

# Large Scale IP-CCTV Transforms Airport Operation

*Oliver Vellacott, CEO of IndigoVision, describes how IP-based CCTV was fully integrated into London Luton Airport*



*The 250 Camera IP-Video system is fully integrated into every aspect of London Luton Airport's operation*

Over a period of 3 years London Luton Airport phased in a new IP-based CCTV system that became one of the largest ever single-site IP based systems in the UK. Installed by system integrator Intruder International using IndigoVision IP-Video technology, the project demonstrates how IP-CCTV can transform the security surveillance and operational effectiveness of a complex operation such as an international airport.

## Background

At the end of 2001 Luton Airport had a large traditional analogue CCTV system consisting of 200 cameras connected via co-axial cable to two matrix in different locations in the airport. Dedicated stations with analogue monitors were needed to monitor the video. Low frame rate time-lapse recording was achieved via digital video recorders connected to the matrix. Many of the outlying areas were not covered due to the expense of expanding such a system. It soon became apparent that Luton Airport needed to expand their entire CCTV surveillance system to meet the ever increasing security threat.

## Air Traffic Control Tower

The first area that needed new cameras was the Airport Operations Centre to monitor aircraft movements on the runways, taxiways and aprons. Due to the remote location of the tower it was decided to use an IP-based solution for this application. This allowed any new system to be piggy backed onto the existing IP network rather than incur the costly installation of dedicated fibre links for analogue transmission. In mid-2002, 20 new IndigoVision IP-cameras (see sidebar) and transmitter/receiver modules were installed to provide the necessary surveillance. The digital video was transmitted over the airport's existing LAN/WAN directly from the cameras back to the terminal building. The IndigoVision transmitter/receiver modules then converted it back to analogue video and fed it into the existing system.

This initial installation provided Luton Airport with two things, a solution to the Operations Centre monitoring needs and an opportunity to trial IP-Video at first hand.

This particular installation also showed how an IP-based video system can be simply integrated into an existing CCTV system, providing a low cost expansion path without the need to replace original equipment.

PCs running IndigoVision's 'Control Center' software were then added to the network allowing the ops controllers to monitor aircraft movement video locally. Crucially these users could be located anywhere on the network, and not tied to the existing analogue monitoring stations. 'Control Center' is a professional CCTV software application that provides control, administration, recording, viewing and playback of live video and audio over IP networks.

## SIDEBAR

### What is an IP-Camera?



IP-Cameras combine a professional full-function high-quality CCTV colour camera with an IP Video Transmitter/Receiver in one unit, which can be connected directly to a standard IP Ethernet network. Significant cost savings can be achieved by employing the integrated camera units in place of traditional analogue video cameras and a separate IP transmitter/receiver unit. The cameras can also be powered locally via 'Power-over-Ethernet' adaptors further reducing installation costs.

## Expansion and Operation

In the summer of 2003 Luton Airport made the decision to IP enable the entire existing, analogue system. Following the successful trial of IndigoVision's IP-Video system, IP was chosen as the platform for the expansion. The new cameras were a mix of traditional analogue units, for both internal and outdoor applications. Each camera was connected to an IndigoVision transmitter/receiver module which converted the analogue feed to digital video which was then transmitted over the existing 1 Gbit LAN/WAN infrastructure. The transmitter/receiver modules also transmitted control data allowing remote PTZ control of the cameras.



*IndigoVision's transmitter/receiver modules transmit MPEG-4 quality digital video, audio and control data over the IP-Network.*

IndigoVision's 'Control Center' software provides users with access to the video feeds anywhere on the network. The majority of the airport operations are monitored from the Network Operations Centre. Here CCTV images from any of the 250 plus cameras can be displayed on a large plasma video wall along with other important information such as Air Traffic Control data and up to the minute weather reports.



*Luton Airport's Network Operations Centre*

All CCTV images are streamed as high definition digital video in real time at 25 frames a second across the network. Using advanced network protocols and IndigoVision's multicast capabilities it is possible to view the live video at multiple locations with no incremental impact on the network. At present over 15 separate locations use CCTV images simultaneously for a variety of purposes. These include:

- Public safety, security and anti-terrorism operations
- Air Traffic Control – monitoring runways, taxiways and aprons
- Baggage handling – to check for lost or left luggage and carousel operation
- Customs & Excise
- Cargo Sheds, airside gates and perimeter monitoring
- Retail and catering operations
- Car parks and car hire desks – viewed by both security and the hire companies themselves for staff protection and monitoring customer check-in queues



*Baggage handling is just one of the many operations monitored by the new IP-CCTV system.*

## Redundancy and Scalability

One of the many advantages of the video-over-IP solution is the ability, in the event of an emergency, to transfer all of the control and monitoring capability to any other point on the corporate network both on site and even at another of the Group's airports such as Cardiff or Belfast. The IP-networked solution offers excellent flexibility and scalability.

Until the adoption of the IP-network, to install a new remotely located CCTV camera would have involved the installation of many hundreds of metres of fibre-optic cable; now it is simply a matter of installing a new network point. As the airport expands the scalability of IndigoVision's IP-Video technology allows new cameras to be added seamlessly with minimum overhead and cost.

It is inconceivable how the type of system now installed at Luton Airport could have been cost effectively implemented without the use of IP-Video technology.

## Digital Video Recording

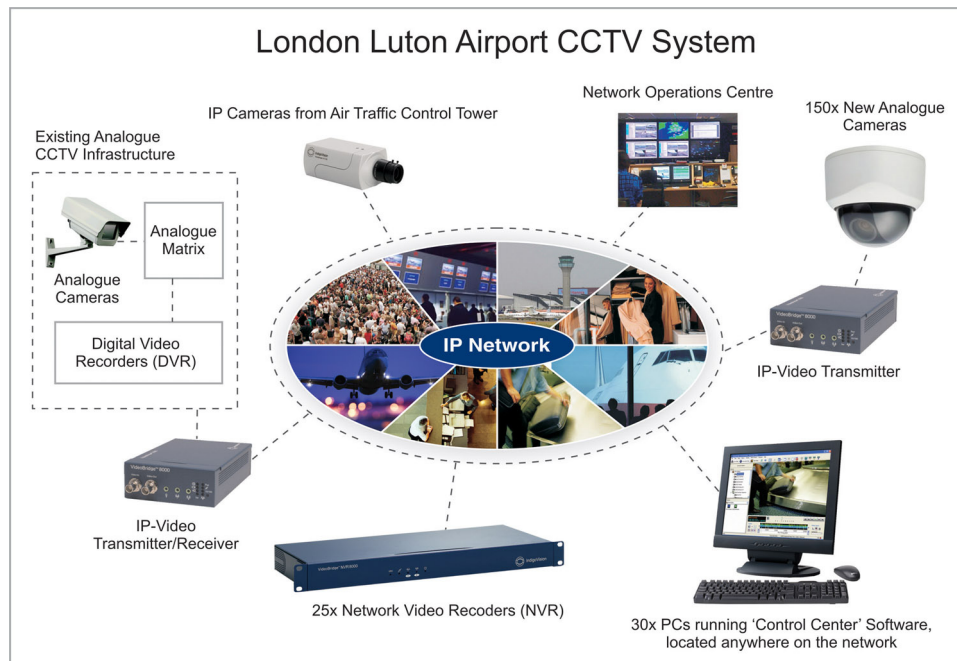
Initially all digital images from key cameras were converted back to analogue and recorded on existing digital video recorders. Following another extensive trial of IndigoVision's network video recording technology, the next phase of the project was to record all the digital video streams directly from the network in real time. 25 IndigoVision dedicated standalone Network Video Recorders (NVRs) were installed, each one mirrored to provide redundancy. This provided high quality, 25 frames a second recording and playback 24 hours a day, every day. The ability to trial system components such as NVRs, alongside the existing DVR solution, shows yet another aspect IP-Video's flexibility.



*IndigoVision's dedicated standalone Networked Video Recorders (NVRs) provide video recording at 25 fps, 24 hours per day, every day.*

Another major advantage of networked video recording is that it can be distributed around the network thereby overcoming the scalability issues associated with stand-alone traditional digital video recorders.

It is important to differentiate between DVRs and NVRs, as both are often termed 'digital'. A DVR digitally compresses analogue video feeds and stores them on a hard-drive, the term 'digital' referring to the compression and storage technology, not the transmitted video images. The DVR therefore has to be located near the analogue feeds, typically next to a matrix. In contrast an NVR stores digital images directly from the IP-network, and can be located and distributed anywhere on the network.



## Summary

The London Luton Airport project is of course a prime example of how the flexibility and scalability of IP-Video provides the only real solution for expanding large mission critical and complex operations such as airports. However, it also underlines how IP-Video isn't just for large installations but can provide simple cost effective expansion for existing systems. IP-Video allows potential end users to easily trial the system at first-hand without commitment to large scale change from day one. Even though IP-Video is an established technology, users will always want to convert to new technology at their own pace.

The Luton Airport project is a showcase for the many compelling benefits of IP-Video:

- Lower cost to install, maintain and to expand compared to traditional analogue systems
- Improved security – quicker to find evidence, more eyes watching from different perspectives
- Fully integrated – one system for the entire operation
- Protects existing investment – cameras, keyboards, monitors
- Phases out obsolete equipment – video matrices and DVRs
- Provide access to a wide range of users – security and operational

The Wheeler Report published in the UK in 2002 recommends that all agencies within an airport must pool their resources to provide a co-ordinated security policy. For CCTV only an IP-Video system can provide this.