Aside from the ongoing challenge of actually gathering accurate data on what’s happening on our roads, another of the other longstanding issues is how best to disseminate that information. Are roadside VMS the best way to inform drivers of current conditions? How about good, old-fashioned traffic radio? TV news, perhaps? Although all of the above have their place, there’s a growing trend that also has great potential – the use of social media.

Social standing
Whatever your thoughts on social networking — whether you’re a prolific Tweeter, avid Facebooker or you shun the entire concept – it’s becoming an increasingly prevalent form of communication. And a fast one at that. You only have to look at how quickly events ‘trend’ on Twitter to realize that the internet is the go-to source for information when something major occurs. The sticking point, though, is just how accurate that information is – consider the numerous celebrity ‘deaths’ that get reported before turning out to be hoaxes.

Accuracy aside, then, how can social media benefit the real-time traffic information sector? The number one selling point is how cheap it is. It costs nothing to tweet. The second is the instantaneous response and dissemination of information. Twitter, Facebook and the like have access to a switched-on and captive audience; one message can be enough for people to alter their travel plans on the spot. It’s no wonder, then, that agencies are embracing the use of social media.

The biggest adopters so far have been in the public transit sphere, with operators around the world choosing to communicate the details of incidents, delays, schedule alterations and more, directly to their users’ smartphones, tablets, laptops or PCs.

Incident management
Road managers and DOTs are also starting to adopt social media as part of their everyday operations however. Nowhere is this tool more valuable than in the case of incidents. If something out of the ordinary occurs, once it has been verified, it can be communicated in real-time to people using – or intending to use – that particular stretch of road. This enables traffic managers to encourage the traveling behavior that best fits their plan for managing specific incidents – which could be anything from diverting to an alternate route to warning people not to access certain roads.

The other noteworthy point about using social media is that it’s an interactive, two-way form of communication. Drivers themselves can share information, experiences and their ‘eyes on the road’ view of what is happening around them – it’s a simple form of crowd sourcing that is unbelievably effective.

Ultimately, though, its value comes back again to how accurate the information is that’s being tweeted, posted and shared. Over the course of the coming pages, we’ve highlighted some of the innovative methods to actually collect real-time traffic data.
Into the blue

The acquisition of traffic data without fixed infrastructure sensor technology

Besides increased public transport, congestion charging and the promotion of electric vehicles, dynamic traffic control can also contribute to helping avoid congestion and its associated emissions. Dynamic message signs (DMS) play a vital role in traveler information and event notification by displaying messages to motorists. But to gather all of the required real-time traffic information in the first place, it’s necessary to use a wide range of sensors.

One of the most compelling classes today could be a system based on Bluetooth, which is a non-intrusive and inexpensive alternative to ALPR. In fact, the latest tests conducted on behalf of the Bavarian government in southern Germany in 2011 have demonstrated that a Bluetooth-based traffic sensor from c.c.com was assessed to be equally or more suitable than a system based on ALPR.

The BLIDS system combines Bluetooth-based sensors and algorithms (such as for adaptive smoothing), which integrate seamlessly into existing ITS. Installation engineers will typically prefer a detection platform that is easy to install and requires no calibration. The BLIDS solution has been created with this in mind and offers user-friendly software tools for set-up, reliability and robustness is key, and the most common data transmission is through cellular data networks.

BLIDS sensors mounted next to the driving lane acquire unique Bluetooth IDs from devices such as cell phones and navigation systems that come within each sensor’s reception range. These IDs are anonymized and are given a highly accurate and synchronized timestamp before being transmitted to the BLIDS server. Based on the information gathered from at least two sensors, real-time information on travel times, traffic interruptions (incidents) and traffic flows can be calculated. The sensor consists of specially developed hardware and software based on embedded Linux. Services that run on the system use Bluetooth sensors, GPS, GSM, RS232, WLAN and USB interfaces to create the scanning and communication components. An external power supply (in/out), a radar sensor for cross-section count, optional battery buffering or solar panels complete the overall package. There is also a built-in monitoring agent to handle possible network problems, low battery, etc, and start the self-healing process to remain online and functional. Firmware over the air (FOTA) is also supported, which allows the sensors to be maintained and updated remotely. With the Bluetooth module, all visible Bluetooth devices are acquired in a single scan cycle. Here, the ‘discovery’ mode is used and only the Bluetooth addresses, time, class of device, and received signal strength indication (RSSI) value are read out.

The BLIDS solution has already been deployed by customers across Europe, notably the local Austrian radio station, OE3, which relies on the online traffic information generated by BLIDS. A further installation in the municipality of the city of Rostock, Germany, is also using BLIDS sensors for traffic flow analysis, travel-time measurement and recognition of retention time within crossroad areas, as well as visualization of travel time via a web interface.

In high definition

TomTom’s new web-based service for mobile devices should give drivers ample opportunity to plot new routes if there is evidence of long delays

One of the recent technological trends in real-time traffic information is to use connected devices – whether be cell phones, satnavs or other sources – to provide the type of information that would traditionally have come from ITS equipment such as cameras, loops, etc.

TomTom has invested heavily in the sector and its HD Traffic system is becoming increasingly popular among those looking for accurate real-time data. HD Traffic fuses information from a number of freely available sources to create an accurate picture of what’s happening on the road network. These include government traffic data, some historic data, data from fleet management systems, some cellular data (accrued by monitoring the movement of cell phones) and of course data gathered from TomTom satnav units. The advantages of all these sources being combined to provide accurate, real-time information are obvious.

HD Traffic is already used by a million people across Europe and is present in 23 countries around the world. Among a flurry of recent contract wins (including the UK’s Automobile Association) one of the latest announcements is that Research In Motion (RIM) is using HD Traffic for BlackBerry applications.
Winning with wireless

A Barcelona-based company has created a new vehicle detection solution for gathering real-time traffic information. Based on a wireless traffic monitoring station, the SenseFields solution consists of several magnetic sensors (depending on the width of the road section to be covered) and a data processing system (DPS) that receives their signal and outputs vehicle-counting and -classifying data.

Core to the platform is the strong and reliable vehicle-detection capability, which is based on advanced wireless sensor networking technologies, paired with a scalable sensor DPS. This allows a cost-effective and versatile solution for the management of traffic in cities and on interurban roads.

The wireless sensors are finely tuned magnetic sensors with highly robust algorithms able to reliably detect vehicles – even in the presence of strong magnetic interference (such as metal pipes, power lines, underground, bypassing cars, etc.). There is no need for extra sensory information, such as sound or light. Sensors send the data collected to the DPSs using IEEE 802.15.4 PHY, compliant with a greatly enhanced MAC, which allows for aggressive duty cycling. Meanwhile, the configurable radio frequency below 1GHz allows sufficient communication range, even in radio-saturated environments such as urban areas.

The wireless sensors are physically accessible by unscrewing the top case, so their battery can be replaced. This accessibility means the system can be implemented in temporary situations for periodical traffic monitoring in different sites with just one wireless traffic monitoring station. They can even be uninstalled while pavement works takes place and then redeployed afterwards.

Offering a scalable and secure platform for traffic management, this wireless monitoring station processes large volumes of data from sensors in real-time and displays relevant information in a customizable view. It also offers advanced analytical tools for historical data.

The wireless sensors are finely tuned magnetic sensors with highly robust algorithms able to reliably detect vehicles.

Probing report

Better traffic monitoring can be achieved at a fraction of the cost using probe technologies.

In the USA, the I-95 Corridor Coalition’s Vehicle Probe Project (VPP) has offered strong evidence relating to the merits of probe technology. The VPP uses crowdsourced traffic data and advanced analytics techniques to turn billions of data points into insights that are transforming how member states build, manage and measure their road networks. During the project, which kicked off in 2008, 19 agencies were given access to vehicle probe data, with several using the data to support their 511 web and phone services. Some use the data to calculate travel times and post them on VMS. Performance measures and travel-time reliability – particularly in congestion-prone areas – are calculated using real-time and archived VPP data.

Part of the appeal of probe vehicle data is that it can help agencies to save money, as illustrated by a case study from New Jersey. During a surprise snowstorm in October 2008, the NJDOT Traffic Operations Center was reviewing an accident on I-80 via a CCTV camera. The vehicle probe data-monitoring site identified a second incident involving multiple jack-knifed tractor-trailers along I-80 where no CCTV coverage was available.

Without the VPP monitoring site, response to this second incident would have been delayed by as much as an hour as operators were busy responding to the first. The expedited response to the second incident translated into a US$100,000 saving in user-delay costs.

Last October, the Coalition, the University of Maryland and INRIX announced a three-year extension and program expansion. It now provides INRIX real-time and historical traffic information for more than 20,000 road-miles across 10 states along the I-95 corridor.

Through a complete, precise view of traffic conditions across their network, the VPP not only helps target investment in roads and transit in the most critical areas but delivers improved traffic operations at reduced cost. According to North Carolina DOT, in fact, where previous approaches to gathering traffic data had a lifecycle cost of nearly US$50,000 per mile, the probe data has been proven to deliver more coverage at 25% of the cost.