The internet of cars

March 22 2010

(PhysOrg.com) -- An internet of cars promises a road system designed around cooperative technology enabling each element of the traffic system -- cars, drivers, traffic lights, signs -- to cooperate proactively to create a safer, more efficient driving experience. No road rage required.

Your cooperative dashboard flashes a warning: "Emergency vehicle crossing at the next intersection!" You start slowing down. On cue, the lights on your route turn red, simultaneously turning green for a fire engine crossing at the intersection. That fire engine will surf a 'wave' of green lights all the way to the blaze further downtown.

As the lights turn green, your display suggests a diversion that will skirt the scene of the accident, avoiding any risk of congestion. You take the suggested turn and your car advises you of a new speed limit.

You slow down and gain some extra 'green miles', bonus points awarded to careful drivers, redeemable against a range of privileges, such as driving in the city centre without charge, or using bus lanes outside rush hour.

The day started more or less as any other. Your mobile phone woke you a little earlier than usual because heavy rain meant traffic was less fluid than usual: the SafeRoute service you subscribe to estimated a 10-minute delay in your normal commute and so sent your mobile an earlier alarm.

Now you are glad for the early start; an unhurried drive is a happy one.

As you make the final turn on the way to work, your cooperative co-pilot reads a message from the car behind you. It's your colleague, asking if you have time for coffee. Thanks to all the cooperative vehicle-infrastructure systems (CVIS), you are early for work so you catch a quick coffee with your friend.

Cooperative driving

This is a future without road rage, a future of cooperative drivers using cooperative vehicle infrastructure systems. It is the vision of the CVIS project, which is itself part of a broader trend internationally with a focus on Intelligent Transport Systems (ITS).

The USA, Japan and Europe are all thinking of cooperative systems like this, according to Paul Kompfner, Head of Sector, Cooperative Mobility at ERTICO - ITS Europe and coordinator of the CVIS project.

"On every continent, part of the spectrum has been reserved for cooperative systems, 5.9 GHz in the States and Europe, and 5.8 GHz in Japan, so this subset of ITS is certainly coming. Right now, I'd say Europe has something of a lead in technology development and

validation across a wide range of test sites," suggests Kompfner.

Europe also leads on vision, with the development by the CVIS team of an open, state-of-the-art ITS platform which can function on a variety of levels, from in-vehicle and roadside systems to portable devices. It can also evolve over time to take advantage of new technologies and business models.

It is a big vision, and the project has the resources to deliver.

The CVIS project is huge, literally and figuratively. The budget is over €40 million with €20 million coming from the EU, and there are 62 partners, developing several core technologies to create a totally integrated, open-source 'internet of cars'.

There have been many piecemeal attempts to create a compelling mobile platform for infrastructure-to-car communications, and other efforts for car-to-car, and still other initiatives for mobile ITS and mapping, but except for GPS none have really broken through.

The cooperative vehicle [infrastructure system](#) tackles all these issues and many others, and incorporates highly ambitious technical goals, compelling applications and extensive demonstration, validation and exploitation plans - the latter being a particular weakness in many earlier efforts of this kind.

Complete infrastructure

First off, CVIS has developed a complete communications infrastructure, running from hardware, through protocols, standards, middleware, application programming interfaces (APIs) and cross-platform integration.

In communications hardware alone, the CVIS team has developed a platform that can essentially use any known communication infrastructure, including WiFi, WiMAX, broadcast radio, satellite communication, dedicated short-range communications (DSRC), radio frequency identification (RFID), microwave, 3G and even infra-red.

Bolted on to a scalable hardware chain is a massively scalable, open (and partly open-source) software chain. It handles all the different elements of the CVIS framework: traffic management, vehicle-to-vehicle (V2V) communications, floating vehicle data collection, appropriate integration of city traffic networks with public communication networks, and so on.

But it also creates a series of APIs and an open application development suite that will allow third-party software developers and service providers to create applications which run across the CVIS platform - a kind of 'ITS app store'.

Large-scale trials

Finally, the project tested the combined technologies in many large-scale trials in seven countries and the team has developed a progressive and detailed exploitation plan that should see these technologies adopted and deployed in the short- to medium term.

The project coordinator is ERTICO, a European public-private partnership representing all the stakeholders, including car and traffic system manufacturers, governments, road operators, telecom operators, users and service providers. Every aspect of road use will be impacted by the new internet of cars, and it is set to become the model for how other Intelligent Transport Systems will be developed in the future.

The CVIS project is demonstrating its main applications at the Cooperative Mobility Showcase 2010, Amsterdam, 23-26 March 2010.

The general public is welcome and will be able to see some of the cooperative technologies in action.

More information: CVIS project - www.cvisproject.org/

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Citation: The internet of cars (2010, March 22) retrieved 10 April 2024 from https://phys.org/news/2010-03-internet-cars.html