

## **ECTRI'S ROLE IN THE STRUCTURATION OF THE TRANSPORT EUROPEAN RESEARCH AREA**

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### **ABSTRACT**

ECTRI, the European Conference of Transport Research Institutes, was established in early 2003 in order to contribute to the development of the land transport issue within the European Research Area. The association comprises 20 institutes, representing 17 countries from the enlarged European Union. Its role is more and more significant in the dialogue with the services from the European Commission (CE) for all of the preparation phases of the calls for tenders concerning the Research and Development Framework Programs. The association assists its members to send relevant replies to these calls for tenders. For this purpose, the association is structured with thematic working groups. Thus the association is the place to create a research offer in the field of transport within the European Research Area.

ECTRI also is a scientific network for exchanges between research institutes. Each of ECTRI's members wishes to reinforce its position in its own country, which implies the development of European and international partnerships. The association is a knowledge centre in the field of transport within the European Research Area.

ECTRI has obtained, or has contributed to obtain significant success for the development of research in field of transport, for example:

- A memorandum of understanding (MOU) was signed with the American Transportation Research Board (TRB) in January 2006 which, on the one hand will enable many cross-Atlantic exchanges, especially in the frame of the SHRP2 program (in the perspective of a reciprocal European program); on the other hand, it acknowledges ECTRI as the relevant interlocutor for European transport research, beyond the European borders.
- A strategic research agenda on urban mobility was adopted in the framework of the « Urbamove » initiative. This initiative was followed by the financing by the Commission of a research project on urban mobility, intending to formalize a European research agenda on this issue (project EURFORUM where ECTRI is participating); the initiative was followed by the introduction of a sub-topic on sustainable urban mobility within the transport issue of the 7th PCRD. In the meantime the Commission has launched the preparation of a Green Book on urban transport.

ECTRI members have organized with each other a significant exercise of “benchmarking”, which reinforced them in their strategic analysis. According to this exercise, the European Research Area is rapidly restructuring, with the emergence of different type of "clusters" in many countries, (i.e. regional and/or thematic issues). However these clusters are as many opportunities to make our research topics progress, thanks to new combinations of

national partnerships, which will in turn be articulated on the European level. It is the French example of the competitiveness poles, the German example of the Fraunhofer Institutes or the European example of the "knowledge regions".

As regards the road and land transport field, a very interesting example is the establishment of the MOV'EO competitiveness pole in France, which is structured around the former military test tracks, contributing to prepare the future intelligent and communicating highway, through its research programs.

## **1. A BRIEF PRESENTATION OF ECTRI**

ECTRI was established in 2003, after to two years of exchanges between its future members. While several European associations were existing, none of them was intended to cover the whole field of land transport, especially as regards its multimodal dimension.

### **1.1. The ECTRI members:**

Five new members joined the original fifteen charter members. Today, ECTRI counts 20 members, from 17 countries, that is a potential of 2 800 researchers and engineers and a total budget of about 282.6 million Euros.

### **1.2. The thematic working groups**

The association has implemented a set of working groups, which are structuring the association's work. Some of them are transverse groups, some others are thematic groups:

#### **1.2.1 *The transverse groups***

There have been three transverse working groups since the establishment of ECTRI in 2003:

A Working Group on Mobility and Training (WG2) which objectives are:

- To tackle the attraction and the preparation of the next steps of mobility and training of transport scientists including the next generation
- To discuss all the elements of "actions to promote human resources and mobility" including or not proposals to Marie Curie programme, exchanges of researchers, post-doctorate and doctorate students
- To define the most suitable areas for action at short, medium and long terms

11 Institutes of ECTRI are involved: POLITO (Moderator, Italy), CDV (Czech Republic), DLR (Germany), DTF (Denmark), HIT (Greece), INRETS (France), ITS (Poland), TØI (Norway), TRL (United Kingdom), UPM (Spain), and VTI (Sweden).

One of the main activity of this WG is the Young Researchers Seminar jointly organised with FERSI and FEHRL. The idea of this seminar is to prepare a new generation of transport scientists and science based professionals in the area of traffic and transport. It aims to enable the networking of young transport researchers belonging to ECTRI, FERSI and FEHRL members and to train young researchers, by tutorial means and through a retroactive manner to elaborate, prepare and present written and oral scientific communications. It used to take place every two years, in different locations in Europe. For

the time being, 3 Seminars took place: in Lyon, France (December 2003), in the Hague, The Netherlands (May 2005) and in Brno, Czech republic (May 2007).

Other activities of this WG are related to the participation to the Marie Curie actions (under FP6) and to the people Workprogramme (FP7).

A Working Group on Hard Research Facilities (WG3) which objectives are:

- To assess the feasibility of creating a European transport research facilities agenda (except the soft issues viewed by WG 4) by distinguishing existing and new ones
- While taking into account the ECTRI survey, INTRANSNET and TREE projects surveys, to discuss all the elements contained in an integrated infrastructure initiative such as: opening, access to existing infrastructure, survey on new needs and the scope of these elements
- To define the areas which are most suitable for such new infrastructures and their roles for research, certification or testing

11 Institutes are involved: FHG-IVI (Moderator-Germany), CDV (Czech Republic), DLR (Germany), HIT (Greece), INRETS (France), POLITO (Italy), TNO (Netherlands), TRL (United Kingdom), UPM (Spain), VTI (Sweden), and VTT (Finland).

A first report “ECTRI – Research infrastructures, survey results” was produced in 2002. The group also took part in the preparation of several projects or studies dealing with facilities testing.

At last, a Working Group on Soft Research Infrastructures (WG4) which objectives are:

- To assess the feasibility of creating a European transport research soft infrastructures agenda notably for libraries, databases, ICT networks of works, Visio conferences, ... (at the exception of hard facilities)
- To discuss, by distinguishing existing, new ones and their interoperability, all the elements contained in an integrated infrastructure initiative such as: opening, access, networking, integrating survey on adaptation or new needs and the scope of these elements
- To define the areas which are the most suitable for integration and their role in front of the European and international excellence of ECTRI networks as a whole

6 institutes are involved: DLR (moderator - Germany), AVV (Netherlands), CDV (Czech Republic), INRETS (France), UPM (Spain), and VTI (Sweden).

So far, the WG has developed a web-based database containing basic information on all ECTRI's institutes, contact people, main research activity areas, libraries, and datasets. This database is about to be opened to the full ECTRI Community.

### **1.2.2 The thematic groups**

The ECTRI Working Group on Urban Mobility (WGA) has been created in 2004, further to INRETS initiative, with the following aims:

- To prepare by May 2005, as first action, a Strategic Research Agenda on Urban Public Transport Mobility to be presented at first place at the 56<sup>th</sup> UITP World Congress and Mobility and City Transport Exhibition at Rome in June 2005
- To define a working programme in this area for actions at short, medium and long terms,
- To propose some common reflections about research needs in urban mobility to European, National and Regional Institutions.

The Working Group is currently composed of the representatives of the 15 following organisations: AVV (Netherlands), CDV (Czech republic), CEDEX (Spain), HIT (Greece), DLR (Germany), DTF (Denmark), INRETS (Moderator-France), POLITO (Italy), TNO (Netherlands), TØI (Norway), TRL (United Kingdom), UPM (Spain), VGTU-TMI (Lithuania), VTI (Sweden), and VTT (Finland).

In accordance with the above terms of reference, this first action was undertaken and the working group has prepared URBAMOVE – Urban Mobility Initiative – issued in June 2005, which proposes a Strategic Research Agenda for Urban Mobility in the European Union. The research themes developed in this document provide an input to complement the strategic research agendas of existing technology platforms. Whereas specific highlight is given to public transport, the research themes listed apply to all urban modes, motorised or non-motorised, with a view to bring global solution to urban mobility problems. (This document is downloadable on the ECTRI website: <http://www.ectri.org>.)

After the URBAMOVE publication, the WG experts have been invited to participate in the EURFORUM (European Research Forum for Urban Mobility) project. This FP6 project is a Coordination Action funded by the EC and coordinated by UITP; besides ECTRI, the 5 other partners involved are the Technical University Dresden, CERTU, ASSTRA, POLIS, and EMTA.

The objective of EURFORUM is to create a forum at a European level, effectively representing stakeholders of European research on urban mobility, including representatives from local authorities, public transport associations, research bodies, etc. It focuses on a better and more innovative coordination of research serving urban mobility of people and goods. This forum will also provide recommendations for the coordination of European research on urban mobility issues in order to:

- help structure the supply side of European research in this area,
- pave the way to make Europe a real competitive global player in the field of urban mobility,
- reduce the overall cost of urban mobility,
- increase the attractiveness of public transport, walking and cycling, while encouraging a more rational use of motorised traffic.

EURFORUM covers all private and public transport modes and focuses both on technology-oriented and on policy-oriented research. The project pays special attention to urban mobility challenges in the New Member States.

This project was launched in April 2006 and will last until the end of 2007.

At last, the WG has recently prepared an input to the EC green paper on Urban Transport.

In its Communication on the mid-term review of the 2001 Transport White Paper (Keep Europe moving – Sustainable mobility for our continent. COM (2006) 314 final) the Commission announced the publication of a Green Paper on urban transport in 2007 to identify potential European added value to action that is taken at the local level.

The Green Paper will examine whether obstacles to successful urban transport policies exist at the EU level. In addition, it will examine where, whilst fully respecting the subsidiarity principle, there is a consensus among stakeholders to develop and implement joint solutions. The Green Paper will form the basis for the development of a European policy on urban transport as part of European transport policy. The Green Paper will address all transport modes, including walking, cycling, motor cycles and motor vehicles, and will cover both urban freight (and logistics) and passenger transport.

The European Commission launched a consultation to which ECTRI has answered last April 2007. ECTRI has welcomed the initiative taken by the Commission to propose such a Green Paper on urban transport and contributed to the debate by proposing some ideas concerning what research areas should be pursued as most appropriate in the field of urban mobility in order to significantly improve mobility and quality of life in urban areas. (This document is available on the ECTRI website).

Further to the successful experience of the WG on Urban Mobility, ECTRI will pursue this effort on deepening the internal cooperation between its members. This idea goes through strengthening the thematic research cooperation among the members in terms of joint research issues. This form of cooperation will be achieved by 6 new Thematic Working Groups which have been recently created on the following themes:

- TWG B - Traffic Safety & Security
- TWG C – Energy and Climate Change
- TWG D – Freight Transport (incl. logistics, technology)
- TWG E - Intelligent Transport Systems and Intelligent Infrastructures
- TWG F - Mobility (socio-economic, demographic e.g. elderly and disabled people, policy aspects)
- TWG G – Transport Economics and Policy

## **2. FIRST ASSESSMENT AND ECTRI PROJECTS ON THE ROAD ISSUE**

ECTRI Members are involved in 67 projects within FP6 which about 20 concern road issues. These road-related projects include 2 Networks of Excellence (NOE) officially supported by ECTRI, 6 Integrated Projects (IP), 7 Specific Targeted projects (STREP), 2 Coordination actions (CA), and 2 Specific Support Actions (SSA).

These projects are listed herewith by including the name, the objective, the ECTRI Members' involvement and the project related thematic (safety, sustainability –incl. environmental-, Intelligent Transport Systems and behavioural issues).

**HUMANIST:** *Human centred design for Information Society Technologies* (**NOE** - DG INFSO)

This Network of Excellence has started in March 2004 and aims at creating a European Virtual Centre by setting up strong connections within its Network members, promote exchanges with Universities and Academic Institutes outside the Network through training programmes and support the involvement of young researchers in the European road transport safety research.

22 partners including 10 ECTRI members: ERT-INRETS (Coordinator), CERTH/HIT, CDV, DTF, TNO, TOI, VTT, VTI, UPM and TRL.

*Related Thematic: Road, Intelligent Transport System (ITS), Behavioural, Safety*

**APSN:** *Advanced Passive Safety Network* (**NOE** – DG RTD)

The aim of this Network of excellence that started in April 2004 is to create a durable integrated European vehicle passive safety research and implementation program and

creation of permanent virtual organisation in the field of passive safety for road transport. This project includes 53 participants including 5 ECTRI members: TNO Automotive (coordinator), FHG, INRETS, UPM and TRL.

Related Thematic: Road, Safety

**APROSYS:** *Advanced Protection Systems (IP DGs RTD, INFESO, TREN)*

This Integrated Project will focus on scientific and technology development in the field of passive safety (crash safety). The field of passive safety concerns in particular human biomechanics (injury mechanisms and criteria), vehicle and infrastructure crashworthiness and occupant and road user protection systems. The general objective of APROSYS is the development and introduction of critical technologies that improve passive safety for all European road users in all relevant accident types and accident severities.

The consortium consists of 47 partners. The TNO is the coordinator.

ECTRI common partners: TNO, TRL, FHG, POLITO, UPM and INRETS

Related Thematic: Road, Safety

**SafetyNet:** *The European Road Safety Observatory, an Information System to support road safety policy in Europe (IP DG TREN)*

This Integrated Project defines a project to build a European Road Safety Observatory as defined in the EC White Paper on Transport Policy. The Observatory addresses the specific need for co-ordinated accident and injury data resources that will supply the basic information supporting safety policy decision making at EU and national level. The project meets the requirements for independent accident and injury data and related information that is freely available as specified in the call.

There are 22 partners. The VSRC (UK) is the coordinator.

ECTRI common partners: INRETS, CDV, TOI, KTI, TNO and TRL

Related Thematic: Road, Safety

**PREVENT:** *PREVENTive and Active Safety Applications (IP DG INFESO)*

The key objective is to develop, test and evaluate safety-related applications, taking advantage of advanced sensors and communication devices integrated into on-Board systems for driver assistance.

There are 51 partners from Industry, Public Authority, Institute, University, Public and Private Organizations. Daimler-Chrysler is the coordinator.

ECTRI common partners: AVV, CERTH/HIT, INRETS, VTT, FHG, TNO and TRL

Related Thematic: Road, Safety, ITS

**AIDE:** *Adaptive Integrated Driver-vehicle interface (IP DG INFESO)*

The project is a part of the Integrated Safety Program. The general objective is to generate the knowledge and develop the methodologies and human machine interface technologies required for safe and efficient integration of multiple driver assistance and information functions into the driving environment, thus maximising the efficiency of ADAS (Advanced driver Assistance systems) and minimising negative effects of IVIS (In-Vehicle Information System).

This project includes 28 partners. Volvo (Sweden) is the coordinator.

ECTRI common partners: INRETS, TNO, VTT, VTI, CERTH/HIT

Related Thematic: Road, ITS, Behavioural, Safety

**SILENCE:** *Quieter surface transport in Urban Areas (IP DG RTD)*

This project emphasizes on refining solutions for attenuation at source and considering noise propagation and the potential effect on noise nuisance. The investigations on noise generation in this project related principally to private cars, public transport and heavy rail applications.

FEHRL project with ECTRI Members involvement: TRL, TOI, VTI

Co-ordinator: AVL.

Related Thematic: Rail, Road, Environment

**DRUID:** *Driving under the Influence of Drugs, Alcohol and Medicine (IP DG TREN)*

As consumption of psychoactive substances such as alcohol, drugs and certain medicines are likely to endanger the drivers' aptitude and impaired driving is still one of the major causes for road accidents, some active steps have to be taken to reach the goal of a 50% reduction in the number of road deaths in the EU. The objective of DRUID is to give scientific support to the EU transport policy to reach the 2010<sup>th</sup> road safety target by establishing guidelines and measures to combat impaired driving.

FERSI project including 36 partners, BAST (Germany) is coordinator.

ECTRI Members' involvement: DTF, HIT, INRETS, MTI, TNO, VTI, CDV, TOI

Related thematic: Road, Safety

**NR2C:** *New Road Construction Concepts (STREP DG RTD)*

The objectives of this project are as follows: to express and derive new concepts for the road of the future, from a more global perspective, to develop a number of targeted innovations of special interest, to fulfil society's most urgent needs concerning sustainable surface transport.

FEHRL project with ECTRI Members' involvement: VTI

Related thematic: Road, Sustainability

**IN-SAFETY:** *Infrastructure and safety (STREP DG TREN)*

This project aims to address the relation between infrastructure and traffic safety. The project will give better knowledge on how roads could be designed to get safe behaviour and minimise the probability for wrong behaviour. In particular, it aims to use intelligent, intuitive and cost-efficient combinations of new technologies and traditional infrastructure best practice applications, in order to enhance the forgiving and self-explanatory nature of roads. IN-SAFETY ambition is to significantly contribute to road safety enhancement by the optimal and balanced use of available resources.

The project work is based on a balanced amalgam of analysis of previous work results and concept, test and report of innovative concepts, in terms of combinations of new technological elements with traditional road infrastructure. These new concepts, along with promising but as yet untested or under-reported solutions, will be realised and extensively tested in 4 inter-related pilots Europe wide, covering all road types and including among others key drivers' cohorts, such as tourists, elderly and novice drivers.

30 partners and key subcontractors from 12 European countries undertake this challenging task.

ECTRI common partners: CERTH/HIT (Coordinator), CDV, KTI, TOI, VTI.

Related Thematic: Road, Safety, Behavioural

**RIPCORD:** *Road infrastructure safety protection-core research and development for road safety in Europe (STREP DG TREN)*

This project shall describe best practice concerning factors as: Indication and analysis of special accidental places, safety inspection on existing roads etc.

FERSI project with ECTRI Members' involvement: TOI, CDV, HIT, KTI. BAST (Germany) is the coordinator.

Related Thematic: Road, Safety

**RANKERS:** *Ranking for European Road Safety (STREP DG TREN)*

RANKERS is Europe's most comprehensive research initiative to date on road safety engineering. The overall objective of RANKERS is to develop scientifically researched guidelines on road infrastructure safety enabling optimal decision-making by road authorities in their efforts to promote safer roads and eradicate dangerous road sections. RANKERS is highly innovative in its scope and objectives. The safety analysis will address all types of existing roads (dual-carriageways, motorways, rural and urban roads), integrate human behaviour and vehicle technology considerations and consider both accident prevention and mitigation.

The project's tangible output will include an index used for assessing and monitoring road safety and a catalogue of remedial measures ranked according to their efficiency. Both measures will contribute to the emergence of a European culture of safe road engineering.

There are 17 partners including one ECTRI partners: CDV. CIDAUT (Spain) is the coordinator.

Related Thematic: Road, Safety

**INTRO:** *Intelligent Roads (STREP DG RTD)*

This project aims to address the problems of road safety and capacity by combining sensing technologies and local databases with real time networking technologies.

Project initiated by FEHRL including 11 partners with ECTRI Members' implication: VTI (coordinator), TRL, INRETS.

Related Thematic: ITS, Road

**CAST:** *Implementing mass media campaigns and evaluating their (isolated) effect on traffic accidents and other performance indicators (STREP DG TREN)*

The CAST project aims at meeting the Commission needs for enhancing traffic safety by means of effective road safety campaigns. CAST will develop evaluation tools and a design tool for road safety mass media campaigns. These tools will enable the EC to design and to implement such campaigns and to evaluate their (isolated) effect on traffic accidents and other performance indicators. CAST will then validate and exploit these tools by testing the evaluation tools on an EU-funded campaign (Euchires) and by using the design tool to design and implement a pan-European campaign to support the implementation of a measure that will recently be taken by the EU at that time.

FERSI project including 19 partners with ISBR as coordinator. ECTRI Members' involvement: TØI, INRETS, VTI, DTF, AVV, CDV

Related thematic: Road, Safety

**PEPPER:** *Police Enforcement Policy and Programmes on European Roads (STREP DG TREN)*

The PEPPER proposal looks critically at all relevant aspects of enforcement and aims to produce recommendations and tools for the development of more effective and efficient



traffic law enforcement (TLE). Speeding, drink driving and use of seat belts are especially targeted. The project views the whole enforcement chain. It recognises the need for improved enforcement data and better understanding of the impacts, and studies the potential of innovative technologies in the different links of the enforcement chain.

FERSI project including 17 partners; ECTRI Members' involvement: VTT (coordinator), HIT, CDV, DTF, INRETS, TØI, TRL, UPM, VTI

*Related thematic: Road, Safety*

**CONNECT: Co-ordination of Concepts for new Collective Transport (CA DG RTD)**

The project aims for the development of knowledge repository for new forms of collective transport both freight and passengers, at European level. The project is coordinated by the University of Newcastle (UK) and has 23 partners.

ECTRI Members: VTT

*Related thematic: Road, Multimodal*

**BESTUFS II: Best Urban Freight Solutions II (CA DG TREN)**

This project is a follow-up initiative of the thematic network BESTUFS and aims to maintain and expand an open European network between urban freight transport experts, user groups/associations, ongoing projects, the relevant European Commission Directorates and representatives of national, regional and local transport administrations and transport operators in order to identify, describe and disseminate best practices, success criteria and bottlenecks with respect to City Logistics.

There are 8 partners including CDV. The coordinator is PVT Planing Transport Verkehr, AG (Germany)

*Related thematic: Road, Multimodal*

**SAFECOS05 and SAFECOS07: Safety Competition for Students (SSA DG RTD)**

This project aims to support the work of European students for International conference on road safety, hence stimulating international cooperation.

ECTRI Members involved ERT – INRETS (Coordinator) for E.E.V.C.

*Related Thematic: Road, Safety*

### **3. THE STRUCTURATION OF THE EUROPEAN TRANSPORT RESEARCH AREA - AN EXAMPLE IN FRANCE: MOV'EO COMPETITIVENESS POLE**

It is striking to observe that transport research in most of the European countries is in progress of restructuration, according to the Lisbon and Barcelona spirit. The same guideline is implemented: the search of cluster effects in both fields of basic research and applied research; the development of partnerships between public research and companies; the provision of funds intended to finance projects on calls for tenders. It is possible to find a lot of good examples in European countries. One of the most significant is, in France, the competitiveness pole called MOV'EO.

The French Government launched a call for tenders in summer 2005, in order to identify "competitiveness poles" on the territory, the aim of which is to develop research, development, innovation and training activities on a determined economic sector, so that new activities will develop, creating jobs. 65 poles were created in that way, including about 10 poles in the field of transport. MOV'EO is the most significant of them. Its

activities are distributed among four strategic action domains - domaines d'actions stratégiques (DAS):

- energy and environment
- road safety
- mobility and services
- mecatronics



The activities of the strategic action domains "Road Safety" and "Mobility and Services" benefit from the availability of the test tracks in Versailles Satory. These test tracks were used for IV2002 (15 European prototypes) and ARCOS final event (400 experts and 10 prototypes). They will be used on September 17 to 20 2007, for a first rank new European event: the final meeting of the PREVENT project, the general meeting of e-Safety, and the launching of the initiative by the European Commission. The event will enable to demonstrate the latest progress in terms of autonomous driving aids e.g. headway and safe speed keeping aid, obstacle detection and collision prevention, ram off roadway accident prevention and collision at intersection prevention on 25 experimental vehicles ...

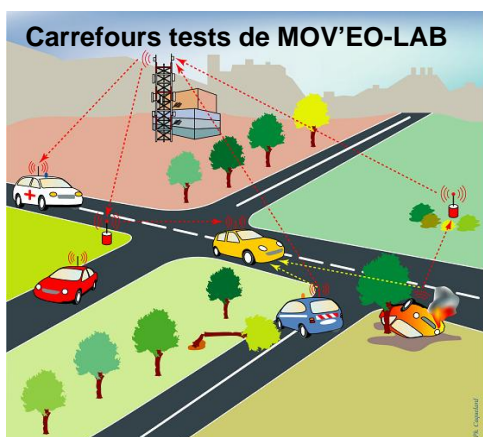
### 3.1 Presentation of the tracks and associated test means



- The test tracks in Satory are at the centre of the project. Three types of tracks represent a 15 km network with large diversity: experimental sections of motorway, highway (national road type), rural (secondary road type) infrastructures; driveways, outlet ends. Their very precise 3D geometrical description is defined with great accuracy, enabling to reconstruct very accurate trajectories. Some intersections exist, some should be completed.



- The development of these tracks is in progress with materials, modifying the « superstructure »: vertical and horizontal traffic signals, cooperative guiding or communicating on full lane or at intersections elements. Some elements are already available: detachable road markings, cooperative magnetic markings (magnets and magnetic layouts on the middle of lanes), reflective roadside elements on curves, transponders on curve starts...



- These tracks will be equipped and completed, through additional experimental devices. The following methodological stakes are taken into account in the tool definition: the confidentiality of the achieved tests on separate tracks, buildings or areas, the test productivity: possible preparation through simulation on synthesis images, possible repetition of the tests, available test vehicles:

MOVEO-Lab will have available test vehicles, making it easier to experiment perception devices (through laser camera, laser, radar) or programmable activators. It will be possible to test the approach of mobile obstacles: the tracks are

equipped with automatons, which are able to drive "collidable" test model obstacles from the road side to the middle of the lane. The time to collision - temps à collision (TLC) is calculated at constant speed and can be programmed (the vehicle is detected by a photoelectric barrier);

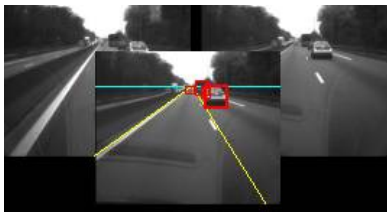


On the track land, it is envisaged to implement test benches, enabling to qualify specific equipments. It was decided to implement a first bench to test on-board perception sensors, allowing repetitive tests in a configurable environment, including lighting and meteorological situations. The test bench will enable to qualify new on-board sensors for obstacle detection.

A second test bench will enable to qualify vehicle-vehicle and vehicle-infrastructure communicating cooperative systems.

### 3.2 Examples of research projects in progress in MOV'EO

#### DO30:



What will be further studied by the LIVIC (an INRETS-LCPC laboratory) is a stereovision method, to enable short and middle range obstacle detection for collision avoidance in urban area and for the decrease of high speed crashes severity. The main technological stakes are associated with the required reliability of the detection and with the dynamic calibration of the cameras. The partners are INRETS-LCPC (LIVIC), Renault, PS, Valéo and the CEA.

#### ANGO:



The project comprises the development of an aid to longitudinal guidance for the buses of TEOR type, using the z profile of the route. An interface will be available for the driver, indicating the driving condition and potential suggestions to reduce fuel consumption, to improve the passenger comfort, and to cross intersections.

Partnership: Veolia transport, Siemens, INRETS...

#### PREVENOR:



The main objective is to prevent ram off roadway accidents. The image processing team works concern the development of measurements: lateral discrepancy, TLC, tangent point...

Partnership: CNRS, INRETS-LCPC, Renault, PSA.

#### **4. CONCLUSION**

Which guideline should be selected on the basis of this presentation?

In the road community, road operation has become a significant stake. It is now at the top of the strategic research agendas:

- energy savings,
- road safety,
- the optimization of infrastructure use, in a context of inter-modality,
- public and private transport in peri-urban areas.

The new technology have been developing even quicker in the fields of on-board communication and complex software, opening a huge potential to vehicle-vehicle and vehicle-infrastructure exchanges. Research and development activities are multiplying on all of these domains, but in the end, vehicles and infrastructures will have to be able to communicate with each other, in an interoperable manner, at least in Europe. It is less and less possible to separate the competition to achieve technological progress and the cooperation to deploy them.

In its fields of activities, ECTRI will thus pursue its efforts to remove barriers.