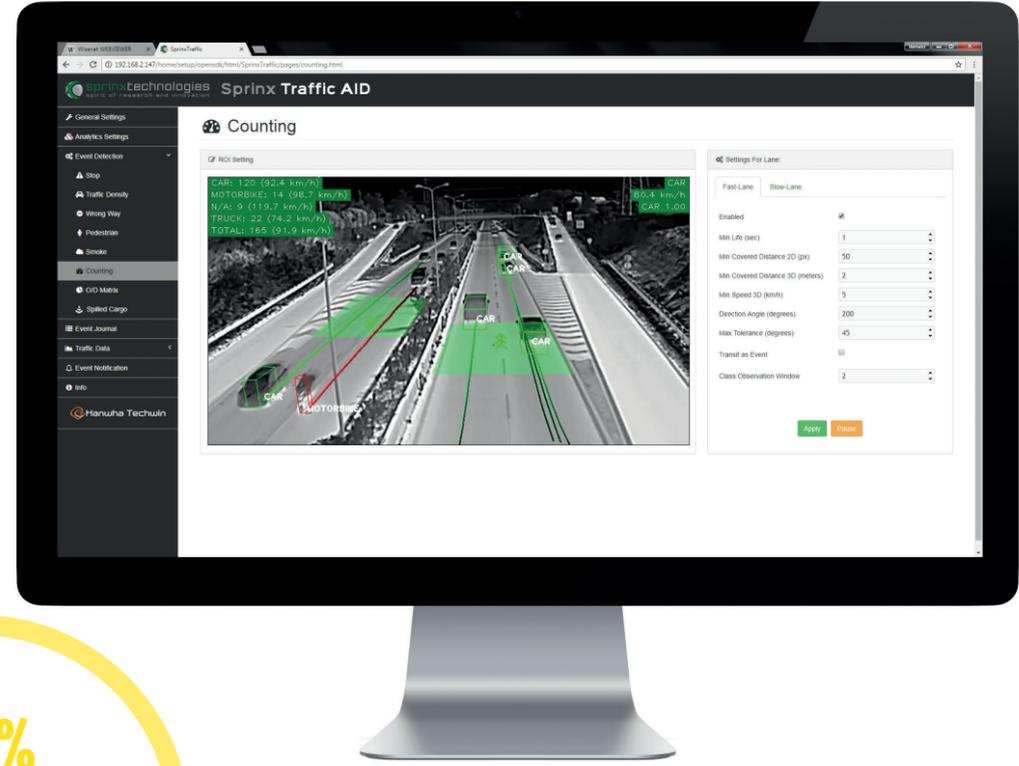


Thermal solutions



25%
The proportion of accidents involving wrong-way drivers that are fatal (compared with 1% of crashes overall)

Video analytics is an extremely useful tool for traffic managers, but it has its limits – which is where thermal cameras can step in. Together they can create the ideal solution for fully reliable detection in outdoor environments

Words | **Andrea Galbiati**, head of development, Sprinx Technologies, Italy

Video analysis is a technology that is becoming increasingly popular in traffic monitoring. Video streams can enable both the detection of several kinds of events (such as stopped vehicles, wrong-way drivers, pedestrians in restricted areas) and the collection of relevant statistics about the traffic flow (counting and classification, traffic density).
The application of this kind of technology can greatly reduce first-responder reaction times when an incident occurs, while collecting useful information that can benefit traffic engineers and planners.
The robustness of such systems is enhanced by running the detection

“ The combined use of video and thermal sensors makes it possible to achieve high performance regardless of external factors

software on board the camera, creating a distributed network of smart sensors that increases the reliability of the system while optimizing the number of servers required for analysis.
However, even if video analysis has been proved to achieve very high performance, there are still some specific issues that can arise in outdoor environments, both linked to the technology (the camera can

have difficulties adapting to reflections or abrupt light changes) and due to the environment (complete darkness, fog, snow) that can not only reduce the detection rate but also increase the number of false alarms.
A thermal solution
One recent advance in this technology is the possibility of embedding video analysis for traffic in thermal cameras. Thermal cameras are not influenced by glare from the sun or car headlights and can see clearly even in the dark or through fog.
The combined use of video and thermal sensors makes it possible to achieve high performance regardless

of many external factors, providing operators with a clear and quick overview of the traffic flow.
The multisensor approach is the preferred solution for high-end surveillance, where the combination of visible and thermal cameras can give the high safety levels required.
Real-world deployment
A successful application of this technology has been delivered by Sprinx Technologies in France, where the Traffix Aid software is used to detect pedestrians in restricted areas close to highways. In this case, the thermal cameras are used as a pure sensor, linked uniquely to the video analytics server. When the software

detects an event it sends a message, using standard communication protocol, to a central video management platform that directs a pan-tilt-zoom, high-definition video camera to focus on the area of detection, enabling the operator to quickly assess the situation.
Since the price of thermal technology is continuing to drop, more end users and systems integrators are willing to invest in it as a standalone sensor. Another system has been provided by Sprinx Technologies in Switzerland, where thermal cameras are used to monitor the traffic flow after tunnel exits. In this case the detection of congested traffic allows the operators to close the entry to a tunnel, preventing potentially dangerous situations arising due to queues forming inside.

Wrong-way driver warnings
A further application from Sprinx Technologies, being tested around Europe, is the use of thermal cameras to quickly alert road operators to the

Above: Thermal cameras can mitigate against darkness

presence of wrong-way drivers. In recent years, particularly during the night, there has been an alarming increase of the incidence of wrong-way driving along highways.
Detection is particularly important because 25% of all wrong-way crashes are fatal, compared with 1% of crashes overall. In cases of wrong-way driving, the environmental lighting can be insufficient to achieve good performance using standard video cameras. Applying thermal technology allows operators to react and reduce risk for highway users.
As shown by these examples, thermal imaging can be of great benefit to traffic managers, which explains why the technology is becoming more popular in this field. Whether used as a standalone sensor or combined with a high-definition color camera, it enables the creation of reliable systems that increase user safety and reduce the workload on traffic operators.
Furthermore, the integration of artificial intelligence and deep learning technologies in Sprinx software platforms provides an enhanced, adaptive system that increases system performance. ■