Combating traffic congestion with advanced data analytics

August 17 2016

Managing traffic the smart way for less congestion and better air quality. Credit: Telefónica Deutschland

Fraunhofer IAO and Telefónica Deutschland are investigating how cell phone data could benefit traffic planning.

Researchers at Fraunhofer IAO are carrying out a study to determine whether data from cell phone networks could offer a reliable source of information for traffic planning and an improvement over current data collection methods. Telefónica Deutschland is supporting the research project by providing anonymized cell phone data.

Stuttgart is facing major challenges in regard to mobility and traffic. The

city is struggling with congestion, excessive noise and stress, and there is a clear need to improve air quality. This deteriorating situation has prompted the state capital of Baden-Württemberg – and a growing number of other cities – to seek out new ways of optimizing transport planning and mobility management. Access to accurate transport data is one of the key prerequisites for taking concrete action. Collecting this data is a time-consuming business, however, and the results of these measurements frequently fail to reflect the huge variations in real-life situations.

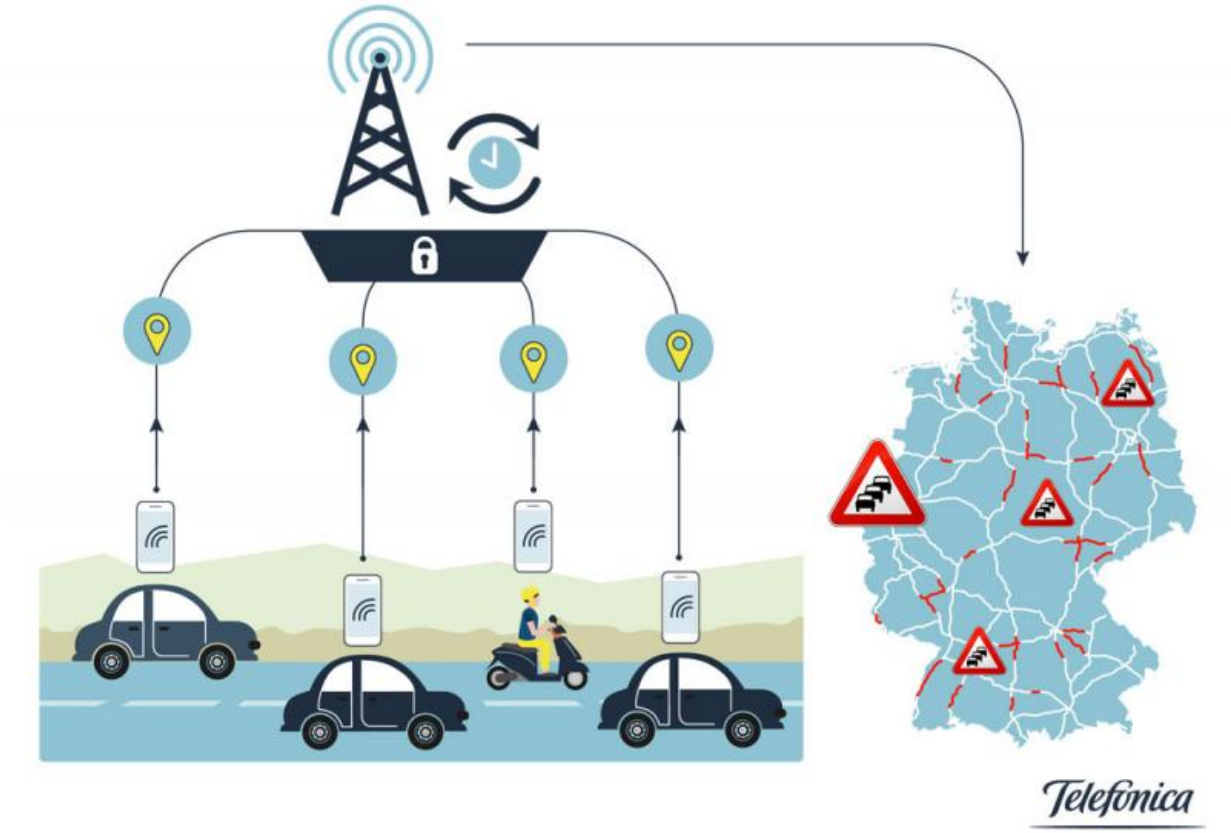
Creating anonymized mobility profiles using cell phone data

This is where the intelligent analysis of cell phone data can make a big difference. This data is collected automatically during the normal course of business at Telefónica Deutschland – for example when a cell phone communicates with a cell tower to make a call or surf the Web – and it can be used to create anonymous mobility profiles. Using cell phone data for transport planning and design would be an economical option that would offer round-the-clock availability and relatively easy access to broad samples. What's more, the data could give cities the opportunity to tailor specific infrastructure projects more closely to people's real needs by providing more accurate information on when and where people travel.

Fraunhofer IAO study to stretch over several months

As part of a three-and-a-half month research project, Fraunhofer IAO is conducting a study to investigate whether mobility data is suitable for measuring traffic flows in cities and whether it is superior to other methods of collecting data. The first step is for the researchers to analyze the status quo of traffic measurement methods based on case

studies and interviews with experts. The next step for the research team will be to shift their emphasis to Stuttgart by comparing the data from existing traffic surveys conducted in the region with the insights obtained from the city's cell phone data. One of the key things the researchers will be focusing on is the real-life variation caused by factors such as heavy rain or major events being held in the region. The hope is that this study will reveal how much potential this data source offers in comparison to other data collection methods.



Data on the move – from smartphone to anonymization to traffic measurement

Telefónica Deutschland is the research partner who will be providing the required cell phone data. This data is anonymized in a three-step process certified by TÜV Saarland, which ensures that customers' personal data is fully protected. This process makes it impossible to link the data to individual customers. Markus Haas, Chief Operating Officer of Telefónica Deutschland, hopes that the study will provide impetus for further projects in the field of advanced data analytics: "As a network operator, our core business yields huge quantities of data. We're pleased that such a prestigious institute is investigating whether we could contribute toward improving transport planning by analyzing this data."

Stuttgart – the perfect test city

Back in 2013, Stuttgart's mayor Fritz Kuhn led an initiative which saw the state capital develop a new sustainable mobility action plan known as "Nachhaltig mobil in Stuttgart." The plan included details of the key measures to be taken by the local authorities in nine fields of action. This is exactly the kind of scenario where the Fraunhofer IAO study can provide vital information in regard to issues such as upcoming roadworks and the availability of public transport.

Dr. Michael Münter, who heads up the strategic planning and sustainable mobility department at Stuttgart city council, explains why the study is important: "Many people understandably wish to have as much individual mobility as possible. We need to achieve an acceptable balance between people's individual mobility needs, environmental concerns, and the interests of the city and the people who live here. Our action plan to promote sustainable mobility in Stuttgart aims to highlight innovative urban mobility projects that have a promising future. That's why we're looking forward to getting the results from Fraunhofer IAO on how we can use cell phone data for transport planning and design in Stuttgart."

The potential of data analytics for traffic and the environment

Telefónica Deutschland hopes that the results of the study will provide it with further valuable insights for its work in the field of advanced data analytics. The telecommunications company is already running a pilot project in Nuremberg to investigate the extent to which air pollution can be calculated on the basis of cell phone data. The results of Fraunhofer IAO's project will provide further insights into the potential benefits of data analytics for transport and the environment.

Prof. Anette Weisbecker, deputy director of Fraunhofer IAO, explains how the study will help: "It's a complex business getting precise measurements of traffic flows in cities. Our study will reveal the extent to which transport planners could use mobile phone data to achieve more accurate, efficient and cost-effective results."

The study forms part of the broad array of research conducted by the Fraunhofer IAO in the mobility arena. The Institute is carrying out numerous studies to determine how people choose to be mobile, both now and in the future. It uses its expertise in this area to help companies and institutions introduce new business models and efficient processes.

Provided by Fraunhofer-Gesellschaft