Intelligent infrastructure: ANPR vs Bluetooth technology

When deciding on the most effective method to monitor traffic flow, Dr Benjamin Watson, global technical manager of the traffic safety and security division at 3M, believes local and road authorities need to consider the total value and scalability of their technology choices, rather than just upfront cost comparisons

> **"It is worth noting that ANPR is an effective tool across a variety of applications"**
>
> **Benjamin Watson**

These technology choices set a foundation for the intelligent Infrastructure of a particular region or network of connected cities and suburbs. Benefits may include improved safety, the reduction of emissions, improved traffic flow, data sharing and more.

With all the recent technological advancements, local and road authorities now have more choice than ever when it comes to deciding on the best way to monitor journey times. Traditionally, travel times have been tracked using automatic number plate recognition (ANPR) cameras, which capture the progress of vehicles along a pre-defined route. The devices also have the ability to count passing traffic and help manage congestion. This technology allows authorities to monitor road network performance to optimise road use, management and operation.

But with so many people on today's roads carrying smart phones, hands-free kits and electronic tablets, it is now possible to monitor journey time data using Bluetooth and Wi-Fi technology. A notable advancement in the sector, this technology requires sensors to be placed on the side of the road, which then detect Bluetooth signals released from smart phones and hands-free kits as vehicles drive past.

The biggest argument championing the move towards Bluetooth/Wi-Fi technology is the cost savings. Manufacturers claim the installation and maintenance costs are much cheaper than that of ANPR, while still offering the same benefits.

Before it is possible to argue cost as a reason for local and road authorities to make the switch, it is essential to establish whether the technology offered with these recently developed systems is equivalent to what is offered with ANPR.

Evidence suggests Bluetooth/Wi-Fi technology is a feasible option for certain applications. But when looking to compare the options like-for-like, ANPR's strengths come in the form of its wide range of additional benefits, including its multi-functional use and high accuracy rates for vehicle identification.

Advantages of ANPR

Bluetooth manufacturers argue less equipment is needed when using this technology to monitor traffic travelling in different lanes, in different directions – resulting in reduced installation and running costs. However, this is not unique to Bluetooth/Wi-Fi systems.

A big step forward for ANPR technology has been doing more with less, to measure and differentiate traffic in both directions, with a single camera. The latest ANPR cameras enable the simultaneous capture of up to four number plates while also detecting the direction of travel. On top of this, ANPR technology can measure journey times with a hit rate currently unachievable with Bluetooth/Wi-Fi tracking.

ANPR cameras, in the UK and Europe, typically achieve detection rates in excess of 98 per cent, with a 95 per cent read rate. The system is able to detect foreign registration plates and function in all weather conditions, unless the plate itself is damaged or obscured. If cost is a contributing factor in the decision making process for authorities, it is worth noting that ANPR is an effective tool across a variety of applications.

Extensibility and multimodal deployments are particularly attractive when working with reduced budgets. This multimodal capability may be used to support enforcement applications and other civilian functions, such as congestion easing and improving security and safety for the general public. These combined solutions can be a good way to spread the cost of a system between, for example, a local authority and other organisations that may wish to share the data.

The embedded camera technology typically includes two cameras within a single enclosure. One provides contextual images for colour overview, while the other is dedicated to ANPR. It is possible to stream MJpeg over HTTP 'video' from either camera. Even though it is not dedicated for CCTV streaming, the colour overview camera is able to provide this functionality, if necessary. The quality may not be as high as a dedicated CCTV system but the output may be sufficient for viewing congestion, accidents and incidents.

ANPR technology is continually advancing and can now be integrated as part of a total lane solution with various third party devices such as DSRC/RFID readers, weigh-in-motion, variable message signs, lane controllers and loop detectors.

While Bluetooth/Wi-Fi systems are able to produce sufficient travel time data, the multi-functional benefits of ANPR systems should be considered. Authorities needing to install enforcement technology and CCTV systems in the same location may utilise ANPR for both functions in certain scenarios. The detection rate and accuracy of vehicle identification should also be taken into account.

As authorities continue to face tight budgets, cost is always going to be a big part of the decision-making process. But the range of benefits each system offers needs to be considered to ensure they are receiving the best service for the money spent.