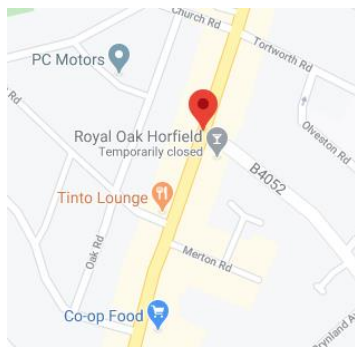


CASE STUDY

BRISTOL CITY COUNCIL

The Challenge

The Gloucester Road area in Bristol is a very busy and constrained part of the city's network. As a result, the traffic signals in the area are controlled via SCOOT to maximise their efficiency.



A few months ago, one of the SCOOT inductive loop detectors failed at the Gloucester Road and Ashley Down Road junction.

There were no viable alternatives available that could be used in place of the failed detector, and it was determined that the detector needed to be replaced.

The detector was on the outbound approach, adjacent to a side road, as shown to the right. The positioning of the detector was optimal for SCOOT operation and could not be easily repositioned, but the location meant that

re-cutting the loop detector would involve expensive traffic management, including three-way temporary traffic signals.

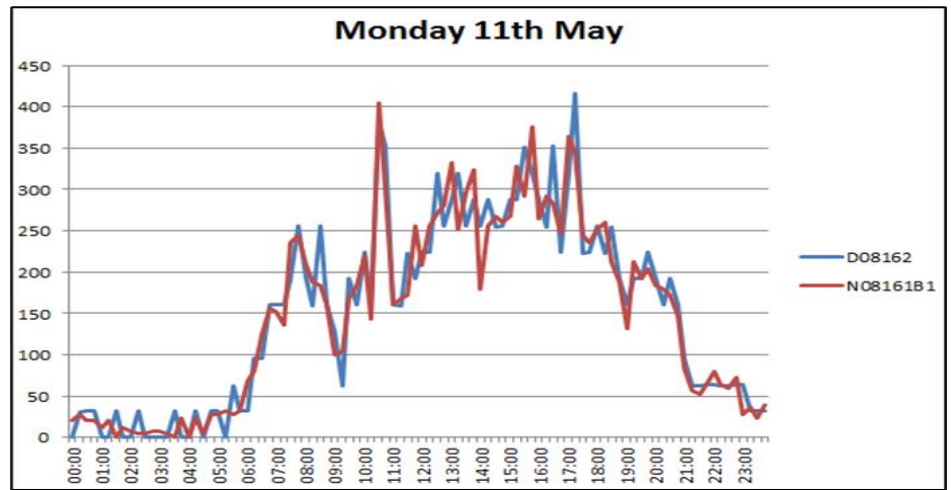
This issue made a traditional detector repair too expensive to be viable, given Bristol City Council's (BCC) budgetary constraints. BCC explored the alternative options available. It was decided to trial the [Iteris VersiCam](#) video detection system, which could be installed onto a nearby traffic signal head and powered using six (6) spare cores available within the head. The detector would then be used as a Filter detector for the outbound movement.



The detector was set up as both a SCOOT detector and count site in the UTC system. The sensor accurately detected the presence or absence of a vehicle and did this without missing smaller vehicles, motorcyclists and cyclists.

The graph to the right shows a comparison of the SCOOT detector data and the count site data generated.

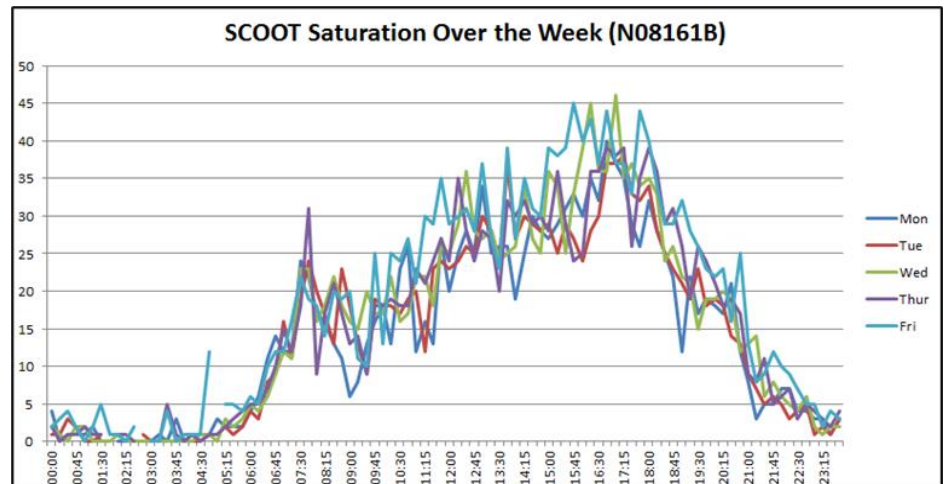
The graph shows that the SCOOT detector is providing an accurate count, as the SCOOT model is taking the 1/4 second detector presence values and converting them into LPU's. To check the performance of the above ground detector, we have graphed the count data against the LPU value, which has been converted back into vehicles / hr, by dividing the value by 17. The results demonstrate that the detection zone and therefore the input into UTC is correct as the SCOOT models' LPU conversion matches closely with the count values from the sensor.



The validation of the SCOOT link was carried out in the same way it would be for a link using an inductive loop. The parameters entered were unaffected by the detector type, with the Saturation Occupancy (STOC / SATO) value being within the expected range for a single lane junction approach.

The performance of the SCOOT link was then checked, and it was apparent from the data that the link was modelling as expected. The graph below shows the SCOOT Saturation data derived from the detector. It is consistent throughout the week, which supports that the sensor provides a consistent and reliable performance.

The data shows similar consistency / reliability at night as in the day. This is also reflected in the slightly higher saturation on the Friday evening, which accurately reflects the actual traffic conditions on Friday evenings.



A manual traffic count was also compared against the count site using the VersiCam as an unclassified count site. The totals are shown below, and graph of the manual count is shown on the right.

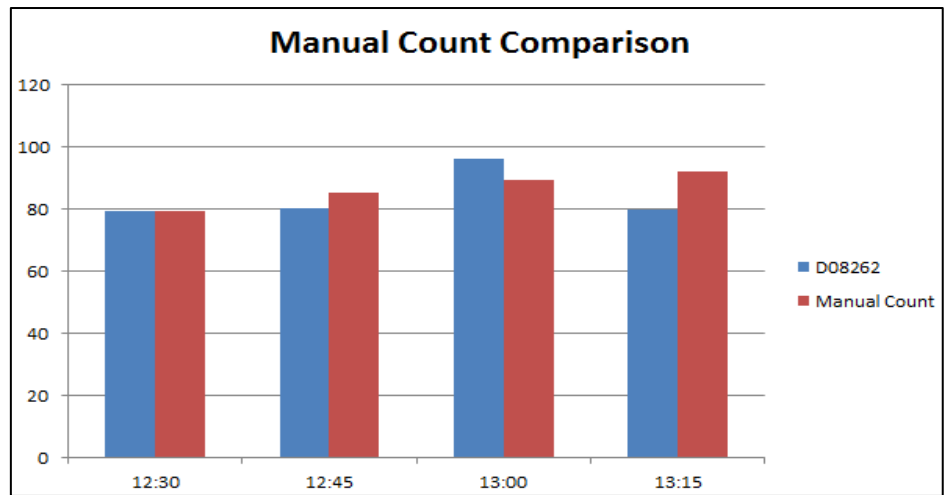
The total traffic counted during the 1-hour period

SENSOR

MANUAL

335

345



This shows that the manual counts, and the SCOOT detector's automated counts were very close. The differences can be explained as follows:

- There were a lot of vehicles that had poor lane discipline and were using lane 2, rather than lane 1. It is possible that not all of these vehicles were detected, as the sensor was for lane 1 (ahead) traffic only.
- The count site replies to UTC in blocks of 8. So a reply would only be sent back to UTC after 8 vehicles have been counted. This may explain the discrepancy between the 13:00-13:15 and 13:15-13:30 time periods.

Night and Bad Weather Performance

After five months, the team at Bristol City Council carried out a manual count in wet and twilight/dusky conditions. It was found that the VersiCam™ performance results were excellent and had not changed since its initial installation. No faults or glitches were found.

At seven months in December 2020, in dark conditions, the performance data was found to be comparable with the previous positive count assessments. The SCOOT detector was also checked for the time against the count site and the LPU conversion rate was very close, within 95% difference.

Conclusion

The conclusions from the trial are that the **Iteris VersiCam** can be used as a SCOOT detector. The sensor is easy to deploy where there is a traffic signal pole in the appropriate location. The detector has some power / cabling requirements, as it can be powered from spare cores available within the traffic signal head. Where there are no spare cores, running in a new cable would often be cheaper than the traffic management associated with a loop detector re-cut.

Provided the sensor is installed appropriately and the detection zone is carefully configured, it works effectively as a SCOOT detector.

Further analysis of the sensor's performance would be beneficial, however. This will include:

- **Long term performance:** These checks will be repeated in 12 months, to check the age of the sensor has minimal impact.
- **Long term maintenance cost:** The working life of the sensor will be examined, along with any costs associated with maintaining it, as BCC need to demonstrate that the sensor offers a whole life cost saving.