

## Ensuring tunnel safety with Situational Awareness

*Case study - Bømlafjord tunnel, Norway*

*The Norwegian Road Authority ensures emergency response teams have vital information with ClearWay's Situational Awareness. Able to see through smoke in a fire, it accurately locates people and their vehicles.*



# The Challenge

## *Safety in tunnels*

### **Bømlafjord Tunnel**

The Bømlafjord tunnel is a subsea tunnel that stretches 7,820m from the island of Føyno to the mainland at Dalshovda in Sveio and is one of Norway's longest subsea tunnels.

Incidents and fires occurring in tunnels are known to have more serious consequences than on the open road, with road networks in Norway expanding, and more tunnels opening every year, safety is paramount for the Norwegian Road Authority.

Due to the location of the Bømlafjord tunnel, it is vital any incident is detected quickly and emergency assistance can respond efficiently.

The Norwegian Road Authority was aware that traditional detection technologies, such as thermal cameras, have limited visibility in the tunnel in the event of a fire. This could mean delays to the emergency response in the absence of accurate information on the location of road users and the number of vehicles and people involved.

The Norwegian Road Authority looked for a detection system they could rely on in all situations, to enhance the safety of the tunnel. Legal requirements also meant that an automatic incident detection system was a necessity.



ClearWay can 'see through' smoke during a tunnel fire, providing emergency services with the exact location of people and vehicles throughout the event, enabling a fast and efficient response.



ClearWay is designed with full redundancy. If a radar or server fails, for whatever reason, another can immediately take its place. This ensures high performance when safety is critical.



ClearWay automatically sends an alert to the central control system in the event of a slow or stopped vehicle. This allows warning signs to be displayed to drivers, helping to reduce secondary incidents.

# The Solution

## *Situational Awareness*

### Enabling a fast response to incidents

Navtech's ClearWay solution has been installed in the Bømlafjord tunnel to increase safety, with its situational awareness technology supporting emergency teams in the event of an incident. Its unrivalled detection and low false alarm rates together with its automatic incident detection (AID) feature is also meeting and exceeding legal requirements.

ClearWay's high-frequency radar signal penetrates even the thickest smoke. Its situational awareness feature provides operators with a visual map of the tunnel and allows emergency services and highway control to understand the exact number of vehicles and pedestrians, and their location, in real-time, enabling a faster response.

At Bømlafjord, Clearway has also been configured to detect slow or stopped vehicles in the tunnel. It detects such incidents within 10 seconds and sends an alert to the central control system. This allows warning signs to be displayed to drivers, making them aware of an obstruction up ahead and helping to reduce the number of secondary incidents.

The ClearWay system at Bømlafjord is designed with full redundancy ensuring high performance when safety is critical. If a radar or server fails for whatever reason, another can immediately take its place. During commissioning we worked closely with the Norwegian Road Authority, optimising the set up using our highly configurable rules-based engine, to minimise false alarms and meet their specific needs.



"ClearWay is working well. It quickly detects incidents, when they do unfortunately happen."

"Navtech worked with us to fine tune the system. We have exceeded our target for low false alarms."

**Torstein Eide,  
Site Construction  
Manager,  
Statens vegvesen**



## About ClearWay

ClearWay is an intelligent safety solution for highways, tunnels and bridges.

It continuously monitors all highway activity with fully automated detection and tracking. It operates in all weather and light conditions, so you can rely on it in fog, rain, snow, bright sunlight and complete darkness, when it is needed most.

ClearWay provides reliable Stopped Vehicle Detection, Automatic Incident Detection, and Traffic Flow Monitoring, giving you full situational awareness. It has been proven to work in the most demanding situations and conditions across the world.

With a single sensor providing coverage of all lanes, in both directions, for up to 350m radius, it means minimal disruption and fast set-up, with fewer infrastructure requirements. While its industry-leading low false alarm rate makes it a solution operators trust in.

As a global designer and manufacturer of high-performance radar-based solutions for critical infrastructure security and Intelligent Transport System applications, we deliver solutions you can rely on.

## Benefits

- ✓ **Situational awareness**  
Pinpoints the location of vehicles and pedestrians in the event of a tunnel fire for a quick response.
- ✓ **Automatic incident detection**  
Detects and reports stopped vehicles, pedestrians, and debris in seconds.
- ✓ **Traffic flow monitoring**  
Monitors traffic flow and integrates to update overhead signs.
- ✓ **Low false alarm rate**  
Operators trust ClearWay with its industry-leading low false alarm rate.
- ✓ **Easy integration**  
Integrates seamlessly with your existing systems.
- ✓ **Performance guarantee**  
We guarantee the performance of our systems and offer comprehensive lifetime support.

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