

— VEHICLE INTELLIGENCE & FLEET COMMAND

Every key. Every litre. Every kilometre.

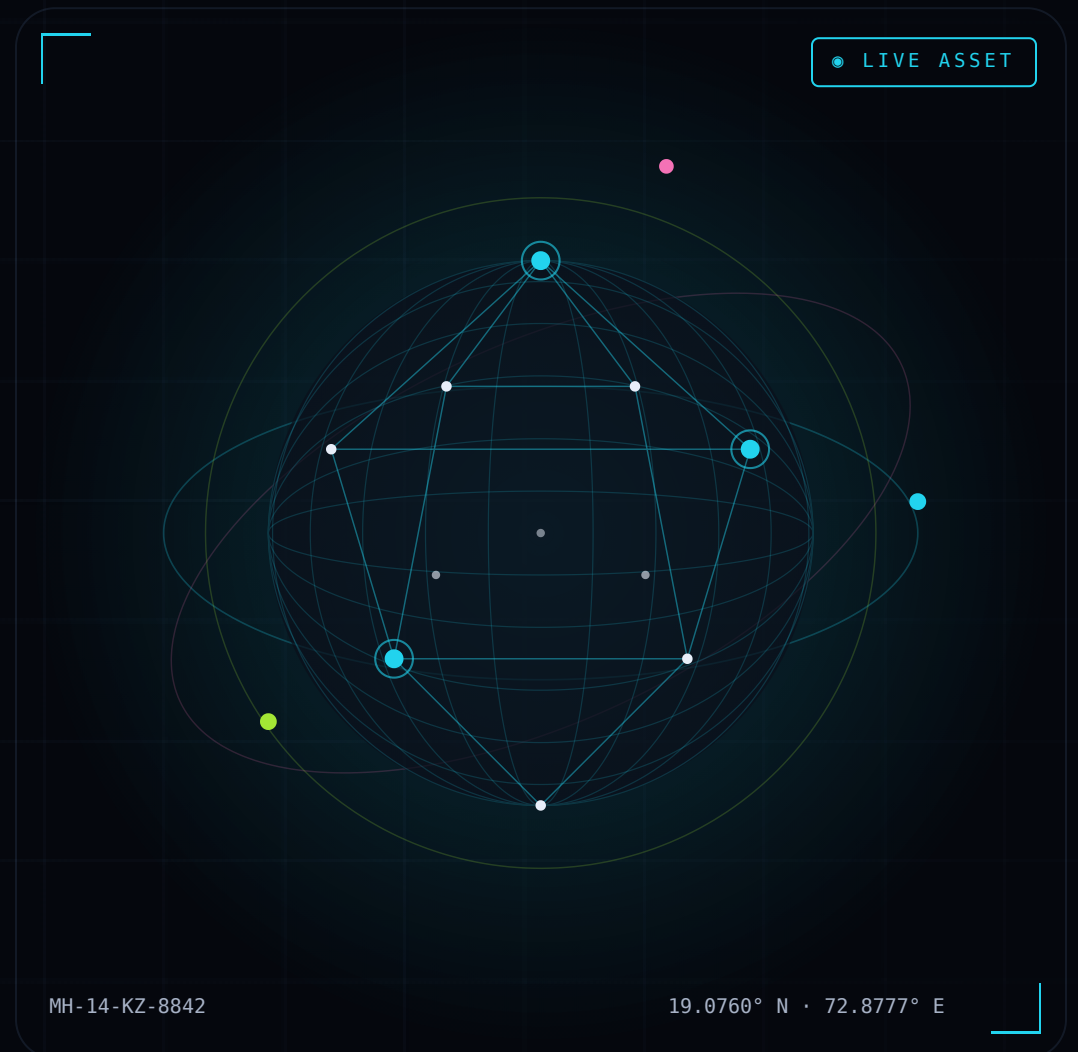
Convert your fleet into a real-time data network. Authenticate drivers at the ignition. Meter fuel at the tank. Decode engine telematics at the CAN. Act on anomalies before they cost you.

● AIS-140 certified

● BS-IV / V / VI compatible

● Edge + Cloud

● Offline-tolerant



18%

FUEL SAVINGS

92%

THEFT REDUCTION

2.4x

TRIP THROUGHPUT

<90_d

PAYBACK

This brief walks through the five pillars of the FleetOS platform, its expansion modules, and the two-mode Fuel Dispensing Management System. Each pillar is shown with its **technical foundation**, the **data it produces**, and the **business event** you can act on.

01

— ACCESS CONTROL

Start-stop auth with the driver's own key.

No key, no crank. The vehicle will not turn over until the driver's personal credential — an RFID card or ruggedised iButton — is presented to the in-cab module. Ignition is physically interlocked through a relay on the starter line.

Every cranking event now carries a signed driver identity. Fuel economy, harsh braking, violations, on-time departures — all bind to a person, not a number plate.

CREDENTIALS	RFID 13.56 MHz · iButton DS1990A · NFC
INTERLOCK	SPST auto relay · 30A starter line
LATENCY	< 180ms tap-to-crank
OFFLINE	512-key local whitelist · auto-sync
FALLBACK	Dispatcher OTP · fully audited



— WHY IT MATTERS

Attribution changes behaviour.

When every trip is signed by *who* started it, driver performance stops being anecdotal. After 60 days of keyed attribution, the spread between best and worst driver fuel economy typically narrows by 22%.

02

— LIQUID ASSET MONITORING

Fuel level & consumption, sensed at the tank.

A capacitive fuel-level probe is installed directly in the tank, wired to the FleetOS module independent of the OEM gauge. Samples at 1 Hz, smoothed with a 15-sample moving median, reconciled against distance and engine-on time.

Three separate flows get their own event streams: **legitimate consumption**, **refuelling**, and **pilferage**.

SENSOR	Capacitive rod · 0.5% FS
RANGE	200mm–2000mm tank depth
SAMPLING	1 Hz · median smoothing
CALIBRATION	20-point volumetric curve
EVENTS	fill · drain · siphon · theft-while-idle



DRIVER-WISE FUEL ECONOMY · 30D

FIG 2.2

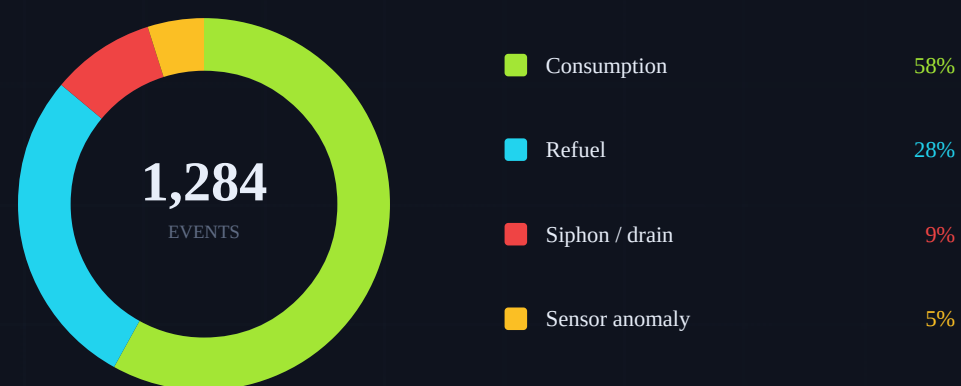


6 DRIVERS · SAME ROUTE CLASS

Δ TOP-BOTTOM 40%

EVENT DISTRIBUTION · MONTHLY

FIG 2.3



FLEET-WIDE · 42 TRUCKS

OCT 2025

03

— TELEMATICS INGEST

BS-VI CAN. BS-IV/V sensor. One unified data model.

FleetOS speaks the language of any vehicle. BS-VI trucks are read via J1939 / OBD-II CAN with full PGN decoding. BS-IV/V without rich CAN get an identical telemetry record via discrete sensors (inline fuel flow, magnetic pickup RPM, GPS speed, accelerometer harsh-event signature).

Upstream, the dashboard doesn't care which generation produced the data.

PROTOCOL J1939 · UDS · OBD-II

PGNS 65262, 65263, 65265, 61444...

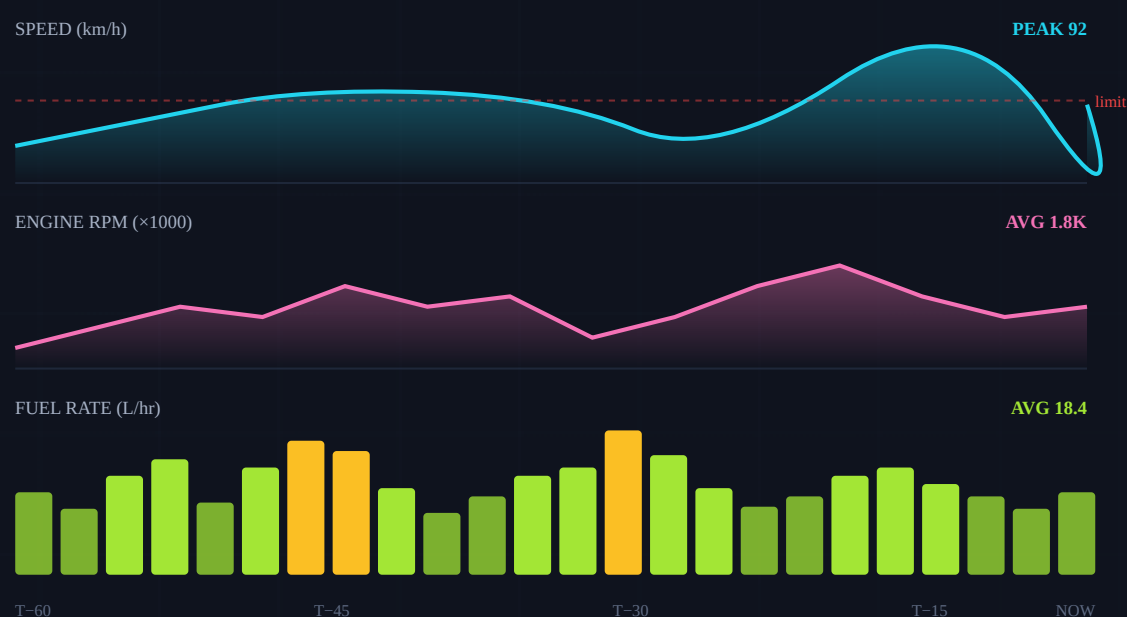
SAMPLE 10 Hz CAN · 1 Hz GPS

EDGE ML Event detection, 120ms budget

UPLINK MQTT over LTE Cat-M1

LIVE TELEMETRY · 60-MINUTE WINDOW

FIG 3.1



CAN STREAM · PGN 65266

LIVE

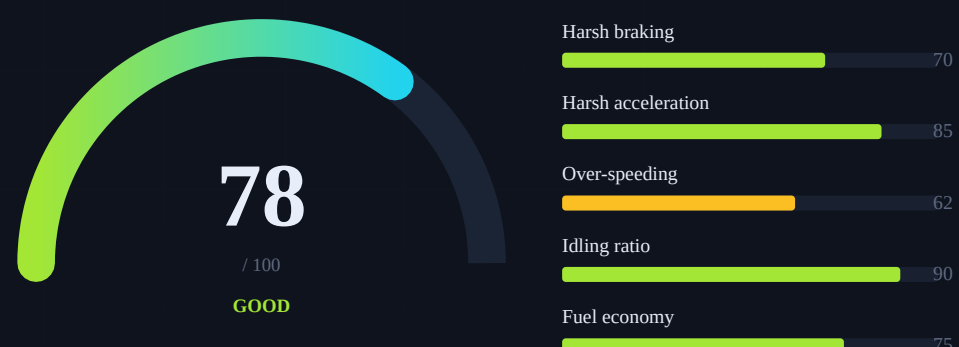
DECODED SIGNALS · SAMPLE FRAME

TBL 3.1

PGN	SIGNAL	VALUE	UNIT
65262	Coolant temp	87	°C
65263	Oil pressure	412	kPa
61444	Engine RPM	1,820	rpm
65276	Fuel level	64	%
65266	Fuel rate	18.4	L/hr
64892	AdBlue level	58	%

DRIVER BEHAVIOUR SCORE

FIG 3.2



R. SINGH · OCTOBER

RANK 4 / 42

PGN	SIGNAL	VALUE	UNIT
64777	DPF soot load	32	%
65132	Seat occupancy	TRUE	bool

J1939 · SNAPSHOT BS-VI

04

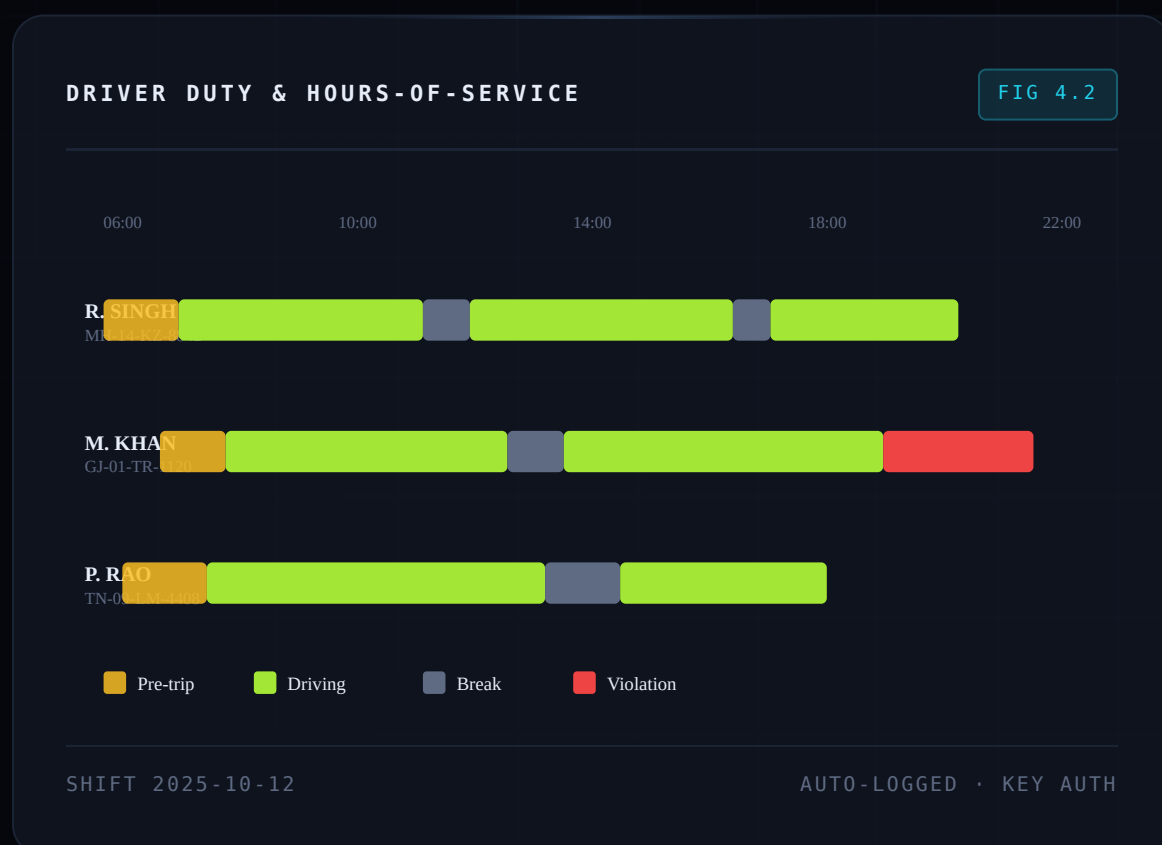
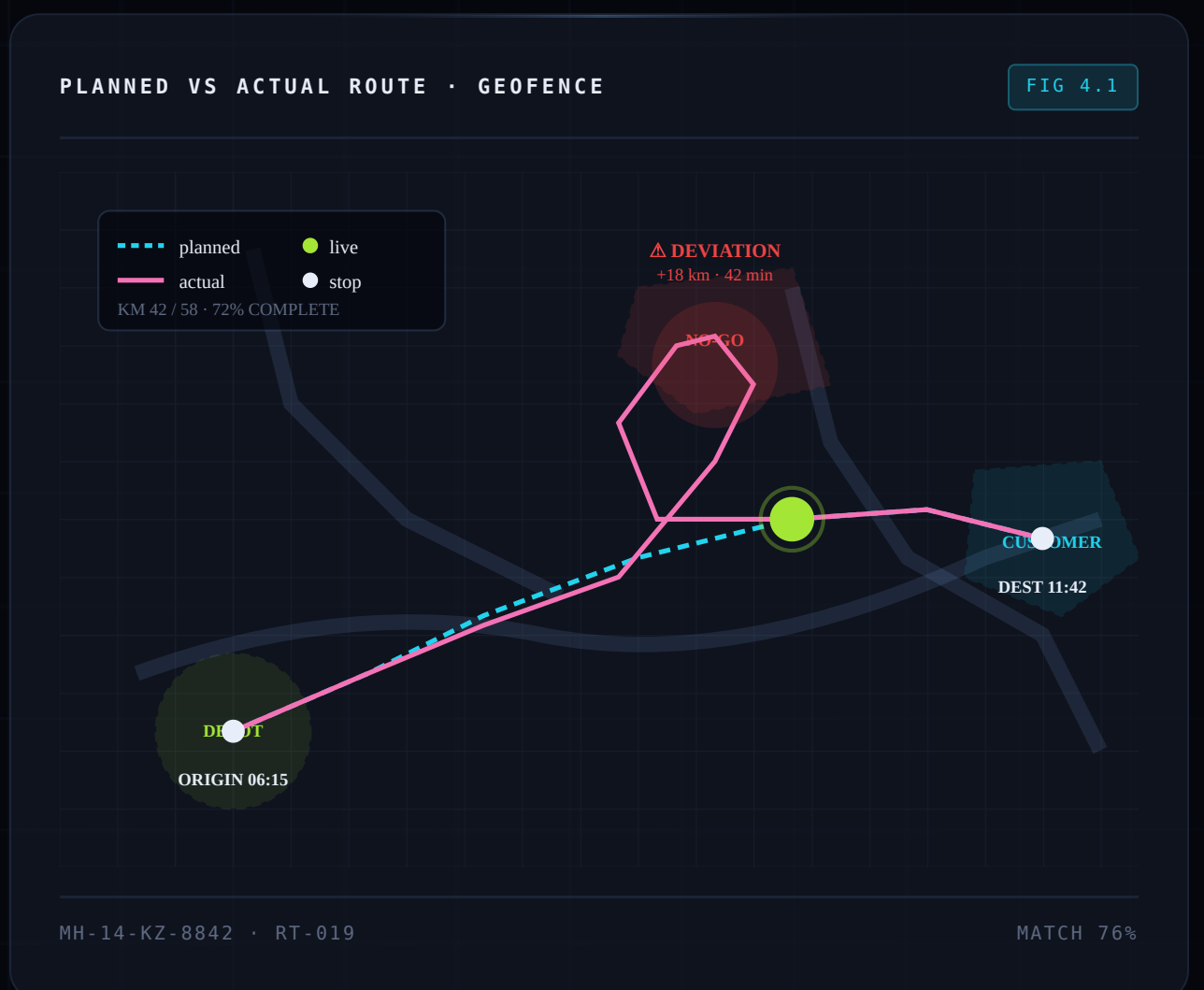
— PERIMETER & DUTY CONTROL

Geofence. Route. Duty. Theft response.

One spatial engine powers four disciplines. Polygon fences mark depots, customer sites and no-go zones. Proposed routes are plotted next to the actual trace — deviation is obvious. Driver-vehicle mapping is enforced through key-auth. Duty allocation encodes shift, break and max-drive policies.

When perimeter, route or duty is breached, the platform escalates through tiered alerts: **SMS** → **siren** → **engine immobilise**.

FENCES	Circle · Polygon · Corridor · Multi-layer
ROUTE	Map-matched Hausdorff · 25m bands
DUTY	Shift · Break · HoS · Rest
RESPONSE	Notify → Alarm → Immobilise



05

— ANOMALY INTELLIGENCE

Alerts that connect dots across sensors.

Raw telemetry is noisy. FleetOS correlates signals that individually look normal but together tell a story — *fuel dropping while engine is off, truck moving with no ignition event, mileage this week 28% worse than last month on the same route.*

Every alert carries a playbook: who is notified, over which channel, what evidence to inspect. Adaptive thresholding manages fatigue.

ENGINE	Hybrid rules + IsolationForest
CHANNELS	SMS · Email · Push · WhatsApp · Webhook
DEDUP	10-min rolling · severity weighted
PLAYBOOKS	32 pre-built · tenant-customisable

ALERT SIGNATURES · LAST 7 DAYS

FIG 5.1

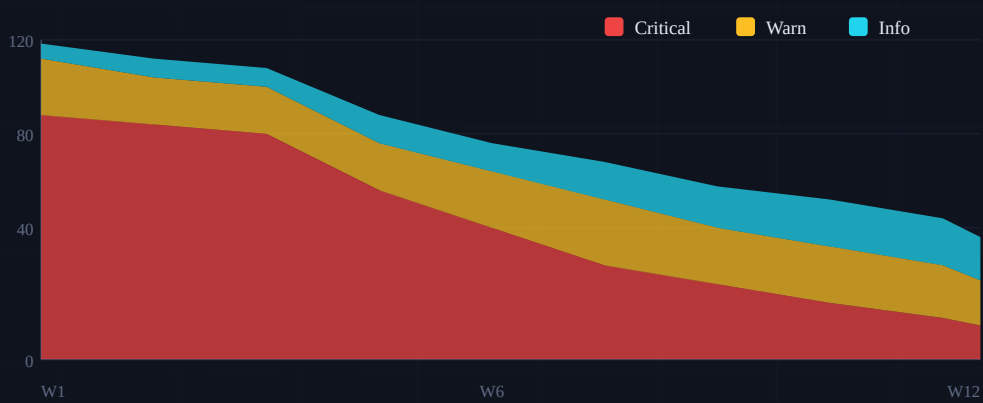
- FUEL DROP · ENGINE OFF** (CRITICAL)
MH-14-KZ-8842 · -42L in 14 min · parked 19°N 72°E
2h ago
- MOTION · NO IGNITION EVENT** (CRITICAL)
GJ-01-TR-1120 · GPS 0.8km · no key auth · towed?
5h ago
- MILEAGE DRIFT · -22%** (WARN)
TN-09-LM-4408 · route RT-019 · 3.3 km/L (was 4.2)
yesterday
- HARSH BRAKING CLUSTER** (WARN)
R. Singh · 8 events in 12 min · NH-48 km 42
yesterday
- DPF REGEN OVERDUE · 720 KM** (INFO)
MH-14-KZ-8842 · soot 78% · schedule depot
2d ago
- IDLING > 15MIN · 3 INSTANCES** (INFO)
P. Rao · depot wait · est. 2.1L wasted
3d ago

6 OF 48 SHOWN

FILTER · ASSIGN · RESOLVE

ALERT VOLUME · 90-DAY TREND

FIG 5.2

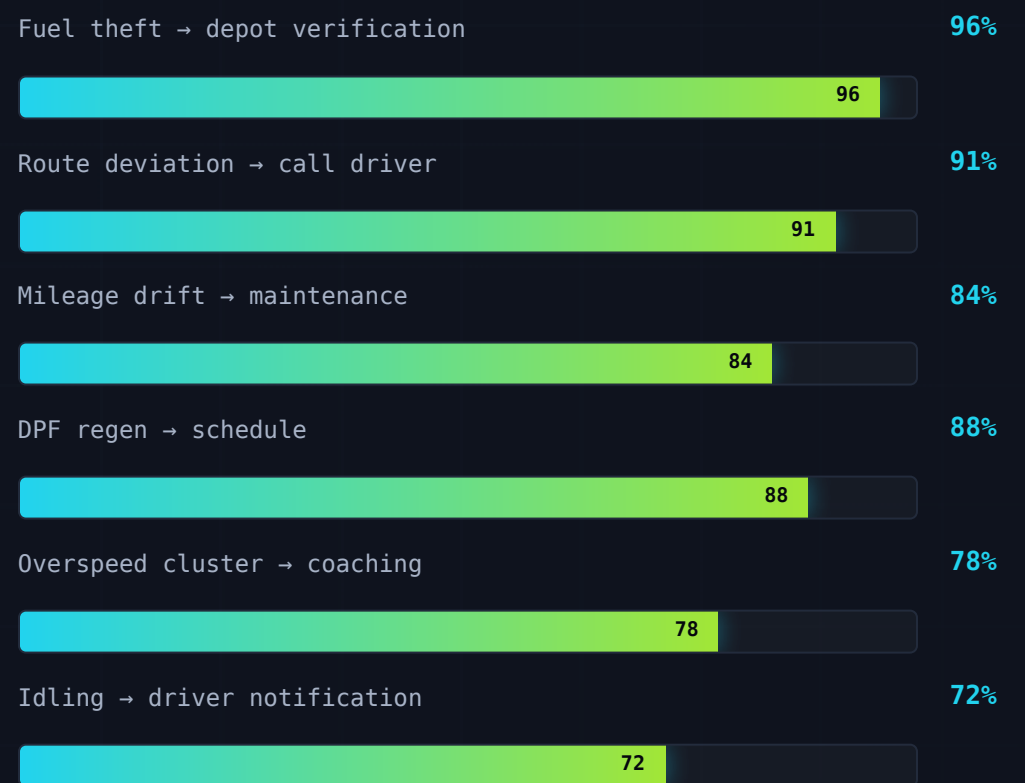


CRITICAL ↓ 64% IN 12W

COACHING IN EFFECT

TOP PLAYBOOKS BY RESOLUTION

TBL 5.1



42 FLEET BENCHMARK

LAST QUARTER

— EXPANSION MODULES

The rest of the platform, on the same pane of glass.

The five pillars rarely deploy alone. Operations teams layer in modules for safety, maintenance, load integrity and compliance — all on the same asset model and



Predictive Maintenance

Engine hours, vibration signature and fault codes rolled into RUL estimates — scheduled against the next depot visit.



AI Dashcam

Dual-lens with on-device inference for distraction, fatigue, phone use, tailgating. 4G stream + event-clip upload.



Tyre Pressure & Temp

TPMS per wheel, retrofittable. Under-inflation costs 3-5% fuel. Real-time alerts and retread scheduling.



Cold-chain Reefer

Cargo-bay temperature and humidity logs, door-open events with GPS. Evidence-grade for pharma and food SLAs.



SOS & Duress

Concealed button + voice-triggered distress. Silent alarm to control room with live GPS and optional cabin audio.



Trip Reports & POD

Auto-generated trip summaries, e-sign POD, and billable-km reconciliation with accounting systems.



EV Telematics

Battery SoC, SoH, pack temperature, charge sessions, regen efficiency. Mixed ICE/EV fleets unified.



Load & Axle Weight

Air-suspension pressure → payload estimate. Prevents overload fines, tracks empty return-trip running.

◆ FLAGSHIP ADD-ON

— FUEL DISPENSING MANAGEMENT

Every litre out of the bowser, accounted for.

Where fuel enters the tank is where most of the leak happens. FDMS wraps any standard in-premise pump with authentication, metering, and per-vehicle policy — so every drop is attributed to a driver, a vehicle, and a reason.

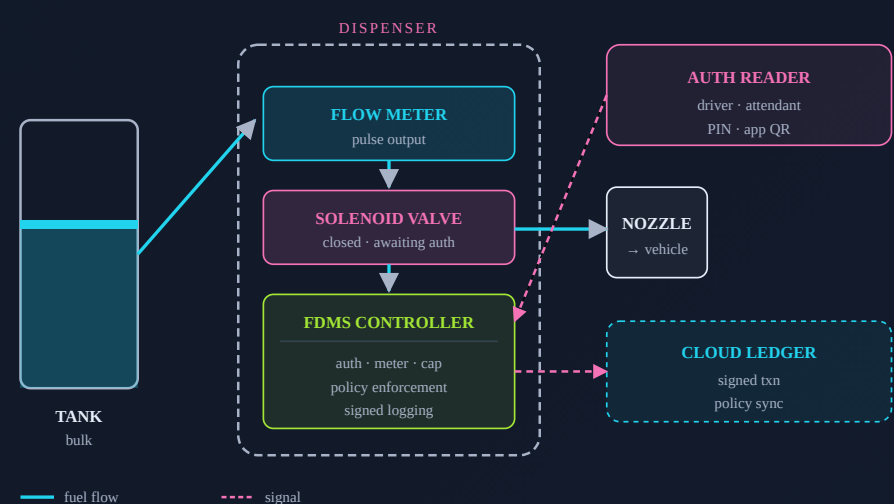
What it does

FDMS sits between the pump's flow sensor and its dispensing valve. Nothing flows without an authenticated session. Every session produces a tamper-evident record: who, what vehicle, how many litres, at what flow rate, against what policy cap.

FLOW METER	Pulse output · 100 pulses/litre
AUTH	RFID · iButton · App · PIN
VALVE	Solenoid, NC, fail-safe
CAPS	Vehicle · driver · day · pump · time
OFFLINE	Queue locally, sync on reconnect
AUDIT	Signed, immutable ledger

FDMS BLOCK DIAGRAM

FIG A.1



RETROFIT-COMPATIBLE

ATEX ZONE 1

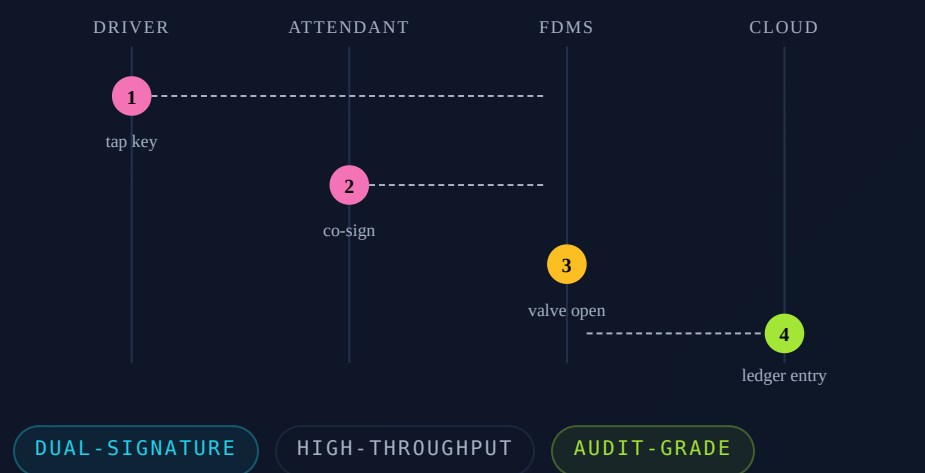
MODE A

Dual-key · Attendant + Driver

MODE B

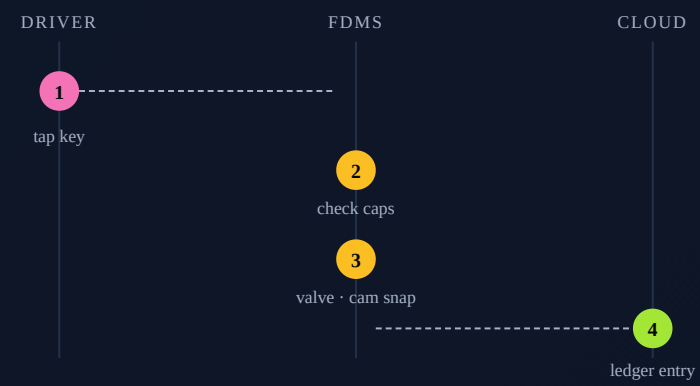
Unattended · Driver self-service

Both the **pump attendant** and the **vehicle driver** must present their keys to open a dispensing session. Two signatures on every litre. Ideal for high-throughput depots where audit rigour is paramount.



DUAL-SIGNATURE HIGH-THROUGHPUT AUDIT-GRADE

For captive depots with no pump operator — night shifts, remote sites, private bowlers. The driver uses their **own key**. Caps enforce the policy: *N litres per vehicle per day, only 05:00–22:00, only at Pump-2*. Camera snapshot anchors every session.



SELF-SERVE CAP-ENFORCED ZERO-HEADCOUNT

POLICY CAP MATRIX · EXAMPLE

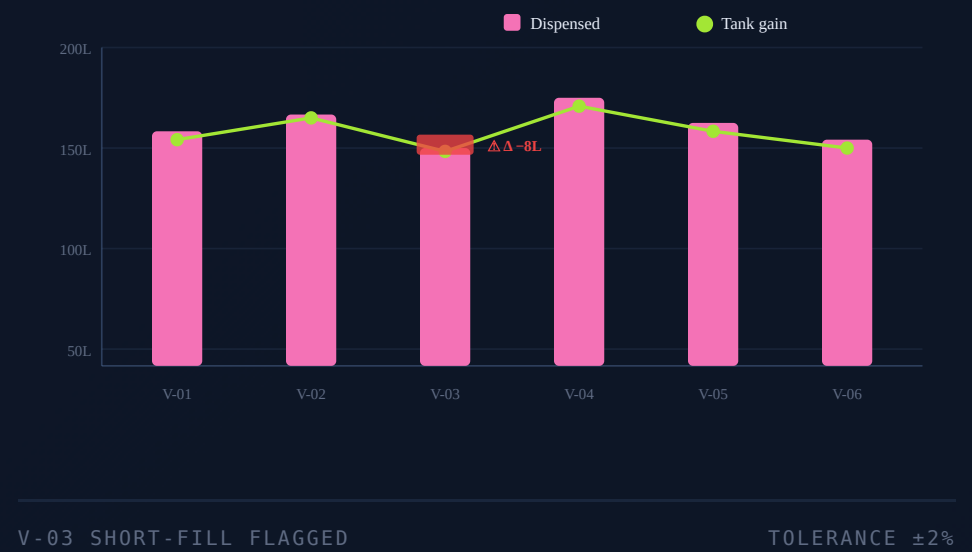
TBL A.1

DIMENSION	CAP	WINDOW
Per vehicle	180 L	per day
Per driver	240 L	per day
Per pump	6,000 L	per shift
Per session	tank vol	auto-detect
Time window	05:00–22:00	configurable
Flow rate	50 L/min max	anti-spill

PRIORITY EVALUATION FIRST-FAIL REJECTS

RECONCILIATION · DISPENSED VS TANK-IN

FIG A.2



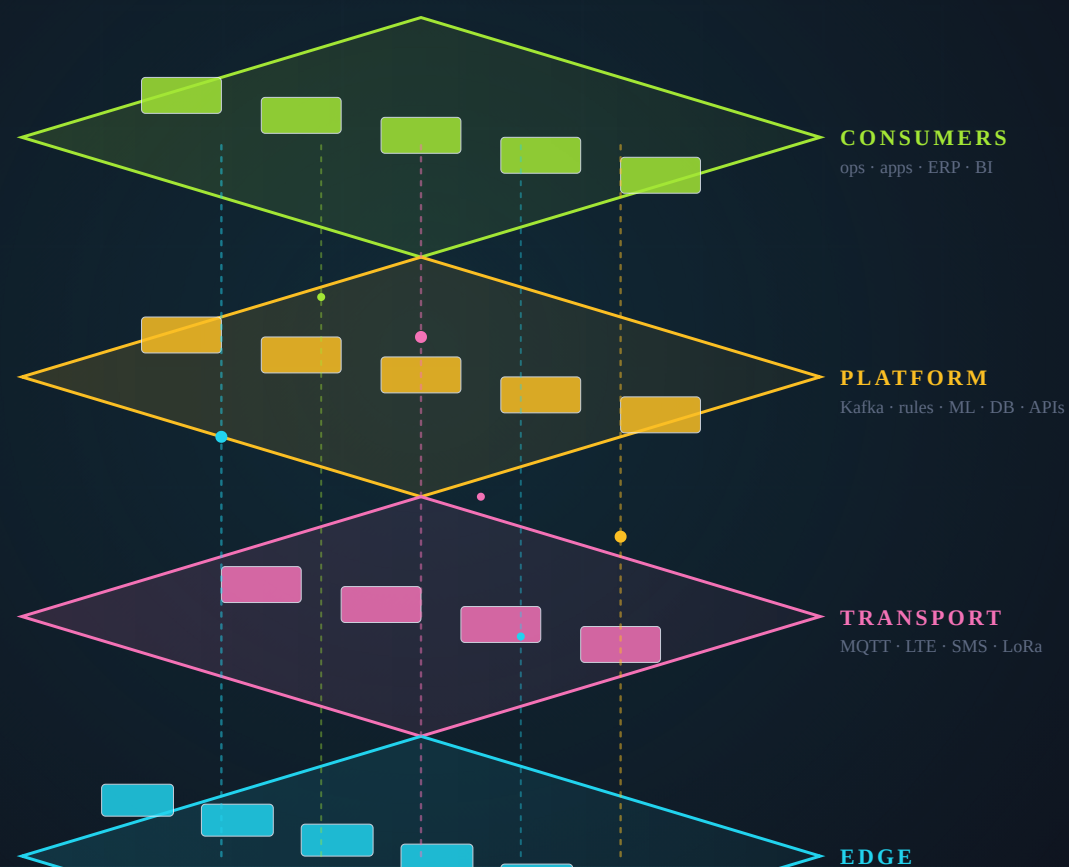
— SYSTEM ARCHITECTURE

From tank sensor to operations dashboard.

PLATFORM ARCHITECTURE · ISOMETRIC

FIG X.1

3D · ISOMETRIC



EDGE

Key reader · Fuel probe · CAN · GPS · Dashcam · FDMS · TPMS

TRANSPORT

MQTT/LTE · SMS fallback · LoRa · Wi-Fi depot

PLATFORM

Kafka ingest · Rules + ML · Timescale · S3 · APIs · MCP

CONSUMERS

Ops web/mobile · Driver app · Alerts · ERP/TMS · BI/LLM

DRAG TO ROTATE

SCROLL TO ZOOM

— BUSINESS OUTCOMES

What changes in the P&L.

Average observed improvements across 12 FleetOS reference deployments (42–380 vehicles each), 90 days post-deployment.

LINE-ITEM SAVINGS · % VS BASELINE

FIG R.1

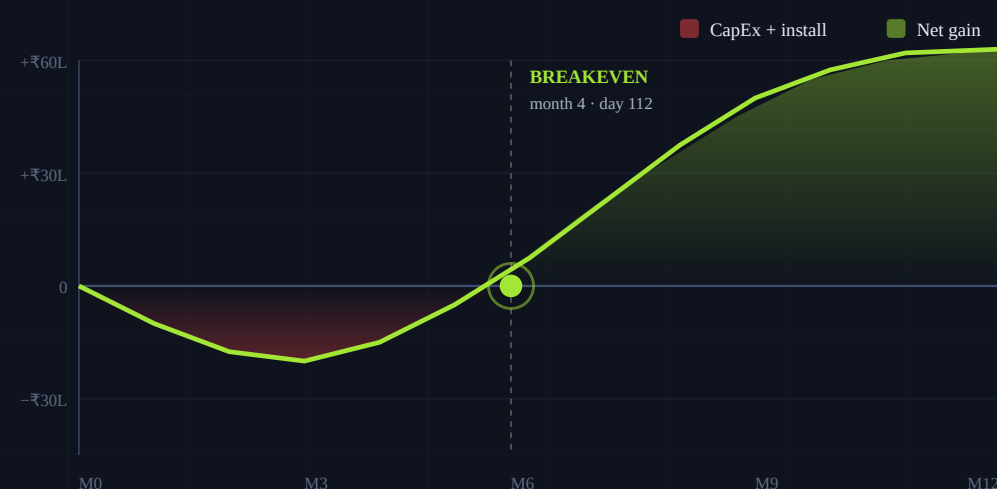


N = 12 FLEETS

90D POST-DEPLOY

PAYBACK CURVE · 80-VEHICLE FLEET

FIG R.2



80 VEHICLES · HW + SAAS

BREAK-EVEN <120D

— THE PLATFORM THESIS

Telemetry alone doesn't save money. Attribution does.

Every competing product can show you where the truck is. The difference with FleetOS is that every signal — a litre dispensed, a kilometre driven, a braking event, a detour — terminates in an accountable human and a contractual outcome. That's why reference fleets recover their capital in under four months.

— DEPLOY

Three models, one codebase.

Public-cloud SaaS · customer-VPC single-tenant · fully on-prem. Identical data model and dashboard across all three.

— INTEGRATE

Built for the ecosystem.

REST & GraphQL APIs, webhooks, MCP server for conversational analytics, connectors for SAP TM, Oracle TMS, Zoho, Tally, SAP B1.

— COMPLY

Regulation-ready.

AIS-140 hardware. GDPR / DPDP data handling. ISO 27001 controls. Evidence-grade trails for pharma and explosives transport.

— GET IN TOUCH

Ready to instrument your fleet?

Reach out for a pilot scoping call, hardware sample kit, or a reference customer introduction. Typical pilot runs 4 weeks across 10-20 vehicles with full commercial rollout options thereafter.

• PRIMARY CONTACT

Jubin Patel

FOUNDER · NXTBYTE.IO



MOBILE

+91 96621 48892



WEB

nxtbyte.io

ABOUT THIS DOCUMENT

FleetOS is a vehicle tracking and fleet intelligence platform by **nxtbyte.io**. Full technical specs, API reference, hardware BOM and commercial terms available under NDA. Figures drawn from reference deployments; individual engagement results may vary.

SECTIONS

- 01 · Key Auth
- 02 · Fuel Monitoring
- 03 · Telematics
- 04 · Geofence / Duty
- 05 · Alerts
- Add-on · FDMS

CONTACT

Jubin Patel
+91 96621 48892
nxtbyte.io

NEXT STEPS

- Request pilot SOW
- Hardware sample kit
- API sandbox
- Reference call

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