FREIGHTWAVES × Motive

The State of Fleet Maintenance: AI, Automation, and Cost of Ownership

How integrated platforms and real-time automation help organizations take control of fleet maintenance in 2026

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Executive Summary

Fleet maintenance and repair costs are climbing*, and the margin for error is shrinking. Rising parts prices, persistent technician shortages, and increasingly complex vehicle systems have turned proactive fleet management into a financial necessity.

According to the *American Transportation Research Institute (ATRI)*, the average cost of operating a commercial vehicle in 2024 was $2.26 per mile. While repair and maintenance costs dipped slightly to about $0.20 per mile, non-fuel operating costs hit the highest level ATRI has ever recorded at $1.78 per mile. Meanwhile, repair and maintenance costs trended back upward in early 2025.[2]

To better understand how organizations are navigating these pressures, FreightWaves Research surveyed fleet professionals across the transportation industry. The findings reveal a critical gap: While organizations that power physical operations can articulate their challenges, they haven't fully connected the systems required to solve them. For organizations that run physical operations, that gap is no longer just a software problem. It's an operational control problem that affects safety, uptime, and the total cost of keeping vehicles and assets ready for work.

At the same time, fleet professionals express strong comfort with AI and automation, and many are already using AI-powered tools in safety and compliance workflows. Despite their willingness to adopt AI-powered technologies, most fleet professionals haven't unified those tools across all areas of fleet management in a single platform. As a result, they're missing the full value of AI-powered insights across every workflow—from the cab, to the back office, to the shop floor.

That's where Motive's maintenance vision becomes especially relevant. When real-time inputs from safety, telematics, inspections, and spend flow into the same operating system as work orders, organizations with fleets can move faster from detection to action.

When AI and automation operate across an integrated platform rather than in silos, the results can include lower total cost of ownership (TCO) per vehicle or asset, safer performance through real-time driver coaching, more productive operations with less manual overhead, and proactive maintenance strategies that prevent breakdowns rather than react to them. The operators who connect these systems are building an integrated foundation for fundamentally better fleet economics.

At its best, this approach helps fleets operate more safely, work more productively, and manage profitability with tighter control over downtime, labor, and per-vehicle cost of ownership.

As physical AI matures across transportation and logistics, its value will depend less on isolated alerts and more on how effectively those signals are translated into real-world operational action.

This report examines how AI-powered insights across Motive's Integrated Operations Platform are giving leaders the visibility and control they need to move from reactive spending to predictive operations that are both integrated and automated.

The Cost Pressures Behind Fleet Operations

To understand the financial and operational landscape shaping fleet management decisions, the FreightWaves Research and Motive survey first established who these operators are, how large their fleets are, and what challenges weigh most heavily on their operations heading into the second half of 2026.

The survey's respondent pool represented the broad middle of the commercial transportation industry. Almost all respondents (93%) came from the trucking, transportation, and logistics sector*.The study captured a diverse range of company sizes, with roughly 27% operating 1 to 25 vehicles, another 27% managing 26 to 100 vehicles, and the remaining respondents spanning mid-market to enterprise-level operations of up to 1,000 vehicles.

Figure 1 shows the respondent fleet-size mix captured in the study.

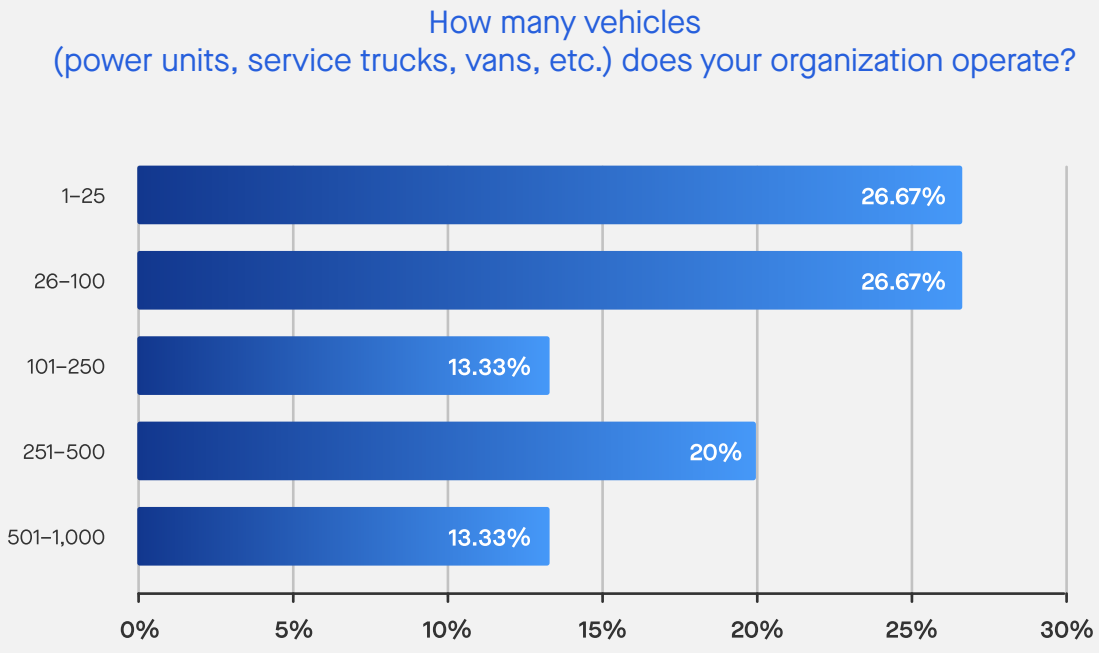

Figure 1: Survey respondent fleet sizes ranged from small fleets to large operations with up to 1,000 vehicles.

*This survey was conducted by FreightWaves Research in partnership with and sponsored by Motive during Q2 2026. This research captures insights from a highly targeted group of C-suite freight executives with direct decision-making authority across the topics explored. The findings offer a concentrated view into the priorities, challenges, and sentiment of senior industry leaders closest to these decisions.

This distribution is significant because it captures the exact segments where connected technology drives the most immediate ROI. For emerging and mid-size businesses, platform integration can bridge the gap of limited IT infrastructure, protecting tight margins from outsized operational risks. For larger enterprises scaling up to 1,000 units, that same integration can eliminate costly data silos and administrative friction. Across this entire spectrum, the move from reactive to proactive management can deliver measurable financial value.

For these leaders, AI-powered fleet management is the mechanism through which integration gaps get closed, manual workflows get automated, and maintenance strategies shift from reactive to predictive. The survey data that follows illustrates both the urgency of that shift and the degree to which the industry is ready for it.

Cost pressures compound across line items. Fuel spend, the third-ranked challenge in this survey, is a case in point. Most fleet cards operate independently from the rest of a fleet's technology stack, leaving fuel transactions disconnected from vehicle telematics, driver behavior data, and maintenance records. The *Motive Card* closes that gap as the only fleet fuel card fully integrated into an AI-powered fleet management platform, combining fuel rebates at more than 25,000 partner locations with AI-driven fraud detection that pairs vehicle GPS data with transaction data to automatically flag and decline suspicious purchases in real time. Bringing fuel spend management onto the same platform that manages safety, compliance, and maintenance eliminates another manual reconciliation workflow and turns fuel data into actionable intelligence.

When asked to identify their top operational challenges heading into the second half of 2026, 80% of respondents cited rising maintenance and repair costs. Driver recruitment and retention followed at 60%, and fuel cost management and fraud prevention ranked third at 50%.

Figure 2 below shows how sharply maintenance cost pressure outranked the other challenges.

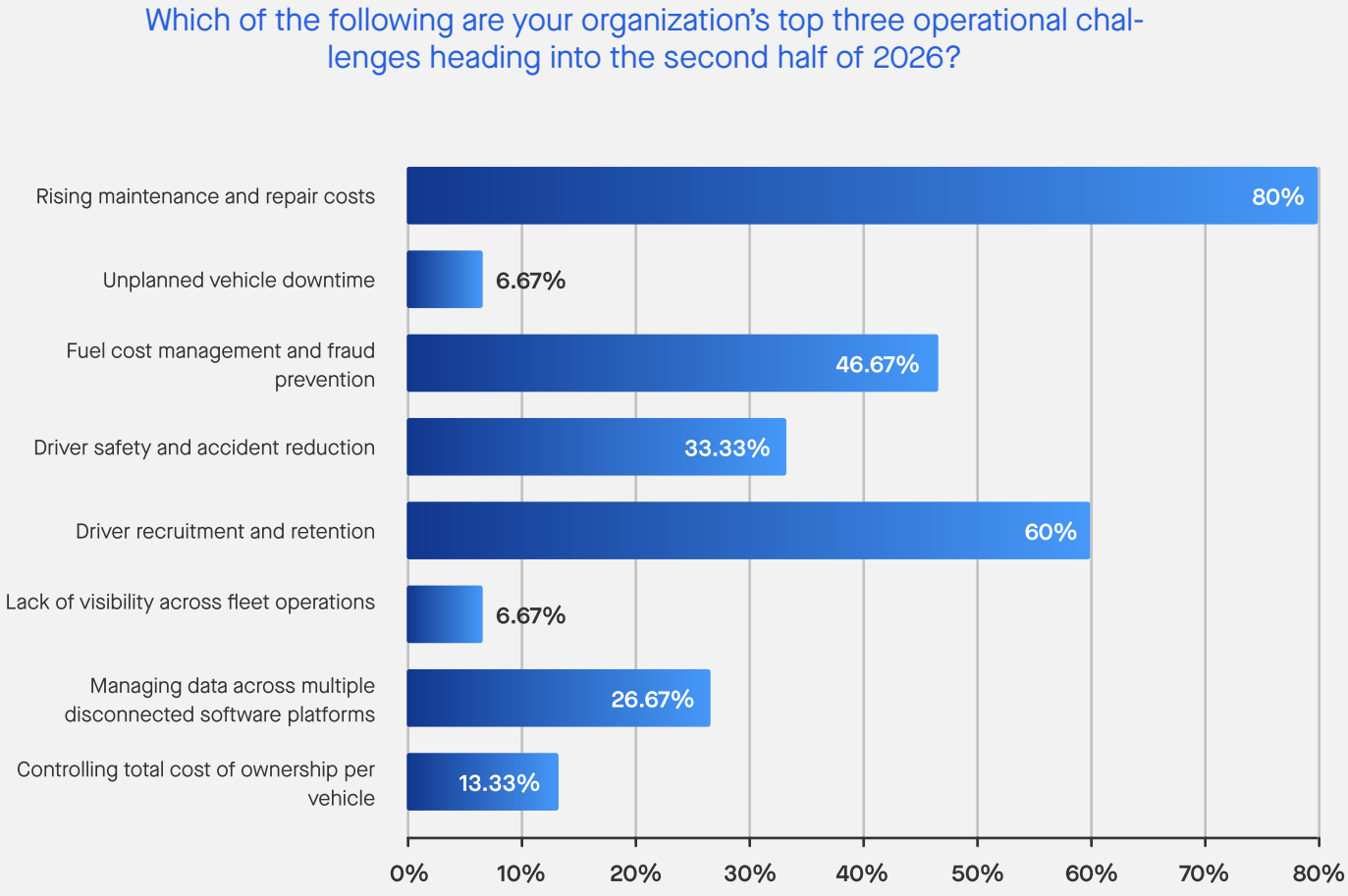

Figure 2: Rising maintenance and repair costs ranked as the top operational challenge in the survey.

These numbers align closely with broader industry data. Parts costs have risen 3.7% year-over-year through Q4 2025,[2, 3] with tariff-driven increases on steel and aluminum components applying additional upward pressure on brake parts, chassis hardware, and structural components heading into 2026. The average annual repair and maintenance cost per heavy-duty truck in the United States now averages $16,192.[2]

Industry research consistently shows that reactive repairs cost three to nine times more than planned preventive maintenance;[3, 4] emergency parts shipping adds three to five times the standard cost; and unplanned downtime costs fleets an estimated $448 to $760 per day per vehicle in lost productivity.[4] Reputational harm and service disruption, likewise, are damaging but much more difficult to calculate.

The emphasis on maintenance costs is not surprising given the compounding nature of the problem. When a vehicle breaks down unexpectedly, the costs cascade: towing, emergency labor rates, expedited parts, rental equipment to cover the gap, missed delivery penalties, driver downtime, and the administrative overhead of rerouting and rescheduling.

Industry data suggests the average fleet experiences 8.7 days of unplanned downtime per vehicle per year.[4] For a 1000-vehicle operation, even at the low end of the cost range, that represents more than $3.9 million in annual productivity losses from unplanned events alone.[2, 4]

The respondents to this survey understand these dynamics. The prominence of maintenance costs as the dominant challenge, outpacing even driver retention and fuel management, signals that fleet leaders see cost-of-ownership control as the most urgent lever they can pull.

But the urgency is not purely financial. Every delayed repair or unexpected breakdown can lead to operational disruption, service risk, and avoidable safety exposure across the business.

Where Operations Break Down

The survey asked respondents to identify the maintenance-related pain points their organizations currently experience.

The single most-cited pain point, at 67%, was the inability to predict which vehicles are at risk of failure or unplanned downtime. Two-thirds of fleet leaders acknowledged that they can't see vehicle failures coming, which means they're not just managing maintenance reactively, they're also absorbing the high costs that come with that approach.

The remaining pain points cluster around data fragmentation: maintenance records scattered across multiple systems (27%); difficulty connecting fuel transaction data to cost per vehicle (27%); slow flow of vehicle inspection defects to maintenance teams (20%); limited real-time visibility into engine fault codes and vehicle health data (20%); and manual compliance documentation follow-up (20%).

Figure 3 captures the maintenance pain-point profile from the study.

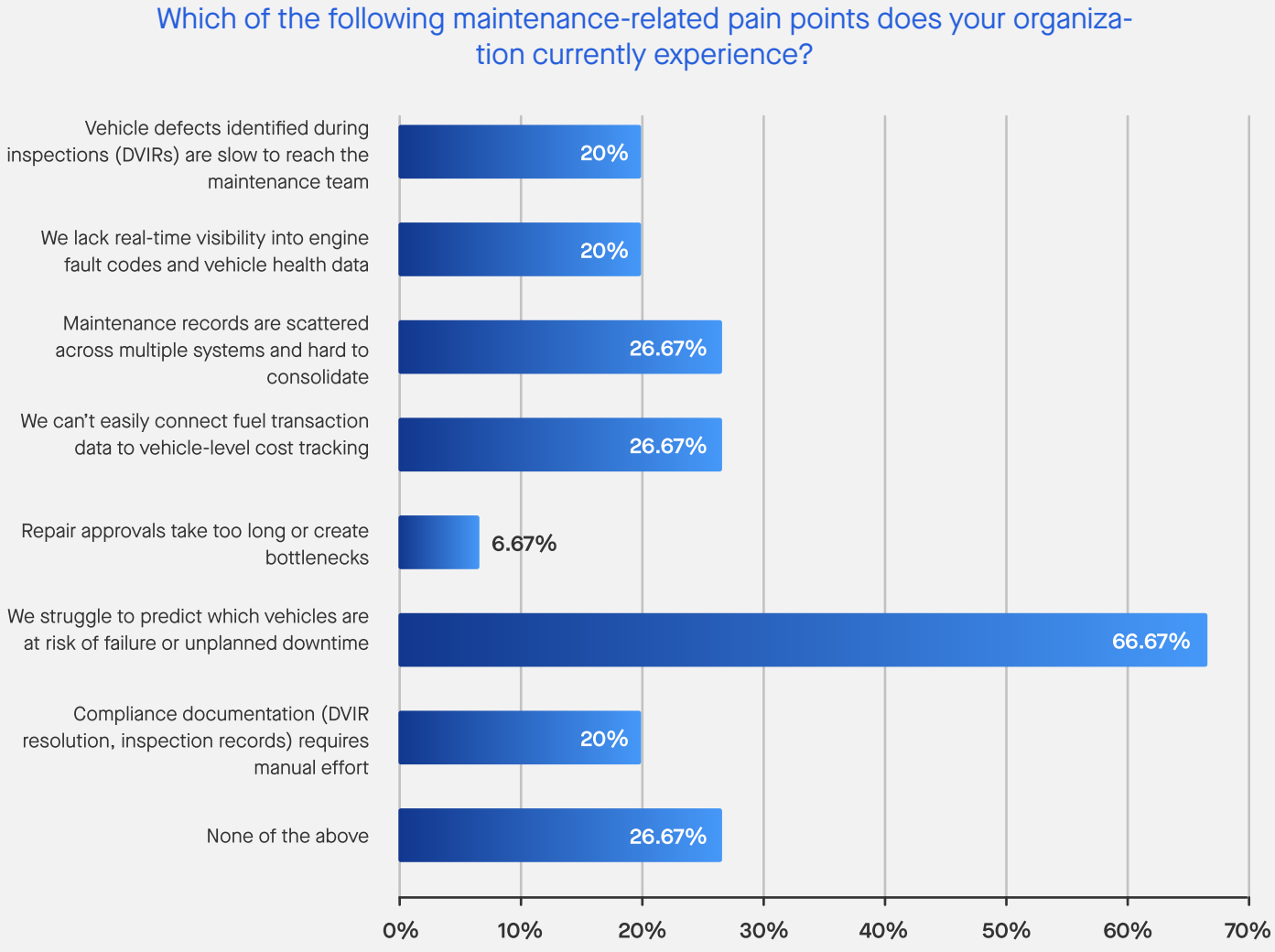

Figure 3: The top maintenance pain point was the inability to predict failures or unplanned downtime.

The top pain point is about foresight — seeing what's coming before it happens. The supporting pain points are about connectivity — getting the right data to the right people in time to act on it. These are not independent problems. The inability to predict failures is, in large part, a downstream consequence of fragmented systems that prevent the data from being analyzed holistically and powering automation.

AI creates the most value when it's embedded in an integrated operations platform, not used as a standalone feature. That is especially true in physical operations, where the value of AI insights depends on whether inputs from vehicles or assets, drivers, and maintenance systems can be turned into timely action in the real world.

When telematics, safety data, maintenance records, fuel data, spend data, and inspection histories flow into a single connected platform, AI models can detect the patterns that predict failures before they happen and automate workflows to proactively address them.

Without integration, the AI has nothing to work with, and operators remain stuck in reactive mode, regardless of how sophisticated their individual tools may be. In practical terms, that means organizations may have more data than ever and still lack the confidence to prioritize the right repairs, escalate the right risks, or intervene before a routine issue becomes an expensive failure.

The consequences of disconnected systems are tangible:

- Two-thirds of respondents, 67%, reported difficulty tracking true per-vehicle cost of ownership.
- Nearly half, 47%, experienced delayed maintenance leading to roadside breakdowns or out-of-service events.
- Another 47% were unable to identify trends across safety, maintenance, and fuel data.
- 27% said they were making decisions based on outdated or incomplete information.

Figure 4 below shows how these siloed systems slow operations.

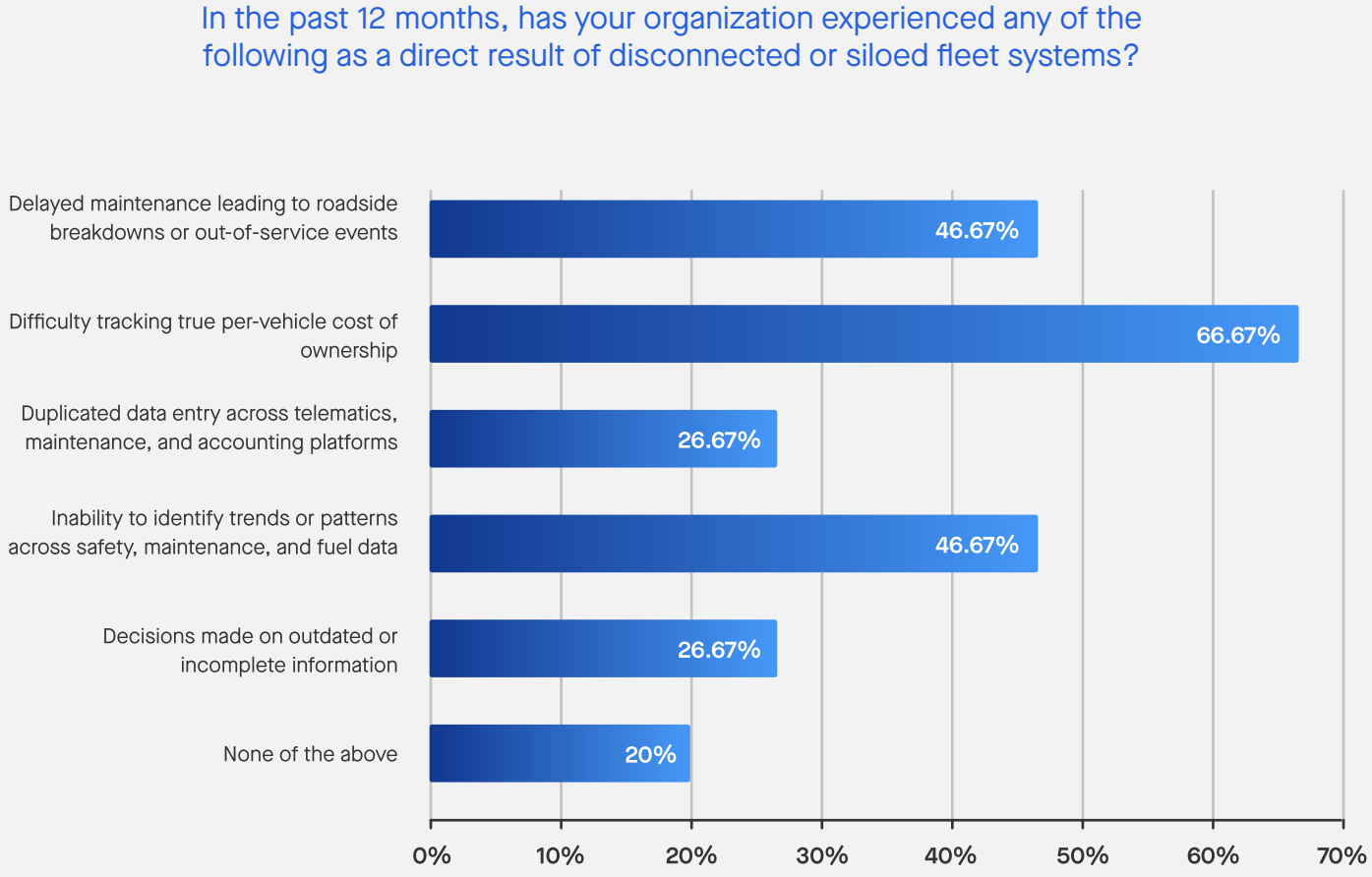

Figure 4: Disconnected systems contributed to delayed maintenance, cost-visibility gaps, and missed cross-functional insight.

The cost-of-ownership visibility gap is particularly notable. Without the ability to track all-in costs at the individual vehicle or asset level, fleet leaders cannot make informed decisions about maintenance investments, repair-versus-replace thresholds, or lifecycle optimization. They are, in effect, managing a portfolio of depreciating assets without the financial data to manage it profitably.

The Integration Gap and the Manual Workflow Tax

Perhaps the most revealing finding in the survey has to do with system integration.

- A full 80% of respondents described their fleet technology environment as having some systems integrated but with significant gaps.
- Only 13% reported well-integrated systems that share data automatically across platforms.
- No respondents reported relying entirely on manual processes and spreadsheets, which suggests the industry has moved past the paper-based era but has stalled in the middle of the digitization process.

Figure 5 below shows the middle ground in which organizations are currently operating.

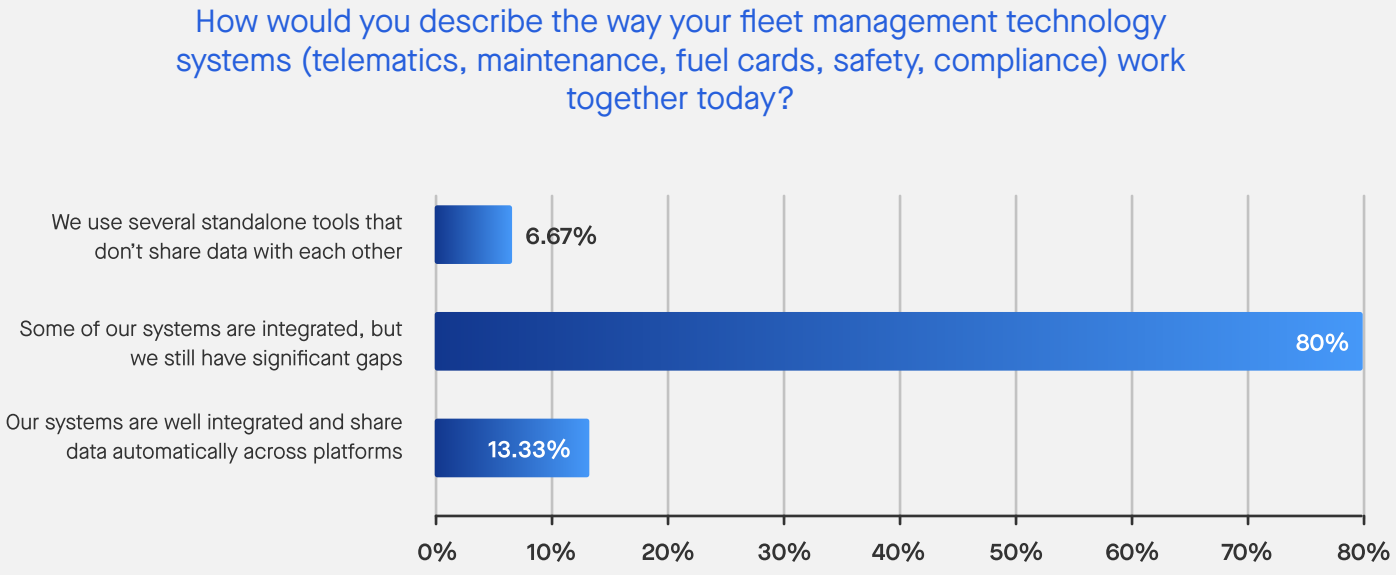

Figure 5: Most respondents reported some integration, but with significant gaps still in place.

This 80% stat is actually what's driving the other pain points identified in the survey. When telematics data lives in one system, maintenance records in another, fuel card transactions in a third, and safety and compliance documentation in a fourth, leaders are forced to manually bridge the gaps. The data exists, but it's siloed — and not connected enough to be actionable. In that dynamic, decisions are delayed, patterns go undetected, and maintenance remains reactive.

The survey quantified the cost of this manual approach. Roughly 29% of respondents estimated their teams spend 11 to 20 hours per week on manual data entry, reconciliation, and information transfer between systems. Another 21% estimated they spend 6 to 10 hours per week. Perhaps most telling, 29% said they don't know or haven't tracked it, which means the true cost of manual workflows is invisible to a substantial portion of leaders.

Figure 6 below shows how much time disappears into manual coordination work.

How much time does your team spend each week on manual data entry, reconciliation, or transferring information between fleet systems (e.g., re-keying telematics data into maintenance software, reconciling fuel transactions, manually updating inspection records)?

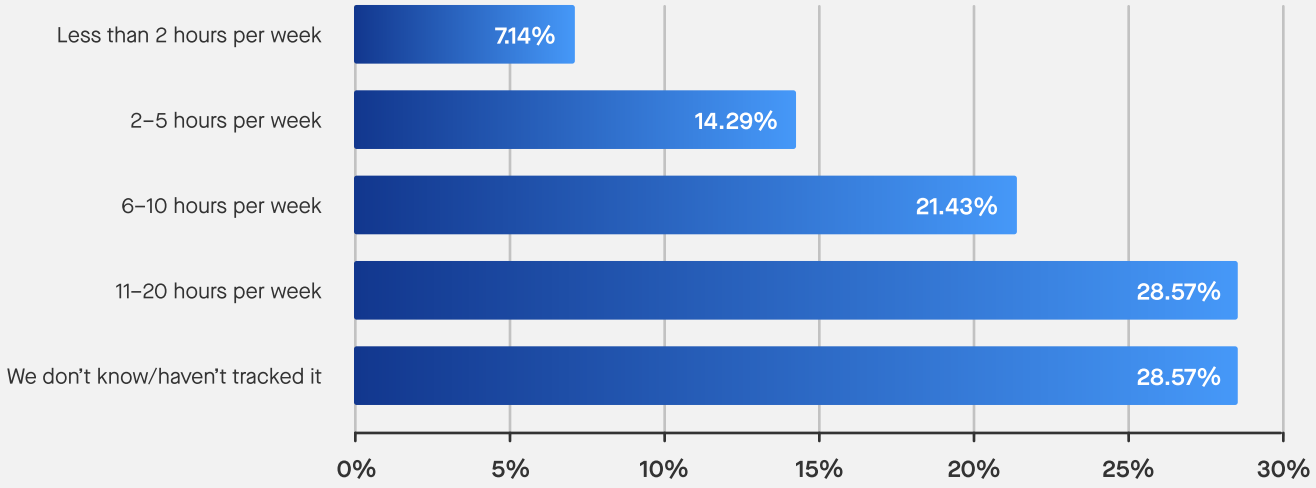

Figure 6: Many teams spend meaningful time each week on manual data entry, reconciliation, and information transfer.

Even at moderate hourly labor rates, the cost of manually entering data into maintenance software, reconciling fuel transactions, and updating vehicle inspections adds up quickly across an operation. More importantly, every hour spent on manual data tasks is an hour not spent on proactive fleet management, including analyzing cost trends, scheduling preventive maintenance, or coaching drivers.

This manual burden compounds the integration gap. When systems don't talk to each other, people end up having to bridge the gap. And people can be slow, error-prone, and expensive. Every manual handoff slows the path from defect identification to maintenance action.

AI and automation can eliminate much of this manual burden, but only when the underlying systems are integrated and connected.

Barriers to Technology Adoption and the Path Forward

Organizations that run physical operations, according to this survey data, are not resistant to AI and automation. However, that automation is unevenly deployed.

When asked which tasks they would be comfortable allowing AI or automation to handle:

- 80% of respondents say they are comfortable with AI summarizing or creating reports.
- 67% would allow AI to automatically schedule or initiate work such as creating work orders.
- 60% would trust AI to approve routine or low-risk work.
- And 47% expressed comfort with fully automated workflows without human review.

Figure 7 shows that the appetite for automation is already there.

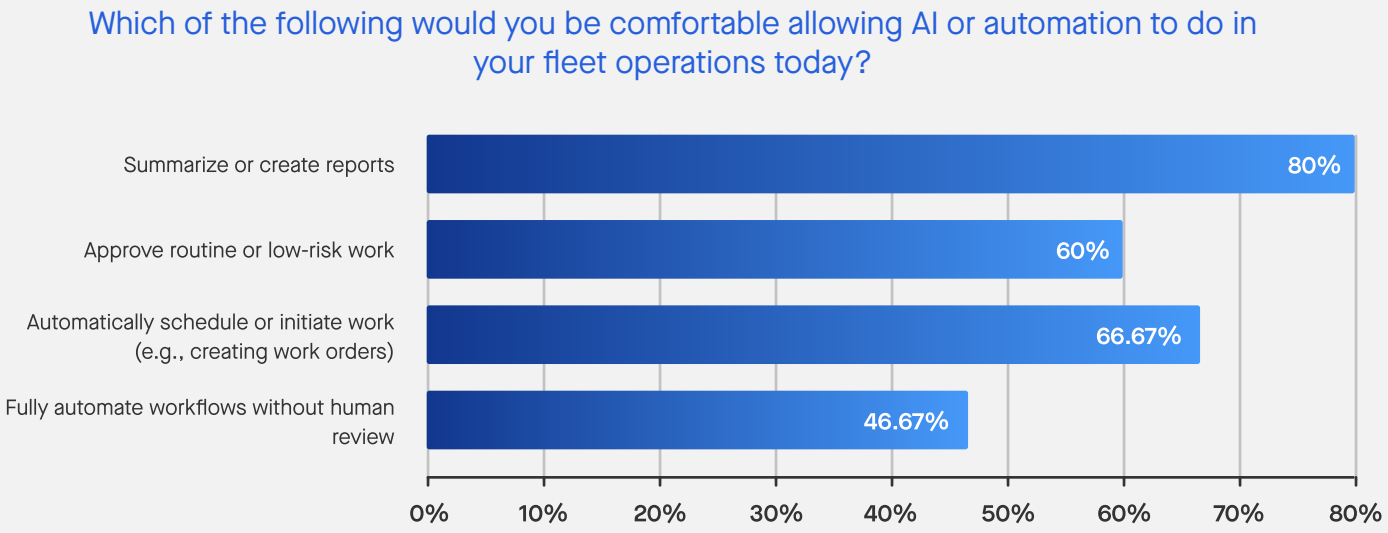

Figure 7: Respondents showed strong comfort with AI handling reporting, scheduling, and routine work.

These comfort levels represent a significant mandate for automation. The industry isn't waiting to be convinced that AI has a role in fleet operations. What the industry is still working through is how to apply AI consistently across physical operations, especially in areas like maintenance — where value depends on connected systems, cross-functional workflows, and reliable execution beyond the cab. The question is no longer whether to adopt automation, but how to deploy it effectively within existing workflows to take action in real time.

The adoption picture becomes more nuanced when looking at specific operational areas. AI-powered driver safety leads adoption significantly, with 88% of respondents who answered this question currently using these tools.

Automated compliance workflows show a more mixed picture, with 50% evaluating these solutions and 20% currently using them. Predictive and condition-based maintenance is notably lagging, with 60% of respondents reporting they're not using these tools at all and only 20% saying they've already deployed them. Automated work order creation shows a similar gap, with 60% not using it, 40% evaluating it, and none who've deployed it.

Figure 8 shows the contrast between AI adoption in safety and in maintenance workflows.

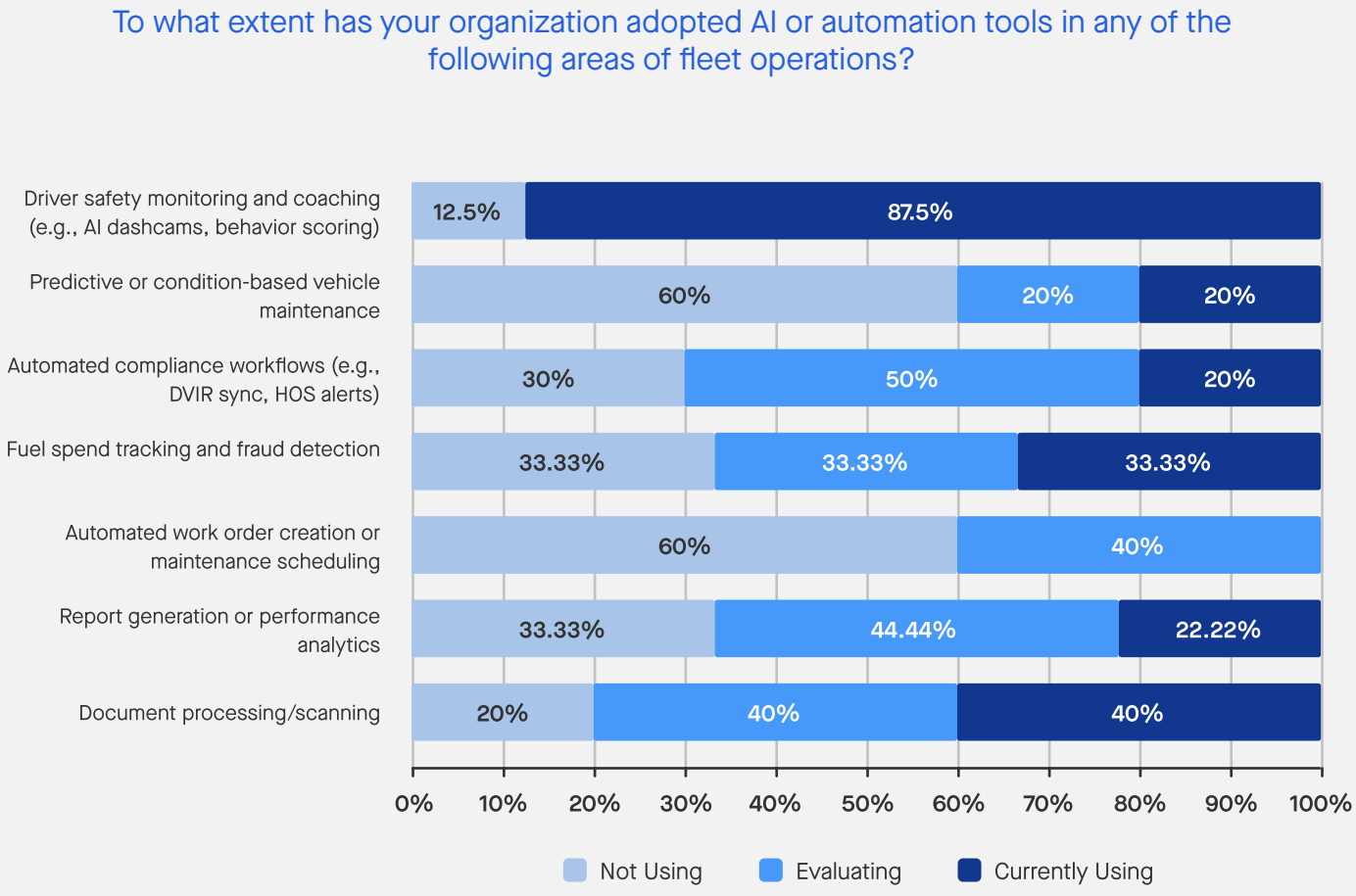

Figure 8: Maintenance-related AI use cases lag behind more mature areas like driver safety.

Organizations that run physical operations have embraced AI where a single, self-contained platform delivers clear value, particularly in safety and dash cam-based workflows. But the areas where AI requires cross-system integration to function, including predictive maintenance, automated work orders, and condition-based service scheduling, lag far behind. Based on the survey, this is primarily an integration problem.

When asked to identify the single biggest barrier preventing their organization from extracting more value from AI and automation, the top response was lack of internal expertise or IT resources at 33%. Insufficient system integration and uncertainty about which tools would deliver real ROI tied at 20% each. Notably, 20% of respondents said they had not identified a significant barrier at all, and none cited driver or field team resistance, data quality concerns, or lack of confidence in prompting AI.

Figure 9 shows how barriers to AI and automation adoption cluster around internal resource and integration challenges rather than resistance or trust issues.

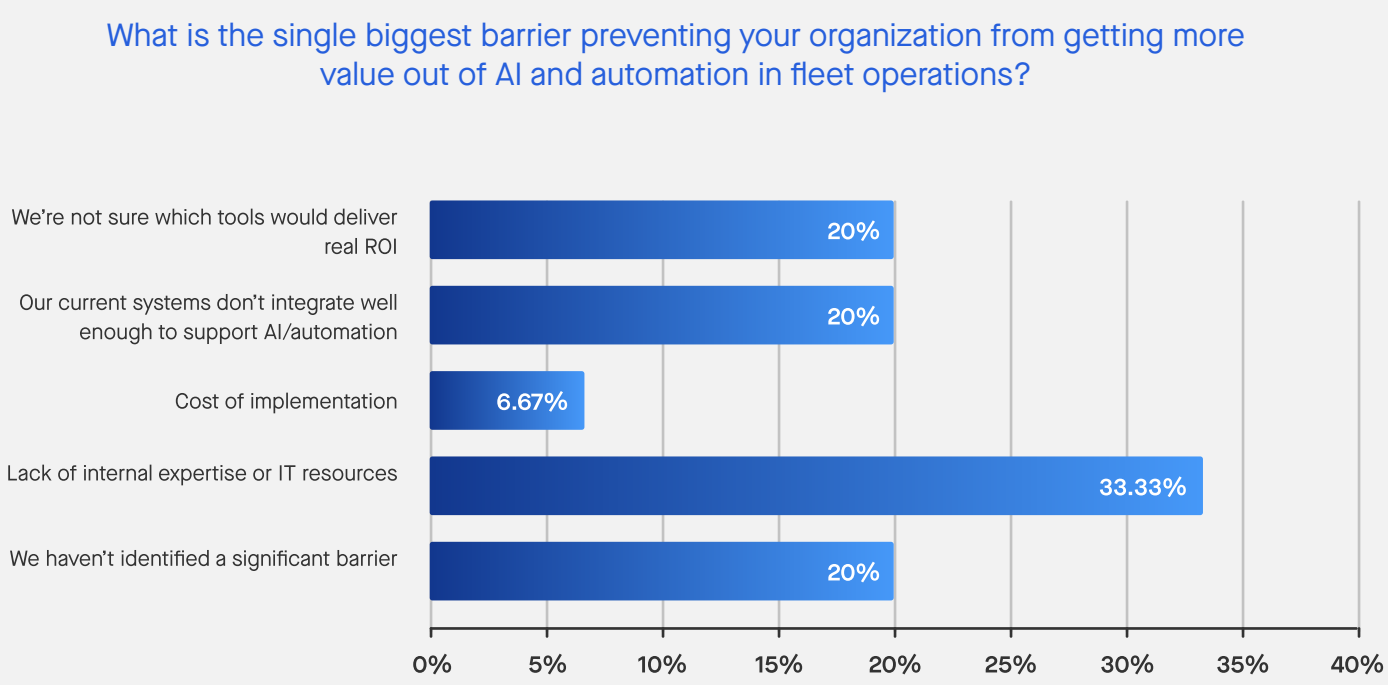

Figure 9: Lack of internal expertise and insufficient system integration were the top barriers to extracting more value from AI and automation.

The responses about the biggest barriers leaders face confirm the central point of the survey data: leaders are willing and, in many cases eager, to adopt AI and automation. What they lack is the integration backbone and the internal resources to connect their existing tools into workflows that can support automated, real-time action and proactive decision-making.

The answer isn't more standalone tools. It's fewer, better-connected platforms that are integrated and automated. In other words, the next phase of adoption will likely belong to platforms that don't just surface insights, but connect those insights directly to maintenance decisions, work order workflows, and cost controls.

Motive's *integrated, AI-powered platform* connects real-time signals from across fleet operations. With safety data living in the same platform as telematics, fuel card transactions, vehicle inspections, and maintenance records, fleets get a single, real-time view of the maintenance operation—from a fault code detected on the road to a completed, cost-tracked repair in the shop.

Motive Maintenance connects three parts of the maintenance operation that often live in separate systems: vehicle and asset health, shop workflows, and spend and cost. That means teams can connect inspections, fault codes, and service schedules to work orders, repair activity, and the costs associated with each vehicle or asset.

When these capabilities operate together inside one platform, the integration gap that 80% of respondents identified as their current reality begins to close.

- Critical fault codes detected by Motive telematics can be directly converted into a work order.
- Inspection defects can move more quickly from drivers to maintenance teams.
- Fuel and maintenance costs can be combined in a single operating-cost view and tied back to the vehicle record, giving fleets a clearer view of total cost of ownership (TCO) by vehicle.

By bringing fuel and maintenance costs together in one operating-cost view, Motive helps fleets see the full TCO of each vehicle or asset—not maintenance spend in isolation—and use that information to identify cost trends and evaluate repair-versus-replace decisions.

The result is a single, connected view of vehicle or asset health, driver behavior, and operating costs.

Motive AI Automations also closes the gap between detection and execution. A fault code, an upcoming scheduled service, or an inspection defect can be automatically converted into a work order, turning an operational signal into a trackable maintenance action without requiring a person to manually enter information from one system into another.

In a connected workflow, a driver-reported defect or fault code can become a work order, move through repair, and feed the resulting cost back into the vehicle record. This is the operating loop that turns maintenance data into decisions about uptime, cost per mile, and whether to repair or replace an asset.

The Data-to-Action Gap

One survey question stood out for its strategic importance: What single fix would most improve data flow across the operation? The top answer, at 40%, was a single dashboard showing true cost of ownership per vehicle across all spend categories. The second-highest response, at 27%, was vehicle health and telematics data automatically triggering maintenance work orders.

Figure 10 shows that fleets want visibility and action together, not separately.

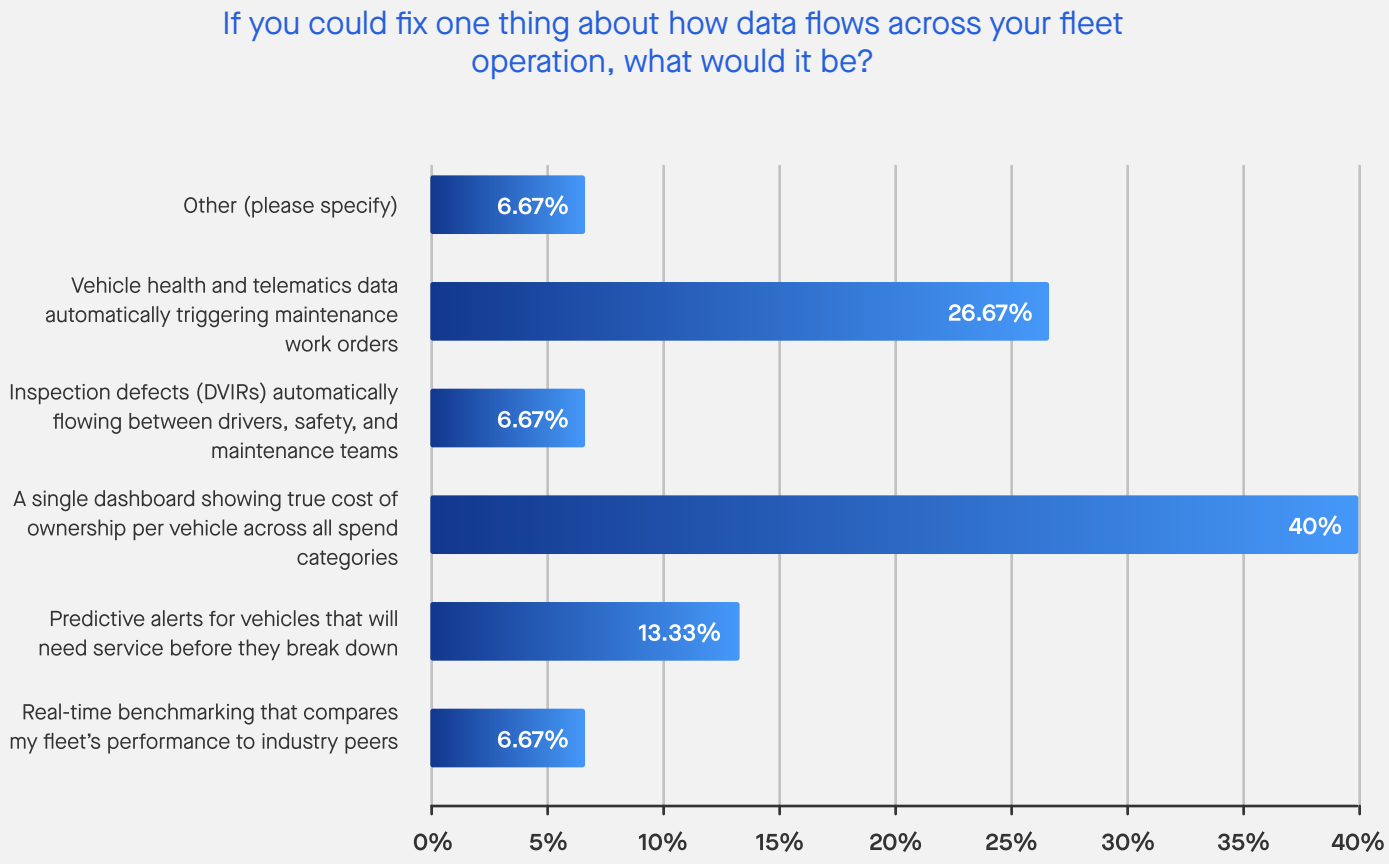

Figure 10: The top future-state priorities were unified TCO visibility and automatic maintenance triggers.

These two priorities encapsulate the insight-to-action gap. Organizations are asking for more than visibility. They're asking for a system that can connect vehicle inputs, maintenance execution, and financial outcomes in the same operating loop.

They're asking for their existing data to be unified and actionable. They want to see total cost of ownership at the vehicle level, with fuel and maintenance costs combined in a single operating-cost view rather than manually assembled from multiple systems.

And they want vehicle-health signals to automatically create a work order rather than requiring a human to notice the alert, log into a different system, and re-enter the information manually.

That closed-loop model is where integrated maintenance programs begin to create outsized value: safer vehicles on the road, faster shop response, and tighter control over the full cost of ownership.

The 13% who prioritized predictive alerts for vehicles that need service before they break down are expressing the logical next step. Once data flows and workflows are automated, the system should be smart enough to anticipate failures.

This is precisely the trajectory that AI-powered fleet management platforms are on. The models improve as more data flows through them, which means the fleets that invest in integration now are building the data foundation that will power increasingly accurate predictive capabilities over time.

When asked which outcome would have the greatest impact on profitability in the next 12 to 24 months, more than half of respondents (53%) pointed to lowering total maintenance and repair costs per vehicle. Gaining full visibility into per-vehicle cost of ownership came in second at 20%, followed by reducing unplanned downtime through predictive maintenance at 13%.

Figure 11 shows the priority order of business outcomes respondents care about most.

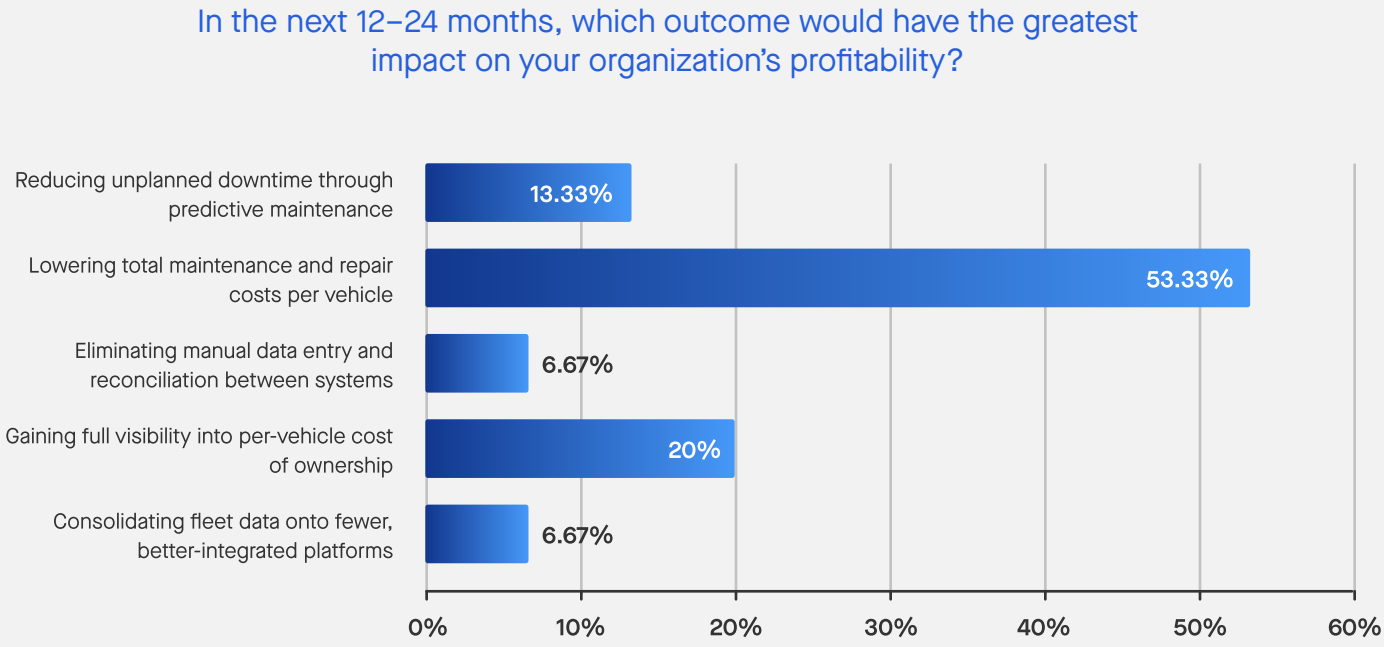

Figure 11: Lowering maintenance cost per vehicle was the most important profitability lever in the survey.

One of the most effective ways to scale an organization efficiently is to reduce costs. And the mechanisms to achieve that cost reduction, including per-vehicle visibility, faster and more consistent maintenance decisions, and the elimination of manual data entry, are all integration-dependent capabilities.

The thread running through every finding in this survey is the relationship between data visibility and cost control. Leaders who can see their per-vehicle costs in real time can make better repair-versus-replace decisions. Organizations whose systems automatically flag vehicles or assets trending toward failure can spend less on emergency repairs and unplanned downtime. Operators whose fuel data syncs to vehicle-level cost tracking can identify anomalies before they become budget problems.

The Motive platform is built around the principle of connecting every mile to a dollar. The broader strategic advantage is that this same model connects operational reality to business performance, helping organizations understand not just what's happening in the field, but also what it's costing them and what action to take next.

The Motive platform tracks every mile driven, every fault code thrown, and every hard braking event. *Motive AI Dashcams* add a critical safety component in their ability to detect high-risk driving behaviors in real time by virtue of the fact they can run more than 30 AI models simultaneously. They also turn in-cab video into actionable coaching insights and exonerating footage that reduces fraudulent claims.

That same visibility extends to spend and upkeep. Motive Card tracks every fuel transaction, while Motive Maintenance tracks work orders, maintenance costs, service intervals, inspections, and inventory movement. By bringing fuel and maintenance costs together in one

operating-cost view, Motive helps fleets see the total cost of ownership (TCO) of each vehicle or asset.

Motive AI Automations help turn operational signals into action: a fault code, an upcoming scheduled service, or an inspection defect can be converted into a work order. AI-powered invoice scanning extends that connected workflow to vendor spend by helping capture maintenance costs from vendor invoices and record them in the relevant maintenance and vehicle-cost records.

This connected record links each vehicle or asset to its inspections, fault codes, work orders, repair activity, and associated spend, giving operations, maintenance, and finance teams a shared view of what needs attention, what work is underway, and what it costs.

With AI embedded directly into these workflows, Motive can translate complex fault codes into plain-language explanations, flag critical issues, support recommended service actions, and help prioritize issues based on severity and operational context.

The ROI of this connected data is concrete and measurable. When Motive's telematics detect an emerging engine fault, and that signal is brought directly into a work order, the fleet can avoid the cascade of costs that come with an unplanned breakdown. When inspection defects move more quickly between drivers and maintenance teams, resolution time compresses. When fuel and maintenance cost data flow into vehicle-level cost records with less manual entry, fleet managers can spot anomalies in real time rather than at month-end reconciliation.

Operators who connect these data streams gain tighter control over per-vehicle total cost of ownership, fewer surprise repair invoices, and better utilization rates because vehicles spend less time out of service. The fleet that waits another year to integrate doesn't just lose a year of efficiency gains. It loses a year of data that would have made its AI tools smarter, its maintenance predictions more accurate, and its cost benchmarks more reliable.

What Comes Next

Organizations that operate vehicles across a variety of industries are facing a critical inflection point: the gap between knowing what needs to change and actually changing it.

The challenges addressed in this survey won't be solved with more point solutions. They require a unified platform that turns real-time operational inputs into automated workflows and faster decision-making. That's the real promise of physical AI: helping organizations prevent disruption, act earlier, and run with more control at scale.

Motive's integrated approach represents exactly this kind of connected model. It delivers an AI-powered system helping organizations track and manage maintenance activities, directly integrated into the Motive platform. By unifying asset health with shop workflows and spending, organizations gain a unified, real-time view of their entire maintenance operations. That means a fault code detected on the road becomes a prioritized work order in the shop, a driver's inspection defect never falls through the cracks, and every repair dollar rolls up into a precise total cost of ownership (TCO) view.

With this unified ecosystem, organizations can stop chasing breakdowns and start managing assets proactively—eliminating data silos, slashing unexpected downtime, and controlling costs at scale. They build the data infrastructure that makes every subsequent decision smarter, faster, and more automated.

The organizations that act now to connect safety, telematics, fuel, and maintenance data inside a unified operating platform will be better positioned to reduce volatility, improve uptime, and make every operational decision with more context and consistency. They are building the data foundation that will power increasingly sophisticated predictive maintenance, automated scheduling, and cost optimization as the AI models and automation embedded across the platform continue to advance. In a market defined by tighter margins and rising complexity, that kind of connected control is quickly becoming a force multiplier.

To learn more about how Motive can help your organization move from reactive to proactive operations, visit gomotive.com

Sources

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