

7 CONNECTED COOPERATIVE ROADS AS A RESPONSE

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There is every reason to believe that "5th Generation Roads" will be connected and cooperative. Current research works rely information exchange between users, vehicles, infrastructures and traffic control centres, in order to provide mobility services more efficient, more reliable and safer. The benefits for infrastructure will include greater availability and lower maintenance costs. The deployment of these "cooperative" systems is a further step towards driving automation.

Gradual deployment of roadside equipment

As far as the infrastructure is concerned, the central element in cooperative ITS systems¹ is the roadside unit (RU). Its function is to coordinate all the connected objects within its zone of coverage, whether static or mobile. Interoperability, telecommunications protocols, data exchange security, data formats and antennas are all active areas for research and development. Standardisation also plays a decisive role in the initial deployment of these technologies. Besides, the strategy enforced to equip the infrastructure must take into account the gradual renewal of current systems.

New services for all drivers and managers

Apart from transmitting traffic information, the first services to be tested will involve driver information. Examples include warnings near worksites and in the event of a hazard (obstacles, fog, etc.), assisting speed limit compliance and providing information about advisory speeds, journey times, parking spaces and public transport.

In a second phase, these enriched data will also be available to road and fleets managers (public transport, freight and car sharing). One concrete application will concern the preventive road maintenance.

Towards a new generation of road equipment

The availability of enriched data on traffic and environment opens the way for a new generation of road equipment. Road signing, street lighting and safety barriers can be design to more efficient. For instance, the power of streetlights could be directly linked to the meteorological conditions and the traffic intensity.

Sensors will not only be used to collect data. The reliability of the collected data could be improved by merging them with data from vehicles, traffic control centres and social networks. Thus, traffic monitoring cameras and sensor networks could be combined and used to collect meteorological data in order to optimise winter maintenance activities.

In the long term, generating individual instructions for vehicles could be possible thanks to the quality of the information collected. Speed, vehicle gaps and even their itinerary could be send so as to automatically regulate traffic.

1. Intelligent transportation systems

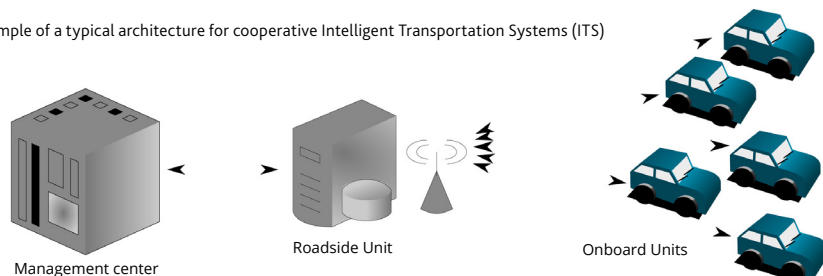
Further readings

Hautière N., De-La-Roche C. et Op-De-Beek F.
Comment adapter les infrastructures routières aux enjeux de la mobilité de 2030. In TEC: Transport Environnement Circulation, 217: 25-32, 2013.

Lepert, P., Hautière, N., 2010. *Projet DIVAS: Dialogue Infrastructure Véhicules pour Améliorer la Sécurité routière. Hermès.*



► Example of a typical architecture for cooperative Intelligent Transportation Systems (ITS)



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