

# Matching Commercial Aviation Demand with XR

By Billy Webb, senior director of business development at Mass Virtual

According to the Transportation Security Administration, a staggering 904 million passengers were screened in 2024, marking a 5% growth from 2023 and an impressive 17% increase since 2022. Despite this rapid growth, the aviation industry is facing significant challenges, particularly in workforce shortages and rising training costs. If left unchecked, these issues could hinder industry growth and impact passenger experiences.

To remain competitive, the aviation sector must explore forward-thinking solutions, with modern technology playing a pivotal role. One of the most promising yet underutilized advancements is the integration of extended reality (XR). No longer just a futuristic concept, XR is now a practical tool that has the potential to reshape workforce training, enhance operational efficiency, and address the industry's most pressing financial and labor challenges.

## The Critical Challenges Facing Aviation

One of the most urgent challenges is the growing skills gap among maintenance technicians. The industry is losing experienced professionals to retirement and replacing them with adequately trained new technicians is proving difficult. As highly skilled workers exit the field, the industry struggles to replenish its workforce with technicians who meet modern maintenance demands.

At the same time, the cost of entering and remaining in the field is escalating. Training and certification expenses range from \$8,000 to \$80,000, creating a significant financial barrier for new technicians. Ongoing recertifications further strain both individuals and airlines, adding to the financial burden of maintaining an adequately trained workforce.

These workforce constraints are exacerbated by increasing operational demands. Airlines must maintain aging fleets for longer while simultaneously introducing more technologically advanced aircraft to meet growing passenger expectations. Addressing these workforce and training gaps is critical — XR offers a scalable, cost-effective solution.

## Modernizing Training for a High-Demand Industry

Traditional training methods rely heavily on bulky manuals, classroom instruction, and limited hands-on experience, leaving trainees underprepared for real-world maintenance scenarios. XR bridges this gap by providing an immersive, interactive learning experience.

Using high-fidelity 3D models, XR enables technicians to practice maintenance procedures, troubleshoot issues, and simulate complex repairs in a controlled virtual environment. A study by PwC on the effectiveness of VR for training found that virtual learners felt a stronger connection to the content compared to classroom learners, and 40% of the virtual learners saw improvements in their confidence compared to their classroom counterparts. Both a strong connection to the content and confidence are essential components of knowledge retention, making XR learning a far more effective approach to skill development.

Beyond effectiveness, XR training is significantly more cost-efficient. Rather than grounding aircraft for training or relocating technicians for instruction — both of which are expensive and disruptive — XR-based training can be conducted remotely, anytime, anywhere. This reduces operational downtime and optimizes training investments.

## Maximizing ROI with XR Training

As training costs continue to rise, organizations need solutions that maximize return on investment. XR not only enhances learning outcomes but also provides measurable cost savings.

With XR, technicians can repeatedly practice complex procedures in simulated environments, eliminating the need for physical aircraft and minimizing costly training disruptions. This hands-on, repeatable practice leads to better retention, stronger performance, and a more confident workforce.

## Fostering Collaboration Across the Aviation Industry

Beyond workforce development, XR creates new opportunities for collaboration. Airlines, MRO (maintenance, repair and overhaul) providers and regulatory bodies can work with technology developers to build standardized, scalable training solutions.

This collaborative approach accelerates industry-wide adoption, ensuring that XR training meets regulatory requirements while also addressing workforce shortages. By aligning industry stakeholders around XR-driven training initiatives, aviation leaders can implement a unified, high-impact strategy.

## Reinforcing Safety with Immersive Training

Safety is the foundation of aviation, and XR is redefining how airlines and MRO providers approach safety training. Through realistic, scenario-based simulations, aviation professionals can rehearse critical situations in a controlled, risk-free environment.

Technicians, pilots, and cabin crews can practice responses to system failures, emergency landings, and other high-risk scenarios. This not only improves preparedness but also raises overall industry safety standards by ensuring personnel can handle real-world emergencies with confidence.

## Flying Higher with XR

The aviation industry is at a turning point. Passenger demand continues to rise, but workforce shortages and increasing training costs pose significant challenges. Traditional training methods alone can't keep pace with the complexity of modern aviation. New approaches are needed to ensure efficiency, safety, and workforce readiness.

XR is emerging as a powerful tool to meet these demands, offering a more effective, scalable way to train aviation professionals. By adopting immersive training methods, the industry can build a workforce that is better prepared, more adaptable, and equipped to meet the demands of the future.

Investing in smarter, more immersive training will be key to ensuring a skilled workforce that can sustain the industry's growth and evolving needs. **AM**

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