

# In Airframe Maintenance, Building Real Partnerships Will Benefit Both Airlines and Suppliers

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Maintenance, repair, and overhaul (MRO) suppliers have been squeezed to unsustainably low levels of profitability. In the long run, that hurts everyone, including airlines. Part of the problem is the dominant outsourcing model of aggressive, price-focused contracts. A shift to true partnerships will lead to renewed investment and a focus on improving performance, not just cutting costs.



**T**he aviation industry has been heavily focused on cost reduction over the past seven years, with maintenance receiving much of the attention. For airframe maintenance in particular, the dominant strategy has been to outsource work to specialized third-party suppliers that have lower labor rates and overall costs. Consider that in 2008, respondents to Oliver Wyman's MRO survey reported that on average 66% of their airframe maintenance activity was performed by vendors, compared to 41% in 2004.

The outsourcing benefits realized by North American carriers have been substantial: 10–20% lower costs for domestically outsourced work and 20–40% lower costs for maintenance outsourced to lower-cost labor regions (inclusive of incremental ferrying and other costs).

Yet while extensive outsourcing has allowed third-party MRO providers to increase their capacity and revenues, their profit margin performance has not fared as well. Oliver Wyman analysis of the North American airframe maintenance market estimates that EBIT margins of North American airframe providers, between 2003 and 2007, range between -3% and 7%. Given the levels of invested capital, this range of performance is unacceptable and unsustainable. While a portion of the profit shortfall can be traced to overall market conditions, other factors have also played a role, including aggressive airline/MRO contracts and ineffective supplier relations, which have resulted in MRO providers underinvesting in activities that would improve performance.

A supplier base teetering on the verge of insolvency is not in the best interest of the industry at large; to the contrary, an unhealthy supplier base poses risks of operational interruption through failure to deliver, or worse, quality or safety issues stemming from the need to control costs. Further cost reductions will no doubt be demanded by carriers, so both sides need a more creative and collaborative approach to cost reduction and performance improvement. A new approach that decreases costs for both parties while improving

financial performance will require a shift in mindset from a transaction and event focus to total lifecycle cost.

### **How We Got Here**

Legacy airlines traditionally conducted their own airframe maintenance at large-scale maintenance bases built at hub locations. While these operations provided a high degree of control, they also featured high infrastructure costs and labor rates. A series of events starting in early 2001 drove fleet reductions, bankruptcies, and the need to pursue dramatic cost reductions, including a round of outsourcing to third parties. Winning this work was a mixed blessing for North American MRO providers, because while revenues surged, margins plummeted, for two reasons.

First, many airlines took a commodity view of airframe maintenance and identified it as an opportunity to quickly cut costs and free up cash. As one airline achieved a lower unit rate, others took to shopping the work to the lowest-labor-rate provider in order to remain competitive. Coinciding with the advent of lower-cost providers in Latin/Central America for narrow-body work and in Asia for wide-body work, domestic pricing came under tremendous pressure.

The second reason was contract structures, which tended to be relatively short-term and rarely provided for incentives related to continuous improvement. Contracts favored the use of sticks (e.g., liquidated damages) with few carrots (e.g., performance incentives). Contract structures thus created adversarial relationships between airlines and MROs.

This short-term, cost-focused structure of contracts has severe consequences for the industry's health and viability. For one thing, capital investment has been low, as investors cannot achieve reasonable returns in an environment of negative or low-single-digit margins. That's resulted in little capacity expansion and tight availability during peak periods. Short-term contracts also provide little incentive for suppliers to invest in

performance improvement, so that turn-time performance at the industry level has not improved significantly over the past eight years. The use of sophisticated production and repair management techniques, such as Lean and Six Sigma, now prevalent in other analogous industries, are scarce or crudely applied within airframe MRO providers. Moreover, few true joint airline-MRO provider performance-improvement efforts have been undertaken. Instead, providers have a “wrench-turning” mentality with little feedback to airlines on underlying work content or process management.

Aggressive sourcing tactics have likely run their course, as the MRO industry has little remaining to give. A new approach is required that emphasizes performance improvement and the total cost of maintenance, and provides benefits to both carriers and MRO providers.

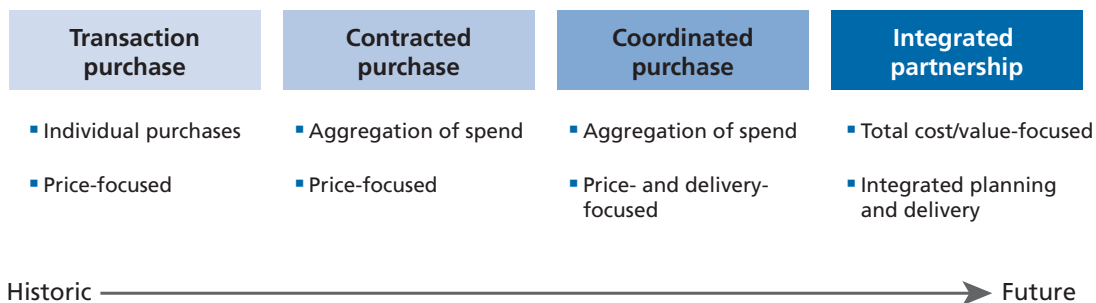
### Building a True Partnership

What we’re describing is not a supplier “relationship” of the dinner and golf-game variety, but rather a committed business partnering at all levels of management (see Exhibit 1).

True partnership, like any strong personal relationship, involves a deep level of trust and transparency. Neither party abuses that trust by using information gained through the partnership to their sole advantage. It takes discipline, commitment, and a constant focus on total life-cycle benefits to prevent short-term manipulation of the relationship. Each party must invest in the relationship in order to share in the rewards. The concept of partnership is not conducive to airlines continually bidding work, nor is it an entitlement to life-long work for MRO providers without demonstrating tangible benefits, at good value, to the purchasing party (Exhibit 2).

### Exhibit 1 Partnership philosophy

Supplier partnership progression



### Exhibit 2 Partnership model



Our experience with carriers and MRO providers suggests that a successful partnership derives from attention to four areas, which we'll explore in more detail.

**Advanced contracting.** Most contracts provide little incentive for MRO providers to collaborate with customers or invest in continuous improvement. Indeed, current practices encourage secrecy. Existing contracts are heavily unit-price-focused and rely on liquidated damages as the sole incentive for performance adherence. To progress to a partnership, where neither party is indebted and each shares risk and reward, contracts should be restructured to support the new framework.

No contract can anticipate all eventualities, of course, and ruthlessly holding the other party to the letter of the contract does not embody the spirit of a true partnership. Advanced contracting should establish rules and responsibilities and allow for the natural development of a long-term partnership intent on improving operational and financial performance. That means changing contracts in three ways. First, by providing a structure for shared incentives and value capture for both the airline and the MRO provider. Regular contract reviews and incentive splitting, with transparent margins, should occur. Second, by including metrics and a common vision of how performance can

be achieved, through a set of management tools and techniques such as Lean or Six Sigma. Third, by articulating each party's commitment to a long-term relationship, including visit volumes and investments made by both sides.

**Operational transformation.** Lean, Six Sigma, and other tools are gaining momentum in the MRO space, with 30% of respondents to Oliver Wyman's MRO survey reporting they have Lean efforts under way. Still, these improvements are immature compared to other industries (see the sidebar, "New Partnerships Ideas from the Auto Industry") and thinly deployed. What's needed is a holistic approach. Improved pre-visit coordination and implementation of fixed scheduling/demand fences will help create smooth demand and reduce lost capacity for both MRO provider and airline. Once in check, a critical-path check-progression management process will ensure that labor, materials, and supporting functions are all in synch. The workplace should be redesigned for a more efficient flow of mechanics, presenting them with the tools, materials, and information they need to perform maintenance tasks without leaving the aircraft to search for a missing piece.

To identify and remedy the root causes of waste, both parties will need to design a practical prob-

## New Partnership Ideas from the Auto Industry

The automotive supply base provides a useful lesson about the importance and potential impact of a true supplier partnership. Throughout the 1980s and '90s, U.S. auto manufacturers made aggressive moves to rationalize their supply base. They outsourced work from their internal, high-cost operations to the open market, and hungry suppliers won contracts by making huge price concessions. The next step was a series of spin-offs of the internal supply base to create new companies such as Delphi and Visteon, which could function autonomously and compete for the contracts written by the OEMs. Yet the value chain remained disconnected, resulting in operational interruptions that raised costs and lowered quality.

Toyota took a sharply different approach, adopting a partnership model with the dual goals of controlling price but also guaranteeing service. Toyota considers suppliers to be part of the "value stream" and takes a great interest in their performance and profitability. Toyota selects suppliers with strong leadership teams and effective operations, then invests by sharing knowledge, techniques, and training. They foster cooperative improvement activities and established an incentive structure where both sides profit from gains in efficiency. Toyota believes that stable operations require profitable suppliers.

lem-solving process tied into a management operating system with aligned, productive metrics. An agreed-upon standard that integrates the necessary process controls will help to reduce complexity of multiple airline oversight systems.

**Improved supplier management processes.** The airline must pay attention to the relationship, be responsive to issues that arise, and hold the MRO provider accountable. MRO providers are structurally set up to focus on the airline as their sole source of revenue, while airlines typically focus on the passenger, with maintenance being an afterthought. So airlines will have to develop and invest in supplier management capabilities to unlock the full potential of MRO partnerships. Improved training for on-site teams, clear communication and data sharing, and high-quality decision management are all ingredients of success in this area.

**Work content management.** Reducing the amount of work performed, although counterintuitive for MRO providers, is essential for driving down life-cycle costs and improving the partnership. Airlines are working on their own to aggressively pursue time extensions on MRB limits for airframes and LLP extensions on engines and components. To achieve further improvements in work content management, they'll need the providers' help. Improving data on task duration and non-routine task generation will enable improved maintenance task analysis. Working together, the airline maintenance program staff and provider management teams can analyze the effectiveness and efficiency of the inspection requirements themselves.

Our experience in this area indicates that reducing redundant maintenance, and authoring efficient work cards that reflect the correct sequencing of tasks and assignments with appropriate skill requirements, can reduce check content and duration by 10-20% or more. Beyond task analysis, though, lies a larger opportunity around packaging the maintenance tasks into visit packages. Improving data flow from MRO providers will make possible more advanced analysis that enables appropriate tuning of the maintenance program visit profiles to best reflect where the aircraft is

in its life-cycle. For example, an aircraft may be worked efficiently in a phased visit approach when it is younger, then may require a bundled "block" visit profile as it ages.

While more difficult to achieve, the ideal scheme would be to contract with an MRO provider for complete airframe engineering and maintenance program services that may include scheduling responsibilities of maintenance events. This requires a significant shift in mindset among airline executives and, if taken to the extreme, among regulators as well. The role of the airline shifts from reliability analysis to oversight of the MRO reliability program. Under this scheme, the provider is required to accept responsibility for schedule dependability and life-cycle costs. The rewards could be significant in that airline overhead associated with maintenance program analysis and job card production would be eliminated. Under this model, the MRO provider designs the maintenance program to fill capacity, streamlines shop-floor productivity through standardized job cards, and improves engineering overhead by applying the maintenance program across multiple airline customers.

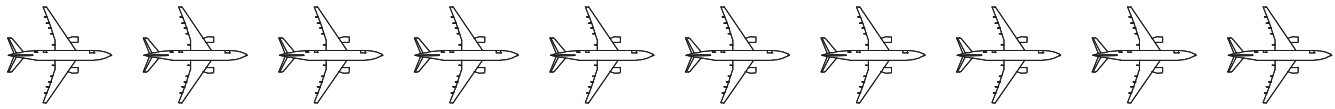
### Reaping the Rewards

There is a compelling value proposition for collaborative partnerships in the airframe MRO space. For providers, partnership offers a justification to inject much-needed investment into their operations, with the contractual promise of being able to realize reasonable returns over an appropriate period of time. For airlines, significant cycle-time improvements and cost reductions can be achieved. Exhibit 3 quantifies some of the benefits of a partnership model.

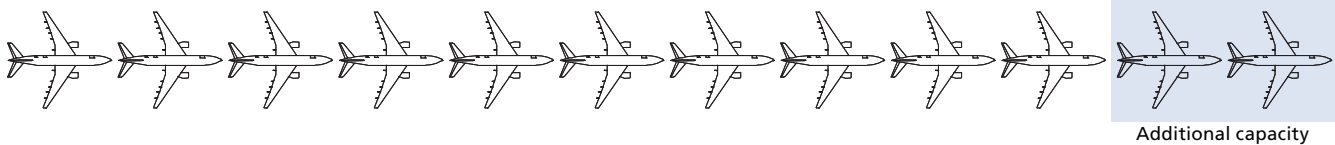
Collaborative efforts can yield significant decreases in event span times, which lead to additional maintenance visits on a line over the course of a year. The increased capacity created allows rebates to the airline on event cost while still increasing provider margins almost four times to a healthy 17%. For the airline, partnering with the supplier helps to create savings on event costs on the order of 6% (either in event costs or rebated at year end)

### Exhibit 3 Shared benefits from airlines and MROs

Before: 10 visits per line



After: 12 visits per line



MRO economics (example)	
<b>Old</b>	<b>New</b>
▪ Revenue \$1.06M per check	▪ Revenue \$1.0M per check
▪ Cost \$1.0M per check	▪ Cost \$0.83M per check
▪ Margin \$0.06M	▪ Margin \$0.17M
▪ 10 visits \$0.6M	▪ 12 visits \$2.04M

Airline economics (example)	
<b>Old</b>	<b>New</b>
▪ 10 visits @ \$1.06M = \$10.6M	▪ 10 visits @ \$1.0M = \$10.0M
▪ 360 days out of service	▪ 300 days out of service
- ~\$15M in financing	- ~\$12.5M in financing
- \$100M per hull at 15% WACC	

Source: Oliver Wyman

and recurrent savings of over \$2 million annually from the elimination of finance charges on out-of-service aircraft. Further, partnering provides operational stability through improving on-time delivery of maintenance events. Partnerships on a large enough scale can also allow the airline to monetize the savings of an entire returned hull.

MRO providers may not have the resources to fully invest in their own improvements, so airlines will have to partner with them to achieve these types of savings. But the benefits in terms of reduced life-cycle costs, lower out-of-service costs (capital), and potential for year-over-year event cost reductions far outweigh the costs of supporting improvement at the supplier. And while this discussion has concentrated on North America, main-

tenance partnerships in other regions could be enacted with lesser but still substantial benefits.

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Achieving an effective supplier partnership is a challenging idea for airlines and MRO providers alike. Few companies want to disrupt their decision-making process, let alone invite outsiders to scrutinize the inner workings of their business. However, providers are in crisis and need the help of their airline customers. Healthy partnerships could prevent providers from sinking further into financial distress and enable both parties to stay competitive in this new, volatile environment. ❖



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## The Aviation, Aerospace & Defense Practice

Oliver Wyman has deep, international experience in all segments of aviation, including airports, airlines, service providers, MROs, OEMs, and investors. The Aviation, Aerospace & Defense Practice has consulted to nearly three-quarters of the Fortune 500 firms in these sectors, as well as to major airports around the world.

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