Siemens References: Car2X conquers the road

The vision: cooperative systems enable vehicles to communicate with each other, with traffic management centers and with the infrastructure on the road. Intelligent intersections and information signs work in concert with vehicles to make traffic safer, more efficient and more environmentally friendly. Drivers receive important traffic messages, restriction advisories, warning notices for accident prevention and action prompts directly in the vehicle, simultaneously reducing traffic congestion, accidents and pollution.

Making this vision a reality involves fitting out both vehicles and infrastructure accordingly: automobiles must be able to report their position, speed and target direction continuously and the road must be able to communicate traffic messages, restriction advisories and warnings. Siemens has accumulated a wealth of experience in this area over the last few years, with activities including research into traffic signals and communication modules designed to support collaboration between vehicles and infrastructure.

The Central European Car2X Corridor between Rotterdam, Frankfurt/ Main and Vienna

The Central European Car2X Corridor, a joint initiative between the Netherlands, Germany, Austria and industry partners to bring cooperative technologies onto the road, is currently taking shape along the route linking Rotterdam, Frankfurt am Main and Vienna. The respective transport ministers, who signed a declaration of intent for the initiative in June 2013, aim jointly to develop a timetable for the introduction of the first wave of applications and lay the foundations for a harmonized vehicle interface. The initiative encompasses the actual implementation of some initial applications too, starting with construction work warnings and the recording of traffic conditions by vehicles. The three countries also intend to develop a joint rollout.
strategy for additional applications. The plans provide for construction trailers along
the corridor to begin transmitting their position and the arrangement of any lane
closures/restrictions at the construction site to vehicles and traffic control centers, by
mobile radio or WLAN, from 2015. Vehicles, in turn, transmit their position and
speed and the local weather conditions – again either via WLAN or mobile radio
depending on availability – with a time stamp. Preliminary development work is
already underway around Frankfurt am Main in Germany and as part of the Eco-AT
project in Austria, while in the Netherlands the DITCM test facility is being
expanded.

Siemens is involved in setting up a "Living Lab" in and around Vienna as part of the
Austrian Eco-AT project, for which it is supplying software and hardware to support
communication between road users. Road side units fitted along the road supply
information to the traffic control centers. It is intended that all communications
relating to traffic management and safety will be signed with a standardized PKI
 Públic Key Infrastructure) key to ensure data integrity and provide assurance that
messages are genuine. Individual vehicle IDs will be anonymized in order to ensure
communications remain confidential. Ultimately it is planned to install cooperative
systems along the whole of the Austrian corridor on the basis of the findings from
the Living Lab. Eventually it should also be possible to supply vehicles with traffic
sign and signal information, departure times for local public transport and details of
free Park & Ride spaces.

Telematics test zone in Vienna
Siemens and project partners including Asfinag, Kapsch and AustriaTech conducted
field trials in 2013 to investigate not only whether the new Car2X technology works,
but also whether users are prepared to embrace it. The main issue considered in the
trials was the potential for driver overload: what – and how much – information
should drivers receive in order to provide the maximum of assistance without
distracting them unreasonably from the road. The project partners installed
hundreds of sensors and cameras to capture the current traffic situation across a
45-kilometer "telematics test zone" in Vienna comprising a freeway intersection, part
of the city and a local public transport interchange. A group of around 50 test drivers
then took to the road, their vehicles supplying position data to the traffic control
centers in real time and receiving in exchange speed advisories, warnings of
hazardous situations such as oil on the road surface, congestion and construction warnings, travel and weather information and messages announcing flight delays, Park & Ride availability and recommendations for transferring to local public transport.

Having completed around 200 test runs, the project partners were able to conclude that Car2X does indeed change driving behavior and can help to make road traffic safer, more efficient and less resource-hungry. In-vehicle displays were found to be more effective than traffic signs by the roadside, for example, in situations like driving round a construction site. Around 60 percent of the test drivers considered the applications presented to be useful and almost two thirds would use them again in future. The result would be a smoother, more coordinated flow of traffic, which would in turn make the roads significantly safer by reducing the number of hazardous situations and accidents attributable to lane-changes.

The telematics test zone in Vienna has demonstrated that in principle, Car2X already works.

For further information see: http://www.testfeld-telematik.at/

Siemens in the Car2Car consortium
Communication standards and common interfaces are essential if different types of vehicle and infrastructure components in different countries and regions are to be able to talk to each other. Representatives of carmakers and the industry have joined together in the Car2Car consortium not just to develop communication standards, but also – and they have committed themselves to this objective – to deploy the cooperative technologies required for functions such as presenting information about stopped vehicles, construction sites and local traffic information in new vehicles from 2015. The representatives of the consortium have created an additional entity together with infrastructure operators known as the Amsterdam Group, which is defining applications suitable for use in an initial phase.

Further information may be found at: http://www.car-to-car.org/index.php?id=20
Compass4D
A three-year project part-funded by the EU is introducing cooperative systems in the cities of Bordeaux (France), Copenhagen (Denmark), Helmond (Netherlands), Newcastle (UK), Thessaloniki (Greece), Verona (Italy) and Vigo (Spain) in order to demonstrate their advantages for residents, municipal authorities and businesses.

Siemens' role in this European research program involves equipping 20 traffic signals in Newcastle with road side units to transmit traffic signal information to vehicles. The applications deployed are green wave and preferential signaling for emergency vehicles.

For further information see: http://www.compass4d.eu/

Intelligent Mobility Application platform (AIM) in Braunschweig
Siemens and the German Aerospace Center (DLR) are conducting research into cooperative systems in the city of Braunschweig in partnership with the state of Lower Saxony, the city of Braunschweig and other scientific, industry and public-sector organizations. Siemens is supplying the necessary hardware and software for the traffic signal installations, with around 40 of its road side units having been installed at traffic signals in Braunschweig since 2011. These road side units use a special radio standard to transmit information about the time-to-change at individual signal groups and the associated junction topology directly to a WLAN receiver in the DLR research vehicles. Software in the vehicle processes this information and lets the driver know what speed will enable the vehicle to reach the traffic signal at green. Additional applications will be possible in future including information about the traffic situation, warnings of hazards such as accidents and congestion, advisories about lane closures and construction work and weather alerts in case of ice, heavy rain or fog.

For further information see: http://www.dlr.de/fs/desktopdefault.aspx/tabid-6422/10597_read-37397/
InMoBS pilot project in Braunschweig

The InMoBS (intra-urban mobility support for the blind and visually impaired) project is using the infrastructure in Braunschweig to support the development of a comprehensive acoustic and haptic electronic guidance system, based on mobile telephones, for people affected by blindness or impaired vision. The consortium and the project as a whole are being led by Braunschweig University of Technology and its Institute of Transportation and Urban Engineering (IVS). Here too Siemens is bringing its expertise to bear, alongside other companies and institutions, as a project team partner. Siemens is supplying the hardware and software used to transmit information to the user terminals. The project has three years' backing from the German Federal Ministry of Economic Affairs and Energy (BMWi).

For further information see: www.inmobs.de/pages/team.php

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