MICHELIN FOR MY BUSINESS

# UNLOCKING THE POWER OF TCO: A FLEET MANAGER'S GUIDE TO EFFICIENCY AND SUSTAINABILITY

Transform your fleet management with this essential total cost of ownership (TCO) guide, steering you towards an efficient, eco-friendly future.

**Total Cost of Ownership*

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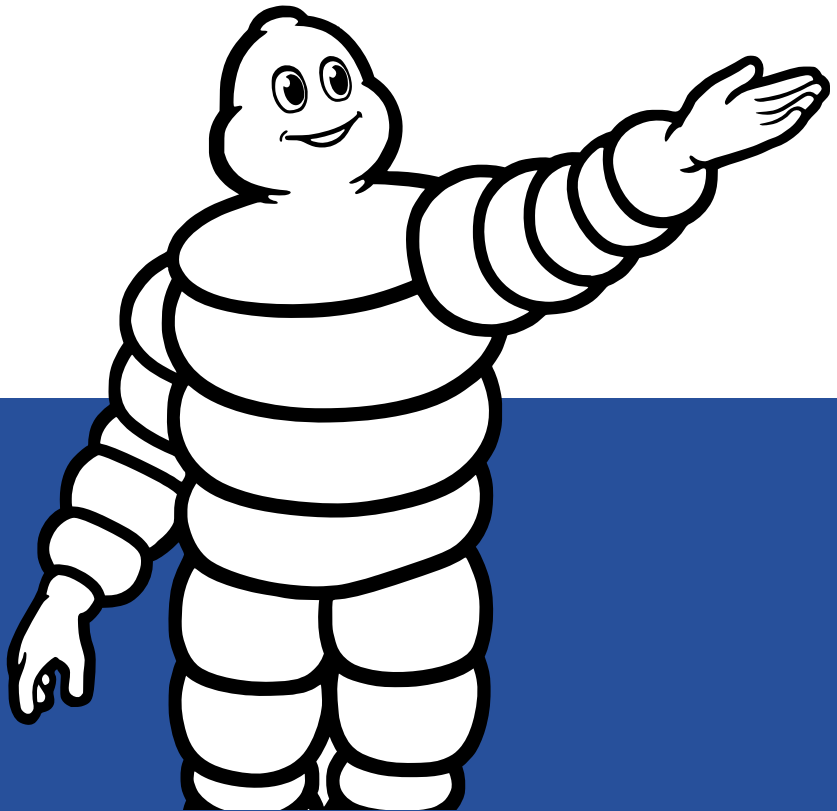
315/80R22.5

# SUMMARY





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# ENHANCING FLEET OPERATIONS WITH TCO

Fleet businesses in South Africa face unique challenges that can put a strain on finances and customers. Soaring fuel expenses, logistical costs and environmental concerns make sustainability a top priority.

This white paper demystifies the concept of total cost of ownership (TCO). We'll debunk common misconceptions and provide you with practical methods to lower your TCO.

Discover how smart choices in tyres and maintenance can not only reduce fuel consumption and environmental impact but also improve your overall TCO.

*Here's what a South African fleet expert has to say about TCO:*

"Many transport operators manage the business in silos, with fuel, labour, tyres etc each being managed separately. It is vital that the operator understands the inter-relatedness of cost components and what makes up the costs on a TCO (total cost of ownership) basis. This helps in improved decision making towards lower total costs."

— Abdool Kamdar, Green Transport & Net Zero Activist

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# THE IMPORTANCE OF TCO FOR YOUR FLEET

Although not a widely known term among fleet owners, Total Cost of Ownership (TCO) is likely something you're already keeping track of, even if you're unaware of it.

TCO is a comprehensive metric encompassing all expenses linked to your fleet, from vehicle acquisition to ongoing costs throughout its lifecycle. Understanding and optimising TCO can serve as a guiding principle for fleet management decisions, ultimately enhancing efficiency, profitability, and sustainability. Let's delve into TCO and its profound impact on fleet performance.

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# DECODING THE POWER OF TCO

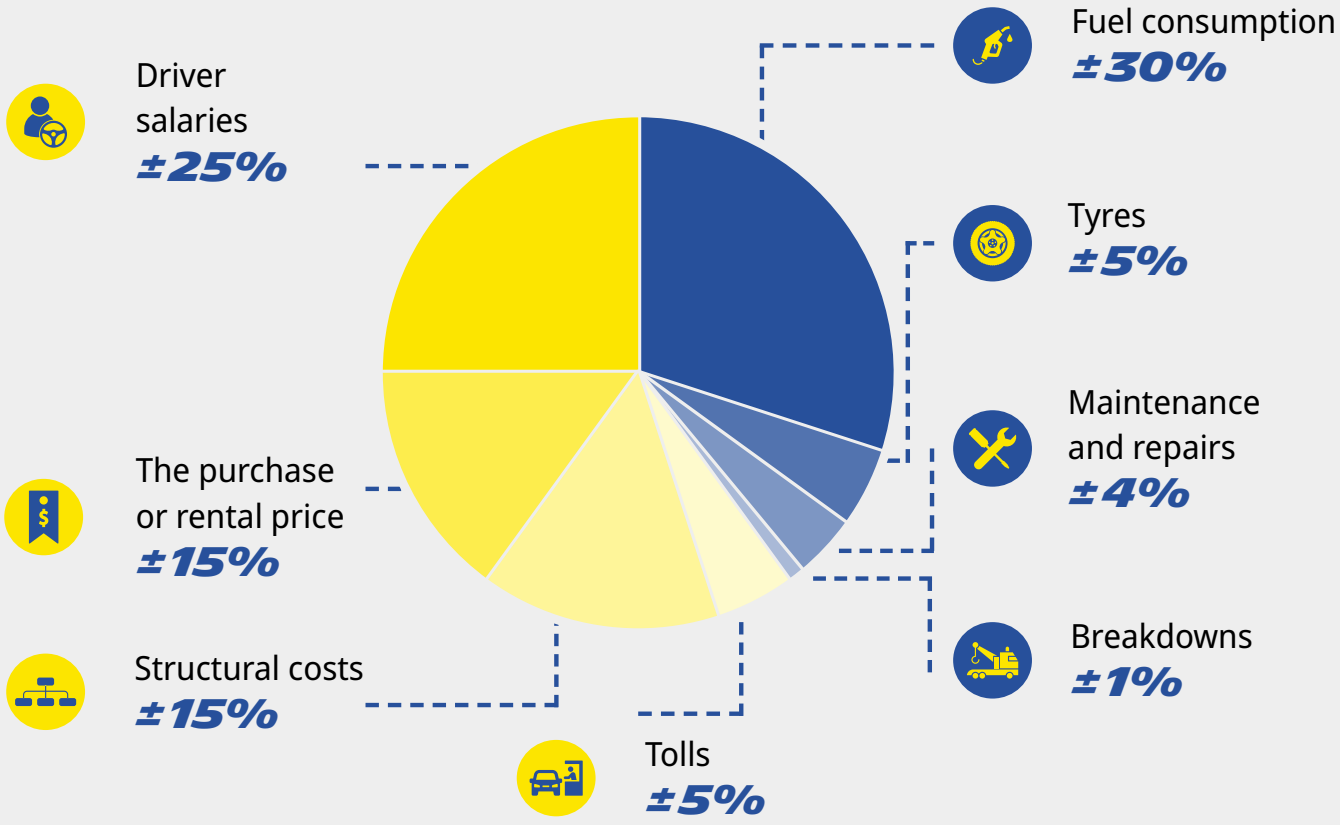
TCO is the ultimate cost compass for truck fleets, going beyond the purchase price. It covers all expenses – fuel, maintenance, insurance, depreciation – and intangibles like downtime and environmental impact.

TCO gives a comprehensive view of your fleet's financial footprint for informed decisions. Customise TCO calculations to align with your priorities and fleet size, ensuring adaptability and accuracy.

As a seasoned manager, you know TCO isn't a one-size-fits-all metric. It empowers data-driven decisions, cost-efficiency, and sustainable fleet management.

## TRUCK TCO INCLUDES:

Figures based on average costs, whatever the usages, the vehicle types/brands and the location of the fleets in Europe.[1]




[1]Ducker worldwide report_ VEHICLE MAINTENANCE COSTS & PAINS_ Michelin Community – December 2017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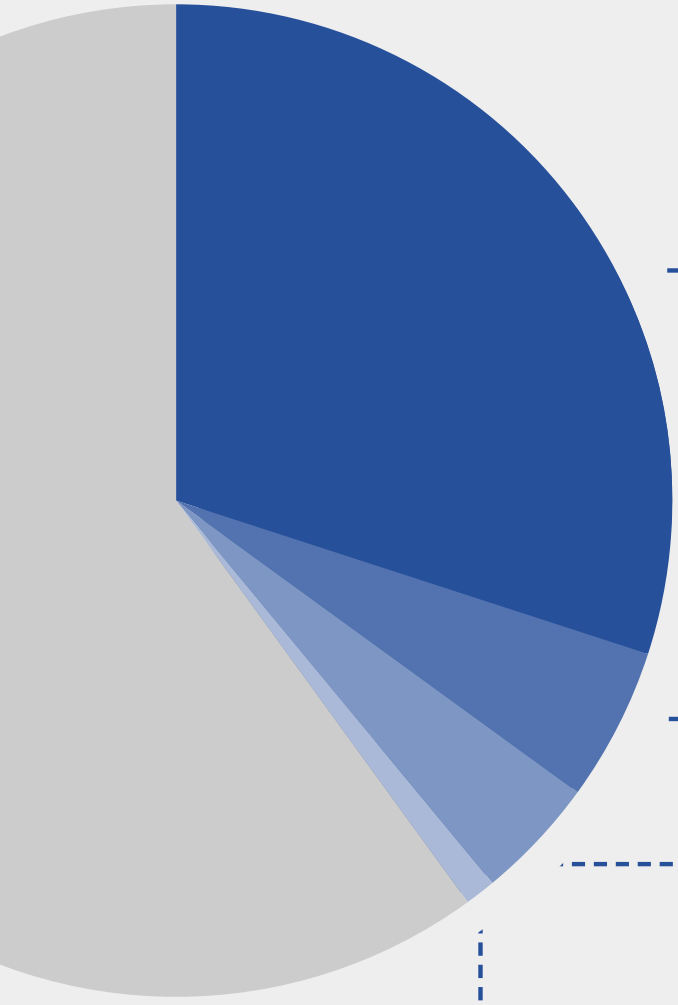
# A CLOSER LOOK AT HOW TYRES IMPACT TRUCK TCO



Fuel consumption

**±30%**

Tyres

**±5%**

Maintenance and repairs

**±4%**

Breakdowns

**±1%**

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In theory, tyres account for about 5% of total truck TCO. However, their impact extends far beyond this.

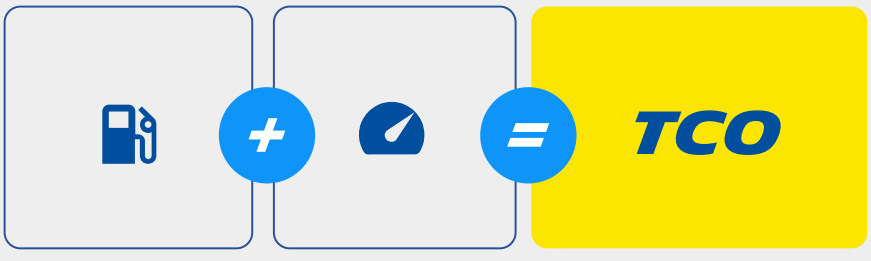
The cost of tyres depends on their longevity in kilometres. Fleet owners calculate the cost per kilometre (CPK) to optimise expenses. They achieve this by selecting durable tyres that can be regrooved or retreaded for reuse.

Tyres play a significant role in reducing fuel consumption, which is often the primary expense for fleets. Up to one-third of a vehicle's fuel consumption can be attributed to tyres. Choosing the right tyres can lead to substantial fuel savings.

Investing in high-quality tyres and implementing good maintenance practices reduces breakdowns, downtime and associated costs.

## HOW MICHELIN CALCULATES TCO

The impact that tyres have on a truck's TCO is primarily influenced by fuel consumption and the cost of tyres. Michelin evaluates the tyre-related TCO based on the resulting fuel consumption and the cost per kilometre (CPK) of the tyres.



# HOW DOES TYRE ROLLING RESISTANCE IMPACT FUEL CONSUMPTION?

At first glance, tyres might seem insignificant, making up only 3% to 5% of a truck's TCO. This is why fleet owners may not always prioritise them. However, delving deeper reveals the significant impact tyres have on fuel consumption.

## WHAT'S SLOWING YOUR TRUCK DOWN?

When a truck travels from point A to point B, five different forces actively and constantly work against it:

**The Inertia**
Prevents the vehicle from advancing (resistance to movement variations).

**Aerodynamic drag**
The air it needs to push through to advance.

**Mechanical friction**
The mechanical friction of the vehicle.

**The gravity**
The gravity linked to the weight of the vehicle.

**Rolling resistance**
The rolling resistance of its tyres.

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# WHAT ROLE DOES TYRE ROLLING RESISTANCE PLAY?

When a vehicle rolls over a surface, the tyre creates rolling resistance. This is crucial as it accounts for up to one-third of the force that opposes forward motion and fuel consumption. Since fuel consumption is often a significant factor in overall TCO, rolling resistance plays a vital role in the equation.

**IF YOU CAN REDUCE ROLLING RESISTANCE BY 1 KG/T FOR A 40 TON TRUCK, YOU CAN SAVE MORE THAN 2 LITRES OF FUEL EVERY 100KM. (1)**

(1)Michelin internal 2016 calculation: fuel savings up to 2.5 litres/100 km for new tyres and 1.25 litres/100 km on average for the 1st life of tyres with a tractor/tractor-trailer ensemble with a cargo load of 40 tons equipped with MICHELIN X® LINE™ ENERGY™ Z 295 / 60 R22.5

# DOES THE IMPACT OF ROLLING RESISTANCE ALWAYS MATTER?

Higher rolling resistance increases fuel consumption in vehicles. The impact varies based on specific use and driving conditions. For instance, trucks face less rolling resistance in urban or mountain routes, but you should not underestimate its influence. Here, tyres contribute up to 20% of fuel consumption. Meanwhile, rolling resistance becomes the prevailing force on long-distance routes, with tyres accounting for up to 35% of total fuel consumption.(2)

(2)Study of the impact of use on the various components influencing fuel consumption on a semi 4x2 + 3-6 tractor based on a VECTO simulation; RR = 6kg/T for long-distance convoys.

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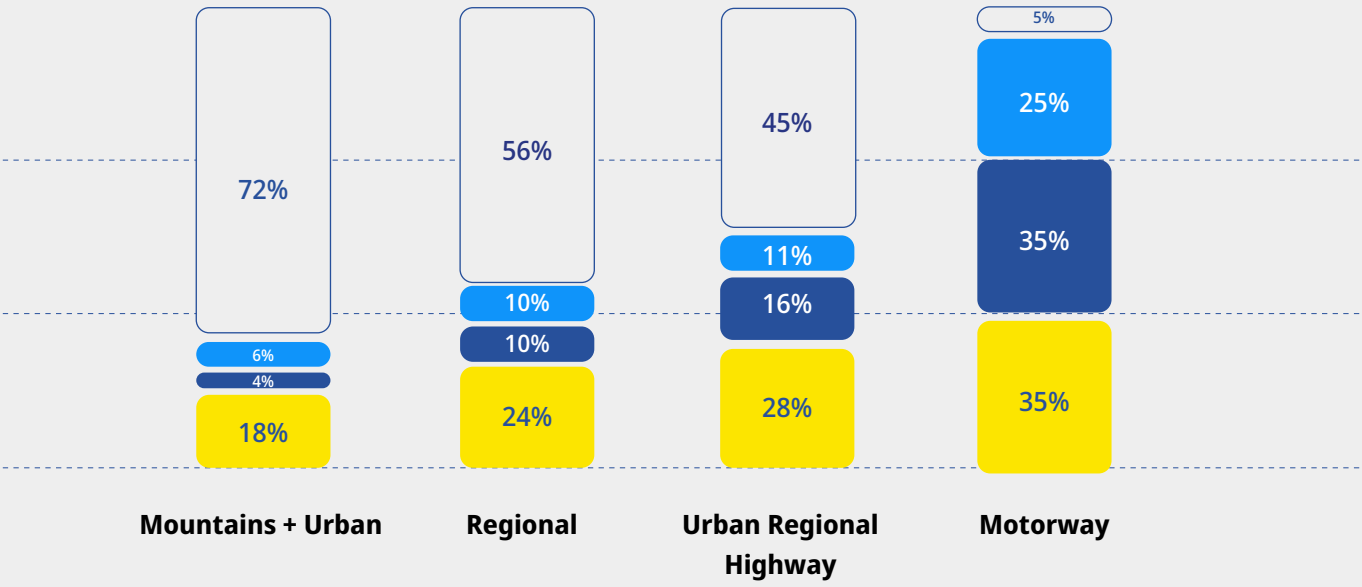
# IMPACT OF DIFFERENT FORCES ON FUEL CONSUMPTION

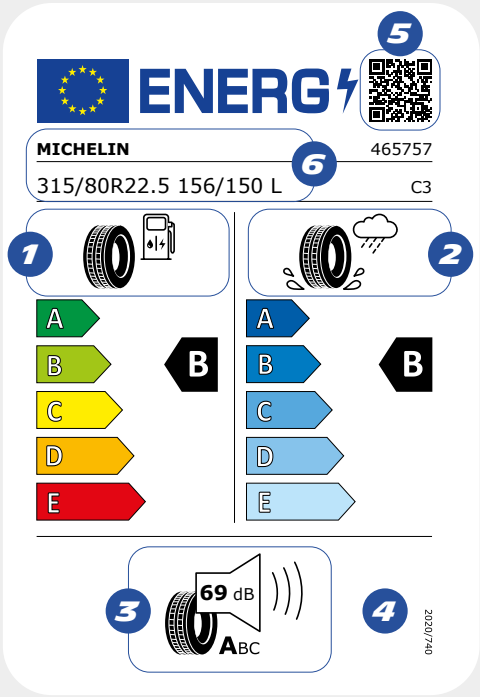



# HOW TO CHOOSE LOW ROLLING RESISTANCE TYRES

Reducing rolling resistance can significantly decrease fuel consumption in fleets. However, how can you ensure you select the optimal rolling resistance? Fortunately, the trucking industry has implemented a labelling system that ranks tyres based on essential criteria, including rolling resistance.

Opting for a grade A tyre with the lowest rolling resistance, as opposed to a grade B tyre with higher rolling resistance, can save up to 0.8 litres of fuel per 100 km travelled.1 To put things into perspective, a fleet of 50 trucks can save R 1 331 050[2] annually by upgrading from grade B to grade A tyres.[3]

[1]Certified value using VECTO calculation tool comparing $CO_2$ emissions of standard 445kW/12.7l tractor-trailer ensemble equipped with MICHELIN X® LINE™ ENERGY™ Z2/D2/T with grade A labelling for rolling resistance and the same vehicle equipped with MICHELIN X® LINE™ ENERGY™ Z/D/T with grade B labelling in rolling resistance, in long haul usage and average cargo load of 17t.
[2]Values in this whitepaper were calculated using exchange rates and may change due to currency fluctuations. Verify current rates for the latest information.
[3]Simulation of an average saving of 0.8l/100km over the life of the tyre between an A-labelled tyre and a B-labelled tyre, achieved by a vehicle travelling 150,000 km per year, on a total fleet of 50 vehicles, with an assumed price per litre of €1.45.




# UNDERSTANDING TYRE LABELS

**1 -** The **rolling resistance** is displayed on a scale from A to E.

**2 -** The braking on wet surfaces indicators are displayed on a scale from A to E.

**3 -** The external noise indicator is rated in decibels and assigned one of three classes (A, B or C).

**4 -** The 3PMSF logo is displayed next to the noise indicator if the tyre qualifies.

**5 -** A QR code associated with the EPREL database provides labelling and a detailed information sheet with additional technical details for the tyre. Find this sheet on our truck tyre product pages, too.Manufacturer's name and tyre dimensions.

**6 -** Manufacturer's name and tyre dimensions. Fuel calculators on manufacturers' websites aid customers in choosing the most fuel-efficient option.

# HOW TO TAKE FULL ADVANTAGE OF LOW-ROLLING RESISTANCE TYRES

Proper tyre maintenance is vital for maximising fuel savings. Maintaining correct tyre pressure reduces rolling resistance, improves fuel efficiency and avoids significant impacts on performance. In France, a study revealed that rolling resistance can increase by 6% with tyres 0.3 bar below recommended pressure and a staggering 30% when 1 bar below. The same study also showed that more than half of the cars driving on French roads had underinflated tyres by at least 0.3 bar.[1]

[1]Data collected on French motorways in 2000, during MICHELIN «Fill up the air» operations.

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# ROLLING RESISTANCE GOES BEYOND TCO

Rolling resistance's influence transcends TCO considerations. It has a profound dual impact, enhancing fuel efficiency and environmental responsibility. For every litre of diesel or petrol spared, you thwart the release of 2.67 kilograms of $CO_2$ emissions for diesel and 2.28 kilograms for petrol, ensuring that fewer greenhouse gases infiltrate the atmosphere. (1)

**FOR EVERY LITRE OF SAVED FUEL, 2.67 KG LESS CO2 IS RELEASED INTO THE ATMOSPHERE.(1)**

(1) https://connectedfleet.michelin.com/blog/calculate-co2-emissions/

"Around half the cost of transport is fuel, and around half of that fuel is wasted in overcoming forces such as friction, aerodynamic and rolling resistance. Any opportunity to directly reduce these forces means a direct impact on fuel consumption. My 400 000 km of tyre testing proved an in-fleet fuel saving of 8 to 10 % using low rolling resistance tyres. This means that you can reduce your total operating costs by 4 to 5%. That's huge.."

— Abdool Kamdar, Green Transport & Net Zero Activist

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# CAN TYRES DELIVER FUEL EFFICIENCY AND LONG-LASTING PERFORMANCE?

**Many consumers believe that they have to make a trade-off between tyres that excel in low rolling resistance and those that ensure other critical performance attributes like longevity, affordability and safety. However, what really lies beneath the surface?**

## GETTING THE MOST MILEAGE OUT OF YOUR TYRES

In a mileage performance comparison by Michelin, our grade A tyres with excellent rolling resistance outperformed grade B tyres. **These grade A tyres offered 11% higher mileage and 20% lower Rolling Resistance Coefficient (RRT), resulting in a 9% reduction in TCO.**[1] We collaborated with Dekra in Spain[2] to conduct a comprehensive mileage study to validate our findings further.

The study involved grade A long-haul rolling resistance tyres from Michelin and three competitor brands. Throughout the study, we consistently measured the tyres' mileage, pressure and tread depth.

The study's results demonstrated that Michelin tyres outperformed the three competitor brands, delivering an average mileage performance that was 31.9% better. Specifically, our tyres showed a remarkable 38.8% improvement on steering axles and a commendable 21.8% better performance on driving axles.


[1] Internal Calculation done using VECTO for fuel, cost and CO2 emissions, Comparing MICHELIN 315/70 R 22.5 X® LINETM ENERGYTM Z2 and D2 versus MICHELIN 315/80 R 22.5 X® LINETM ENERGYTM F and D.

[2] https://www.youtube.com/watch?v=TzudnajQDRk

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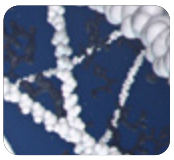
# REVOLUTIONISING TYRE TECHNOLOGY: THE MICHELIN ADVANTAGE

At Michelin, our unwavering commitment to excellence has birthed groundbreaking technologies, redefining the landscape of tyre performance. Our dedication to research and development has given rise to the following innovations:



## CARBION

This innovative material, formed through a unique liquid mixing process, creates a homogeneous blend of tread components. The result? Improved mileage performance and enhanced rolling resistance.

## SILICON

Our cutting-edge Silicon technology incorporates a high silica content into the tread rubber, effectively pushing the boundaries of rolling resistance reduction while preserving tyre longevity.

## REGENION

Awarded and renowned, Regenion employs self-regenerating tread blocks and harnesses 3D metal printing. This technology ensures a consistent, firm grip throughout the tyre's lifecycle, reducing fuel consumption and increasing mileage.

## INFINICOIL

Featuring an expansive steel belt extending up to 400 meters, wrapped around the tyre, Infinicoil bolsters stability, endurance, mileage, and fuel efficiency.

## POWERCOIL

Our state-of-the-art Powercoil technology introduces a new era of robust steel cables. These cables offer superior oxidation resistance, fortify casing endurance, and decrease rolling resistance. The result is a win-win scenario – lighter cables contribute to enhanced efficiency.

# MASTERING TCO: A ROADMAP TO FLEET EXCELLENCE

**Unlocking the true potential of your fleet's TCO is pivotal for profitability, environmental stewardship and your overall reputation. While certain TCO components might be beyond your influence, there are strategic areas where your actions can genuinely optimise this critical metric.**

## ANALYSING YOUR FUEL CONSUMPTION IS KEY

It doesn't come as a surprise that **the average diesel price in South Africa has increased by a staggering 102% between October 2018 and October 2023.**[1] While fuel consumption is just one of several factors that contribute to your total TCO, it holds substantial weight.

Historically, fuel consumption ranked as the second largest contributor to a truck's total TCO, following driver wages. However, given the current landscape of fuel shortages and escalating prices, fuel consumption has been elevated to the forefront, accounting for up to 30% of the overall TCO.

[1] https://aa.co.za/fuel-pricing/

**Factors that impact your fuel consumption:**

**Total vehicle weight**
A full truck consumes 10.5l/100km more than an empty truck.

**Road conditions**
Regional routes consume 3.2l/100km more than highway routes.

**Vehicle aerodynamics**
An aerodynamic design can reduce consumption by 2l/100 km.

**Driver behaviour**
Eco-driving consumes 2l/100km less than dynamic driving.

**Tyre rolling resistance**
A grade A tyre consumes 0.8l/100km less than a grade B tyre.

**Weather conditions**
A truck consumes more fuel when temperature is low.

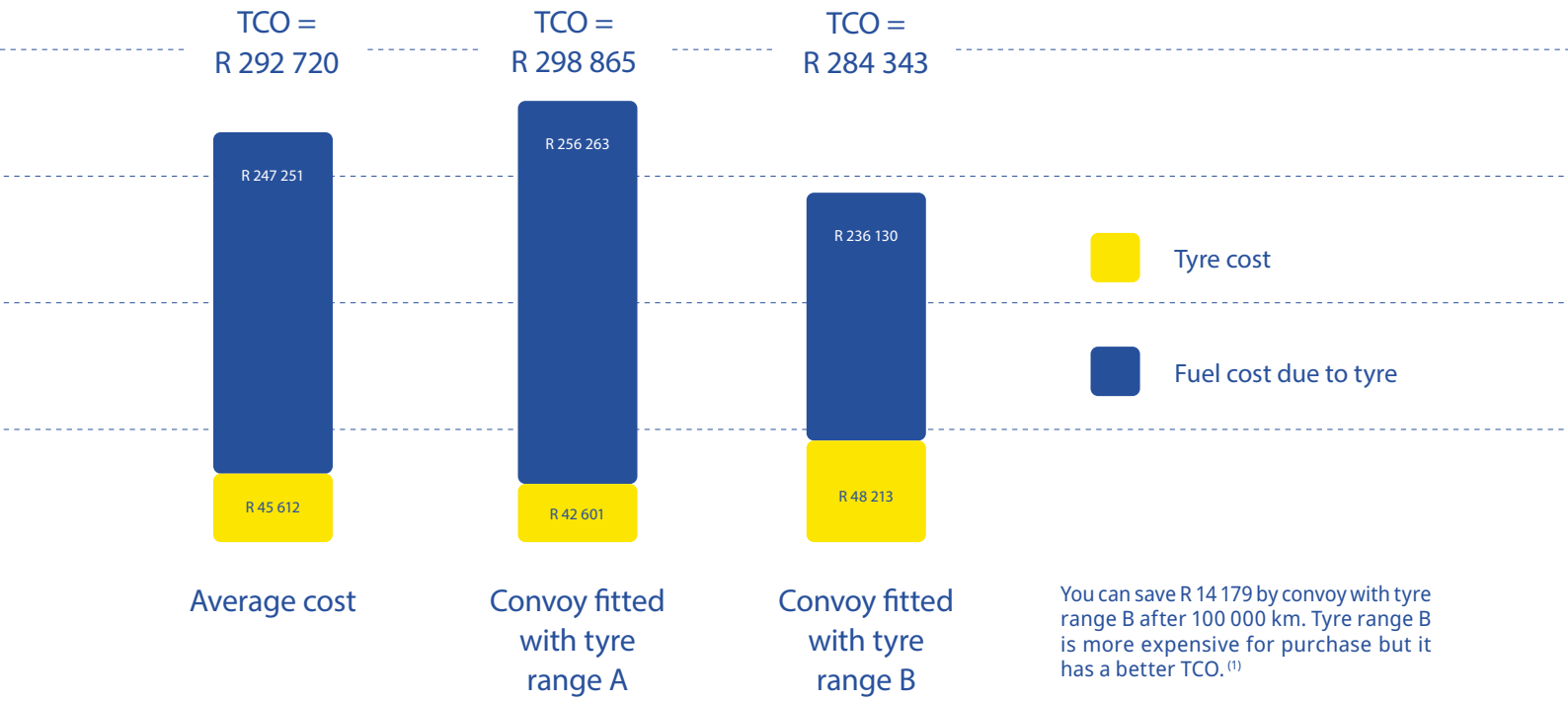
Let's zoom in on the role tyres play in fuel consumption. As we mentioned before, rolling resistance accounts for up to as much as one-third of fuel consumption. And for a 50-truck fleet, upgrading from grade B to grade A tyres can save R 1 331 050[1] a year.[2] All the more reason to take a closer look at the tyres you're rolling on.

[1] CValues in this whitepaper were calculated using exchange rates and may change due to currency fluctuations. Verify current rates for the latest information.
[2] Certified value using VECTO calculation tool comparing $CO_2$ emissions of standard 445kW/12.7l tractor-trailer ensemble equipped with MICHELIN X® LINE™ ENERGY™ Z2/D2/T with grade A labelling for rolling resistance and the same vehicle equipped with MICHELIN X® LINE™ ENERGY™ Z/D/T with grade B labelling in rolling resistance, in long haul usage and average cargo load of 17t. * XLEZ/D/T vs XLEZ2/D2/T: saving 0,8litre / 100km = 0,8l / 100km * 1,2€/litre * (200 000km) / 6 tyres = 320 € /tyres.

## *WHY SHOULD YOU MONITOR TCO AND NOT ONLY TYRE COST?*

Let's consider two scenarios for tyre ranges: Tyre Range A has a higher CPK than Tyre Range B, but Tyre Range B has a better overall TCO. If you only focus on the cost of the tyre range, you might be inclined to go for Tyre Range A. However, although Tyre Range A may appear cheaper upfront, it will cost you more in the long run.

## TCO (R/100 000 KM) = TYRE COST + FUEL COST DUE TO TYRE




Although low-rolling resistance tyres may have a marginally higher upfront cost and slightly shorter lifespan, their fuel savings far outweigh these initial expenses. Opting for low-rolling resistance tyres will ultimately reduce your TCO.

(1) Study calculated with TCO2 tool (calculation based on Vecto), for complete 40-ton convoys (tractor - semi-trailer), equipped for 100% long haul use, diesel litre price: 1.65€.

# TCO, A DECISION SUPPORT TOOL

**TCO will help fleet owners :**

- **Choose the most overall cost-effective offers**
- **Define the most pertinent strategy and transport offers**
- **Improve their business profitability**

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# SOME SIMPLE WAYS TO OPTIMISE YOUR TCO

**As we discussed, managing your TCO is crucial to your fleet's profitability, environmental footprint, and overall image. While not all line items are within your control, here are some areas where you can act and truly optimise your TCO.**

## REDUCE FUEL CONSUMPTION

Let's remember that fuel is the second greatest (if not the greatest, in some cases) contributor to your truck TCO. While you can't control fuel prices, you can optimise your fuel consumption. Here are three tips:

**The first step** to lowering TCO is to choose the right equipment for your individual use case. Truck and equipment manufacturers regularly develop technologies that help reduce fuel consumption. They propose lightened and optimised vehicles (lightened air suspension systems, robotised gearbox, light weighting and design of equipment for more aerodynamics, low-rolling resistance tyres).

Whether your fleet usage is long haul, regional or urban will be a deciding factor in the tyres you select. You can easily reduce costs and shrink your carbon footprint by choosing low-rolling resistance tyres. Tyre performance announced rolling resistance labelling and fuel calculators will help you choose the best option for your use case.

*MICHELIN's POWERCOIL technology integrates a new generation of robust steel casing cables which help to make each tyre lighter, leading to better endurance and reduced rolling resistance.*

**Secondly**, diligently maintain your trucks. Regular inspections and maintenance work is essential to eliminating factors that lead to fuel overconsumption.
The regular monitoring of tyre pressure is also necessary to prevent excessive fuel consumption. Proper tyre pressure management avoids under- and over-inflated tyres and can save 0.8 litres of fuel [(1)] every 100km. You can use a TPMS tool to easily monitor tyre pressure.

**Last but not least** is an adapted driving style. Train your drivers! Factors such as planning routes, speeding, shifting gears and braking can have a huge impact on fuel consumption. Promoting good driving practices (avoiding dynamic driving and routes with more difficult conditions or traffic) will contribute to reducing your fuel consumption. You can follow your drivers' behaviour with telematics applications and provide drivers with ecodriving courses.

**PROPER TYRE PRESSURE CAN SAVE 0.8 LITRES OF FUEL EVERY 100KM ***

[(1)] Certified value using VECTO calculation tool comparing $CO_2$ emissions of standard 445kW/12.7l tractor-trailer ensemble equipped with MICHELIN X® LINE™ ENERGY™ Z2/D2/T with grade A labeling for rolling resistance and the same vehicle equipped with MICHELIN X® LINE™ ENERGY™ Z/D/T with grade B labeling in rolling resistance , in long haul usage and average cargo load of 17t.

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# LOWERING YOUR TCO BEYOND FUEL SAVINGS

## OPT FOR EFFICIENT TRUCKS AND TYRES

Choose efficient vehicles with lightweight designs, aerodynamics, and low rolling resistance tyres. Consider your fleet's unique needs (long haul, regional, or urban). Low rolling resistance tyres reduce costs and environmental impact. Utilise fuel calculators and tyre performance labels for informed decisions.

## ENSURE PROPER TRUCK AND TYRE MAINTENANCE

Prioritise vehicle inspections to reduce fuel consumption. Surprisingly, many heavy goods drivers skip the walkaround check, missing potential issues. Regularly monitor tyre pressure to avoid wasting fuel. Proper pressure management can save 0.8 litres per 100 km. Simplify the task with a tyre-pressure monitoring system (TPMS).

## ADOPT A SMOOTH DRIVING STYLE

Factors like route planning, speed control, gear changes, and braking drastically impact fuel use. Cultivate efficient driving habits: avoid aggression, challenging routes or traffic jams. Employ telematics apps for driver behaviour tracking and eco-driving training.

## MAXIMISE TYRE LIFE

Longer tyre life means reduced CPK and less fuel consumed, as worn tyres offer lower rolling resistance. For example, a used Michelin X Multi Energy tyre consumes 5.4% less fuel than a new one without compromising safety.[2] Regrooving extends tyre life by 25%[3], maintaining reduced rolling resistance compared to new tyres. This cuts fuel consumption and CO2 emissions. Retreading trims tyre costs per km, preserving performance and minimising raw material use by repurposing casings.

(1) 22020 survey by CameraMatics, on 250 HGV fleet managers about vehicle checking systems.
(2) Demonstration performed by MICHELIN under DEKRA supervision in May 2021 between MICHELIN X Line ENERGY Z2 and D2 New State and MICHELIN X Line ENERGY Z2 and D2 Regrooved State for 2 identical Vehicles loaded at 40 Ton.
(3) True or false? Putting an end to misconceptions about regrooving and retreading - MICHELIN - 05/201

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# TCO, SUSTAINABILITY AND ENVIRONMENTAL RESPONSIBILITY

**Your route to sustainable mobility begins with understanding TCO and its connection to eco-consciousness. The rising demand for sustainability in the transport industry, driven by client commitments and manufacturing advancements, presents an opportunity for fleet owners. Today, 78% of fleets have embraced sustainability goals.[1]**

## REDUCING $CO_2$ EMISSIONS: A COLLECTIVE RESPONSIBILITY

Each litre of fuel burned emits 2.66 kg of CO2. To control your carbon footprint, consider upgrading to A-grade tyres, saving 0.8 litres per 100 km, equivalent to 1 132 km of train travel in emission terms.[2] Low-resistance tyres for electric vehicles provide longer range and energy savings without compromising longevity.

## EXTENDING TYRE LIFE FOR ECO-FRIENDLY GAINS

Environmental concerns extend beyond fuel consumption. Premium tyres with options for regrooving and retreading offer enhanced longevity, reducing raw material usage and emissions. Regrooving can extend tyre life by 25%, saving the environmental impact of one new tyre. Retreading reduces raw material use by 70% while minimising the carbon footprint.

[1] Ducker study – Michelin Fleet Community – June 2021
[2] Certified value using VECTO calculation tool comparing $CO_2$ emissions of standard 445kW/12.7l tractor-trailer ensemble equipped with MICHELIN X® LINE™ ENERGY™ Z2/D2/T with grade A labelling for rolling resistance and the same vehicle equipped with MICHELIN X® LINE™ ENERGY™ Z/D/T with grade B labelling in rolling resistance, in long haul usage and average cargo load of 17t.

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# TCO, YOUR COMPASS IN PURSUIT OF AN EFFICIENT AND SUSTAINABLE FLEET

**Managing TCO effectively is crucial to prioritise both financial strategy and environmental responsibility. Each saved litre of fuel brings us closer to a greener future.**

The choices we make, from vehicles to tyres, shape this journey. Michelin's X Line Energy and X Multi Energy tyres offer exceptional performance and sustainability.

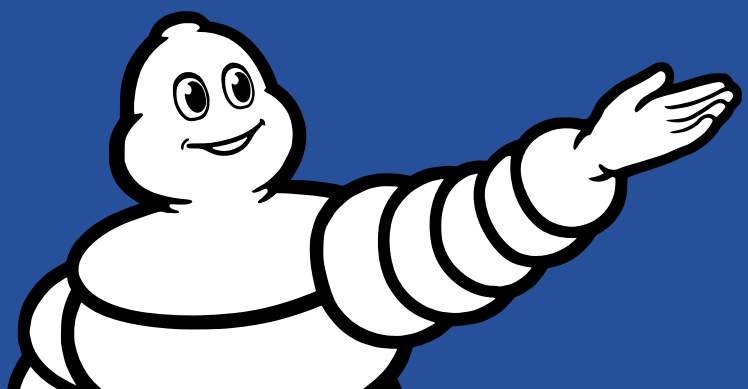

*DISCOVER THE*
***X MULTI ENERGY*** *RANGE*

**LEARN MORE**


*DISCOVER THE*
***X LINE ENERGY*** *RANGE*

**LEARN MORE**

Choosing Michelin's innovative tyres optimises TCO and contributes significantly to sustainable transport. These tyres reflect your environmental commitment and secure your fleet's future. Choose efficiency, choose sustainability – **choose Michelin.**



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