

A417 Air Balloon Missing Link Roadworks Scheme



Case Study

P&D Specialist Services Ltd, experts in designing and building CCTV systems for the highways industry, recently completed in the first phase of a major project as **Kier's A417 Air Balloon Missing Link Roadworks Scheme** in Gloucestershire.

Traditional fibre optic and power cable solutions were impractical for this site due to: Lack of roadsire power availability and geographically separated work areas constructed in phases.

P&D proposed a wire-free solution using 5G cellular connectivity and off-grid solar power. This innovative approach overcame the constraints and offered several advantages: Eliminated vulnerable cables, reducing the risk of vandalism and theft, prevented cable strikes by on-site machinery, minimised traffic management coning, required only at camera sites, accelerated installation time with no need for longitudinal cabling and enhanced safety by removing the need for IPV crash cushions for cabling crews.



Delivering a reliable wireless transmission system in a roadworks environment required addressing several factors: Harsh environmental conditions, variability in camera mounting mast rigidity, differences in elevation between camera sites and the control room antenna and physical obstacles like over-bridges and dense tree foliage.

Standard **10-metre CCTV masts** mounted on re-locatable concrete blocks were used, avoiding the need for tall cellular masts that require lengthy permissions and significant civil works.

The most significant challenge was ensuring reliable transmission without a clear line of sight at typical motorway camera heights. **P&D** used innovative equipment capable of penetrating foliage and bypassing obstacles such as bridges. The system was tested under challenging conditions, including full leaf cover in high summer and occasional torrential rainfall, performing reliably with minimal downtime.

P&D successfully demonstrated that reliable, high-quality wireless video transmission is achievable despite challenging site conditions. The performance exceeded traditional video quality expectations, proving that these restrictions can be overcome.

P&D Specialist Services Ltd has proven that innovative, wire-free CCTV systems can be effectively implemented in complex roadworks environments, ensuring safety and operational efficiency.



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Key Facts:

- **Wire-free** – 5G and solar eliminated the need for traditional fibre & power cabling.
- **Complex environment** – foliage, bridges & elevation changes required innovative transmission equipment.
- **Reduced site risk** – no cabling meant fewer strikes, less TM & no IPV crash cushions.
- **Phased delivery** – solution designed around geographically separated, staged work areas.



A417 Air Balloon

Kier's missing link scheme.



Off-Grid Solar

No roadside power required.



5G Wireless

Reliable transmission without line of sight.



Faster Installations

No cabling across site.



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