutions that are reliable, safe, and efficient. The company leases more than 235,000 vehicles a year to customers ranging from small businesses to large, national enterprises.

Ryder has a strong history of leveraging emerging technologies that help make its business, and, ultimately, its customers' businesses more efficient and competitive.

## The Challenge

Part of Ryder's mission is to regularly explore and evaluate new vehicles, new technologies, and early-stage development products that could directly benefit customers by improving fuel economy, enhancing safety, and reducing environmental impacts and long-term operating costs.

Fuel is one of the biggest and most volatile costs for Ryder's customers, driving interest in new technologies that have the potential to improve fuel economy in existing fleets and reduce operating costs. According to a 2019 study by the American Transportation Research Institute (ATRI), fuel accounts for 24%, on average, of the total operational costs for trucking companies. Customers are also seeking greener, more eco-friendly solutions. The challenge is identifying new technologies and rigorously testing them under realistic road conditions before rolling them out fleetwide and bringing them to customers.



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# The Solution



To address this challenge, Ryder evaluated TruckWings, an active aerodynamic device made by TruckLabs. TruckWings automatically deploys and closes the gap between the cab and trailer to reduce drag, improve handling, and save fuel. Improved fuel efficiency also means lower greenhouse gas emissions.

TruckLabs has done extensive testing and demonstration of the technology with other fleets, but Ryder wanted further validation of TruckWings' promoted fuel savings. The company has a dedicated team of internal resources devoted to a rigorous approach to new-product testing.

TruckLabs worked with Ryder to design a robust on-road test to quantify the

benefits of TruckWings. The test would compare the relative performance of a truck before and after TruckWings was installed. The evaluation was based on industry recommended practices for fuel-economy tests developed by members of the Technology & Maintenance Council of the American Trucking Associations and adopted by the Society of Automotive Engineers.

The companies chose 60 identical trucks across five Ryder locations in the Southwest region to minimize the impact of changing drivers and routes. To balance variables such as temperature and fuel quality, the trucks were randomly split into control and test groups per site.

## Test Equipment

Tractor Specification	Trailer Specification	TruckWings Specification
Freightliner Cascadia Day Cab Tandem Drive Axle Roof Fairing & Cab Extenders 54" Average Tractor-Trailer Gap	53' Dry Van Side Skirts	34" Tractor-Trailer Gap Coverage Fully Automated Deployment On-Board Telematics Device Patented Folding Panel Design 5052 Aerospace-Grade Aluminum Frame with Integrated Actuators

A six-week baseline period was run to capture data on what normal operations looked like for mileage and fuel economy across each of these locations. After TruckWings were installed on 30 trucks, a six-week pilot test was conducted.

Throughout the pilot period, TruckLabs monitored live telematics from the trucks to track automated deployment and uptime. Fuel mileage was compiled weekly using Ryder's data for each truck.

The final fuel savings calculations compared the relative fuel consumption between the control and test groups in the pilot segment against the same delta in the baseline segment. The companies established a benchmark for success in the pilot of fuel savings of 4% or more on vehicles with TruckWings.

In conjunction with this robust on-road test, TruckLabs hired a firm to conduct computational fluid dynamics (CFD) simulations to visualize and assess the aerodynamic performance of TruckWings. CFD is the industry-standard method for predicting drag on commercial vehicles. The U.S. Environmental Protection Agency also accepts CFD simulations to quantify the benefits of add-on technologies to tractor-trailers.

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# The Results



## No Mechanical Issues

Over 12 weeks, the test collected nearly 2.7 million miles of data. TruckWings were deployed on about 560,000 miles of open-road driving. TruckLabs set a target that over ALL miles driven, TruckWings would be open at least 70% of the time. Ryder pilot trucks came in well above that at an 86% overall operational deployment.

In addition, Ryder test trucks saw 97% deployment at highway speeds, above the 90% target. During the pilot, there was no downtime due to mechanical issues with the technology.

## Praise from Drivers and Fleet Managers

The feedback from site management and drivers was overwhelmingly positive. Here's a sampling of their comments:



"In high crosswinds, it feels much safer with TruckWings, especially driving across Coachella and Palm Springs."

JOSE IN YUMA, ARIZONA



"I love them - I think they should be in all day cabs."

JUSTIN IN TULSA, OKLAHOMA



"I suspected it would be troublesome but so far it's been good & smooth. I don't even realize when it opens or shuts."

ROBERT IN AMARILLO, TEXAS



## Test Trucks Beat Fuel Economy Benchmark

Over the course of the pilot, Ryder realized a net MPG improvement of 4.1%. The results were predicted by the modeling done through the independent CFD analysis. The simulations demonstrated a wind-averaged drag reduction of 7.4% with a predicted fuel economy improvement of 4.1% at 65mph and fully loaded.

TruckLabs estimated that Ryder saved 3,456 gallons of diesel fuel during the pilot. This means the company would save 1,130 gallons of diesel and eliminate more than 25,000 pounds of carbon dioxide emissions per truck per year.

"Ryder takes new product testing seriously. The wings ran without any issues and the fuel economy results came in above what we were promised," said Mike Plasencia, group director of RyderVentures and new product strategy at Ryder System. "It's been a great experience so far."