Case Study

Heathrow Airport Terminal 5

LED media towers redefine safety, efficiency, and impact

A landmark LED deployment at one of the world's busiest airports delivers exceptional visual impact while setting new benchmarks for fire safety, resilience, and energy efficiency.

Heathrow Airport is one of the world's most important international transport hubs, handling more than 84 million passengers annually. Terminal 5 alone welcomes nearly 35 million passengers each year, making it one of Europe's highest-footfall terminal buildings.

Located in the main concourse of Terminal 5, seven extra-large digital media towers form one of the most visible advertising environments of any airport worldwide. The original LED displays, installed in 2015, had reached end of life and no longer met Heathrow's requirements for performance, safety, and sustainability.

To futureproof this iconic media location for the next 10 years, Heathrow undertook a major replacement programme, delivering seven new LED displays while maintaining full terminal operations throughout the project lifecycle.

The Challenge

Heathrow required a next-generation digital media solution capable of operating reliably in a demanding airport environment, while meeting stringent requirements for safety, electromagnetic compatibility (EMC), energy efficiency, and long-term serviceability.

The displays needed to deliver significantly higher resolution and brightness to perform in the naturally lit terminal, while reducing overall power consumption and operational carbon impact. Reliability was critical, with minimal tolerance for downtime in one of the world's most publicly exposed spaces.

Fire safety presented a particular challenge. Large format LED displays represent a substantial fuel load, and Heathrow required a solution that addressed this risk comprehensively, rather than relying solely on product certification.

Installation also needed to be completed without disrupting passenger flow, commercial activity, or daily airport operations.

The Solution

Heathrow appointed Digital Design Team as lead AV, IT, and systems integration consultant, working alongside a multidisciplinary design and delivery team including Mace, 3DReid, Baker Hicks, and Sharp/NEC.

The project comprises seven extra-large format LED displays, each measuring approximately 14 metres wide by 6.5 metres high, integrated into five structural towers across Terminal 5. Five displays face the landside concourse, with two facing the departure lounge, ensuring maximum visibility for both arriving and departing passengers.

Each display consists of 364 LED modules with 3.9mm pixel pitch delivering near UHD resolution at an exceptional scale. This equates to 2,548 modules installed overall with an additional 20% held in stock for long-term spares. In total, more than 50 million LED diodes are used, all produced from a single manufacturing batch to ensure long-term colour consistency and uniform performance.

A custom lightweight mounting system significantly reduced display weight compared to previous generation technology, lowering structural loads while simplifying installation and ongoing maintenance.

Energy Efficiency and Smart Operation

Despite a substantial increase in resolution, the new LED displays deliver dramatically lower energy consumption. Typical operational brightness is automatically adjusted based on ambient conditions and currently runs at approximately 18% of maximum output, reducing power usage to around 2.6kW per display. This represents a significant reduction in power consumption and will also enhance the longevity of the displays.

In addition to ambient light sensing, the system incorporates intelligent temperature-based control. Brightness is automatically reduced during periods of elevated ambient heat, lowering thermal load within the terminal and supporting the airport's wider energy management strategy.

Automated standby modes allow the displays to enter a low power state overnight, eliminating unnecessary energy consumption when passenger footfall is minimal.

System Resilience and Monitoring

The media infrastructure is designed with full redundancy throughout. Dual media players, dual video paths, and independent fibre routes provide continuous content delivery, with automatic failover in the event of any system fault.

Remote monitoring and diagnostics provide real-time insight into display performance. A dedicated monitoring platform tracks system health at module level, while integrated camera monitoring provides visual confirmation of content playback. Automated alerts trigger rapid response workflows, significantly reducing downtime and improving long-term reliability.

Fire Safety and EMC Compliance

Fire safety was addressed with an uncompromising approach. The aluminium construction of the Sharp/NEC LED technology means it is resistant to both heat and fire and is compliant with EN 13501-1 fire classification. Furthermore, each display is protected by dedicated fire detection and suppression systems, including linear heat detection, very early smoke detection, and high-pressure sprinkler coverage. These systems are fully integrated with the airport's building management and safety infrastructure and have been carefully concealed to preserve the clean architectural appearance of the displays.

In addition to their fire-safe behaviour, Sharp/NEC's LED technology emits exceptionally low electromagnetic emissions, ensuring compliance with Heathrow's strict EMC requirements. This vitally important factor could not be assumed however, and all the displays were constructed, tested and certified at full-scale in a specialist aircraft hangar prior to implementation on site.

> “This project has pushed the boundaries of what is technically possible to meet EMC standards involving intricate product design changes in production and strict installation methods to meet final on-site levels of compliance when scaled up. This would almost certainly not be possible with any other product choice in the market.”
>
> Jim Maynard,
> owner of Digital Design Team

The Result

The Heathrow T5 Media Towers have transformed one of the airport's most prominent spaces, delivering exceptional visual impact while setting new benchmarks for safety, sustainability, and operational resilience.

Reflecting on the scale and complexity of the programme, Jim Maynard explains:
"To undertake a project to replace just one of these displays would be a challenge well beyond the reach of many firms. To do seven displays is an immense undertaking, but to do this inside one of the world's busiest airports without interfering with the 'business as usual' operation of millions of passengers is an astonishing feat".

Passengers now experience brighter, sharper, and more engaging content, while advertisers benefit from one of the most visible and impactful digital media platforms in Europe. For Heathrow, the new system delivers long-term reliability, significantly reduced energy consumption, and unprecedented visibility into system performance and health.

Jim Maynard adds, *"the project demonstrates where 'total design' philosophy and clear vision over 3.5 years delivers seamless integration of the building, its systems and its software to fully meet and go beyond the Client's expectations."*

"The T5 Towers replacement project was highly complex, requiring seamless coordination across multiple internal teams and external partners. We are thrilled with the final result. The new solution has exceeded our expectations and stands as an exemplary model for how to design and deliver a project of this scale smoothly, reflecting the high standards we set for innovation and operational excellence."

Richard Freeman,
Product Owner
Heathrow

Site information

Sector
Aviation / Transportation

Customer information
Heathrow Airport
www.heathrow.com

AV consultant
Digital Design Team
www.digitaldesignteam.io

Installation date
Summer 2025

Display Equipment

- 2,548 B039i LED modules
- 10,192 B039i LED pixel cards
- 2,548 LED fibre and power interconnects
- 2,548 i-Beam brackets
- 14 SX Master 4K controller
- 10-year service support package
- 10-year manufacturer's warranty for 24/7 use

Heathrow
Making every journey better

DIGITAL DESIGN TEAM

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