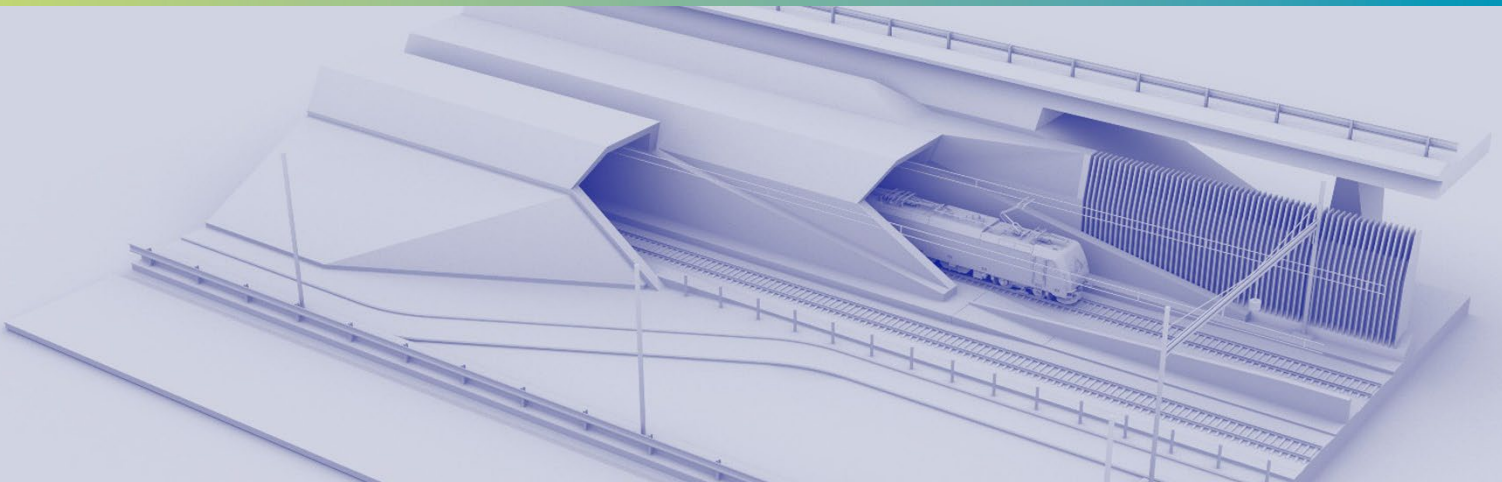


# Railways

Accur8vision is shedding a new light on the security and safety world for its ability to now track an intruder or object the entire time.



## Challenge

- How far from entrance can be tunnel guarded?
- Could Accur8vision detect human inside and outside the railway tunnel?
- Could Accur8vision guard still standing train?
- Object stopped at the crossing inside bars could be potential dangerous to fast approaching train. Could it be prevented?
- Could be workers near track protected somehow?

## Solution

- The area outside the tunnel could be covered up to 300m if necessary.
- Accur8vision safety zone can be placed outside the tunnel. Inside this zone alarm could be activated if an object of the average width and height of a human entered the zone.
- By placing a virtual security area around the parked wagons, vandalism of the wagons will be at a minimum.
- By placing accur8vision along the crossings, objects will go detected on the tracks. This will inform the train or the command centre that the track is obstructed.
- Let's say there are two tracks going alongside each other. One is operational and one is being repaired. Inside accur8vision, safety zones can be placed near the still operational track. These zones could have many different priorities. The workers could be notified that they were dangerously close to the operational track.

Railway safety and security has become a major concern across the world. From railway tunnels and crosses to keeping the actual workers safe, railways have become a major discussion in the security and safety sectors.

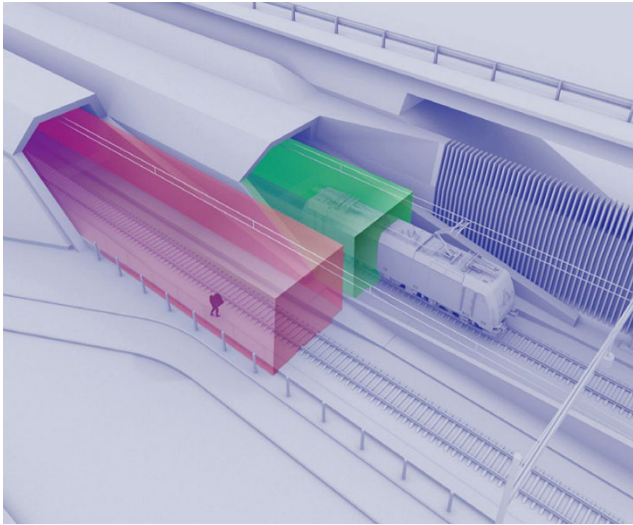
With the help of lidar technology paired with the accur8vision software, the safety and security of the railways can now be monitored. Lidars are mostly known for the autonomous industry but are becoming known in other industries like security, smart cities, robotics and much more.

Combining lidars with accur8vision allows the tracking and monitoring of objects and is a safe way to secure not only humans but companies as well.

In the case of railways, safety and security are a cause for concern. How are the tunnels protected from people, but the trains are still allowed to go through? How can graffiti artists be stopped from using the trains parked on the tracks as canvases? How can railway crossings be clear of objects like cars and people when a train is coming? How can workers be safe when working around tracks that are still in operation?

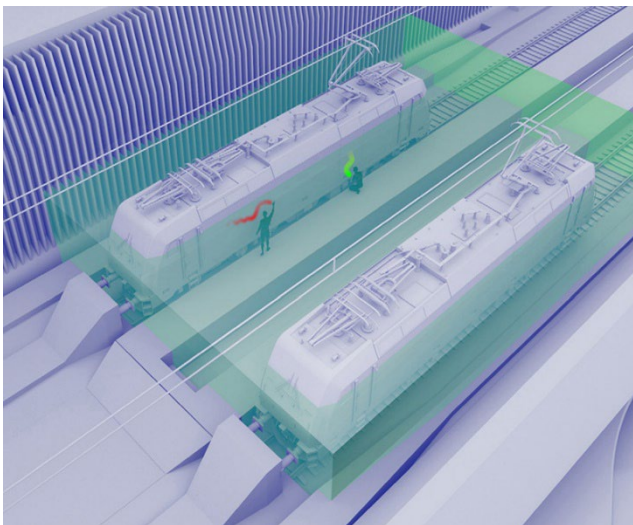
These are all questions that accur8vision can answer. Accur8vision is an answer for the future needs of the safety and security world.

# 1 | Tunnels



By placing lidar outside the tunnel, accur8vision was able to scan the entire area outside the tunnel. The area outside the tunnel could be covered up to 300m if necessary. Once the lidars were in place, an accur8vision safety zone was placed outside the tunnel. The zones can be used for different reasons and have different priorities. Inside this zone, the priorities for setting off an alarm were set to be activated if an object of the average width and height of a human entered the zone. This allowed the bigger object (ex: train) to pass through the zone without setting off an alarm.

The safety zone outside the tunnel was also set up to notify the railroad command centre of all alarms. It was also set up to alert the police of possible 'trespassing' inside the train tunnel. This was a sure way to eliminate anyone from getting hurt inside the tunnel while allowing the train to pass through. It could be regarded as a virtual fence.



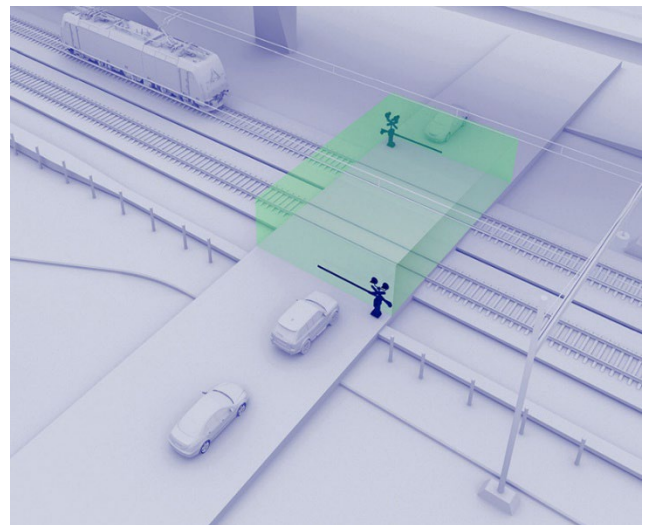
By placing a virtual security area around the parked wagons, vandalism of the wagons will be at a minimum. The lidars along

with accur8vision can be placed around the area of the parked wagons. Accur8vision can be mounted as a permanent installation or as a moveable system.

With the moveable system it will be possible to set up the system around the parked wagons in case the wagons are not parked on the same track every time. This is how the virtual security area can be set. By placing lidar with each corner of the parked wagons and setting up security zones around the parked wagons, it will make it extremely difficult to vandalize the wagons. It is also possible to set up an excluded zone for security guards to patrol without setting of the alarm.

It is not only possible to protect the wagons from graffiti but also the railway station or garage where they work on the trains. By protecting these buildings with accur8vision graffiti artists would activate and alarm. This way the guards can head to that area and catch the artists. It is also possible to set up pre-alarm zones around the security zones. When the graffiti artists step into a pre-alarm zone, a loudspeaker or alarm can be activated through I/O modules. This could in return scare the graffiti artists before they even get to the security zone which is around the wagons or building. This can be a preliminary step that could deter the artists in the first place.

# 3 | Crossings

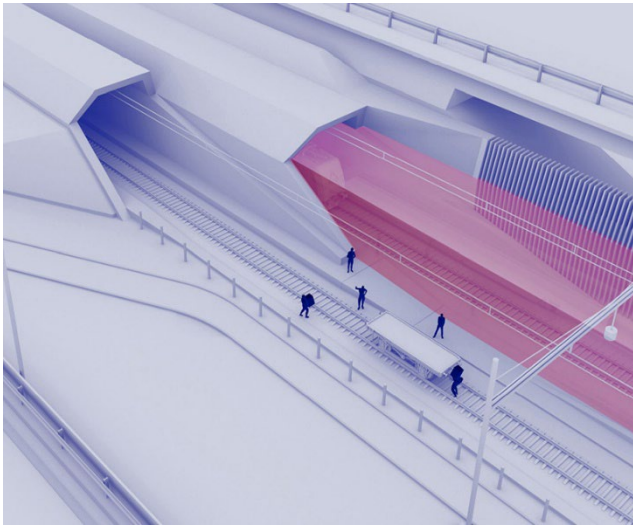


Having objects on the railroad tracks is a hazard to the train and the people or object on the track. Most railroad crossings have a bar that will come down when the train is coming. Most everyone follows these rules but if someone doesn't and crosses the tracks, what could happen? By placing accur8vision along the crossings, objects will go detected on the tracks. With the lidar's laser beams rotating 360 degrees, the object cannot be overlooked. This could secure the safety of railroad crossings everywhere.

A safety zone is placed on the railroad tracks at the crossing. When a train is at a certain checkpoint close to the crossing, the zone will be activated. This will inform the train or the command centre that the track is either clear or obstructed. Depending on the distance to the crossing, this could give the train time to try to stop if accur8vision discovers an object on the track.

would have one alarm sound. A medium sized object like a human would have another alarm sound while a bigger object like a car would have a separate alarm sound. This will also help the train conductor in knowing what is on the tracks.

## 4 | Working near Tracks



For this case study, workers were working on one side of the railroad track while the other side was still in operation. To help protect the workers, lidars were placed between the area of the track that was being worked on and the operational track. Inside accur8vision, safety zones were placed near the still operational track. These zones could have many different priorities. In this scenario the workers were to be notified that they were dangerously close to the operational track. Setting this up in the zone allowed accur8vision to alert the workers when they entered the zone. This allowed the workers to stay safe while working on the other track.

Accur8vision is not only used or needed for security purposes. It can also be used to create a safe environment for all things to do with railroad crossings, tracks and tunnels. If safety is needed for employees, conductors, people on the trains, people in general around the tracks, accur8vision can provide safety to all these categories. The use of lidar and the safety zones makes accur8vision a more than adequate means for railway safety.

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Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future. Learn more about Hexagon (Nasdaq Stockholm: HEXA B) at [hexagon.com](https://www.hexagon.com) and follow us @HexagonAB.

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