Although technological developments in incident detection make for interesting reading, Louise Smyth looks beyond the componentry and alerts to see how they are improving safety and increasing efficiency in the field.

Illustration courtesy of Tim Ellis

Although many articles within these pages explain the theory and technology behind certain systems, sometimes it helps to approach things from a different angle. For sure, technical papers have their place in disseminating knowledge and experience, but as product vendors will only too aware, potential customers are keen to discover who else is using a system – and vitally, what it’s allowing them to achieve.

This is particularly true in the field of incident detection, in which stories from end-users regularly provide the best way of showcasing the merits of the technology being deployed. As Traficon’s Eddy Vermeulen suggests, such feedback is as invaluable to vendors as it is to their potential new customers: “You need knowledge and understanding of customer requirements to create new products, it’s one of the golden rules of development!” he states. “The only place to get that is by going into the market and talking to the people who use the technology every day.”

As product manager of Traficon’s VIP-T range of video-based automatic incident detection (AID) products, Vermeulen has formed a close customer relationship with the authorities managing the Antwerp ring road – a flagship AID project for the Belgian video detection specialist. “This went live in 2004 with an order for 300 VIP-I detection boards and has expanded every year since,” Vermeulen reveals. “Today, the incident detection coverage also encompasses the Flemish part of the Brussels ring road and almost 500 modules are being used, the most recent being our VIP-T boards.”

Traficon’s technology is used around Antwerp for alerting authorities to the usual incidents that occur on busy roads – stopped vehicles, shed loads, accidents, and so on. But it’s also used for an additional purpose that provides the authorities with a rather useful ‘added-value function’ – measuring vehicle flow, speed and occupancy, in doing so allowing the Flanders Traffic Control Centre to set VMS to inform drivers of real-time traffic conditions as well as any incidents. Speed limit information on the VMS is adapted automatically based purely on data from the detection modules, aptly demonstrating just how much faith the operators have in the accuracy of the data.

UNDERGROUND MOVEMENT

Traficon’s AID bread and butter has long been in tunnel deployment and the company has recently been busy on a new project a little further afield – Australia’s newly opened CLEM7 tunnel in Brisbane, which links five existing major motorways and arterial roads on the north and south sides of the Brisbane River. Andy Ivett from the Clem Jones Tunnel feels that the Traficon technology contributes to making CLEM7 one of the safest tunnels in Australia. In all, 190 cameras were deployed together with VIP-T modules, ensuring real-time data on traffic flow as well as automatic detection of all traffic incidents. Such functionality enables Ivett’s colleagues in the operations room to see immediately any variations in normal traffic flow, therefore providing a critical window of opportunity to enact emergency operations, such as activating variable speeds and message signs to notify drivers to...
any problems and broadcasting advice on a radio rebroadcast service.

**SITUATION CRITICAL**

Another European outfit with an eye on the AID sector might be better known within these pages for its work in the ETC field, and Kapsch TrafficCom’s Rudolf Benedik, key account manager, echoes Vermueelen’s feelings on the value of communicating. “It’s a complete value chain,” he suggests. “I deal with people from the very beginning to the end of the entire solution, including everyone from legislators to operators.”

Kapsch’s IDS (Incident Detection System) is being deployed on roads, bridges and, of course, in tunnels – basically anywhere regarded as ‘critical infrastructure’. At the heart of the system is the company’s detection algorithms, whose software modules run (via Linux) on the industrial PCs that are also provided by Kapsch.

When prompted for real-world examples as to how Kapsch’s IDS is faring, Benedik takes no time at all to recall a slightly older installation that has repeatedly proved its worth with regard to one of the most dangerous events that such systems can detect – ‘ghost’ or wrong-way drivers. “In the Strenger Tunnel in the Tyrol region of Austria, we built a system some years ago. In 2007, it accurately detected a wrong-way driver, allowing ASFINAG (the Austrian road operator) to prevent an horrific accident within a very confined area. I use this example a lot as it shows that even back in 2007 our technology was sophisticated enough to accurately detect these types of events in real-time. ASFINAG has long had the system set up so that if a ghost driver is detected, the tunnel automatically and immediately closes to traffic – no mean feat in itself – which goes to show the trust that they have in the accuracy of our technology.”

This strategy has proved incredibly valuable in more recent times too, as Benedik reveals: “One ghost driver was shocking enough, but there is a modern phenomenon that’s causing an increase in these incidents. Inaccurate sat-nav systems have been ordering drivers to make an about turn inside the tunnel. Some drivers have so much faith in these systems that they ignore what their own eyes are telling them and start doing what the sat-nav has told them to do. The latest such event – which our system successfully detected and dealt with – was two months ago.”

A more recent project in which Kapsch has been involved is currently being rolled out. “We’re working with a global player in automation management in Italy, together with the University of Salerno on a project that blends incident detection with real-time traffic information,” Benedik outlines. “The layout of the system is an open stretch of road with four gantries, a small tunnel and then another gantry. On the first gantry, VMS display the license plates and speeds of drivers breaking the limit. In parallel to this, we conduct exactly the same incident detection as we would in a tunnel – stopped vehicles, shed loads, ghost drivers, etc.”

Benedik predicts the project will be of great interest to anyone interested in getting the most from incident detection systems in terms of using them as a part of a wider traffic management strategy.

**GHOSTLY APPARITION**

Another man only too familiar with the horrors of ghost drivers is Patrick Leweurs, deputy MD at Conseil Général des Côtes d’Armor – a regional entity in Brittany, France. “We had been working on this..."
problem for a long time and intuitively realized that detecting wrong-way drivers on exits was not enough, and that detection on the speedway itself and automatically warning road users were crucial to having an efficient and safe system. We decided to equip a 26km section of speedway with triple technology devices from Neavia Technologies, coupled to VMS. On October 25, 2009, we had confirmation that our instincts were right — even though the system was not rolled out on the entire stretch yet. At the merging point of two speedways, an 80-year-old lady — realizing that she was not traveling in the expected direction — took the speedway in the wrong direction instead of going ahead. She was detected several hundred of meters along. Further confirmation came just six weeks later when a driver who Leweurs can only assume missed his exit simply drove backwards — for more than a kilometer!

Jean-Hubert Wilbrod, president of Neavia, expresses no surprise at this type of driver behavior; he hears of such examples every day. "The baseline is that wrong-way drivers are either completely unconscious or extremely conscious of what they are doing wrong," he says. "And experience shows that it is better to warn the other road users — via real-time VMS, for instance — rather than the wrong-way driver." Leweurs is meanwhile counting his blessings for Neavia’s video-based solutions: "In both of the cases I mentioned, the drivers did not cause any accidents. We are now accumulating data and working on the best messages we have to deliver to road users in order to avoid accidents and maintain this record."

**BEAM OF HOPE**

Although video-based incident detection is a big trend in the ITS industry, it is not the only solution capable of achieving good results in this field, and the adoption of radar-based systems is testament of this. Often proven in equally challenging surveillance applications in the industrial and security sectors, radar is fast becoming an indispensable component of ITS. Navtech Radar is a UK organization capitalizing on this movement. Dr Stephen Clark, the company’s co-founder and director of incident detection systems, explains how the company became involved in the traffic market. "Our background is in industrial automation, but a while ago we moved into the security market with a wide-area surveillance system. This received a lot of interest from customers wanting to detect traffic flow, stopped vehicles, pedestrians, debris on the road, and so on. The first traffic project we did was a trial on the M4 motorway for the Highways Agency (HA). We subsequently worked on a number of motorways conducting trials that were a mixture of incident detection across the whole carriageway and hard shoulder monitoring for managed motorways."

At the end of 2008, the HA requested that Navtech demonstrate the abilities of its solution in a tunnel environment. A trial in Southwick Tunnel using two radars has now led the HA to order six ClearWay radar systems in each tunnel bore for the new Hindhead Tunnel on the A3 in Surrey. Clark attributes the HA’s enthusiasm for his company’s technology in part to the low false alarm rate offered by radar. "Radar is not affected by rain, fog, dust, smoke or even bright sunlight, which can be a problem for video-based detection systems at tunnel portals," he says. "Also, our radar is quite different — even from other radar systems, which tend to use side-fired radars. Ours scans up and down the surface of the road and it covers the whole road, whereas a single-point system loses any vehicle that stops after that point. We offer a longer detection range, which ultimately means that fewer sensors are needed." Clark views his system as being supplementary to video coverage however. "Most operators will still want to see an incident for themselves but using radar sensors to detect that incident means they’ll need fewer cameras."

Unsurprisingly for a company with a background in security, Navtech Radar is now picking up ITS contracts in regions such as the Middle East. "We’ve been working on a project in Kuwait for which we’ve sold a radar-based incident detection system for a security application," Clark explains. "It’s being used to detect incidents next to some oil field infrastructure. This particular part of the perimeter is a multilane highway and a single radar covers the hard shoulder, the lanes in the first carriageway, the median strip and the lanes in the second carriageway. It also provides control messages to a pan/tilt/zoom (PTZ) camera so that any incidents it detects can be viewed by operators." The project went live some months ago and Clark is proud of how well his technology is performing in some very challenging environmental conditions (the radar was rated to 70°C before being installed). "Aside from the fact it’s very hot, there’s also a lot of dust and sand," he says. "Radar works very well as a detection system in that environment, whereas other above-ground sensors would struggle."

**Navtech Radar’s ClearWay uses high-frequency radar to scan the whole road surface, both up and down stream**

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Dr Stephen Clark, co-founder and director, Navtech Radar, UK