INDRA LAUNCHES TESTS OF THE AUTONOMOUS VEHICLE IN MADRID, WITHIN THE FRAMEWORK OF THE AUTOCITS PROJECT

- **This European project for innovation, led by Indra, also includes pilots in Paris and Lisbon, and its goal is to contribute to adapting regulations, traffic control centers and infrastructures to autonomous driving**

- **The Bus-HOV lane of the A-6 highway is used for testing and deploying the cooperative equipment and systems developed by the project, which enables vehicle-infrastructure information exchange, and which been integrated in Indra's Horus traffic and tunnel management solution**

- **AUTOCITS will allow for autonomous vehicles to circulate in urban nodes and across different European countries, promoting their safe coexistence with other vehicles and adapting the regulatory framework and traffic rules to the autonomous vehicle**

Madrid, October 11, 2017. Indra, one of the foremost global consulting and technology companies, has launched the deployment of the pilot in Madrid of the AUTOCITS European innovation project, that will test autonomous driving in the metropolitan area of Spain's capital, as well as in Lisbon and Paris. These three cities, the largest in the Atlantic Core Network Corridor, comprise roads that are regarded as priorities for developing Europe's transport infrastructure.

The project's goal is to contribute to modifying the regulatory framework, traffic control centers and infrastructures to autonomous driving to enhance the interoperability of autonomous vehicles while ensuring correct use on all types of roads in every country in Europe and safe coexistence with other vehicles. To achieve this, it will develop intelligent transport services based on cooperative systems (C-ITS) that will enable communication and safe exchange of data between vehicles, users and infrastructures, using the ITS-G5 European communication standard.

Three C-ITS services have been developed for the pilot in Madrid, which will broaden the autonomous vehicle's "vision" and enable decision-making through alerts; for example, notifications of construction work on the road, traffic jams or adverse weather conditions.

These C-ITS services have been integrated in Indra's proprietary Horus traffic and tunnel management solution, for which a new module has been created to manage the sending of information to the autonomous or connected vehicle as well as taking advantage of the data these vehicles generate, processing these in real time and providing valuable information for decision-making by managers, the connected vehicles themselves and drivers of conventional vehicles.

The in-cloud Horus platform obtains information from incidents through the DGT information channel using the DATEX2 protocol, a European standard for exchanging information among traffic control centers.

The first RSU (Road Side Units), that use various ITS-G5 communication and mobile communication technologies, are already being installed at the pilot scenario, the bus-HOV lane of the A-6 highway that connects with the M-30 beltway in Madrid. These devices will remit information to the autonomous and connected vehicles when they use the reversible, high-occupancy lane of the A-6.

In addition to the initial deployment, the first tests are being done with an autonomous vehicle in a closed circuit at Indra's facilities in San Fernando de Henares to verify that information is correctly sent and received. The tests at both this setting and the bus-HOV are being executed in line with DGT-approved regulations, which makes available to companies and research centers open regulations for performing tests, given the fact that it is not bound to the Vienna Convention.

Exchange of services among pilot projects

The pilots in Madrid as well as Lisbon and Paris are the very first of their kind in the Atlantic Core Network Corridor and among the first ones in Europe to include tests of autonomous vehicles, from different providers, both closed and open to conventional traffic on urban and arterial roads and highway interchanges. It is expected that the services and systems tested in one city will be exchanged with the other two to verify their interoperability and proper functioning.

The pilot in Lisbon will take place using the A-9 highway. Those C-ITS services to be deployed will send the autonomous vehicle alerts on traffic jams, notifications of slow or parked vehicles, and warnings about adverse weather conditions. For communications with the vehicles, six RSU (Road Side Units) will be installed, and at least two autonomous vehicles will be deployed, of the IPN and the Polytechnic University of Madrid (UPM), and an instrumented vehicle for validation tests of services and infrastructures alike.

In addition, for tests in more urban settings, another two low-speed autonomous vehicles will be used as shuttles on the IPN to transport passengers along a stretch of approximately 500 meters.

In Paris the system will issue warnings not only about dangerous situations but traffic jams as well, offer information on speed and recommended or alternative lanes, etc., using communications between the control center and autonomous vehicles. Tests will be performed on the A-13 highway on the city's outskirts.

Partnership ecosystem

In addition to Indra, participants in AUTOCITS include Spain's General Traffic Directorate (DGT), the Polytechnic University of Madrid (UPM), Portugal's National Road Safety Authority (ANSR), University of Coimbra (UC), Instituto Pedro Nunes (IPN) and Inventors for the Digital World (INRIA). The project has a budget of €2.6 million and receives funding by the CEF (Connecting Europe Facility) European program.

AUTOCITS collaborates, furthermore, with other European R&D&I initiatives on a European scale in this area, as for example, the C-Roads platform and C-Roads Spain project, as well as with other organizations interested in projects related with the connected and autonomous vehicle. To this end, a series of open sessions are underway to incorporate organizations interested in this field, so that they may contribute their vision about the autonomous vehicle and the activities carried out over the course of the project.

The last workshop was held on October 10 in Lisbon. The President of the ANSR, Jorge Jacob, closed the session, which also counted with the participation of companies and institutions like BRISA, ITS Portugal, IMT and Indra itself.

The open sessions held previously in Madrid and Paris counted with organizations like DGT, SACYR, Ferrovial, OHL, Mapfre, the Road Technology Platform (PTC), PONS Foundation, COMSIGNIA, YOGOKO, Vedecom, AutoKAB and VICI.

About Indra

Indra is one of the world's top consulting and technology companies, the leader in IT in Spain, and the advanced technology partner for core business operations of its customers everywhere. 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 and Security; Transport and Traffic, Energy and Industry, Telecommunications and Media, Financial Services, Electoral Processes, and Public Administrations and 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 Tecnocom, Indra's combined revenues amounted to more than €3,200m in 2016 with a team of nearly 40,000 professionals.