



Let's get the right pressure
for your car

ENTER REGISTRATION PLATE

GB

AB12 CDE

SELECT TYRE BRAND

Michelin

HOW MANY PEOPLE MOST
FREQUENTLY TRAVEL IN THE CAR?

1

2

3

4

5+

Recommended pressures
for your car

FRONT

36

PSI

REAR

38

PSI

WHITEPAPER | EDITION 4.0

INTELLIGENT TYRE INFRASTRUCTURE

The why. The system. The evidence. The result.

A measured intervention for safer, more efficient journeys, from machine manufacture to every road user.

READ THIS FIRST

A pre-deployment business and evidence case, designed to be challenged, tested and independently validated.

EVIDENCE STATUS

Published evidence

Correct pressure matters to tyre mechanics, energy use and vehicle behaviour. UK road use, casualty and licensing data are published. Nitrogen slows pressure loss in controlled tests, but does not remove the need to check pressure.

EVIDENCE STATUS

Proposed

AiR MAX, HOME and GO, the four-hose service, intelligence network, AiR | Nitro, circular-air recovery and Nitro Plus are pre-deployment propositions.

No AiR pilot is live. No operational savings are presented as achieved. No carbon credits or offsets have been issued.

EVIDENCE STATUS

AiR model

Family, fleet, host and national examples are sensitivities, not forecasts. Inputs are shown so reviewers can reproduce or replace them.

EVIDENCE STATUS

Engineering estimate

Supplier RFQs, production validation, consumer adoption, repeat use, measured savings, durability and environmental claims require a funded pilot.



FOUNDER PURPOSE

WHY THIS MATTERS TO ME

“I am a father of seven. Five are my stepchildren, and they lost their dad a number of years ago in a tragic car accident.”

That loss did not establish that tyres caused the accident, and this paper makes no such claim. It made me question how families can be helped to identify preventable road risk before a journey, rather than learning about it after something has gone wrong.

Tyre safety is practical, measurable and teachable. A driver can see the pressure found, understand the correct target, watch all four tyres being corrected and retain a record.

PURPOSE

Education changes perception.

Evidence makes that change credible at scale. AiR brings both together. The purpose is not fear. It is confidence, proof and a safer habit.



Extends tyre life
Even wear, less replacement



Lowers
Better
lower

AIR TURNS A CHECK INTO INFRASTRUCTURE



One guided service. Four measured outcomes.

4

tyres measured and corrected

1

vehicle-specific record

3

machine lives: MAX, HOME and GO

01

Before

Identify vehicle and load context. Retrieve an approved target.

02

During

Measure every corner, correct four channels and surface exceptions.

03

After

Create a time-stamped result, guidance and repeat-check pathway.

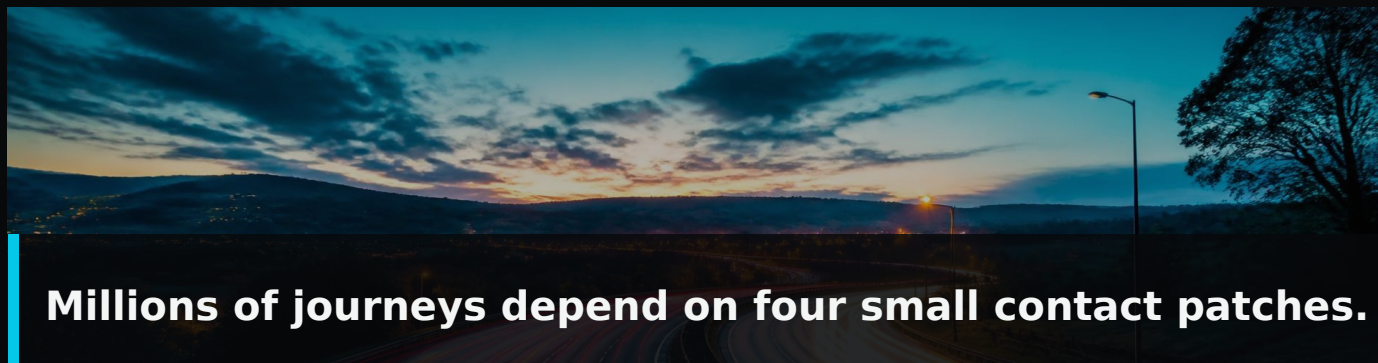
04

Network

Aggregate anonymised evidence for fleets, research and policy.

Core service: air at £2.50 per use. Premium service: AiR | Nitro at £15 for all four tyres. Commercial terms remain subject to pilot and partner agreement.

A SMALL ERROR, REPEATED AT NATIONAL SCALE



Millions of journeys depend on four small contact patches.

42.3m

licensed UK vehicles, end 2025

342.6bn

GB motor vehicle miles, 2025

29,918

people killed or seriously injured,
2025

PUBLISHED EVIDENCE

Pressure prevalence

A 2024 Motor Ombudsman survey reported 57% of UK cars at least 10% under-inflated and 37% of drivers not confident checking pressure. Survey evidence, not a measured census.

PUBLISHED EVIDENCE

Tyre condition

The 2023 TyreSafe and National Highways replacement survey found 16.7% of replaced tyres in England below the legal 1.6 mm tread limit. It measures tyres at replacement.

PUBLISHED EVIDENCE

Roadside disruption

National Highways FOI data recorded more than 51,500 tyre-related strategic-road-network breakdowns in 2023.

PUBLISHED EVIDENCE

Casualty context

DfT recorded 201 people killed or seriously injured in tyre-related reported collisions in 2025. Reported factors do not capture every contribution.

PRESSURE CHANGES THE CONTACT PATCH



Pressure changes load, heat and wet-road margin.

01

Load and shape

Pressure helps determine deflection and contact-patch shape. Too little increases flex and heat; too much changes stress concentration.

02

Wet-road margin

The classical NASA hydroplaning relation scales with the square root of pressure. Lower pressure reduces theoretical onset speed, all else equal.

03

Crash association

NHTSA found tyres at least 25% below specification substantially more represented in tyre-related pre-crash cases.

04

Energy and wear

Under-inflation increases deformation and rolling resistance. Wear depends on pressure, alignment, load, compound, road and driving style.

AiR does not claim inflation prevents every collision. It addresses one measurable risk state, records the intervention and refers visible damage or unsafe tread to a professional.

THE MACHINE IS DUMB. THE RISK IS NOT.

GAP 1

One hose

The user walks corner to corner, remembers values and may stop early.

GAP 2

One number

A generic target can ignore vehicle variant, tyre size and load.

GAP 3

No proof

No persistent before and after record.

GAP 4

No network

The host sees payment, not tyre-readiness outcomes.

GAP 5

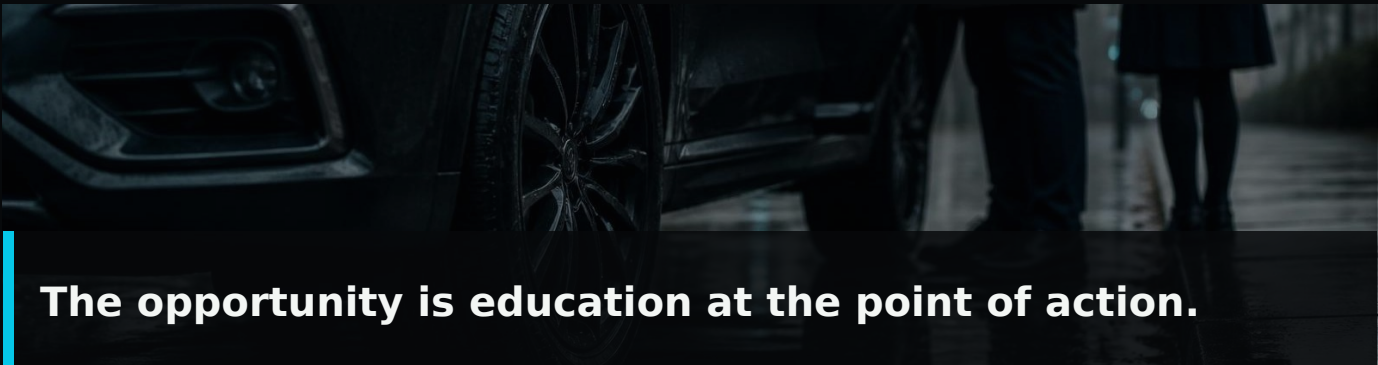
Late warning

TPMS warns; it does not replace routine checking.

GAP 6

No learning loop

No structured evidence to improve behaviour.



The opportunity is education at the point of action.

ONE INTERVENTION. FOUR CONNECTED LAYERS.

01

Machine

Calibrated sensing, independent channels, guided interface and local safety controls.

02

Driver

Vehicle confirmation, plain-language guidance, payment, record and return prompt.

03

Operator

Uptime, use, revenue, consumables, calibration and exceptions.

04

Evidence

Anonymised intervention records for fleet reporting, research and policy.

Safety-critical control remains local. Connectivity enriches the service, but a lost network cannot make the pressure loop unsafe.

THREE MACHINE LIVES. ONE STANDARD.



MAX

Forecourts, charging hubs, depots and dealerships. Four independently metered hoses, outdoor display and edge intelligence.



HOME

Wall-mounted domestic or private-estate unit with the same guided pressure logic and driver record.

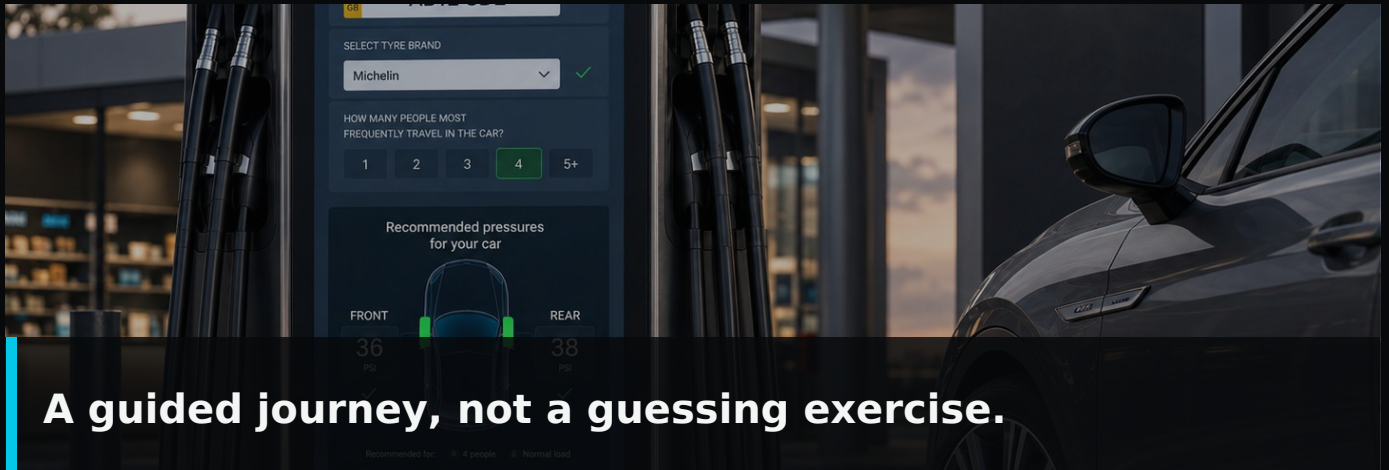


GO

Portable unit for boots, patrol vehicles, events and handover. Same profile logic in compact form.

Product names and form factors are production intentions. Final certification, packaging and industrialisation remain subject to design freeze and validation.

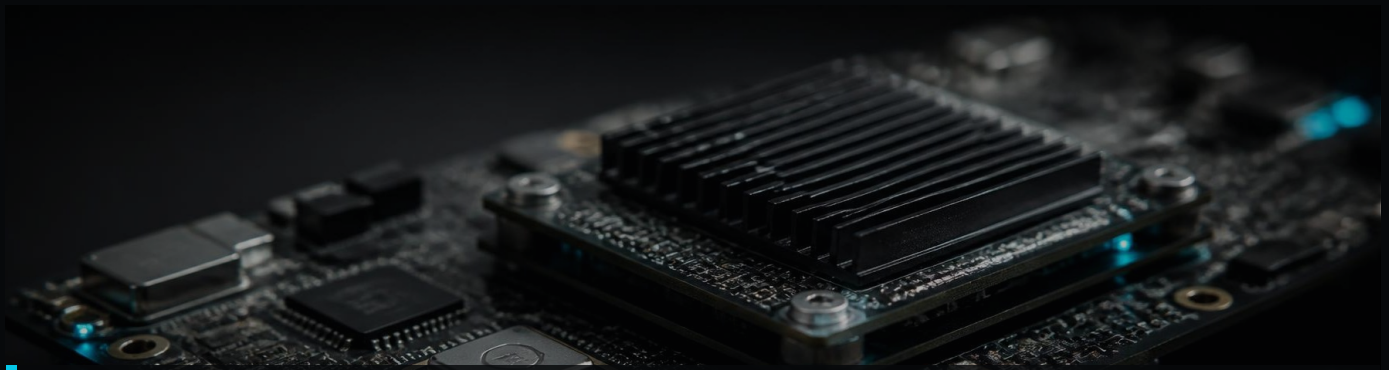
FOUR HOSES. ABOUT ONE MINUTE. ONE PROVABLE RESULT.



- 01 Identify** Confirm vehicle, variant, tyre size and load context.
- 02 Connect** Attach all four controlled-retraction hoses.
- 03 Measure** Read all corners before correction and flag exceptions.
- 04 Correct** Inflate or release each tyre to the approved target.
- 05 Record** Issue a driver result and retain an auditable machine event.

Exception rule: AiR corrects pressure. It does not certify tyre condition. Visible damage, abnormal readings or unsafe tread trigger referral, not reassurance.

EVERY FILL CAN BECOME EVIDENCE



From local correction to auditable evidence.

EVIDENCE LAYER

Vehicle context

Confirmed profile, load selection and approved target.

EVIDENCE LAYER

Measurement

Before, target and after pressure at each corner.

EVIDENCE LAYER

Integrity

Device ID, calibration status, timestamp and tolerance.

EVIDENCE LAYER

Outcome

Correction completed, exception raised or referral made.

EVIDENCE LAYER

Privacy

Data minimisation, retention and controlled access.

The result is not a score invented by AiR. It is a traceable account of what the machine measured, what target was used and what correction was completed.

Pre-Journey Check



Vehicle Ready

Vehicle	SUV
Registration	ABC123
Tyre Size	235/55 R19
Recommended Pressure	34 PSI

32
PSI



32
PSI

34
PSI

34
PSI

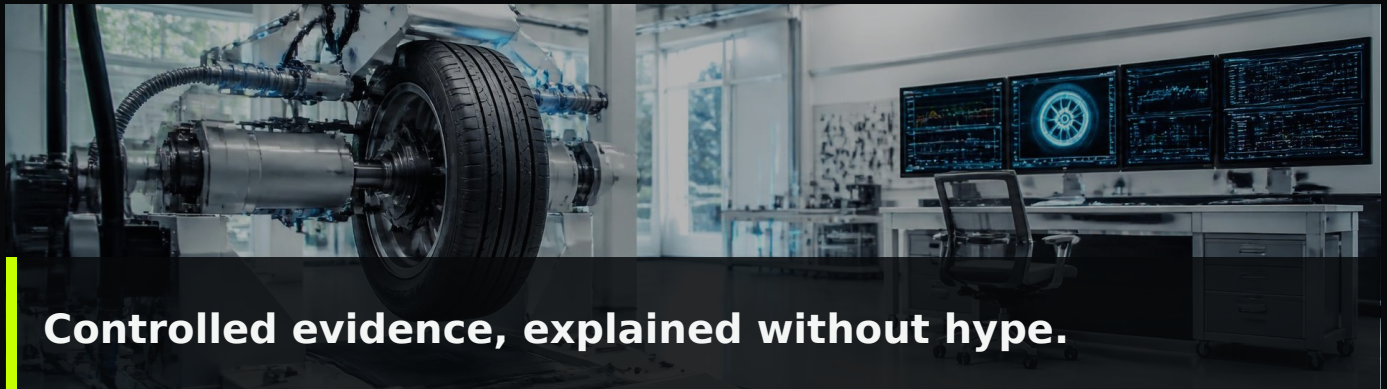
AIR | NITRO

BRINGING NITROGEN TO THE FAMILY CAR

£15 ALL FOUR TYRES

A premium service made visible, understandable and accessible where ordinary journeys begin.

WHAT NITROGEN DOES. AND WHAT IT DOES NOT.



78%

nitrogen already present in ordinary dry air

95 to 99%

concentration tested in the NHTSA study

about 2/3

pressure-loss rate versus air over 90 days

EVIDENCE

Defensible benefit

In controlled testing, high-purity nitrogen reduced pressure loss. The study average was 1.39% per month versus 2.13% for air.

EVIDENCE

Important limit

As air-filled tyres lose oxygen faster, internal nitrogen rises and the relative advantage narrows. Punctures and leaks remain possible.

EVIDENCE

No direct magic

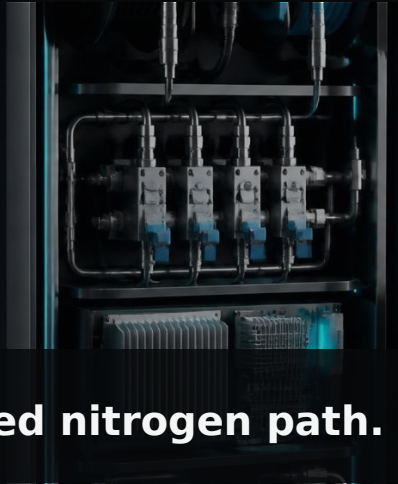
Nitrogen did not directly improve new-tyre rolling resistance in the NHTSA test. Value must arise through maintained pressure.

EVIDENCE

Still check

Nitrogen does not replace monthly and pre-journey checks, the manufacturer target, TPMS response or professional inspection.

NITROGEN. MADE ON SITE.



A separate, monitored nitrogen path.

1

Compress

Oil-free compressed air is dried and filtered.

2

Separate

A membrane passes oxygen and water vapour, retaining nitrogen-rich gas.

3

Store

Nitrogen-rich gas is held in a dedicated rated vessel.

4

Purge

Controlled vent-and-refill cycles raise tyre concentration.

5

Deliver

Four metered channels complete and record the service.

ENGINEERING ESTIMATE

Indicative sizing

35 L internal tyre volume, 2.3 bar gauge, 95% supply purity, up to 100 L vessel at 10 bar for MAX. Final design requires specialist review.

SAFETY REQUIREMENT

Safety architecture

Electronic pressure control backed by mechanical relief, rated vessels, non-return protection, drainage, inspection and fail-safe isolation.

Current purge model: about 740 free-air litres of nitrogen-rich gas for one four-tyre, two-cycle service. A design input, not a measured production result.

NOTHING WASTED. BY DESIGN.

PROPOSED

Recover

Low-pressure tyre air captured before controlled release.

PROPOSED

Filter

Remove particulates and moisture before reuse.

PROPOSED

Recirculate

Reuse as compressor intake or electronics-bay pressurisation, subject to validation.

PROPOSED

Explore exhaust

Membrane oxygen-enriched air and moisture may support bay ventilation or the screenwash water path after safety review.

Recovered air is not direct NVIDIA chip cooling. Electronics require a closed thermal loop and heat exchanger. Exhaust reuse is an engineering opportunity, not a shipped feature.

VALUE FOR EVERYONE AROUND THE VEHICLE



One service. Shared value across the chain.

Families

Confidence, education and a record.

Road users

Fewer preventable tyre events.

Manufacturing

Repeatable demand and service work.

Fleets

Pressure compliance and measurable exceptions.

Site hosts

New service revenue and repeat visits.

Tyre industry

Earlier referral for damage and wear.

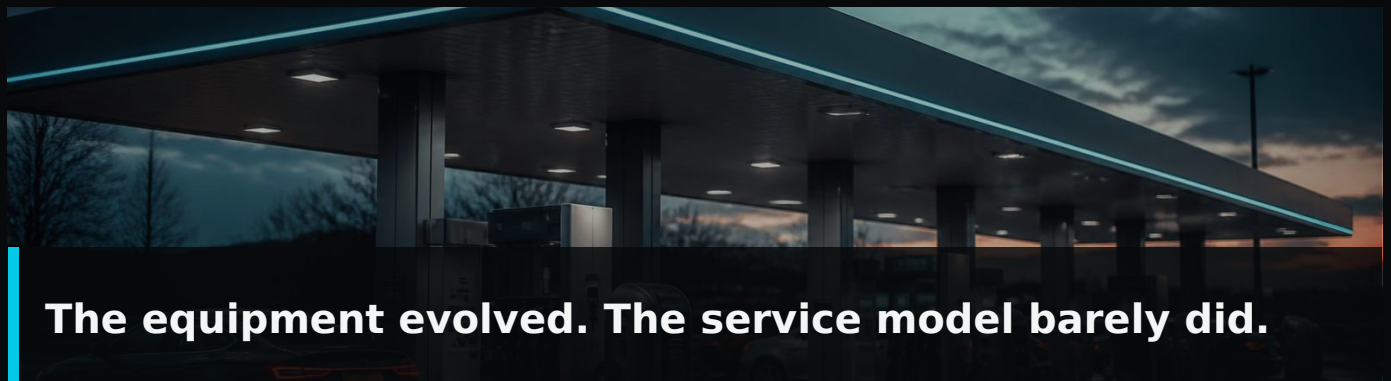
Government

Evidence for targeted intervention.

Future road users

A stronger routine safety culture.

SEVENTY YEARS OF INCREMENTAL CHANGE



The equipment evolved. The service model barely did.

1945

PCL Vertex MK2 gauge establishes a familiar garage and service-station design lineage.

1954

Presetair automatic meter enters production and remains manufactured until 2005.

1976

Parliament records gauges described as widely inaccurate and no dedicated powers to address them.

2005

AA Motoring Trust reports 40% of 53 sampled forecourt gauges inaccurate.

2008

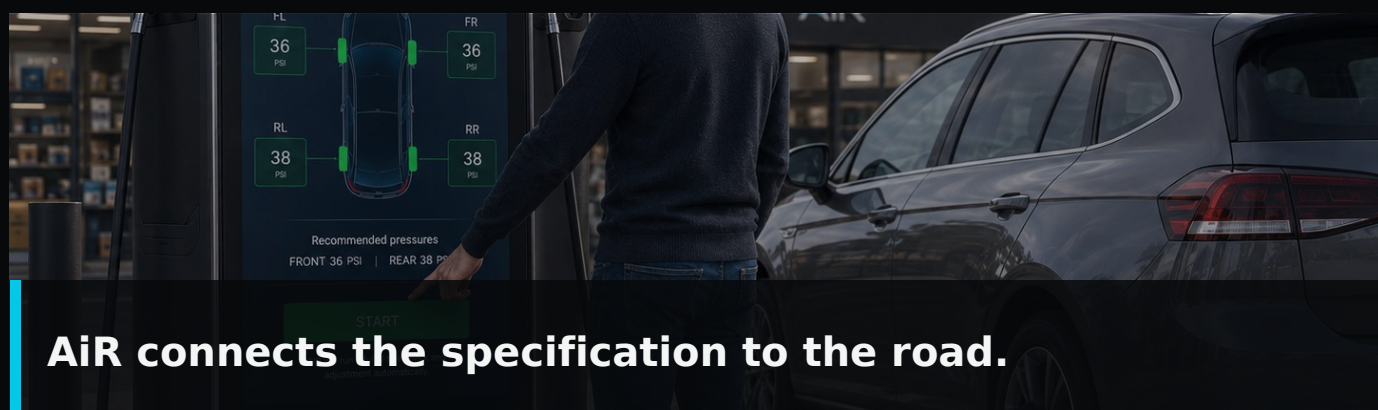
Independent UK spot checks again find roughly 40% faulty, damaged or out of service.

2020

A Dutch field study finds conventional users achieved only half the intended pressure rise on average.

The historic tests do not prove that most UK machines fail today. They do prove a long-standing accuracy and usability problem, plus a current monitoring gap.

ENGINEERING STOPS WHERE THE DRIVER BEGINS



BEFORE

Legacy forecourt air

One hose; user-entered target; corner-to-corner walking; uncertain in-use verification; no persistent result; no follow-up; payment data only.

AFTER

AiR intelligent service

Vehicle and load context; four controlled hoses; calibrated measurement; automatic correction; digital result; return prompt; operator and fleet evidence.

01

Tyre engineer

Defines safe pressure and performance intent.

02

Vehicle maker

Publishes the vehicle-specific target.

03

AiR

Delivers, verifies and records the correction.

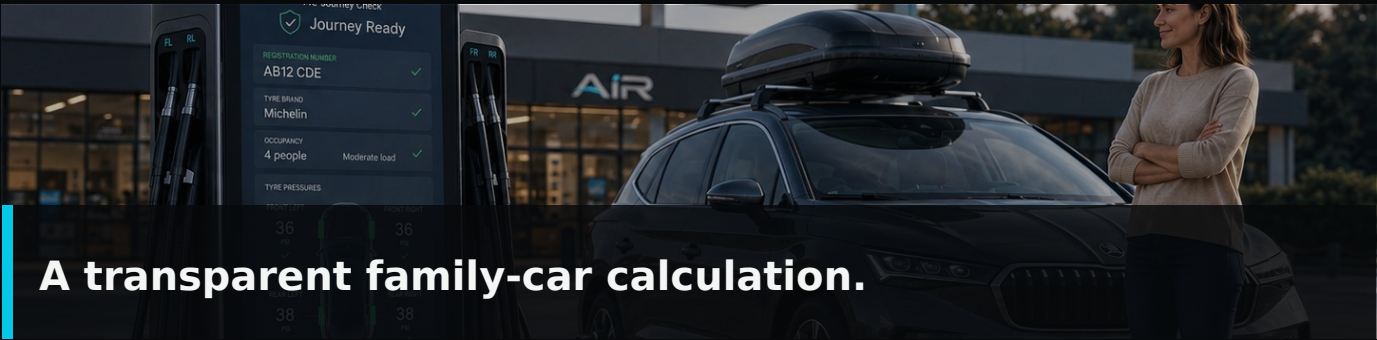
04

Road user

Leaves with all four tyres corrected and understood.

Fuel pumps have a statutory accuracy regime. This research found no equivalent UK mandatory in-use verification regime for forecourt tyre inflation gauges.

CURRENT PRICES. EVERY SAVING LEVEL.



A transparent family-car calculation.

172.01p
petrol per litre, GOV.UK

7,200
miles per year

42 mpg
representative efficiency

Fuel benefit	Annual cash saving	Meaning
0.6%	£8.04	DOE observed average
1.0%	£13.41	about 5 psi average deficit
2.0%	£26.81	sensitivity, not a promise
3.0%	£40.22	DOE severe-case upper figure

Model: 779.3 litres and £1,340.53 annual fuel spend. Official UK weekly average dated 21 September 2026. RAC Fuel Watch on 25 September reported 173.6p, a market cross-check. Prices change weekly.

AIR MODEL

Air cadence

£2.50 every 90 to 150 days equals about £6.08 to £10.14 per year.

AIR MODEL

Nitro cadence

£15 every 90 to 150 days equals about £36.50 to £60.83 per year. Fuel saving alone may not cover Nitro.

PRESSURE VALUE MULTIPLIES WITH MILEAGE



Representative diesel van model at current prices.

195.53p
diesel per litre, GOV.UK

20,000
miles per van per year

£5,555.61
fuel per van per year

Benefit	One van	100 vans
0.6%	£33.33	£3,333
1.0%	£55.56	£5,556
2.0%	£111.11	£11,111
3.0%	£166.67	£16,667

Model: 2,841.3 litres per van at 32 mpg. RAC reported 198.32p diesel on 25 September 2026, close to its all-time high. Downtime and breakdown savings are excluded until each fleet supplies its cost per event and measured event-rate change.

MODEL BOUNDARY

Best case is conditional

The 3% figure is a published severe-under-inflation upper case, not an expected fleet result. Pilot measurement must establish the actual deficit and persistence.

MORE THAN FUEL. NEVER DOUBLE COUNTED.



Direct savings, avoided cost and wider value stay separate.

VALUE LAYER

Fuel

Cash saving from the measured efficiency effect at current pump prices.

VALUE LAYER

Tyre life

Michelin: 20% under-inflation can reduce life by about 20%. Recoverable value: £80 on a £320 set, £120 on £480, £200 on £800, only where that deficit existed.

VALUE LAYER

Downtime

Fleet input: tyre events avoided x verified cost per event. No invented default value.

VALUE LAYER

Carbon

Litres avoided x the current government conversion factor. Reported separately from money.

VALUE LAYER

Safety

A measurable risk state corrected. No claim that AiR has prevented a collision.

VALUE LAYER

Social value

Use DfT TAG prevention values only with observed casualty-risk change, not as private revenue.

DIRECT CASH SAVING + AVOIDED OPERATING COST + WIDER SOCIAL VALUE = TOTAL VALUE CASE

A SERVICE LINE WITH A SAFETY PURPOSE



Designed for forecourts, supermarkets and destination hubs.

£2.50

core air service

£15

AiR | Nitro, four tyres

£17.50

Nitro Plus estimate

Sessions/day	Mix	Gross annual revenue
10	80% air / 20% Nitro	£18,250
25	80% air / 20% Nitro	£45,625
50	80% air / 20% Nitro	£91,250

Illustrative revenue before VAT, fees, consumables, energy, maintenance, host share and finance. Average ticket £5.00 and 365 trading days. This is not a demand forecast.

PROVE BEFORE SCALE

Commercial gate

Pilot must prove conversion, uptime, session duration, repeat rate, service cost and host economics before rollout or ARR claim.

FOURTEEN ROUTES. ONE DISCIPLINED MODEL.



Transaction, media, subscription and network value.

REVENUE STREAM

TRANSACTION

Air; Nitro; Nitro Plus; screenwash and seasonal consumables.

REVENUE STREAM

MEDIA

Idle-screen DOOH; in-session category sponsorship; app advertising.

REVENUE STREAM

PERFORMANCE

App partner offers; tyre, garage, MOT, insurance and breakdown referrals.

REVENUE STREAM

B2B

Fleet subscriptions; host reporting upgrades; maintenance and uptime contracts.

REVENUE STREAM

FUTURE

Privacy-safe aggregate insights; white-label and OEM licensing. Excluded until approved or contracted.

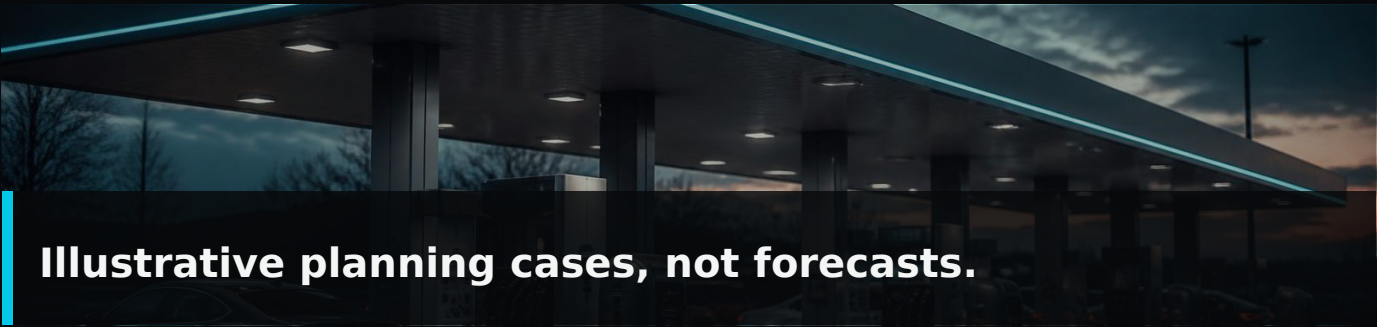
REVENUE STREAM

RULE

One impression or referral can only be sold once. VAT is never revenue.

A single machine is not a meaningful media network. Idle-screen value becomes material only when hundreds of sites can be packaged, measured and sold together. Unsold inventory carries AiR safety education and service prompts.

WHAT ONE LOCATION COULD CONTRIBUTE



Illustrative planning cases, not forecasts.

Annual line	Low	Base	High
Transactional contribution	£21,103	£32,834	£49,345
Network media allocation	£300	£900	£2,200
App, affiliate and referral	£59	£230	£650
B2B and service contracts	£150	£880	£3,420
Less host share	(£3,395)	(£5,770)	(£10,196)
Less fixed site costs	(£4,500)	(£3,500)	(£2,500)
Indicative annual contribution	£13,717	£25,574	£42,919

Model assumes about 15 paid uses per day in the base case, 70% air, 25% Nitro and 5% Nitro Plus. Consumer prices include VAT. Contribution is after modelled direct costs, host share and site fixed costs, but before central overhead, hardware depreciation, finance, marketing and R&D.;

All volumes, mix, host share, media fill, conversion and cost inputs are uncontracted
AiR planning assumptions requiring pilot validation.

FROM COMPONENTS TO DEPLOYED INFRASTRUCTURE



Design, certify, manufacture, install and maintain.

£7,965

MAX first-article estimate before supplier RFQ

8 weeks

indicative first-build path

WORKSTREAM

Mechanical

Enclosure, vessels, hoses, retractors and weather protection.

WORKSTREAM

Pressure system

Oil-free compression, filtration, metering, valves and safety relief.

WORKSTREAM

Electronics

Outdoor display, payment, sensing, local controller and connectivity.

WORKSTREAM

Operations

Installation, calibration, cleaning, consumables and field service.

Estimate includes component assumptions, not production tooling, certification, VAT, contingency, site civil works or finance. Supplier RFQs are required.

SCALE MEASURED CORRECTION, NOT A HEADLINE



National value starts with measurable local correction.

AiR does not use an unsupported national fuel-waste total. The national case starts with measured pressure deficits, current fuel inputs, published coefficients and observed mileage, then reports a range.

0.2%

fuel effect per 1 psi

0.6%

DOE average benefit

3.0%

DOE upper case

20%

life loss at 20% low

MODEL RULE

Do not double count

Energy, tyre, downtime and carbon effects stay separate. Reduced duty and VAT are fiscal transfers, not additional social value.

CARBON INTEGRITY

No offset claim

Avoided emissions are operational estimates only. No credits issued. Verification, additionality and an accepted method would be required.

The national case is a testable hypothesis: find pressure risk, correct it, measure persistence and scale only where evidence supports the claim.

PROVE IT. THEN SCALE IT.



A gated pathway from bench evidence to network decision.

01

Instrument

Freeze targets, calibration, safety cases and data definitions.

02

Compare

Run monitored sites and fleet cohorts with suitable controls.

03

Validate

Measure pressure state, repeat behaviour, uptime, service cost and exceptions.

04

Scale

Expand only if safety, adoption, reliability and economics pass defined gates.

Pilot decision gates must be agreed before deployment. Positive stories cannot substitute for complete data, failure records and comparable controls.

EVIDENCE BEFORE CLAIMS



Trust depends on control, traceability and restraint.

OEM targets

Use authoritative pressure sources and preserve context.

Calibration

Traceable intervals, tolerances and lockout rules.

Privacy

Minimise personal data and control retention and access.

Cybersecurity

Signed software, secure updates and monitored access.

Claims

Separate observed, modelled, estimated and proposed statements.

Independent review

Invite scrutiny of methods, results and exceptions.

Revenue is not a defence if evidence is weak. AiR must earn trust through measurement, calibration, transparent limits and challenge.

EVIDENCE BEHIND SAFETY AND ECONOMICS

01	DfT: Vehicle Licensing Statistics 2025; Road Traffic Estimates 2025; Reported Road Casualties Great Britain 2025.	02	DESNZ, Weekly road fuel prices, published 21 September 2026: petrol 172.01p/L; diesel 195.53p/L.
03	RAC Fuel Watch, 25 September 2026: petrol 173.6p/L; diesel 198.32p/L.	04	US Department of Energy, Keep Tires Properly Inflated, fueleconomy.gov.
05	US EPA, Effect of Tire Inflation Pressure on Vehicle Fuel Economy, EPA-AA-SDSB-80-04, 1980.	06	Michelin, How to Properly Inflate Your Car Tires, technical guidance.
07	NHTSA, Tire Pressure Special Study, DOT HS 809 317, 2001.	08	NHTSA, Tire-Related Factors in the Pre-Crash Phase, DOT HS 811 617, 2012.
09	NHTSA, Effects of Varying Nitrogen in Inflation Gas, DOT HS 811 094, 2009.	10	General Motors Service Bulletin 05-03-10-020E, Use of Nitrogen Gas in Tires, 2014.
11	Transportation Research Board, Special Report 286, 2006.	12	Horne and Dreher, Pneumatic Tire Hydroplaning, NASA TN D-2056, 1963.

INFRASTRUCTURE, REGULATION AND MEDIA

13	PCL Air Technology, Evolution of PCL Forecourt Equipment; Presetair history; PCL 80 years of handheld inflation.	14	UK Parliament, Garages (Tyre Pressure Gauges), HC Deb 24 May 1976.
15	AA Motoring Trust survey, 53 forecourt gauges, reported August 2005.	16	Auto Express / Caltec and TyreSafe forecourt equipment surveys, 2008.
17	CE Delft, Practical use of conventional air pumps at petrol stations, 2020.	18	Weights and Measures Act 1985; Measuring Instruments Regulations 2016. Fuel-meter accuracy comparison.
19	Motor Fuel Group and Wildstone forecourt digital media partnership; Bauer supermarket digital screen network.	20	Smart Outdoor / IAMCATZ forecourt D6 rate card; Focus Media petrol pump advertising context.
21	TyreSafe and National Highways, Tread Depth Survey 2023.	22	National Highways FOI, tyre-related strategic-road-network breakdowns 2021 to 2023.
23	DfT TAG Data Book and Unit A4.1 Social Impact Appraisal, updated 28 May 2026.	24	DESNZ UK Government GHG Conversion Factors for Company Reporting 2025.

