Car2X conquers the road

Our vision is that cooperative systems enable vehicles to communicate with each other, with traffic control centers and with the infrastructure along 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 their vehicles. This simultaneously reduces traffic congestion, accidents and pollution.

Turning this vision into reality, however, requires vehicles and infrastructure to be equipped accordingly. Automobiles must be able to constantly report their position, speed and target direction, and the road must be able to communicate traffic messages, restriction advisories and warnings. Siemens has gained a wealth of experience in this field over the past 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 and Vienna

The Central European “Car2X Corridor”, a joint initiative between the Netherlands, Germany, Austria and partners in industry to bring cooperative technologies to the road, is currently taking shape along the route linking Rotterdam, Frankfurt and Vienna. A corresponding declaration of intent for the initiative was signed by the respective transport ministers in June 2013. The joint aim is 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. As of 2015, construction trailers along the corridor will report their position and any lane changes/restrictions at the construction site to vehicles and traffic control centers by mobile radio or WLAN.
Vehicles, in turn, will transmit their position and speed and the local weather conditions with a time stamp – again either via WLAN or mobile radio depending on availability. Preliminary development work is already underway around Frankfurt, 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 the software and hardware to support communication between road users. Road-side units installed along the corridor supply information to the traffic control centers. The intention is to sign all communications relating to traffic and safety with a standardized key (Public Key Infrastructure or PKI) to ensure data integrity and that messages are genuine. Individual vehicle IDs will be anonymized in order to ensure communications remain confidential. Ultimately, cooperative systems are to be installed all along 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 transportation and details about parking spaces available at Park & Ride facilities.

**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 focus was on determining the type and amount of information that drivers should receive at all to be optimally assisted without distracting their attention from live traffic around them. 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 an interchange to local public transportation services. A group of around 50 test drivers then took to the road. Their vehicles supplied position data to the traffic control centers in real time and, in exchange, received 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 transportation.
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, while almost two-thirds said they would use them again in future. The result would be a smoother, more coordinated flow of traffic, which in turn would 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” does indeed work.

**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 for the carmakers and the industry have joined together in the Car2Car consortium not just to develop communication standards, but as of 2015 – and they have committed themselves to this objective – to deploy the cooperative technologies required for functions such as presenting information about disabled vehicles, construction sites and local traffic information in new vehicles. 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**