



# TOTAL INTEGRATED SOLUTIONS

Enhancing Transportation Management:  
A Case Study of a Rapidly Established  
CCTV Network for the Commonwealth  
Games in Birmingham.



## INTRODUCTION

The Commonwealth Games is a prestigious multi-sport event held every four years, bringing athletes from various countries together. Birmingham, England, was chosen to host the 2022 Games after Durban, South Africa, withdrew. The West Midlands Combined Authority (WMCA) was responsible for managing transportation during the event. To enhance traffic management, a rapidly deployed CCTV network was deemed crucial. This involved strategically placed cameras capturing real-time video, ensuring smooth operations and efficient movement of athletes, officials, and spectators. WMCA needed a reliable and quickly deployed CCTV network across Birmingham for comprehensive surveillance. Total Integrated Solutions (TIS), specialising in transportation infrastructure, was contracted to provide the expertise and equipment for the network.

## AT A GLANCE

### Challenges

- Interference mitigation
- Network design and optimisation
- Time constraints

### Benefits

- Traffic management success
- Flexibility and scalability
- Cost savings and operational efficiency

## DESIGNING AND PLANNING THE RAPIDLY DEPLOYED CCTV NETWORK

For the 2022 Commonwealth Games CCTV network in Birmingham, site surveys were conducted to assess Line of Sight (LOS) from camera locations to existing "Node sites." Clear LOS is vital for optimal camera performance and reliable video transmission. Cameras were strategically placed in high-traffic areas, transportation hubs, venues, and other critical locations to ensure comprehensive surveillance coverage. Birmingham Airport, within the coverage area, required additional measures to address potential 5GHz interference from its radar system. To maintain stability and functionality, 60GHz and 80GHz frequency bands were used alongside the standard 5GHz band commonly used for Wi-Fi networks. These measures mitigated potential interference and ensured a reliable and effective CCTV network throughout the games.



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## BENEFITS OF THE RAPIDLY DEPLOYED CCTV NETWORK

The rapidly deployed CCTV network for the Commonwealth Games in Birmingham played a crucial role in traffic management and transportation infrastructure control. It ensured smooth operations, prevented gridlock, and addressed traffic-related issues promptly. The system's success had a positive impact on the city's post-Games transportation management legacy, paving the way for future development. The comprehensive surveillance coverage allowed authorities to monitor traffic patterns, identify congestion points, and make data-driven decisions for improved flow. Real-time information empowered officials to implement targeted interventions, such as adjusting signals or rerouting traffic. The CCTV system also provided valuable data for post-event analysis, enabling transportation authorities to review traffic patterns, identify areas for improvement, and make informed decisions for future projects. Its significance in traffic management and long-term planning cannot be overstated.

## THE ROLE OF CAMBIUM WIRELESS TECHNOLOGY IN THE CCTV NETWORK

Cambium wireless technology, specifically the Cambium 450b radios operating in the 5GHz band, played a crucial role in ensuring the reliability and efficiency of the CCTV network for the Commonwealth Games. These radios provided reliable wireless links between camera locations and existing node sites, with the flexibility to adjust frequencies in the presence of airport radar transmission. The combination of Cambium and Siklu technologies allowed for a scalable and flexible network design, delivering the required connectivity and performance. The Siklu backbone infrastructure provided long-range and high-capacity connectivity, while Cambium extended this connectivity to individual cameras and endpoints, ensuring a comprehensive and reliable network. Additionally, the deployment of Cambium cnWave 60GHz equipment enabled high-capacity wireless links, eliminating the need for extensive trenching and cabling, and enabling faster deployment compared to traditional wired solutions.





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## COLLABORATION BETWEEN TIS AND PURDICOM

TIS partnered with Purdicom, a top wireless networking distributor, for the Commonwealth Games CCTV network deployment in Birmingham. The collaboration covered network design, pre-configuration, installation, and commissioning.

TIS and Purdicom collaborated closely on tailoring the network design for the Commonwealth Games. They considered camera locations, coverage areas, and connectivity requirements to achieve comprehensive surveillance coverage. Optimal camera placement was determined for effective monitoring of high-traffic areas, venues, and transportation hubs.

To speed up installation, Purdicom pre-configured wireless radios in advance, saving valuable time during the deployment. This streamlined approach enabled the focus to be on physically installing cameras and wireless equipment. By reducing initial configuration time, the installation process was accelerated, ensuring the CCTV network was operational within the tight schedule before the Games.

After installing the hardware, TIS and Purdicom collaborated on network commissioning and optimisation. This phase included verifying camera functionality, ensuring connectivity, and conducting initial tests to validate network performance. Following the initial commissioning, TIS and Purdicom fine-tuned network parameters to optimise coverage and performance. This process allowed adjustments based on real-world conditions and encountered challenges during testing.



## POSITIVE LEGACY AND FUTURE EXPANSION

The successful wireless network implementation for the Commonwealth Games in Birmingham led to ongoing advancements in subsequent phases. The initial CCTV deployment enhanced security during the event and left a positive transportation management legacy. Post-Games, the network expanded with 11 route cameras and rail station coverage, improving surveillance and security. Cambium's scalable wireless connectivity facilitated this expansion without major infrastructure investments. Additionally, the wireless network replaced expensive rented fibre circuits, resulting in cost savings, and increased operational efficiency for the WMCA. The wireless solution matched wired networks' performance while offering greater flexibility for changing infrastructure needs.





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## CONCLUSION

The successful deployment of the rapidly deployed CCTV network for the Commonwealth Games in Birmingham exemplified the importance of collaboration, wireless communication solutions, and efficient network design. TIS and Purdicom's partnership, along with the utilisation of Cambium wireless technology, ensured the reliable transmission of video data and enhanced security throughout the event. The positive legacy of the network expansion and the cost savings achieved, highlighted the long-term value and flexibility of wireless networks in transportation management. The lessons learned from this case study have important implications for future infrastructure development, emphasising the effectiveness of collaboration, wireless communication solutions, and efficient network design in enhancing transportation management and public safety.

