**BACKGROUND**

Sheriffhall is a six-arm roundabout which connects several important routes, including the A7 and the A720, and handles upwards of 42,000 vehicles a day. It is the only at-grade junction on the Edinburgh City Bypass and the high traffic volumes mean it has the potential to become very congested at peak times. An improvement scheme undertaken in 2008 widened the circulatory carriageway and the three congested approaches, dramatically increasing Sheriffhall roundabout’s capacity.

The new scheme featured multiple sets of lane designation signs and markings, and a comprehensive lighting scheme to ensure clarity in all conditions; however, despite these measures, Sheriffhall roundabout remained highly prone to accidents with statistics recording the highest number of collisions of any roundabout on the Scottish trunk road network in the 10 years to 2013.

**FIRST USE**

In 2014, following a Stage 4 Road Safety Audit which cited poor lane discipline as the prime cause of collision at the roundabout, BEAR (Scotland), the contracted Operating Company for Transport Scotland at the time, proposed a new, more radical approach to improve the safety record of the roundabout.

The audit suggested that lane transgression was likely to be due to the level of difficulty that certain drivers may experience in understanding and reacting to the complexity of the junction. Therefore, an LED-powered, intelligent road stud scheme was proposed to guide traffic through the roundabout. The intention being that the studs would encourage drivers to stay within their lane by drawing drivers’ attention to the delineation of the existing lane markings and guide them through the roundabout.

**APPLICATION**

The key aim of the active road stud scheme was to guide A720 traffic around the roundabout lanes. However, a potential issue became apparent that drivers on the circulatory carriageway from the minor arms would be confused by the studs. As this would be counterproductive, a more innovative solution was sought. The solution came in the form of a scheme using actively controlled road studs whereby the studs are switched on and off in coordination with the traffic signals on the roundabout.

As the traffic signal turns red, all of the studs on that section switch off and then the studs at the next section illuminate as the corresponding traffic signal turns green. In this way, drivers get an illuminated green phase to guide them all the way around and off the roundabout, with clear visual definition of the lanes to heighten lane discipline and reduce preventable collisions. This scheme is the first of its type in the UK.

**BENEFITS**

Researchers from the Transport Research Institute at Edinburgh Napier University undertook a full ‘before and after’ study on driver behaviour at the roundabout.

The research found Clearview’s Intelligent Road Stud (IRS2) reduced in lane transgression activity across nearly all vehicle types and manoeuvres and has had a significant positive impact on collision risk at the roundabout, meaning less congestion and fewer accidents on this major gateway to Edinburgh.

This scheme attracted widespread industry recognition in 2016, winning the following awards:

- Chartered Institution of Highways & Transportation - John Smart Road Safety Award
- National Transport Awards - Most Innovative Transport Project
- Highways Magazine Excellence Awards - Road Marking Project of the Year
- Scottish Transport Awards - Excellence in Technology and Innovation Award

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