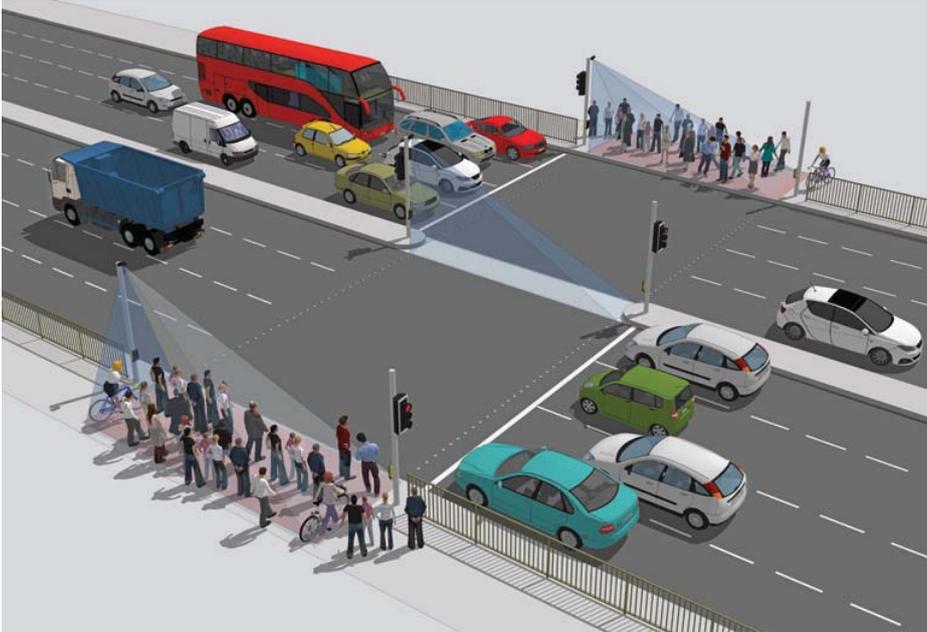


Case Study Light-changing experience



The volumetric capability of the 645 Pedestrian Detector allows for real-time dynamic adjustments to pedestrian green time

Cambridgeshire County Council wanted to improve the safety of its pedestrian crossings in areas of high demand and help ease cycle congestion at city centre junctions. Traffic signals consultancy Green Signals set up two trials using cutting-edge volumetric detection technology from ITS expert AGD Systems.

When large volumes of pedestrians are expected to cross the road, it has always been possible to timetable special conditions at traffic signals, extending the invitation period at fixed times to allow for an increase in demand. But this is an inflexible solution that does not allow for unpredicted fluctuation in pedestrian numbers. So what happens when school's out earlier or later than usual? In many cases, the efficacy of the crossing is compromised, and so is the safety of pedestrians, cyclists and motorists.

Cambridge, with its many university campus sites, is a prime example of an area with large transient pedestrian numbers using crossings throughout the city. Students can emerge at any time during the day or early evening, often in large numbers, making these locations more difficult to timetable.

Puffin and toucan crossings go some way towards adding efficiency with their extended red period, but this does not always cater to the number of people waiting to cross. These crossings also employ pedestrian detection that cancels unwanted demands, which improves both pedestrian safety and traffic flow.

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What Cambridgeshire County Council needed was a solution that could provide an indication of how much demand there is for a particular crossing, in real time. They wanted the flexibility to increase the invitation period, giving priority to pedestrians when suddenly there isn't enough room to accommodate the people waiting to cross and those trying to pass them on the pavement.

In the past there has been provision to allow traffic signal controllers to make dynamic adjustments to the invitation period, but until now the technology has not been able to provide credible information. However, using the 645 Pedestrian Detector from ITS specialist AGD Systems, Green Signals Consulting came up with a ground-breaking solution.

Is anybody there?

Two trials took place using the 645 Pedestrian Detector. The 645 was recently enhanced to include the capability to provide optical volumetric data that enables the controller to select the appropriate pedestrian green time from a range of options.

At Long Road in the Cambridge suburbs, one particular site – a toucan crossing close to a sixth form college – experiences high variation in pedestrian flows, as Green Signals senior engineer Chris Kennett explains:

“At this site, you get substantial numbers of pedestrians arriving at almost any time of the day, while in between times the crossing is quiet – although the road itself is very busy.

“When there are lots of students waiting, the crossing doesn't have the ability to cope with the number of pedestrians, which means you can get a queue of people forming on the pavement and then spilling across the road, crossing in between cars and ignoring the signals, which is dangerous for pedestrians and motorists alike.”

In the trial, which started in early August 2018, at the start of the pedestrian green stage, the 645 provides readings on pedestrian occupancy, reporting to the traffic signal controller on whether occupancy is zero, medium or high. “This is happening automatically and locally on the site,” continues Kennett. “The controller then ‘chooses’ based on what it has been told, from a selection of green man times that are available. Normally only one selection would be available – a fixed green time. But we have configured it to be able to select from a range of higher values according to occupancy level.”

The trial has been a great success: “It has gone so well that the authority is considering making it permanent. We have also started talking to them about making this standard on sites near schools and colleges throughout the county.”

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Counting cyclists

The second trial uses the 645 pedestrian detector's capability in a different way. "We have used it to measure occupancy of cyclists on the road waiting for the green cycle filter at signal-controlled junctions," explains Kennett. "The trial site is at Castle Hill in Cambridge city centre – a location that sees huge numbers of cyclists, many of them students at the university, waiting at the lights."

This junction can see several thousand cyclists go through every hour, and it's not unusual to see hundreds waiting to cross at the lights. "The cyclists stop on red and wait for a green cycle filter that lets them go before the rest of the traffic gets the green light," explains Kennett, who was instrumental in creating this innovative solution during his time with Cambridgeshire County Council.

"At the moment, cyclists get the cycle filter for a fixed period before the full green comes on and allows general traffic behind them to continue. But because the site gets so very busy, the fixed period isn't always long enough. So now we're using the 645 to extend the green cycle filter before the full green comes on."

For more information on volumetrics configuration please visit [Green Signals Good Practice Guide](#)

Rather than checking for cycle occupancy once and giving the cycle green phase if required, the 645 now enables the controller to check the level of occupancy while the green filter is on, and to extend the cycle filter phase until the threshold is met. "It's proving to be very effective," says Kennett.

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