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AI Video Analytics Brings Passenger Counting into Sharp Focus

By Lynn Bacigalupo, Product Manager – Video Solutions, Icomera

For years, transportation operators have used video surveillance for a narrow purpose – a watchful eye ensuring passenger safety and operational security. But the technology behind these systems has evolved far beyond simply recording footage.

AI Is Everywhere, So Why Not in Video?

Video analytics provide operators with an efficient solution for a routine yet essential task: passenger counting. With AI-powered modules and video surveillance, it's not just about viewing – it's about providing clear, measurable insights.

Using the power of artificial intelligence (AI), today's video surveillance systems are transforming into dynamic tools that can streamline services and operations. One standout advancement? AI-enhanced solutions for automatic passenger counting (APC).

Video isn't just for surveillance anymore. It's the technology foundation for a new wave of applications.

Beyond the Old Approach to APC

While effective within certain parameters, these systems have inherent drawbacks. First, they involve complex hardware installations and carry high maintenance costs. The systems are fully separate from other in-vehicle hardware systems, increasing the cost and complexity of each individual vehicle. And for all of that cost, they aren't completely accurate: most vendors evaluate their products under ideal conditions, leaving inaccurate measurements in real-world conditions.

With AI video analytics, transit operators can improve accuracy in real-world conditions while

AI-powered video analytics measure how many passengers are moving into and out of vehicles at any time, transforming the vehicle's interior cameras into smart sensors that optimise capacity and comfort on the move

reducing the cost and complexity of their onboard technology. Integrating AI algorithms into existing video surveillance cameras allows operators to count passengers while simultaneously gathering valuable operational insights.

Benefits Beyond Operators

Improved APC data doesn't just benefit the operators.

For passengers, real-time data on train occupancy can help them choose quieter or less crowded services – improving their journey experience.

One operator has already demonstrated the potential benefits of this innovation. Northern, the second-largest train operator in the United Kingdom, implemented an AI-enhanced passenger counting system on its Class 769 fleet. The results? **An impressive 98.3% accuracy rate**.

AI video analytics marry efficiency with versatility. Instead of depending on multiple systems for surveillance and passenger counting, public transport operators can achieve the same results with a single, integrated video network. The insights derived from video analytics also help operators to refine their service schedules and allocate resources more effectively – reducing operating costs and improving revenue efficiency.

Why It Matters

Operators are under enormous pressure to deliver more efficient, comfortable services while simultaneously reducing expenses.

By leveraging advanced technology, we can address inefficiencies in current systems, improve resource allocation, and make transportation more accessible and reliable. However, this requires thoughtful implementation and collaboration among stakeholders to ensure the data collected translates into actionable, equitable solutions.

The opportunity is clear: video offers a new format to power intelligent, scalable and sustainable public transportation solutions. By converting onboard surveillance systems into multifunctional tools, operators are securing more efficient, passenger-focused transit systems while reducing costs.

AI video analytics offer a clear path forward, representing not only an opportunity to enhance operations but also to align with broader goals for sustainability and passenger experience.

The next step is a more intelligent approach to public transportation: AI-driven data collection.

If you'd like to discuss how video is making automatic passenger counting more accurate and affordable for transportation operators, reach out and let's discuss further: **sales@icomera.com**.

Ingenious Technology, Intelligent Solutions, Inspiring Partners

Icomera has observed the growing proportion of its on-train internet connectivity being used by Internet-of-Things (IoT) applications. Leveraging Ingenious Technology to deliver a hybrid approach to connectivity – integrating LEO satellite networks with terrestrial cellular networks – we ensure the reliable and secure transmission of the data that all of these applications generate and utilise, to and from the moving vehicle, in real-time.

These real-time insights enable Intelligent Solutions, like AI-enhanced solutions for automatic passenger counting, that reach far beyond compliance reporting. For example, accurate occupancy data steers travellers to less crowded trains, informs dynamic timetabling, supports evidence-based staffing and energy-use decisions, and lets operators adapt services on the fly – cutting costs while elevating the passenger experience.

We aim to be Inspiring Partners in driving the rail industry's digital transition: collaborating with operators, manufacturers, and transport authorities to turn raw data into equitable, sustainable, passenger-centric mobility. Together, we can shape services that respond to demand in the moment, drive modal shift, and keep public transport moving smarter, safer and greener.

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For over two decades, Icomera has kept you connected on the move, delivering seamless onboard connectivity.

Our networks have the power to fully integrate tens of thousands of vehicles into the cloud, paving the way for a bold new generation of safer, more efficient and sustainable transport solutions.

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