Transforming Multimodal Fleet Operations with Intelligent Automation

MobilityCorp

IX FIve Nines

The Scale of Multi-Modal Complexity

Our Fleet Portfolio

Cars & Vans: 200 vehicles across urban markets

eBikes: 500 units for micro-mobility

Scooters: 5,000 scooters in high-density zones

Managing diverse vehicle types creates margin leakage and service variance. Different usage patterns, maintenance needs, and customer expectations multiply operational complexity.

Target Performance Gains

+32%

Overall Utilization

From baseline to target through demand matching

–€22

Maintenance Cost

Per vehicle per month reduction

–45%

Dispute Refunds

Decreased through evidence automation

96

Target NPS

Customer satisfaction score

Our Unified Platform Architecture

1

User Interactions

UI dialogue, bookings, returns, payments across all vehicle types

2

Event Backbone

Unified event stream processing fleet signals in real-time

3

Shared Fleet State

Single source of truth for availability, location, condition

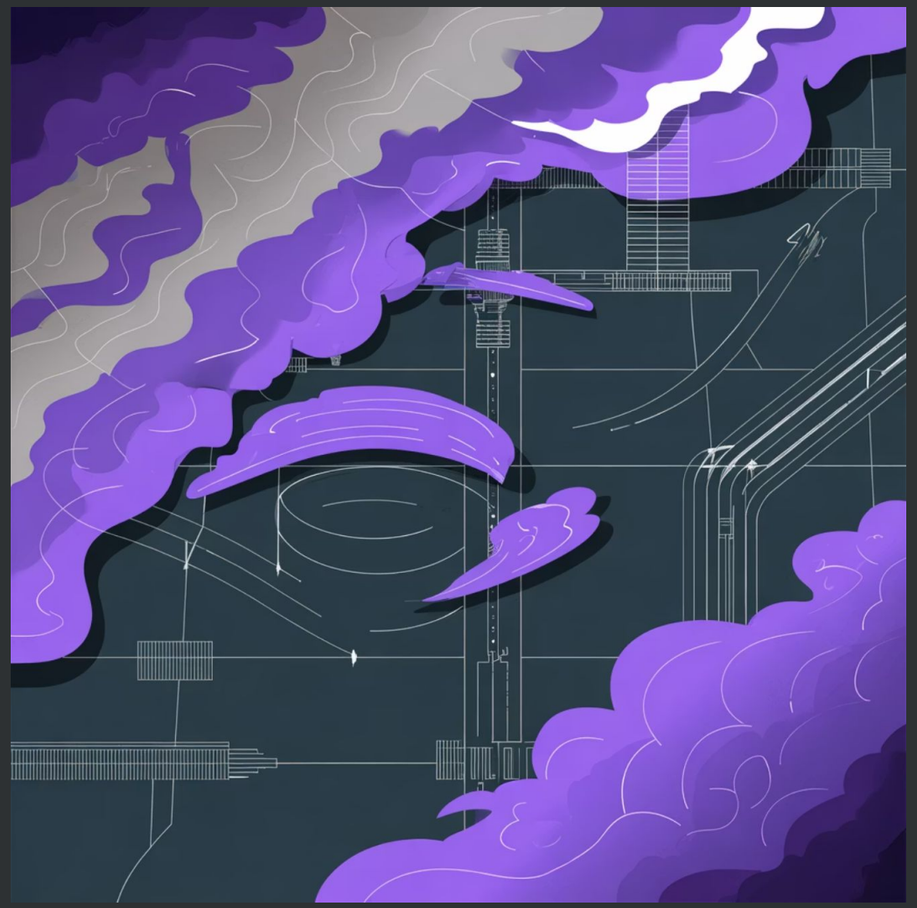
4

AI Services

Targeted intelligence delivering measurable outcomes

This architecture enables mode-specific optimization while sharing core infrastructure, reducing data silos and ensuring consistent KPIs across vehicle categories.

Business Challenges Require a Sophisticated Solution



Multi-Modal Operating Challenges

Demand volatility: Weather and events create unpredictable usage patterns across vehicle types

Uneven wear: Cars accumulate mileage differently than scooters experience battery cycles

Charging inefficiency: Battery rotation for scooters and EV charging coordination for cars

Dispute overhead: Photo evidence processing varies by vehicle category

Price elasticity: Different customer sensitivities across scooters versus premium vans

Compliance complexity: Geo-fencing, parking rules, and territorial regulations

Our Design Philosophy: Event-driven core with unified fleet state (ADR-0007) plus targeted AI only where KPI gates justify investment. This delivers faster value with phased ROI gates, avoiding premature heavy ML spending.

Architecture at a Glance: Three Key Takeaways

Shared Event Backbone

Sensor data sharing, demand forecasting, pricing, and relocate/ maintenance services are reused across all vehicle types.

Unified Fleet Service

Single source of truth for availability, location, battery state, and charge levels ensures consistent KPI tracking across vehicle types.

SRE as a Service

Observability, SLAs, and rollback paths keep AI model usage safe. Continuous performance monitoring and retrain AI models if quality gates are not met.

Our container view diagram minimalistically covers such domains as User Dialogue, Booking, Pricing and Charging Advice as well as Fleet info, Demand Forecasting, and Maintenance scheduling for ops team.

Value-Gated AI Portfolio: Spend Smart, Scale Fast

01

Demand Forecasting (All Modes)

Approach: Start statistical, upgrade only if MAPE plateaus. **Gate:** 24h MAPE ≤ 15%; weather and event features adjust scooter/bike demand separately. **Win:** Higher peak availability → Rev/vehicle-hour +23%.

02

Dynamic Pricing (Elastic Segments)

Approach: Adjust pricing bands per mode elasticity while protecting NPS. **Gate:** Acceptance rate ≥ 20%, Utilization band ± 5% maintained.

03

Maintenance & Wear Leveling

Approach: Even usage across scooters/bikes and vans reduces downtime. **Gate:** Wear variance (std dev mileage) ↓ 10%; predictive accuracy ≥ 7%. (ADR-0019)

04

Charging & Battery Advice

Approach: Simple ML reduces mid-ride abandonment for scooters/bikes; EV optimization for cars/vans. **Gate:** Abandonment due to battery/charge 63% → 6-8%. (ADR-0021)

05

Vision (Damage & Cleanliness)

Approach: Phase limited to cars/vans; lightweight scooter checks planned. **Gate:** Precision ≥ 92%, False positives < 5%, Override rate trending ↓10%. (ADR-0020)

Human-in-the-Loop Safeguard (ADR-0016): Reviewer overrides feed retraining, preventing automation risk. Model/vendor abstraction monitors cost per 1k inferences and storage footprint with disciplined retention (ADR-0017).

Measurable Outcomes: Three Cross-Fleet Success Stories

Forecast → Smart Reposition

Impact: Idle hours −18%; Peak availability +12% → Revenue lift €240,000/mo,

Metrics: Utilization +9%; Forecast MAPE ↓ to 13%; Battery rotation efficiency +26% for scooters/bikes.

Intelligent repositioning across all modes ensures vehicles are where demand peaks, maximizing revenue per available vehicle hour.

Wear Leveling & Maintenance Scheduling

Impact: Downtime hours/vehicle −14%; Average maintenance cost/vehicle/month €117.1→ €79.08.

Metrics: Mileage std dev −39%; Predictive maintenance hit rate ≥ 80%; Spare parts inventory turns +25%.

Balancing usage across scooters, bikes, and vans extends vehicle life while reducing emergency repairs and inventory carrying costs.

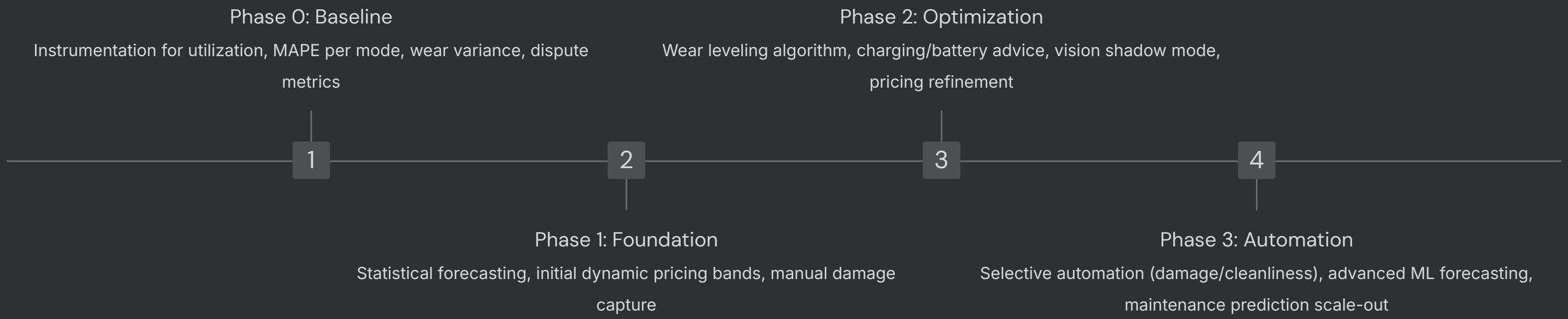
Damage & Cleanliness Triage

Impact: Manual inspection time −35%; Dispute refund rate 46% → 6%.

Metrics: Cost per inspection €1.80 → €0.90.

Automated visual assessment for cars/vans (scooters planned) reduces dispute processing overhead while improving customer trust.

Phased Rollout: Earn Sooner, Spend Later



ROI Investment Summary

Initiative	One-time €	Ongoing €/mo	Uplift €/mo	Savings €/mo	Payback	Modes
Demand Forecasting	120000	12000	240000	—	1 mo	All
Dynamic Pricing	110000	8000	—	160000	1 mo	All
Wear Leveling	15000	20000	40000	120000	2 mo	All
Vision Services	90000	6000	—	60000	2 mo	Cars+ Vans

Front-load cross-fleet wins with shared backbone reducing incremental cost for new mode features. Upgrade only at KPI gates to maximize capital efficiency.

Trust, Compliance, & Resilience by Design

- **Evidence-Rich Automation**

  Photos, confidence scores, and reviewer overrides logged—reducing false fees and legal exposure while maintaining audit trails.

- **Data Retention & Privacy**

  ADR-0017 ensures cost control plus GDPR alignment: delete non-value media early, retain anonymized training sets for continuous improvement.

- **Continuous Model Evaluation**

  ADR-0011 model gates prevent silent drift in forecasting and vision services, with automated alerting on accuracy degradation.

- **Cross-Border Compliance**

  Location telemetry enforces territorial rules automatically, reducing manual compliance checks and minimizing regulatory fines.

- **Operational Resilience**

  Multi-zone deployment, idempotent events, and rollback strategies lower outage costs and maintain service continuity during failures.

Executive Decision: Approve Phases 1–2

Projected Headline Impacts

Overall Utilization

Increase across all vehicle modes

Average Maintenance Cost

Reduction per vehicle

Dispute Cost

Decrease through automation

Market Rollout

Until first cost saving

What We're Asking

- Executive dashboard demo showcasing cross-fleet KPIs
- Approve Phases 1–2 investment plus KPI instrumentation budget
- Quarterly review gates to validate ROI before Phase 3 scale-out

Approve Investment

Schedule Demo