



FLIR CAMERAS SPOT TRESPASSERS ON BELGIUM'S BUSIEST RAIL CONNECTION

Rail trespassing remains a huge problem on Belgium's railway network despite various countermeasures by Belgian rail infrastructure management company Infrabel. Trespassers not only put their own lives at risk, they also cause severe delays, which cost a fortune to the Belgian tax payer. In order to prevent incidents and delays on Belgium's busiest railway trajectory, Infrabel now uses thermal imaging cameras from FLIR as one of the means to detect people walking on the tracks.

In 2018, Infrabel reported 768 railway trespasser incidents, leading to 139,650 minutes of delays, which amounts to an average of more than 6 hours per day. Trespassing incidents are undesirable everywhere on the Belgian railway network, but maybe even more so on the busiest railway line in Belgium, the Brussels North-South connection. With one in three Belgian trains passing through this railway tunnel, an incident there can put the punctuality of the entire railway network under serious pressure.

BELGIUM'S BUSIEST RAILWAY LINE

The North-South connection is a railway link of national and international importance. It runs through the center of Brussels and connects the major railway stations in the city. With 1200 trains a day, the North-South connection is the busiest railway line in Belgium. The connection has six tracks and is used for passenger trains. It is partially underground (around Brussels Central Station) and partially raised above street level.

"When an incident happens on one of these tracks and the trains come to a standstill, it affects a large part of the Belgian railway network," said Stefaan Vernieuwe, Project Manager at Infrabel's ICT Division. "That's why it was important for Infrabel to have a robust intrusion detection system in place, to be able to detect trespassers in time and prevent worse incidents from happening."

DETECTING RAIL TRESPASSERS

Since most of the North-South tunnel's technical installations dated back to 1952, the year of its inauguration, the tunnel was ready for a serious upgrade. As part of a larger masterplan Infrabel therefore decided to upgrade the tunnel with state-of-the-art technology, including electrical systems, safety systems, fire detection, ventilation and more. In answer to the continuing problem of trespassing, an advanced intrusion detection system became part of the upgrade plan.

Be it for vandalism, out of ignorance, or just with the intention of taking a shortcut, people trespass for a variety of reasons, according to Stefaan Vernieuwe. With the new intrusion system, Infrabel wanted to reduce the risk of such incidents and as a result minimize associated costs and delays.

THERMAL IMAGING RAILWAY CAMERA

Infrabel now uses 30 FLIR ITS-Series Rail thermal imaging cameras to look for intruders inside the North-South railway tunnels. The thermal cameras pick up heat signatures from people entering the tunnel and, using smart algorithms, they can see whether it's a person or something else. Upon detection, an alarm is activated and a control room operator is warned of oncoming danger.

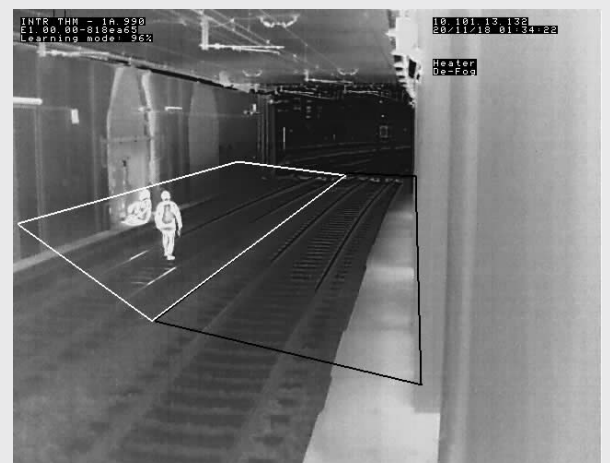
FLIR cameras ensure 24/7 detection on tracks or in tunnels and do not need any illumination to operate. The system uses advanced detection algorithms in order to accurately detect people without being triggered by unwanted objects like small animals or passing trains. Infrabel put forward a demanding requirement of 99% detection accuracy, which the FLIR cameras have been able to achieve.



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When an alarm is activated, an automatic intrusion scenario can be initiated by an Infrabel control room operator. Such a scenario includes measures like turning on the lights at the place of detection, sending a voice message to the intruder, and warning a traffic control operator at the relevant signaling center.

“Since an alarm leads to an extensive set of prevention measures and to possible traffic delays, it is important to have as few unwanted alarms as possible,” said Stefaan Vernieuwe. “We don’t want a scenario to be initiated unnecessarily. Of course, it is nearly impossible to have no false alarms at all, especially with 1200 trains per day. But at this time, we can already say that the FLIR intrusion detection system is very accurate.”

The accuracy is partly due to the system’s configurability. With the FLIR ITS-Series Rail cameras, the intelligence is built into the thermal imaging camera. According to Stefaan Vernieuwe, this makes it much easier to maintain the camera and configure it in function of its direct environment (e.g. to take into account lighting conditions).

LIVE FEEDBACK

In contrast to other technologies, there is also an invaluable visual component, said Stefaan Vernieuwe. “Thermal imaging actually shows you what is going on at the time of detection. This allows control room operators to better assess the situation in real time and decide whether a scenario needs to be activated or not. The generated thermal video can also be used for incident analysis afterwards.”

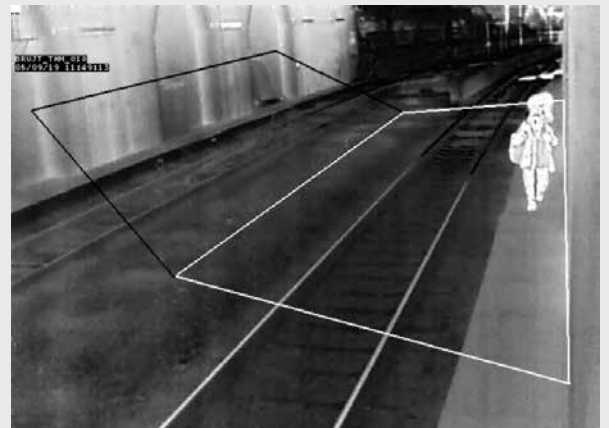
Detection alarms are presented to the control room operators through the FLIR FLUX video management system. The FLUX software collects the events, alarms and video images generated by the thermal cameras. The system is fully integrated with Infrabel’s proprietary camera system. When an alarm is coming in, this immediately activates video images of the neighboring cameras on the SCADA wall, so operators can fully assess the incident and make well-founded decisions.

Between December 2018 and September 2019, several intrusions have been detected on the North-South line. During one incident Infrabel operators decided to halt train traffic in order to prevent further harm. So, in terms of saving lives and reducing standstills, the thermal cameras have already proven their value. Projects like Infrabel’s North-South connection demonstrate that thermal imaging can play a vital role in helping public transportation systems operate safely.

In summary, FLIR ITS-Series Rail allows railway operators to detect people on tracks, prevent damage to infrastructure and enhance safety.



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For more information about thermal imaging cameras or about this application please visit: www.flir.eu/traffic/avoid-accidents-and-damage-to-infrastructure

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