

Tech that trumps traffic tangles

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With the relentless rise in geo-locative services - those that exploit location data - it's about time we used global positioning satellite (GPS) systems to get us out of a jam.

The potential for GPS systems to track traffic snarls will be on show at the World Congress on Intelligent Transport Systems (ITS) in New York this week, where one of two systems that went into operation earlier this month will be showcased.

Besides improving traffic reporting, the information that the systems glean can also help to route traffic, assist town planners and fine-tune future assistive driving technologies.

Current municipal traffic monitoring systems study individual stretches of road that use induction loops to sense the passage of cars, or complex camera systems that capture licence plates.

In order to keep maps up to date, an even more expensive approach is in place, employing fleets of sensor-equipped vehicles constantly driving around. The data can take weeks to be entered into digital maps.

By contrast, the new approach is instantaneous and practically free in terms of infrastructure - because the information the system uses comes from mobile phone and sat-nav device users directly.

"One of the reasons we're so excited about community data is the sheer volume of it," says Rik Temmink, vice president for product management at TeleAtlas, the digital mapping subsidiary of sat-nav manufacturer TomTom.

"In the past we received user feedback, but it was a drip-feed of ad hoc reports. Now we get literally billions of GPS measurements every week - it's unprecedented and really exciting for us."

Anonymised data

Earlier in November, TomTom released the newest models of its sat-nav devices, with a service known as HD Traffic.

The basis of the system is a constant stream of real-time location data, that in large part comes from mobile provider Vodafone's data centres.

As handsets move, their signals are re-routed to the nearest mobile masts. The "hand-off" from one mast to the next provides an indirect signal of movement, and the rate of those hand-offs represents a speed.

The idea of using mobile phone hand-off data as a means of traffic reporting has been around for a while, but these new efforts will see thousands of people contributing to the reporting, with both mobile handset and GPS data.

TomTom's software anonymises the data as it arrives. Then, employing digital maps provided by its subsidiary TeleAtlas, it forms aggregated estimates of road speeds that can quickly point to traffic jams if compared with historical data.

The new TomTom devices are also themselves connected to the mobile network, so that as each device reports its GPS co-ordinates every few seconds, it contributes to the stream of speed data.

At the moment, the majority of the information comes from Vodafone hand-off data, but Rik Temmink,

vice president of product management for TeleAtlas, believes the fraction will shift as GPS devices become more prevalent.

Traffic trials

At the ITS conference, a different initiative that is taking root in Northern California, with the same goal in mind, will be shown off.

" This is a service that should run on a whole range of devices "
Quinn Jacobson, Nokia Research Center

Last week the Mobile Millennium project was opened to the public. The project is a collaboration between Nokia, the digital mapping company Navteq, the California Department of Transportation, and the University of California, Berkeley.

In February, the project - then called, less ambitiously, Mobile Century - saw 100 Berkeley students driving along a stretch of road, armed with GPS-enabled Nokia handsets.

Having worked out the details for turning the resulting GPS data into traffic information, the team has expanded the trial, allowing the northern California public to download a small piece of software to any GPS-enabled phone.

The team is working also on a system to ensure that user privacy is kept safe, by only collecting GPS data when users are near "virtual trip lines" - specific locations in public spaces - instead of a constant monitoring system.

Quinn Jacobson, from the Nokia Research Center in Palo Alto, says a wider rollout of the service will happen next year, and sees the approach finding its way into other applications.

"The mobile device is your digital companion," Mr Jacobson says. "So we see navigation, route planning, and the calendar all tying together, and that's when it gets really interesting."

For example, your phone might see that you have a meeting coming up and warn you that traffic snags mean you should leave extra time to get there.

Because Nokia owns Navteq, which can provide the real-time maps to other manufacturers, Jacobson does not see the development as a Nokia-only enterprise.

"We believe that this isn't just for our handsets; this is a service that should run on a whole range of devices, just as Mobile Millennium runs on a number of handsets."

Crowd wisdom

More than just optimising routes around traffic jams, the data stream that the approach generates shows its strength in numbers.

Most obviously, the traffic flow data can be fed back to transportation authorities for town planning or to optimise the phasing of traffic lights. The data might also be used in advance of natural disasters, to ensure the best use of escape routes.

The future will see driver-assistive technology for crash avoidance and simple convenience. Cars might, for example, turn the headlights around a curve automatically, illuminating the road better.

But that means the car must know the curve is coming, which in turn means that digital maps have to be incredibly true to life.

"We believe we can do that from these GPS measurements because we have so many of them," says Mr Temmink. "None of the individual points is accurate but through statistics, if you have 10,000 points, the average will be super-accurate."

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