



# Case study

## Railway train carriage CCTV

### THE CHALLENGE

CCTV cameras are mounted to the outside of train carriages to monitor passengers moving on and off the carriage at the doors. As the train carriage needs to run in both directions they are placed on both sides of the train. However, this means that half of the time, at least one camera points in the direction of the oncoming air - resulting in the airborne debris obscuring the view.

As a result, Frazer-Nash Consultancy was appointed to develop a cost effective solution which would prevent a build up of dirt, debris, water etc, collecting on the camera lens which would otherwise obscure the camera vision.

### OUR SOLUTION

Whilst it was possible for a number of electro-mechanical devices to be developed, Frazer-Nash looked into an innovative, low-cost solution which would deflect the air flow away from the camera pod. This would prevent the camera lens becoming soiled and opaque.

Using the computer simulation technique known as 'computational fluid dynamics', Frazer-Nash generated a model of the CCTV camera pod and analysed the airflow around the camera.

We then designed and developed a bespoke 'ramp' to be positioned just upstream (*and out of line-of-sight*) of the camera to deflect any airborne debris from the camera window, as shown in figure 1. This device is robust, maintenance free, tamper-proof and more reliable than using a wiper or similar solution.

The pod in which the camera sits does not need to be aerodynamically shaped at the opposite end. In fact, its domed styling helps with both the impact and bonding of debris to the back of the camera as well as improving the overall aesthetics of the pod. The sealed pod also protects the camera from the elements and the small ledge above the lens window protects the window from rain and glare from the sun.

### Client

Confidential

### Business need

Production of aerodynamic ramp to be retrofitted to CCTV camera.

### Why Frazer-Nash?

Frazer-Nash Consultancy have extensive experience in developing innovative solutions to complex engineering problems. Our bespoke technology enables us to analyse the behaviour and direction of airflow across solid objects.

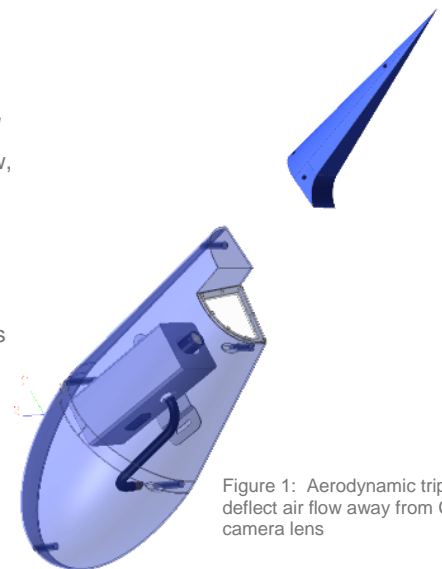


Figure 1: Aerodynamic trip ramp to deflect air flow away from CCTV camera lens

### Find out more

To find out more about our work and how we can add value to your business visit our website.