InTraDE
Intelligent Transportation for Dynamic Environment

NEWSLETTER JANUARY-JUNE 2012

InTraDE: ITS SYSTEMS AT THE CORE OF EU RESEARCH

The European Commission's Communication Freight Transport Logistics Action Plan [COM(2007)607] states that "*the deployment of Intelligent Transport Systems (ITS) in helping to better manage infrastructure and transport operations is slow*".

The InTraDE project partnership has been working jointly since 2009 to develop a technology which can effectively assist ports in the management of freight traffic by utilising an innovative Intelligent Autonomous Vehicle (IAV). Because the scheme is due to finish in June 2013, the researchers and industry collaborators are currently relentlessly operating to complete all the preparation programme tasks on time.

According to Rochdi Merzouki, InTraDE Project Manager and Professor at the Ecole Polytechnique Universitaire de Lille, "*2012 is a key year for the project. Much has been achieved so far by our transnational team of experts on the system's simulation and supervision. We expect that the prototype implementation planned for September and relevant validation tests in the ports of Le Havre, Dublin, Rouen and Oostende will help us demonstrate the functionality and feasibility of the IAV and that all our efforts will pay off*".

ITS IN EUROPE

Intelligent Transport Systems (ITS) can significantly contribute to a cleaner, safer and more efficient transport system. A new legal framework (Directive 2010/40/EU) was adopted on 7 July 2010 to accelerate the deployment of these innovative transport technologies across Europe.

ITS include telematics and all types of communications in vehicles, between vehicles (e.g. car-to-car), and between vehicles and fixed locations (e.g. car-to-infrastructure). However, ITS are not restricted to Road Transport - they also include the use of information and communication technologies (ICT) for rail, water and air transport, including navigation systems.

InTraDE SIMULATES PORTS ENVIRONMENTS

Analysis of virtual movements of goods have been increasingly being used by port authorities all around the world to optimise their operations, performance and strategies for infrastructure development and cost reduction. Software platforms allow to reproduce the configuration of a given area, simulating contingencies such as weather events, bottlenecks, etc.

The InTraDE partners LAGIS (Laboratoire d'Automatique Génie Informatique et Signal of the Lille Polytechnic) and LOOM (Liverpool John Moores University) together with the company OKTAL have developed port environment simulators for the ports of Le Havre, Rouen, Dublin and Oostende. Videos are available on the project website at www.intrade-nwe.eu/project-live.

The functioning of the integrated simulator, finished IAV prototype and supervision system will be tested in the port locations in the forthcoming months.

Although significant and steady progress has been made, a few challenges have also been encountered in the project implementation. At the Dublin Institute of Technology, for example, Kay McGinley highlighted that the main -and unexpected issue- has been "*finding a postgraduate with the qualifications to come on board to initiate space optimisation*". This proves how in Europe skills are still difficult to find in some high-tech or greatly specialised sectors.
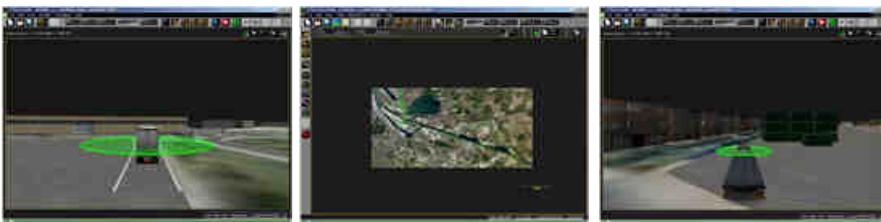
THE EUROPEAN COMMISSION APPOINTS THE ITS ADVISORY GROUP

Pursuant to Article 16 of Directive 2010/40/EU, the Commission set up, in its Decision of 4 May 2011 (2011/C 135/03), a group of experts on Intelligent Transport Systems (the European ITS Advisory Group). On 27 January 2012, the members were appointed by Mr. Matthias Ruete, Director-General for Mobility and Transport DG. The list is available on the Register of Commission Expert Groups (http://ec.europa.eu/transparency/regexpert/detailGroup.cfm?groupID=2736).

The task of the EU ITS advisory Group is to advise the EC on business and technical aspects of the deployment and use of ITS in the Union. The team is composed of 25 members from relevant ITS services providers, associations of users, transport and facilities operators, manufacturing industry, social partners, professional associations, local authorities and other relevant fora.

InTraDE will try and establish contacts with the Group in the next months.

InTraDE EXPLAINS THE ADVANTAGES OF IAVs IN PORTS

The Intelligent Autonomous Vehicle developed by InTraDE is expected to deliver distinct performance, operational and environmental benefits to the small and medium sized ports adopting it. These include:

- Optimised traffic management
- Energy efficiency
- Pollution minimisation and improved air quality
- Acoustic emissions reduction.

The InTraDE IAV, which is battery operated, does not have to follow designated routes. Its unique feature is the ability to operate unmanned without rails or other similar expensive infrastructures set into the ground. This makes it more economically and environmentally effective.

The IAV is guided by a remote control system which allows enhanced traffic management and space optimisation, two qualities necessary in modern port logistics. The vehicle is also flexible: it works as a single unit, but it can be connected to others to form a platoon such as a train with locomotives.

Wim Stubbe, Business Development manager at the Port of Oostende, commented: *"Due to the spatial and financial constraints they are facing, it is a challenge for smaller ports to search for an innovative and cost effective way to handle goods. Therefore, it is important to investigate how IAVs / semi IAVs can be utilised in smaller ports in an energy efficient and flexible way, where many diverse goods are handled. The port of Oostende counts on the intelligence of the researchers to develop a vehicle that can operate in these port conditions. We look forward to organizing the tests at the end of the year in our port.".*

The InTraDE RobuTAINeR prototype

InTraDE LOOKS FOR CONTACTS TO TEST ITS TECHNOLOGY TRANSFERABILITY

Different types of AGVs are currently used in a few industries, such as PHARMACEUTICAL, CHEMICAL, MANUFACTRING, AUTOMOTIVE, PAPER AND PRINT, FOOD AND BEVERAGES, HOSPITAL, WAREHOUSING. Most of them are mainly wire trucks, laser or magnetic tape navigated. Hybrid versions -which help reduce the environmental impact of terminal operations- have recently been adopted, e.g. by Rotterdam's ECT Euromax terminal.

Automation is recognised to be one of the best ways to enable significant operational cost savings. The InTraDE partners believe that the IAV technology developed by the project could be transferred to other environments such as AIRPORTS, RAIL FREIGHT YARDS, BUS ROUTES, CAMPUSES, MUSEUMS, even FARMS. A study co-financed by InTraDE will eventually analyse in detail its possible future exploitation and applicability.

Robin Poté, Director at CRITT Transport & Logistique, said: *"We are keen to contact stakeholders outside the maritime sector to explore the technology's potential. Public transport operators, Chambers of Commerce and Industry and other possible end users can help us enhance the technological specifications of our prototype and analyse the feasibility of its adaptation to different usages and vehicles. The economic studies we have been conducting demonstrate that this type of solution is relevant for several industrial applications, such as container transfer and movements of goods inside an industrial site. We therefore intend to explore these opportunities to transfer the technology".*

ARE YOU INTERESTED IN THE InTraDE IAV? WOULD YOU LIKE TO DISCUSS ANY POTENTIAL APPLICATION OF THIS TECHNOLOGY WITH THE PARTNERSHIP?
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IAV or AGV for ports?

The first Automated Guided Vehicle (a tow truck that followed a wire in the floor instead of a rail) was installed in 1954 at Mercury Motor Freight in Columbia by an American company based in Illinois. Over the years the technology has become much more sophisticated. In the early 1990s it was the Europe Container Terminals in Rotterdam to pioneer the introduction of AGVs in EU.

Not long ago new generation diesel-hybrid and fully-automated battery-powered AGVs have been put into regular fleet service (e.g. in Hamburg). AGVs are now extensively used in the Maritime Industry worldwide and already have several applications on the market.

The InTraDE partners believe that their IAV's higher flexibility and intelligence in manoeuvre in the area where the logistics operations take place will prove that it is technologically superior to the existing AGVs and could potentially become a valuable asset especially for SME ports.

AGV for containers

AGV system in a hospital

AGV system recently installed at a UK FMCG (Fast Moving Consumer Goods) factory

INTRADE SHOWCASED AMONG ECO-INNOVATIVE COMPANIES

9 February, Calais. In occasion of the cross-border Business to Business event "Eco-innovation a bon port" organised by the Interreg IVA 2 Seas PATCH (Ports Adapting To Change) project, InTraDE introduced its innovative concept to an appreciative multi-sector audience, gaining considerable attention from various industries and port authorities (www.calais-port.fr/en/2012/02/20/b2b-eco-innovation-on-february-the-9th-report).

Mohamed Benmerikhi, the IntraDE Coordinator who participated in the event, explained that the latter *"showed particular interest in attending future pilot demonstrations of the Robutainer later this year"*.

INTRADE UNVEILS ITS SIMULATOR & SUPERVISION SYSTEM

22 June, Polytech'Lille. At the trans-national workshop "Simulation Integration and ITS system demonstrations", the InTraDE partners unveiled the results of the produced port simulators (that allow the functioning of the project prototype) to a varied team of experts and observers. The event focused on: - Online Simulation of IAVs in port environments using the SCANeR Studio real-time simulation platform (software developed by OKTAL); - Offline Simulation of IAVs in port environments using the FlexSim platform; - On-line supervision.

As noticed by Prof. Jin Wang, Director of the Liverpool LOgistics, Offshore and Marine Research Institute, *"the event gave the partners the opportunity of visually assessing the developed intelligent control and surveillance systems. We were pleased to receive very positive feedback from professional delegates"*. Dr. Zaili Yang, co-Director of LOOM, added: *"Because of its low investment requirement and flexibility and accessibility in operation, IAV shows strong competition in improving port efficiency, thus attracting interests from ports, especially those with the plan of developing automated container terminals"*.
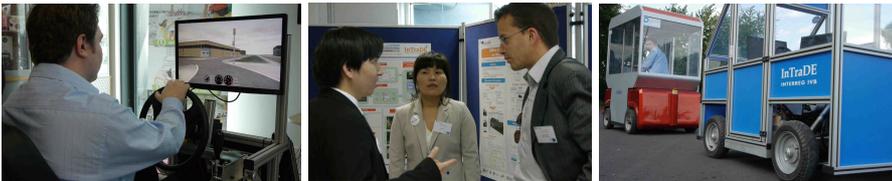
INTRADE CONTINUES ITS COLLABORATION WITH THE INDUSTRY

The EC recommends that ERDF co-funded projects utilise the so-called "triple helix" approach in their implementation, i.e. the joint working of three types of actors: university-industry-government. The InTraDE partners have welcomed this kind of model which captures multifaceted and complementary roles and synergies, acknowledging that the interaction of research, delivery and policy can more easily enable innovation and foster technological change. Within the framework of InTraDE, close cooperation has been reached with 2 companies, Oktal and Robosoft, whose expertise is helping concretely achieve the project's goals. François Charpillet, Director of the National Institute of Research in Automatics and Computer science stated: *"In the MAIA team, a joint research group between INRIA & Laboratoire Lorrain de Recherche e Informatique et ses Applications we specialise in Artificial Intelligence and virtual reality. Although we are a knowledge centre, we understand the need to transfer our scientific results to real life by creating partnerships with industrial players in the field, stakeholders and decision-makers. InTraDE is a good example of this effort"*.

THE InTraDE IAV:

° Hybrid drive, battery operated, plug-in, with a build-in thermal generator (GPL) to ensure unconditional autonomy.
° Two degrees of mobility x and y to steering control.
° Totally operable by a remote control computing in virtual environment.
° Ability of pairing/unpairing enabling a pair of 1-TEU (20-foot Equivalent Unit) IAVs join and transport any size between a 1-TEU and a 1-FFE (40-foot Equivalent) containers.
° Feed-back to the remote control by sensors (GPS, lasers, ultrasonic)
° 4 wheels drive, 4 wheels steering on 360°, integrated suspensions.

OKTAL

Headquartered in Toulouse, Oktal (www.oktal.fr) designs, manufactures and provides simulation software and systems for the Aero-space, Defence, Automotive and Rail industry. Its software SCANer can easily create complex driving situations for driver training & driver bahaviour analysis.

Oktal is providing the InTraDE project with the SCANeRStudio software which allows for real-time testing and driving simulation.

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ROBOSOFT

Founded in 1985 as a spin-off of INRIA and located at Bidart, in the south west of France, Robosoft (www.robosoft.com) designs and supplies advanced robotics solutions and transport systems for people and goods. It aims at drastically reducing costs and improving the quality of transport, cleanliness, health and security thanks to its set of mobile robots and the "robuBOX", an original embedded control technology.

Robosoft has been selected by the InTraDE consortium as a sub-contractor to develop and supply the intelligent, omni-directional vehicle able to carry containers.

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WHAT IS INTRADE?

InTraDE - Intelligent Transportation for Dynamic Environment (www.intrade-nwe.eu) is a €7m project 50% co-financed by European Regional Development Funds under the Interreg IVB trans-national cooperation North West Europe Programme. Started in 2009 and led by the Polytechnic of Lille, it brings together seven partners from France, Ireland, Belgium and the UK:

- University of Science and Technology of Lille (USTL-LAGIS)
- Institut National de Recherche en Informatique et Automatique (INRIA-LORIA)
- South East England Development Agency (SEEDA) - abolished in March 2012
- Centre Régional d'Innovation et de Transfert de Technologie - Transport et Logistique (CRITT TL)
- Port of Oostende (AGHO)
- National Institute for Transport & Logistics, Dublin Institute of Technology (DIT)
- Liverpool John Moores University (LOOM)

The project intends to design, test and validate innovative intelligent transport vehicle prototypes (autonomous and human-driven) to utilise in port areas or urban-confined spaces. The main objectives are to reduce traffic, improve operational effectiveness and mitigate adverse environmental effects.

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FUTURE InTraDE EVENTS

- October 2012: testing of InTraDE prototype in the port of Radicatel (Rouen)
- November 2012: testing of InTraDE prototype in the port of Dublin
- December 2012: testing of InTraDE prototype in the port of Oostende
- June 2013: InTraDE final conference

OTHER EVENTS

- 06/08/2012: Intelligent Transport Systems (ITS) in Hong Kong: Recent Development and Future Applications, New York (www.utrc2.org/events/events.php?viewid=326)
- 25/09/2012: RTIC Conference, London (http://conferences.theiet.org/rtic/about/index.cfm)
- 03/10/2012: GreenPort Congress, Marseille (www.greenport.com/congress)
- 08-10/10/2012: 40th European Transport Conference , Glasgow (http://www.aetransport.org/lc_cms/page_view.asp?id=22)
- 10-13/10/2012: Transport Systems Telematics 2012, Katowice (http://www.tst-conference.org/index.php?page=home&lang=en)
- 18/10/2012: ITS (uk) Enforcement conference (http://www.its-uk.org.uk/events)
- 22-26/10/2012: ITS World Congress, Vienna (http://2012.itsworldcongress.com)
- 20-22/11/2012: EasyWay Annual Forum It's time for ITS..., London (http://www.easyway-its.eu/events/2012-London)
- 27-30/11/2012: FISITA World Automotive Congress, Beijing (http://www.fisita.com/events/congress)
- 26-28/06/2013: IFAC Symposium on Intelligent Autonomous Vehicles, Brisbane (www.iav2013.org)
- 07-09/10/2013: IEEE ITSC 2013, The Hague (http://ieee-itsc13.org/)
- 09/10/2013: GreenPort Congress, Rotterdam (www.greenport.com/congress)
- 14-18/10/2013: ITS World Congress, Tokyo (http://www.its-jp.org/tokyo2013)

ITS NETWORKS

Creating valuable networks for collaboration can be fundamental to exchange know-how, evaluate and compare best practices or even just obtain key contacts. For Intelligent Transport Systems and Services stakeholders in Europe, the main reference point is ERTICO - ITS Europe (www.ertico.com).

The body was founded at the initiative of leading members of the European Commission, Ministries of Transport and the EU Industry. ERTICO connects 100 partners (public authorities, industry players, infrastructure operators, users, national ITS associations and other organisations) together. In the past, it has played a key role in advancing:

- TMC standards;
- an open framework for telematics services;
- next generations of preventive safety systems;
- next generation of digital maps & associated applications;
- the technical framework for interoperable tolling in Europe;
- global implementation of ITS together with ITS America and ITS Japan.

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ITS WORLD CONGRESS

The World Congress on Intelligent Transport Systems is an international meeting and exhibition that rotates among three major geographic regions (Americas, Europe and Asia Pacific) annually.

The 2012 edition will be held in Vienna from 22 to 26 October. Focusing on the benefit of ITS for all traffic users, it will gather over 300 international exhibitors and attract over 10,000 senior ITS professional visitors from more than 60 countries worldwide

ITS products and solutions will be presented across 15,000 square metres.

For info: http://2012.itsworldcongress.com