The growing importance of in-vehicle monitoring systems

By Howard Mellet

Operators need to do make drivers better, safer assets – particularly as technology advances change the face of the industry. Ever-evolving video technology is playing a growing role in helping transporters manage and reduce risk, save lives and boost the lifespan of assets – including trucks, trailers and cargo

SOUTH Africa has one of the worst road accident records in the world. Accidents cost SA more than R 300-billion each year in collision claims and downtime. What can be done to reduce the carnage?

A reduction in collisions is only possible through a proactive programme aimed at creating solid practices geared to changing driver behaviour, reducing driver distractions on the road and offering driver coaching and training where needed.

> By placing the emphasis on accident avoidance rather than containing damage after the fact, fleet operators can significantly reduce their liability exposure and protect their drivers.

These are key messages from DriveRisk, one of the leading driver behaviour management companies in SA. It offers transport operators a range of technology options from simple, easy-to-use monitoring services to sophisticated event recorders capturing signals from accelerometers, GPS systems, engine control units, video cameras, microphones and advanced safety systems.

DriveRisk's DriveCam programme uses technology from Lytx, the US-based risk management company that designs and manufactures video-based driver safety programmes. DriveRisk is one of Lytx's leading global partners.

> In addition to its DriveCam programme, DriveRisk also markets its DriveReport, DriveAlert, SmartCam, DriveFuel and DriveTrac offerings targeting specific areas in which operator performance and safety can be monitored, refined and improved.

According to Steve Ford a director of DriveRisk, the transport of goods in southern Africa has far more to do with people – the truck drivers – than the vehicles. Speaking at the second annual Lytx DriveCam User Group conference held in Johannesburg recently, Ford highlighted the low levels of driver skills in SA which he said were evident in the shocking accident statistics.

"Sadly, professional driving is not seen as an attractive career option in SA," he said, adding that the transport industry is not attracting a high level of driver, a situation which is exacerbated by the 10% 'churn' in drivers every year.

Craig Proctor-Parker - accident investigation and reconstruction specialist

He underlined the poor lifestyles practiced by many drivers, their less-than-suitable living conditions and the high levels of debilitating health issues from which they suffer.

> "We must do everything in our power to make our drivers better and safer assets," he stressed. "This is more important than ever as the nature of business is changing to become increasingly future-orientated, driven by rapid advances in technology."

Ford placed the spotlight on the power of ever-evolving video technology to help transport operators manage and reduce risk, save lives and boost the lifespan of assets – including trucks, trailers and cargo.

Craig Proctor-Parker, an accident investigation and reconstruction specialist, echoed Ford's words during his presentation at the conference. He emphasised the importance – and practical value – of in-vehicle monitoring systems (IVMs) as tools that could improve road safety.

"It's an industry that's growing exponentially," he said, quoting analysts'

Transforming video into actionable intelligence

In his presentation to delegates to the second annual Lytx DriveCam User Group conference, US-based Rael Morris, vice president of Growth Markets at Lytx, highlighted the huge numbers of vehicle accidents and fatalities involving commercial vehicles that occur on a global scale.

He said that 20 years ago, when the Lytx organisation was founded, road accident fatalities in the US were 60 times greater than fatalities associated with aircraft accidents. "Yet aircraft are packed with technology in the form of 'black boxes' to record and help analyse the cause of accidents. In the transport industry there was nothing.

"Since then, our vision as a company has always been to use the power of video to make the world a safer place. This is the essence of the company story over the past two decades."

The Lytx DriveCam journey, said Morris, started with the in-vehicle camera, which quickly become representative of an enabling technology. "We built a video recorder which was soon described as a 'black box'. It gave us an insight into what was 'going on' in the vehicle, particularly in the event of an incident.

"We soon realised that while understanding what happens after-the-fact is important, preventing an incident or accident in the first place is far preferable. Our challenge was to leverage the technology to prevent awful outcomes."

He said meeting this challenge relates directly to the current evolution of in-vehicle video camera technology. "The power of video is helping us understand what happens in the event of an accident and prevent a similar incident from happening again."

Morris said that preventing collisions and understanding why they occur drives a certain amount of value, but with scale even more value can be derived.

He explained that by collecting and collating the data from hundreds of thousands of IVM systems, enormous value can be generated from analysing the data and learning from the insights this data represents.

Rael Morris, VP of Growth Markets at Lytx

"For Lytx DriveCam, scale means more drivers, more clients, more sectors, more types of driving, more roads and more vehicles. Our understanding [of accidents] goes up as the analysis of the data goes up. We're not just following a hundred drivers, we're following hundreds of thousands of drivers."

Based on the information gleaned from data analysis on this scale, coaching becomes a powerful tool. "Showing drivers what they do wrong and asking them if they would do it any differently is often all that is needed to effect a change in driving behaviour. The power of seeing oneself in action is transformative."

Turning to the power of technology, Morris contrasted the 'old days' where video clips were stored on cameras and the data had to be downloaded to computers. "It was complicated and a barrier to making these tools effective.

"Today cell phones and cellular networks are ubiquitous. The ability to get the images off the camera and into the hands of drivers for coaching and other purposes is easier than ever before."

He said technology allows more video data to be collected and "pushed down the line" at higher resolution. "In getting the video of 10 000 vehicles to a place where it can be useful and valuable, cellular plays a key role. The video gets collected into a [computer system] back-end, there is a programme behind it allowing the video to be reviewed and KPIs measured. All this comes together to translate into insights and value," he stressed.

"There are so many more opportunities now to connect with the driver and to see what is unfolding on the road and what is going on in the cab. Cellular has become the enabling technology."

Technology and its ability to make information actionable has also streamlined the coaching process. "We now understand that risk is concentrated in a small segment of the population. Ten percent of drivers represent the majority of the risk. It might be hard to individually coach 500 drivers but its easier to coach the 50 drivers who have been identified as the most in need of the focus and attention of the DriveRisk programme."

Morris confirmed that Lytx is working to integrate machine vision technology into the IVM equation. "While it's 'powerful' for a risk analyst to review video footage and understand what was driving the accident or event that resulted in the video being uploaded, we can now train computers to understand and analyse situations in real time.

"Here in SA we're testing seatbelt recognition technology. If you show a computer enough clips of a driver wearing and not wearing a seat belt, the machine vision algorithm can work this out by itself.

"Similarly, passenger recognition algorithms can quickly understand when a passenger is in the cab and when no passenger is present.

"We can send the clips to the customer who can then decide whether this type of information is important or not. In this way video footage can be turned into actionable intelligence, in real time, without human intervention."

Morris concluded by saying that Lytx can make the claim that there are thousands of people on the planet today who would not be here but for the company's technology.

"They don't know it, but somewhere a driver showing the worst behaviour traits was prevented from causing a collision through coaching and being given an opportunity to change.

"It's an incredible opportunity to achieve something positive. It helps me get up in the morning."

predictions that the IVM market will be worth more than 70 billion US dollars annually by 2020 – up from around 950 million dollars in 2014.

Looking at the local IVM market, he said it is being driven by safety concerns in the commercial vehicle sector, in particular issues associated with liability in the event of accidents, hijackings, cargo theft – and the safety of drivers themselves.

Proctor-Parker said the technology underlying today's IVM systems has come a long way since the tachograph. "It's progressed to GPS and now video monitoring which has become a 'big thing' as the importance [and relevance] of visual evidence has grown."

How does a visual record benefit the transport operator in the event of an accident? According to Proctor-Parker it's a valuable complement to the process of investigation.

Conference attendees

> "The investigation is usually initiated by police at the scene and is followed by a technical appraisal including a full reconstruction which must take all aspects into consideration including vehicle speeds and driver proficiency, backed by blood test reports.

"Video footage plays a significant role in speeding up the investigation process and cause analysis," he noted. "Video evidence can identify who is at fault or help to apportion the percentage of negligence [among all parties]. Importantly, it is usually the easiest evidence to validate."

Proctor-Parker used his presentation to highlight some of the more recent, high-profile accidents – such as the 2015 Town Hill crash in Pietermaritzburg – in which IVM played significant roles in assisting investigators understand the sequence of events.

From left: DriveRisk's Gerard Kloppers – Key Client Success Manager Western Cape; Sabelo Sithebe – Director; Johann De Beer – Senior Client Success Manager

Keynote speaker Nick Malleff with DriveRisk director Steve Ford

> "As was the case in the Town Hill crash, the importance of analysing every aspect is key. Not only the speed and positioning of the crashed vehicle, but the speed and positioning of other vehicles and their relevance to the outcome."

He said video footage – even from bystanders and uninvolved vehicles – can also be used to determine a host of relevant issues, such as sighting distances, the ambient light and its relationship to visibility. If the crash occurs at night, driver visibility may be impaired by poor headlights, which can be confirmed by video evidence.

"While IVMs can help clarify so many issues relating to an accident, the actual cause of the crash might not be known – as in the Town Hill case. In these instances, vehicle loading, what gear the vehicle was in and the condition of the brakes are all important and must not be overlooked."

Proctor-Parker encouraged transport operators to understand the importance of securing an IVM system and establish standard operating procedures for collecting and storing data.

"IVM records can form important parts of criminal and civil cases, so it's vital that the video evidence is secured and validated."

He pointed to a five-vehicle accident on the N3 between Harrismith and Van Reenen in which two people were killed and seven

Proving the value of productive partnerships

The leading causes of collisions include distracted driving, traffic violations, speeding, driver fatigue and a lack of adherence to the fundamentals of safe driving. This is according to Wesley Ferreira, SHEQ (safety, health, environmental and quality) manager at Reef Tankers.

Addressing delegates at the second annual Lytx DriveCam User Group conference, he highlighted some of the challenges faced by his company in managing its fleet of vehicles in SA.

In the past, Reef Tankers experienced a number of significant safety-related incidents involving its drivers. Unfortunately, management had limited visibility of the drivers and their actions and was therefore limited in its ability to correct undesirable behaviour on the roads.

"A decision was made to take steps to actively reduce the number of collisions we were experiencing and change driver behaviour throughout the fleet," he said.

The answer was to install IVM video cameras and partner with DriveRisk and its DriveCam programme powered by the Lytx engine. By being able to identify, prioritise and help the causes of poor driving before they lead to collisions, Reef Tankers was able to record a substantial 53% reduction in collisions between 2012 and 2017 and a sizable reduction in near-collision incidents.

Reef Tankers separates 'near-collision' incidents into a number of segments including traffic violations (which showed a 33% reduction), occurrences of following too closely (67% reduction) and distracted driving (53% reduction).

Ferreira explained that DriveRisk collects data via video event recorders and 'on the road' caller reports. This data is analysed and managed to create a focused risk profile for each driver.

"Using industry-leading parameters, the data is transformed into effective corrective coaching tools and predictive analytics," he said, noting that there are three key steps that must be taken to successfully implement an IVM system.

"Once the challenge has been defined, a solid corporate leadership commitment is needed – across all levels of the organisation – to understand the strategic importance of the programme and support its long-term value benefits.

"Secondly, the objectives of the programme must be aligned and realistic targets set. All employees must be engaged in the programme and complete training must be provided along with an understanding of the reasons for, and importance of, the programme.

"Finally, a culture of driver safety must be encouraged and sustained. Performances should be reviewed and any disciplinary action aligned through revised policies and systems. A 'recognition system' should be introduced to motivate continuous improvement. If necessary, training and development methodologies must be adjusted in order to realise the stated goals."

Ferreira concluded by highlighting the spin-off benefits of changed driver behaviours. "Since 2012 we have recorded a 9% saving in fuel across the fleet, a 10% improvement in our customer satisfaction index, a 33% company growth based on volume and a 66% reduction in wasted idling time."

Summarising, he added that the DriveRisk implementation at Reef Tankers required four key elements: governance, training, coaching and a change in company culture.

A similar success story was told by Unitrans. Jacques Greeff, operational excellence executive at the transport

Wesley Ferreira, SHEQ (safety, health, environmental and quality) manager at Reef Tankers

Jacques Greeff, Operational Excellence executive at Unitrans

giant which boasts a fleet of some 3 000 vehicles across six operational business units, says, "Data is the new gold in a business environment constantly driven by decisions that impact the profitability of the bottom line. You want to make sure you make the correct decision at the right time. In a business, factual data trumps subjective opinions – any day of the week!"

Greeff echoed the sentiments of Ferreira in commending the Lytx DriveCam team at DriveRisk for their solutions. "You have been influential in our business in terms of centralising operational excellence and helping us to utilise technology to deliver value."

DriveCam technology was introduced at Unitrans in 2010 and, despite some hiccups in the early days, the solution has now become key to profitability and excellence, confirmed Greeff.

What are Unitrans' key requirements? "Asset tracking is important to us, as are critical management warnings – and we need to be SOP [standard operating procedure] driven."

He said Unitrans is focused on helping drivers understand their risk profiles so they can be better assets to the business – and to themselves. "Identifying risk profiles translates directly into improved efficiency as a business."

Greeff pinpointed the correlation of trend analyses as an important tool. "Data is collected from DriveCam, DriveAlert and DriveFuel management systems, all of which helps to refine coaching content and techniques."

He also mentioned the role – and business value – of the [computerised] Unitrans Control Tower which performs a centralised management function with the goal of supporting safe and reliable transport services for customers.

"It's managed like a centre of excellence," he explained, adding that the results include improvements in driver performances, coaching principles, process standardisation and decision-making.

"While the adoption of new technologies may happen quickly in our environment, without a 'push-through' on innovation it can fall flat."

Greeff said the 'push-through' involves continuous communication via email with staff, regular management briefings, and meetings with drivers to reinforce the value of the DriveRisk systems.

"We celebrate our victories, acknowledge improvements and reward excellence," he added.

injured. "The IVMs were improperly secured and the video footage was tampered with. As a result, it could not be validated," he said, adding that the civil and criminal outcomes of cases like this can be delayed interminably as a result.

Proctor-Parker encouraged transport operators and their risk management companies to increase the proactive – not reactive – use of IVMs by taking steps that will bring greater rewards and benefits to them in the event of an accident.

> "Across the industry, we see a need to revise the pre-crash recording parameters. They need to be set for substantially longer periods," he added, noting that the data gained could be invaluable in follow-up investigations.

In closing, he highlighted some of the challenges facing the IVM industry, mostly posed by drivers' unions that regularly raise issues related to driver privacy and possible driver victimisation. These issues gain in significance when dual-view cameras – simultaneously looking at the road and the driver – are employed.

The solution lies in communicating with drivers and advising them of the many benefits that they could enjoy as their levels of proficiency and safety on the road are raised through coaching and training based on driver behaviour monitoring via IVMs.

The power of BI analytics

One of the challenges facing transport operators, particularly those running large fleets, is processing the huge amounts of data gathered by in-vehicle monitoring systems (IVMs).

The problem, according to Clinton Savage, business development manager at InteleQt Consulting, can be overcome by using the power of business intelligence (BI) and analytics technologies.

These technologies assist transport operators to view all aspects of the driver and his functionality within the business and make a call on the risks he poses to the organisation and himself.

InteleQt Consulting, partnering with DriveRisk, currently has the ability to consolidate and 'wrap' the data collected into something that is user-friendly and available at the click of a button on any device, he said.

In his presentation to delegates to the DriveRisk conference, Savage underlined the implications and consequences of the growing numbers of IVM products on the market.

"There are various products available – currently some 35 000 DriveCam products alone are on our roads – so the data generated is huge. Together with the digitisation of our companies, data is becoming a big thing. However, we know we're not handling it well.

"Companies will need to transform significantly, as data will undoubtedly increase exponentially over the next five to 10 years. How companies manage data and turn data into insights – quickly – in order to make decisions is key."

According to Savage, his company is able to employ BI analytics to give transport operators a holistic 'risk dashboard' that shows the overall risk rating for the company, together with trending analyses highlighting performances at a particular moment in time or over a period while providing all the details to effect remediation as required.

"Our objective is to give our customers a single view of the risk analysis as it pertains to the company, its business units or divisions, and the drivers.

"To meet these goals, InteleQt makes use of all the tools available to pull data onto a single database, update it daily and deliver it to users through the DriveRisk online portal. It is fully secure with parameter changes and customisation permitted."

Savage gave delegates insights into how BI technology works to give transport operators the ability to get access to data that can be used to create customised reports.

"Today, the concept of 'reports-on-demand' is gathering momentum. Our [InteleQt's] bots represent the latest step in the move towards data-on-demand and reports-on-demand. Instead of receiving hundreds of emails each week on transport events, we provide functionality that allows users to query the information they need or require on a Whatsapp-type platform.

"The [computer] servers will actually respond to you and your questions. All the reporting that you set up and all the standards apps are accessible through the bots and on mobile phones and tablets," he said, addressing the transport operators in the audience.

Clinton Savage, business development manager at InteleQt Consulting

Savage presented a number of demonstrations highlighting the value of the data sourced and how it can be used selectively to present intelligence on the basis of a wide range of criteria.

"Information can be put into a presentation format and emailed to specific people on a schedule that you choose. While you're going through the data – perhaps while you are having a discussion with someone – it gives you the ability to click back to the data source which shows you the [initial] selection you opted for when first doing the analysis. You can then interrogate this information in many ways before returning to the presentation."

Savage added that the reports can also be saved or exported and put onto shareware or the users' computer servers. It can then be interrogated and consumed on mobile devices in a bid to expedite decision making and reduce risk going forward.

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By Jim Campbel

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