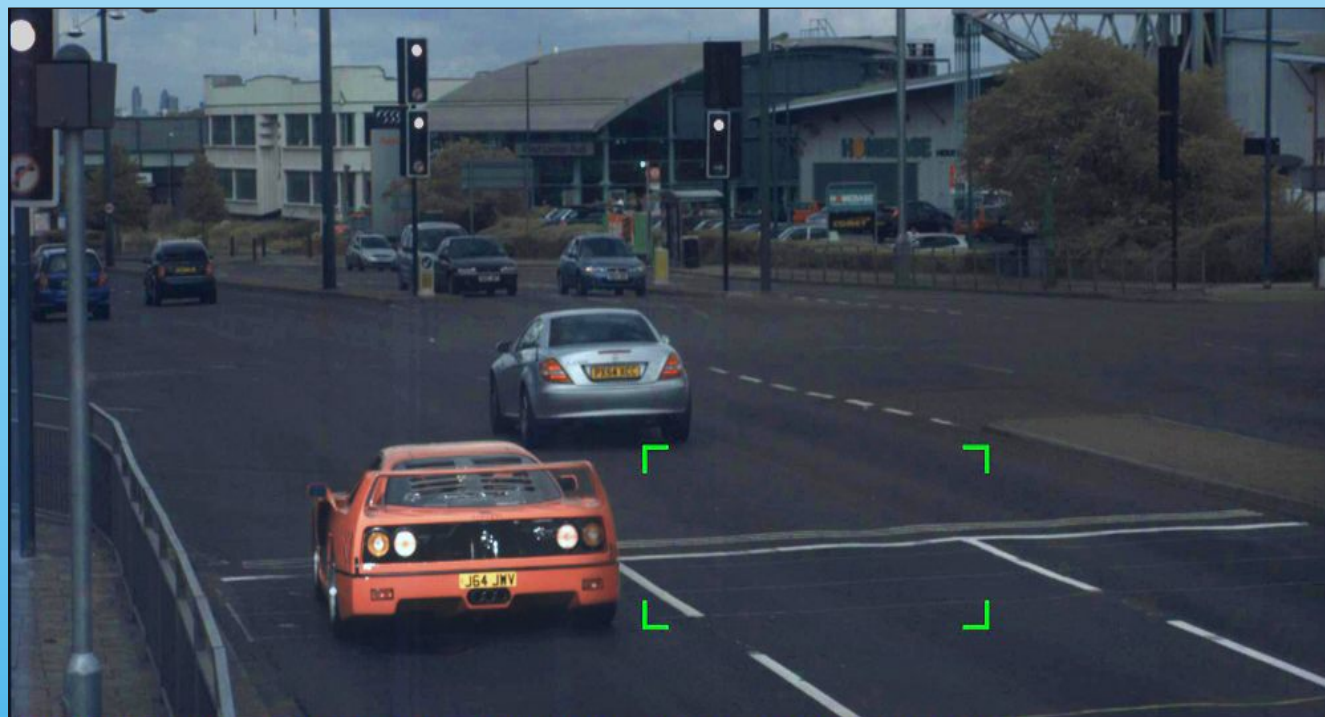


14/07/07 16:54:02 Loc GilletteCnr DCAM1024 Viol 86 (1 of 2) Frame 361  
 Red light: Speed=53mph Lane 2  
 Secondary check distance=5.9ft Time=75ms Red time=1.2s Amber time=2.9s

Red light offence: Photo 1  
 Offence committed at 53mph in lane 2. Secondary check provided.  
 Region of interest marker highlights offending vehicle



14/07/07 16:54:03 Loc GilletteCnr DCAM1024 Viol 86 (2 of 2) Frame 362  
 Red light Lane 2  
 Interval time=508ms Red time=1.8s

Red light offence: Photo 2

(Test photos for illustration purposes only)

**TRUVELO (UK) LTD**

*Forward thinking.....*

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# TRUVELO

## TRUVELO "D-CAM" Digital Speed & Red Light Camera

The Truvelo "D-Cam" is a dual capability, speed only and speed/red light camera.

It is an extremely versatile and multi-functional camera system. A "D-Cam" can be deployed at a speed only site, or at a speed & red light site. It can be moved from one type of site to another, and back again, as desired. Speed violations are recorded by means of a single front or rear photo. Red light offences are recorded using two photos. Coverage of up to 3 lanes is achieved by means of a single colour camera.

### As a speed camera

The "D-Cam" can be used for front or rear photography, and in a variety of different site layouts, as explained later. Three sub-surface sensors are used for speed measurement and simple vehicle classification. The sensors are installed just before the "Stop" line such that the 1.8m secondary check line is 750mm beyond the "Stop" line. Vehicle classification allows the camera to automatically select a lower speed threshold where required. The sensors also provide lane ID information which is displayed in the image data field.

### As a speed/red light camera

The "D-Cam" will act as speed camera during the green and amber phases, and for the red "grace period", using a single rear photo. After the red light grace period the "D-Cam" becomes a red-light camera and captures two red-light photos. The first photo records the vehicle's true speed and secondary check timing information. It also shows the front wheels 750mm beyond the "Stop" line, and within the secondary check lines. The vehicle is thus shown to have crossed the "Stop" line. A distance of 750mm is chosen so that the front wheel of a motorcycle is shown to be beyond the "Stop" line, whilst the rear wheel is still behind. The second photo will be set for 40 or 50 feet later, depending on the junction size. This distance is chosen at the outset by

Truvelo, in conjunction with the Police, and programmed into the camera. This confirms that the offence has been completed. At speeds above approximately 68 mph the camera will automatically change to a half second photo interval. This is because at high speeds there is not always enough time for the flash to recharge fully in the time needed to travel 50 feet. The D-Cam system then automatically reverts to the standard 40/50 feet interval.

### LED Traffic lights:

Please note that we have a Home Office agreed, patented solution, for monitoring red and amber times on LED traffic lights. This solution forms part of the Home Office approval.

### Secondary checks

The standard secondary check distance for a single front or rear photo is 1.8 metres. This distance is measured between the last





piezo sensor, the point at which the speed calculation is made, and the centre 1.8m line. Supplementary lines 18cm either side reflect the Home Office requirement for +/- 10%. However, we have now introduced a 5m front axle secondary check for speed/red light sites. This allows us to leave the check lines just beyond the "Stop" line, but to move the sensors further back when required, in order to avoid loops or metal-work in the road surface. The 5m front axle secondary check is also used for simple classification to select a lower speed threshold when required.

A rear axle 5m secondary check is another new Truvelo innovation devised to work with our Simultaneous Bi-Directional sites.

#### Multiple Site Layouts

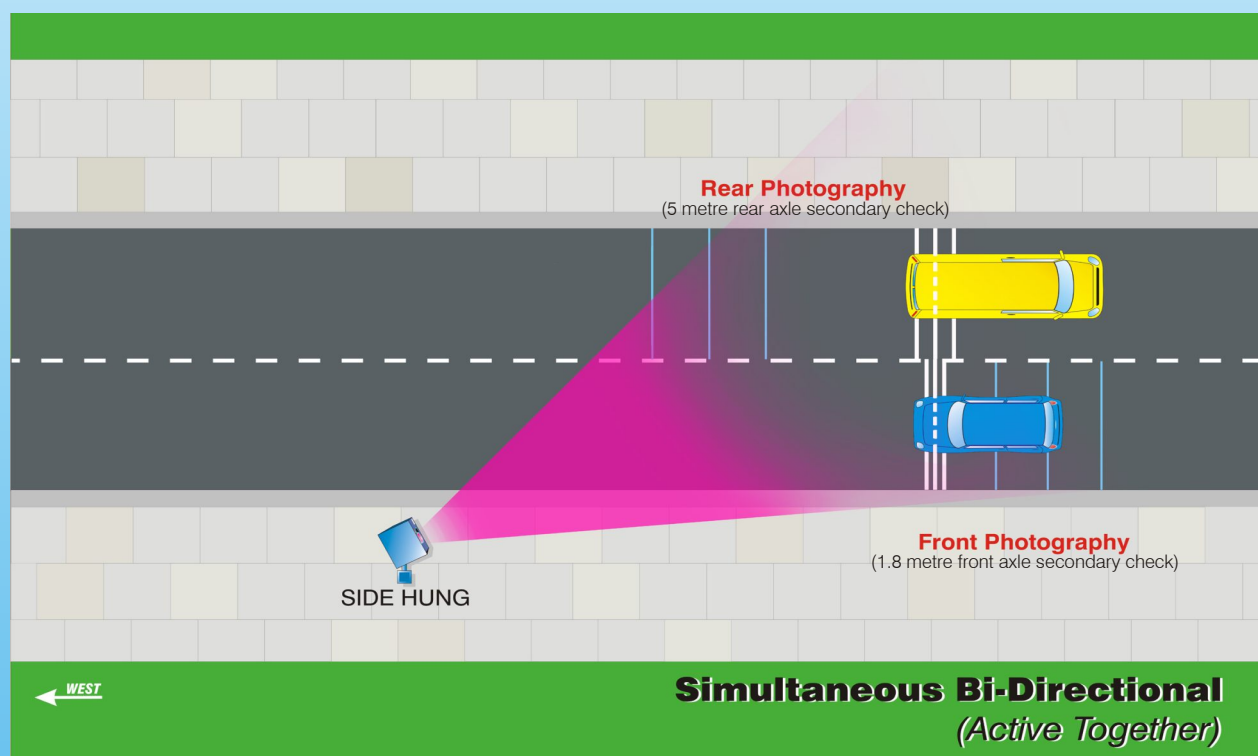
The "D-Cam" has been designed to provide even greater versatility, and to enhance Truvelo's reputation for accuracy, versatility and reliability. As well as front

#### Back Office:

Truvelo supplies a pair of servers, capable of handling in excess of 25 cameras. The TBOS (Truvelo Back Office Server) receives encrypted images, stores them, and writes them to a CD. The CD is then inserted into the TVM (Truvelo Violation Manager) where the images can be viewed. This creates the "air gap" required by the Home Office. The D-cam has been designed to be compliant with both the Startrak and Serco back-office systems.

#### Image transfer:

Images are continually transferred to the TBOS via an ADSL line or 3G connection. They must be received by the TBOS within 24 hours. This provides a constant workflow for the back-office staff. It is also possible to visit site and download the encrypted images onto a Shuttle PC, when required. This feature is of benefit should there be delays in connecting ADSL to a new site, or if the connection to the back office should go



or rear photography speed sites, various "combination sites" are possible. These include Front and/or Rear photography, Bi-Directional Front photography and Bi-Directional Front plus Rear photography. These are all achieved by rotating the camera housing and pointing the camera towards different sensor arrays. A new innovation unique to Truvelo is the Simultaneous Bi-Directional site layout. (see illustration). The "D-Cam" is able to monitor traffic in two directions at the same time (one lane each way) and take photos on demand as speed violations are created by either set of sensors. A front photo will be taken of vehicles in the lane adjacent to the camera, and a rear photo of vehicles in the opposite lane. For the rear photo the "D-Cam" provides a rear axle 5 metre secondary check. This is another Truvelo innovation that allows us place both the front licence plate and the rear licence plate at essentially the same distance from the camera, and within its field of view.

down for an unacceptable period of time. In these situations the site can still be used, or the camera could be removed to another site, assuming there are more sites than cameras. The camera technician with the Shuttle PC is unable to view the images. The Shuttle PC image transfer option is only intended for instances where the ADSL/3G connection is down or otherwise unavailable.

#### At a glance.....

- Dual speed/red-light capability
- Speed on green amber and red grace period
- LED traffic light compatible
- Front or rear photography.
- ADSL, GPRS/3G image transfer.
- Lane ID
- Multiple site layouts & combinations.
- Upgrade of existing sites
- 25 cameras per server



Date: 22/08/2011 Time: 14:12:21 Site: MK001 DCAM1053 Viol: 47 Frame: 50  
Speed: 25mph Lane: 2 Secondary check: 5.9ft Time: 155.5ms

Speed offence: Offending vehicle in lane 2. Region of interest markers highlight the offending vehicle



Date: 01/03/2012 Time: 00:13:01 Site: MK002 DCAM1053 Viol: 30 Frame: 38  
Speed: 47mph Lane: 1 Secondary check: 5.9ft Time: 84.2ms

Speed offence: "D-Cam" classifies vehicle and selects lower speed threshold

(Test photos for illustration purposes only)

For further information or a demonstration contact

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