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INDRA DEVELOPS A SOLUTION THAT USES ARTIFICIAL INTELLIGENCE AND BIG DATA TO REDUCE TRAFFIC AND DRIVE SUSTAINABLE MOBILITY

- **The company leads the European R&D&i project BeCamGreen, which will perfect and test, in a real scenario with traffic, a system that enables the automated identification of vehicle types and their number of occupants, in real time and with unique precision**
- **The solution allows traffic managers to know mobility patterns and define policies to promote the use of public transportation, high-occupancy and low-emission vehicles, and apply discounts, penalties, access restrictions, etc.**
- **Indra reinforces its commitment to sustainability and innovation in transport with this pioneering solution, based on the analysis of macro data and using state-of-the-art computer vision technologies, *deep learning* and multispectral analysis**

Madrid, August 31, 2017.- Indra, a leading global consulting and technology company, is leading the European R&D&i project BeCamGreen, with the goal of developing a solution based on computer vision and big data, to contribute to reducing traffic, especially of vehicles with a single occupant, and boosting new policies on sustainable mobility.

This innovation activity in the area of the digital cities is financed and carried out within the EIT Digital, a leading European digital innovation and entrepreneurial education organisation driving Europe's digital transformation, and it counts with the participation of the Polytechnic University of Milano. The project intends to take advantage of previous studies to perfect and test, in a real scenario with traffic, a product that is fully marketable and unique, for the automated, real-time and highly precise identification of the type of vehicle traveling on the road and its number of occupants, in both front and back seats.

The solution will make it possible for local authorities and other transport infrastructure managers, like road and parking operators, to know mobility patterns and define strategies and policies to reduce traffic congestion, prioritize and promote the use of public transportation, high-occupancy and low-emission vehicles, with the resulting improvement in traffic, air quality and noise levels.

The automated and precise characterization of vehicles and occupants, combined with data processing and analysis, will facilitate better knowledge of traffic, the application of discounts or penalties, for example, variable rates at parkings or tolls; access restrictions to certain roads, especially in city centers, depending on the passengers or vehicle type, license plate number, etc. It will also contribute to promoting shared transportation among citizens: public transport, car-sharing, high occupancy, low emissions, dissuasive parkings, etc.

Currently, the implementation of these types of measures and the detection of infringement entails surveillance and dissuasive controls by traffic authorities, which is complex and hardly effective or reliable in scope. BeCamGreen intends to culminate in the development of a commercial product that is reliable and reasonably priced to address a real market need. Currently this type of solution is being demanded in USA, where the number of HOV/HOT (High Occupancy Vehicles / High Occupancy Toll) lanes is increasing. In Europe, this solution intends to be a key element also for the demand management and city



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access strategies that are being gradually deployed in many cities since the past few years, based on the number of occupants, type of vehicle, plate or peak hours.

Computer vision, *deep learning* and multispectral analysis

BeCamGreen will develop an automated, non-intrusive solution, thanks to the use of state-of-the-art big data, computer vision, *deep learning* and multispectral analysis technologies.

Indra will work on the evolution and improvement of the image processing algorithms for face and body detection that the company started to develop in previous R&D&i projects in which it has participated, like DAVAO. To reach the highest precision, the company will include better vision equipment and will combine these algorithms with new ones to improve accuracy. Furthermore, the solution will include multispectral analysis for detecting human skin to avoid false or erroneous detections, helping to differentiate a doll or “dummy” from a person, for example. The goal is to incorporate cutting-edge technology, in both hardware and software, to increase the system's precision and cut investment and operating costs for potential clients.

The Polytechnic University of Milano will focus on developing a big data engine to detect and predict traffic situations by using and integrating data in real time from IoT sensors, social networks, different types of *open data* and of the vision subsystem itself developed during the project. This real-time macro big data engine will contribute valuable information to help managers in their decision-making and in validating and improving their mobility management strategies.

About Indra

Indra is one of the main global consulting and technology companies, the top IT firm in Spain, and the technology partner for the core operations of its clients businesses worldwide. It offers a comprehensive range of proprietary solutions and cutting-edge services with a high added value in technology, which adds to a unique culture that is reliable, flexible and adaptable to its clients' needs. Indra is a world leader in the development of end-to-end technology solutions in fields such as Defense & Security, Transport & Traffic, Energy & Industry, Telecommunications & Media, Financial Services, Electoral Processes, and Public Administrations & Healthcare. Through its Minsait unit, it addresses the challenges of digital transformation. In 2016 Indra posted revenues of €2,709m and had a workforce of 34,000 professionals, a local presence in 46 countries, and sales operations in more than 140 countries. Following its acquisition of Tecnom, Indra's combined revenues amounted to more than €3,200m in 2016 with a team of nearly 40,000 professionals.