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INTERNATIONAL
RAILWAY SAFETY COUNCIL

Camera surveillance on the Swedish rail network

▶ A pilot test of a new camera system

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The Swedish Transport Administration (Trafikverket)

- ▶ Is in operation from April 1st 2010.
- ▶ Replaces the Swedish Road Administration (Vägverket) and the Swedish Rail Administration (Banverket).
- ▶ Has about 6 500 full-time employees.
- ▶ Is responsible for long-term infrastructure planning for all transport modes (including air and maritime transport).
- ▶ Is the infrastructure manager for state-owned roads and railways in Sweden.

Background and aim of camera surveillance project

- ▶ Test a new camera surveillance system and evaluate the results after a six month test period.
- ▶ Prevent suicides and trespassing and thereby decrease their impact (on the traffic) on the Swedish network

Safety goal

- ▶ "Vision zero", at Trafikverket for fatal accidents (including suicides) on the rail network
- ▶ Safety goal, fatalities on the railways should be reduced by 50 % from 2010 to 2020.
- ▶ Requires a reduction of the number of railway train-person collisions

Train-person collisions on the Swedish railways

- ▶ About 100 railway fatalities every year, 75 - 80 are due to suicides.
- ▶ A lot of trespassing that disturbs the traffic (traffic stop, reduced speed)
- ▶ Countermeasures against train-person collisions normally don't affect the safety of railway passengers.

Measures to prevent train-person collisions

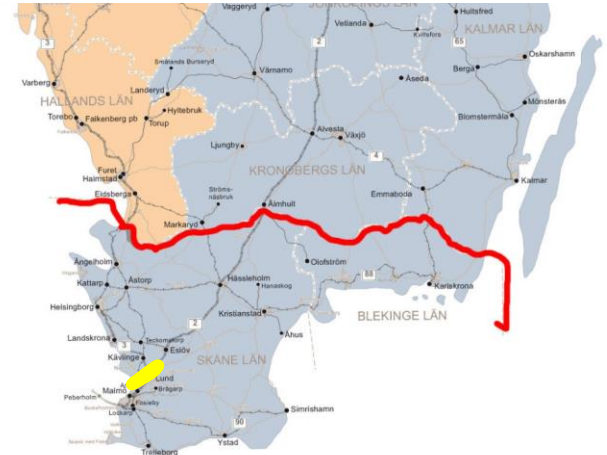
- ▶ Fencing program
- ▶ Updating CCTV-equipment
- ▶ Anti-trespass grids
- ▶ Organisational measures, societal collaboration

Collaboration with:

- Municipalities, local authorities
- Police and rescue services
- Security companies
- Railway undertakings
- Contractors
- Hospitals
- Regional and national programs for suicide prevention

Camera surveillance project

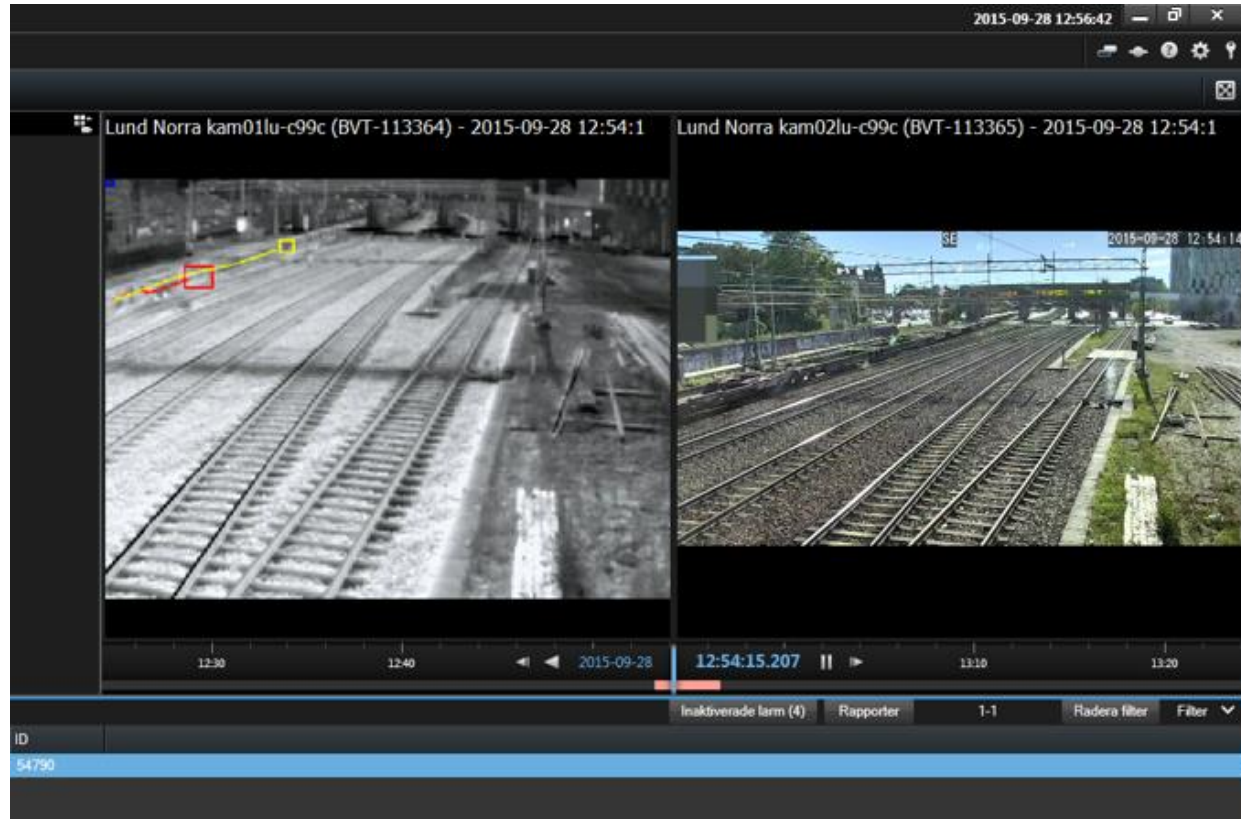
- ▶ Pilot test in the south part of Sweden within and between two bigger cities (Lund and Malmö)
- ▶ The testing area includes two of the major rail lines connecting Sweden to the European continent (ca 450 trains/day)
- ▶ 15 new cameras were installed in combination with new fences



Types of cameras

- ▶ Thermal cameras, detect human activities and video analysis starts immediately (stored in 7 days).
- ▶ The thermal cameras have a built-in redundancy, high reliability and are not dependent on local surveillance because of availability via Webb based access.
- ▶ Day/night cameras gives a clear picture within 500 metres and are activated by thermal cameras.
- ▶ For best result, a combination of both thermal cameras and day/night cameras.

Camera surveillance



Alarm management

- ▶ Thermal cameras trigger the alarms to train control centre
- ▶ Train control centre can use supplementing day/night cameras with high resolution
- ▶ Train control centre contacts the emergency call centre and stops the train traffic/reduces train speed
- ▶ Emergency call centre contact the Police, Rescue services and Ambulance/hospital
- ▶ Important to overview the whole process from triggering of the alarm until resuming the train traffic

Area of use for better safety and control of the system

- ▶ Suicide prevention
- ▶ Access protection
- ▶ Intrusion detection
- ▶ Surveillance at platforms
- ▶ Surveillance of the tracks (e.g. switches)
- ▶ Collecting data on the train traffic, passengers

Challenges

- ▶ See the differences between people, animals and train
- ▶ Weather conditions like, wind, rain, snow, fog
- ▶ Differences in heights
- ▶ The distance to the object
- ▶ Heat differences on the trains (heat from wheels)

In most of the cases, the video analysis filters for trains and other bigger objects

Results from the test period (20 weeks)

- ▶ 77 % correct alarms
- ▶ 23 % false alarms
- ▶ 1 correct alarm/4 hours
- ▶ 1 false alarm/12 hours
- ▶ Optimal for managing alarms are thermal cameras in combination with day/night cameras

Results

- ▶ Graffiti painters
- ▶ Trespassing by outsiders
- ▶ Trespassing by contractors

Easy for the train control centre to notice if the person who trespasses is leaving the track area or stays within the railway system. The information is obtained in a much faster way than if the police or others have to go to the area and inspect it visually.

Summary

Result experienced by the train control centre:

- ▶ The camera system has led to faster management of trespass occurrences and thereby less disturbance of the train traffic

The pilot test is ended and the cameras are now used on a permanent basis.

Thank you for your attention!

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