

Researchers develop advanced traffic management system to reduce costs and pollution

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A team at the InLab of the Barcelona School of Informatics (FIB), at the Universitat Politècnica de Catalunya BarcelonaTech (UPC), has developed an information system to improve the mobility management of people and vehicles that is based on intelligent data processing. It solves problems related to traffic congestion and transport systems, energy consumption, air pollution emissions and quality of life in cities.

At the [InLab](#), the FIB laboratory specialising in teaching and research in informatics engineering, a research team led by Jaume Barceló has worked on the [In4Mo](#) project, which focuses on the development of advanced information systems on vehicle mobility in [urban environments](#). The aim is to use, efficiently and innovatively, a combination of traditional technologies for [traffic](#) detection (such as magnetic induction loops, magnetometers, image processing and radar) in combination with new technologies for capturing vehicles equipped with electronic devices (such as GPS, Bluetooth sensors and sensor tags). The integrated use of these technologies, together with new methodologies for acquiring, filtering and processing the data obtained, are all channelled into creating a new technological platform that supplies broader and more precise information to traffic control centres.

The platform was developed from the In4M project initiated by a team at the Centre for Innovation in Transport (CENIT), which is currently part of the FIB inLab and is funded by the Centre for the Development

of Industrial Technology (CDTI). Other organisations that have collaborated in the project are the association Intelligent Transport System España and the companies Bitcarrier, TEKIA Ingenieros and Telvent (Schneider Electric).

The researchers and collaborators in the project took as their thesis the idea that technology is a necessary but insufficient condition for generating information that is reliable, specific and available when and where it is needed. In other words, the degree of smartness is the result of an efficient combination between data gathering and data processing.

A wide range of data are supplied by the various technologies that can be used. It is in this particular regard that the platform created in the In4Mo project incorporates and integrates a variety of data analysis and processing methods that are more flexible and more precise than standard technologies. These techniques allow data to be filtered more effectively, eliminating atypical information and complementing it with the information that is missing to generate complete series. It also makes it possible to combine the data collected using the different technologies in a coherent manner, in order to generate homogenous information of higher quality.

The techniques developed can also be used on dynamic models of the evolution of traffic flow to estimate, predict and visualise the state of the road network. The integrated use of these techniques in a single platform can supply any traffic information system with information that enables the state of road networks and their short-term evolution to be visualised and estimated. This enables more efficient and cost-effective decisions to be made, such as closing off roads, preparing for evacuation and proposing alternative routes.

A response to the increasing use of sensors in cities

In the near future, cities will be filled with sensors that collect all manner of data. This is known as the 'sensorisation of cities'. The main aim of the In4Mo project has been to develop applications that constitute the nucleus of smart mobility, one of the fundamental pillars of the 'smart city' concept.

The In4Mo project responds to the challenges in the spheres of logistics, transport, mobility and urban [traffic management](#), which has gone from a situation in which data acquisition was costly, and in many cases insufficient, to the current situation, in which data managers can be overwhelmed by the amount of data that technology can generate. The problem lies in the fact that it is not technologies themselves that generate information. InLab researchers feel that the key is to process data intelligently so that the necessary information can be generated for more efficient traffic management and to satisfy the demands of mobility services.

The smart management of traffic data can also help to solve congestion problems as well as reducing [energy consumption](#) and emissions and improving quality of life in cities, all of which are factors that play a part in current transport and mobility models.

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