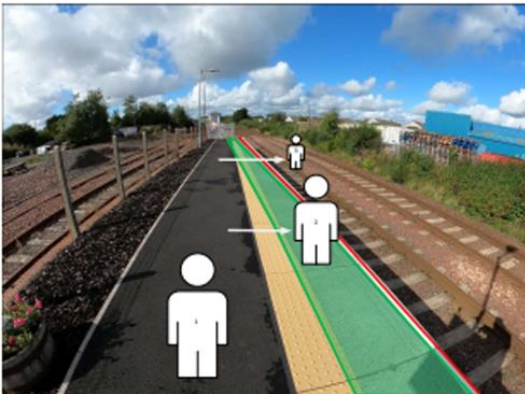# ScotRail CCTV Analytics

Principles Document

Management of analytical triggers

With over 8,000 station CCTV cameras networked into our customer service centres at Dunfermline and Paisley, the introduction of analytics will help us to respond in real time to incidents at our stations.

The types of analytics which have been introduced are:

Tripwire
Where a virtual line is drawn across an area and an alert will be triggered if this line is crossed either by a trespasser on the line or by a person sitting with their legs over the edge of the platform

Object detection
Where an object or person is identified as being in an area which has been prescribed as out of bounds by a virtual field.
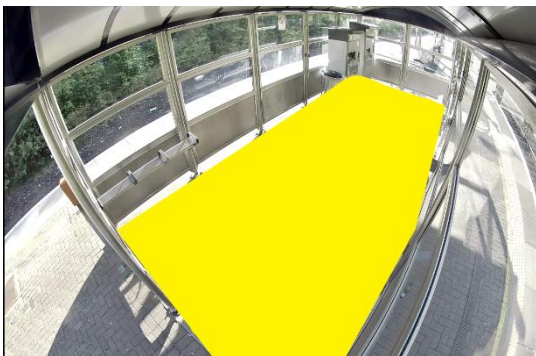
Linger

The ability to create a trigger area (area highlighted in yellow) where we can monitor out of course lingering. Groups congregating with intent to cause anti-social behaviour or potential suicides.

ScotRail
SCOTLAND'S RAILWAY

The first 60 stations chosen were identified through analysis of instances of trespass, person struck by a train and fatalities as reported in the ScotRail Control log. Various internal and external stakeholders were involved in this decision making.

Analytics are configured to generate alerts within the Customer Service Centres and trained operators will react to all alarms against an integrated flow chart (within the system) to determine next steps and actions to be taken.

Video analytics will
1. Enable alerts to be set up at key stations to allow is to respond to certain events such as linger and trespass.
2. Potentially save lives by responding quicker to instances of potential suicide and trespass on Scotland's Railway, reducing the impact on families, staff and customers affected.
3. Reduce delays and improve Public Performance Measure (PPM) by improving our incident response times to trespass and suicide
4. Enhance CCTV coverage in and around stations due to new technology within advanced IP cameras which will help to prevent any other acts of theft, vandalism etc, around the ends of platforms and tracks
5. Improve customer service by reducing disruption caused by trespass and suicide both to ScotRail operations and other operators which can often last for many hours
6. Reduce the impact of trespass and suicide events on ScotRail operations and enhance service recovery, i.e., crews and trains out of position due to incidents, additional workload in ScotRail Control and the CSCs dealing disruption and customer welfare, the impact on the engineering functions in the business.
7. Identify instances where people are lingering within stations for longer than they should. This will assist with identifying why they are still in the station and potentially addressing potential anti-social behaviours.
8. Assist with crowd management and social distancing at stations.

How analytics work in the Customer Service Centres

The analytics operating system has been configured with several business rules to generate alerts for staff to respond. These alerts will be monitored 24/7 hours, 365 days a year.

Alert categories:
- **Critical** – trespass (set to activate if someone crosses a virtual tripwire and accesses the running line or dangling legs over platform
- **Linger** – potential person on site longer than normal (set to activate if someone is in the station for a predefined period.
- **Crowding** – station crowding (set to activate if more than a predefined number of people are in the virtual box)

NOTE: Alerts can be programmed to be turned off and on as per business rules. Centre Managers will consider deactivating the linger and station crowding alerts during a disruptive incident for the affected route, special events and peak flows if we deem that

**analytics are not required during these times due to live monitoring.**

How does the operator know an alarm has been activated?

An audible alarm will **sound** on every computer to alert staff to a new trigger.
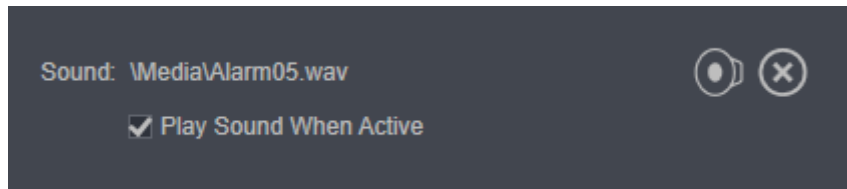
A visual alert will be displayed on the CCTV video wall in the control room. This is called the **Event Priority Window** and will be configured with 2 red bands at each side of the screen. The window will be configured to show 4 potential alarm images. The black boxes will be blank when there are no alarms active. The window will be configured to show 4 potential alarm images. The black boxes will be blank when there are no alarms active.

When the alarm is triggered the **Event Priority Window** will populate with a live image of the camera that has triggered the alert. As new alerts are received new live images will start to populate. The most recent will be displayed in the top left-hand side of the screen. As alerts are acknowledged the images will be removed from the screen. See example below.
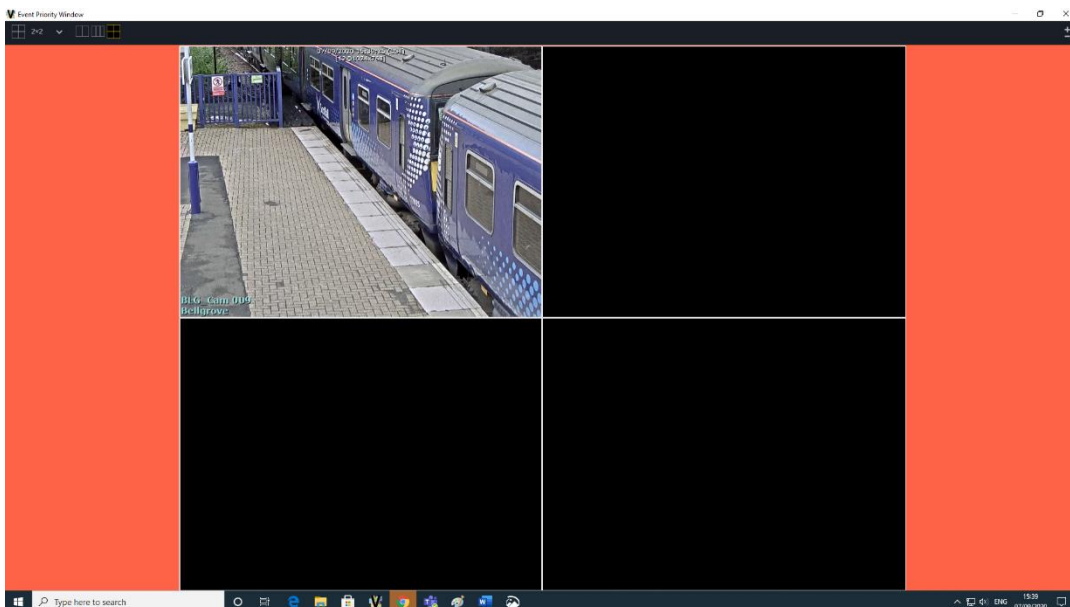
The CCTV Operators will manage alerts via an **Event Viewer Window** which will populate with new alerts.   The alerts have a different response time based on the type of alert. If multiple

alerts are received in the office the **priority will always be a critical alert** which could result in the loss of life.

The CCTV Operator will be required to complete a bespoke workflow process for each alarm as documented below.

CCTV Operator analytics action flow chart

- CCTV images are recorded onto a Networked Video Recorder (NVR), which are overwritten on a continuous loop, every 30 days.
- Once downloaded, all CCTV images must comply with the ScotRail Retention and Disposal Policy.